



**International Test and Evaluation Program  
for Humanitarian Demining**

**ITEP Work Plan 2009**

Portfolio of the ITEP Participants' test and evaluation activities for 2009<sup>1</sup>

**20<sup>th</sup> of March 2009<sup>2</sup>**

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<sup>1</sup> This document is complemented by the ITEP Work Plan 2000 – 2008, which summarises all test and evaluation activities carried out by the ITEP Participants since the creation of ITEP, and that were completed by the end of 2008.

<sup>2</sup> The draft ITEP Work Plan 2009 was compiled using the T&E project updates delivered by the ITEP Participants during the ITEP Work Plan annual revision meeting (Brussels, 3.03.2009). It was endorsed by the ITEP Executive Committee on the 20<sup>th</sup> of March 2009.



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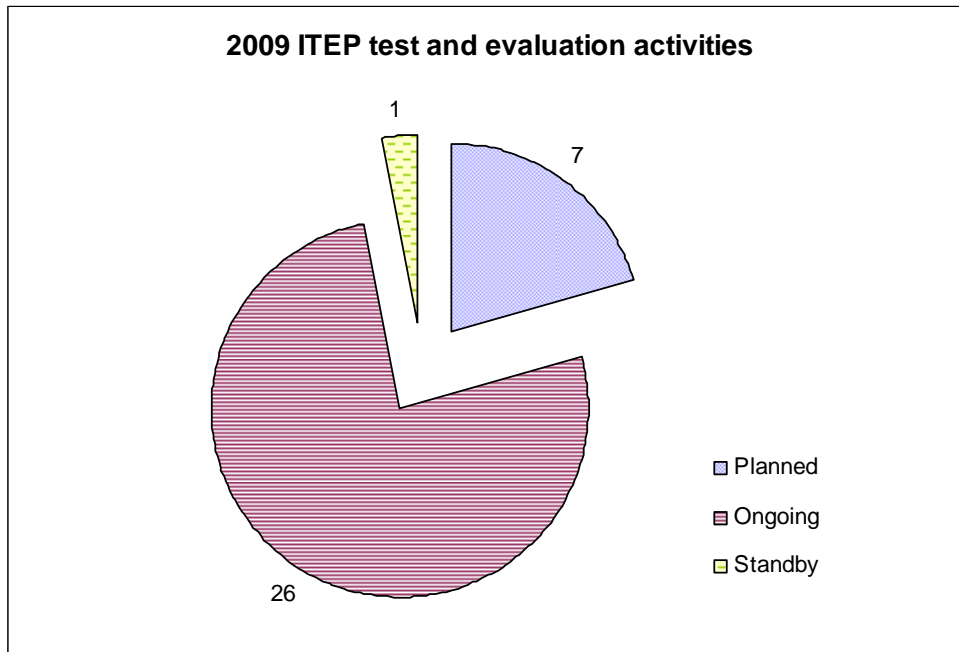
## 1 INTRODUCTION

ITEP was created as a response for the desire to strengthen worldwide demining efforts and it seeks to achieve this through active co-operation among the Participants and also with other agencies and organisations. These efforts are realised through the ITEP Work Plan. Its aim is to increase efficiency by avoiding duplications and feeding lessons learned back into the process. The output is to publish test results and to release them worldwide.

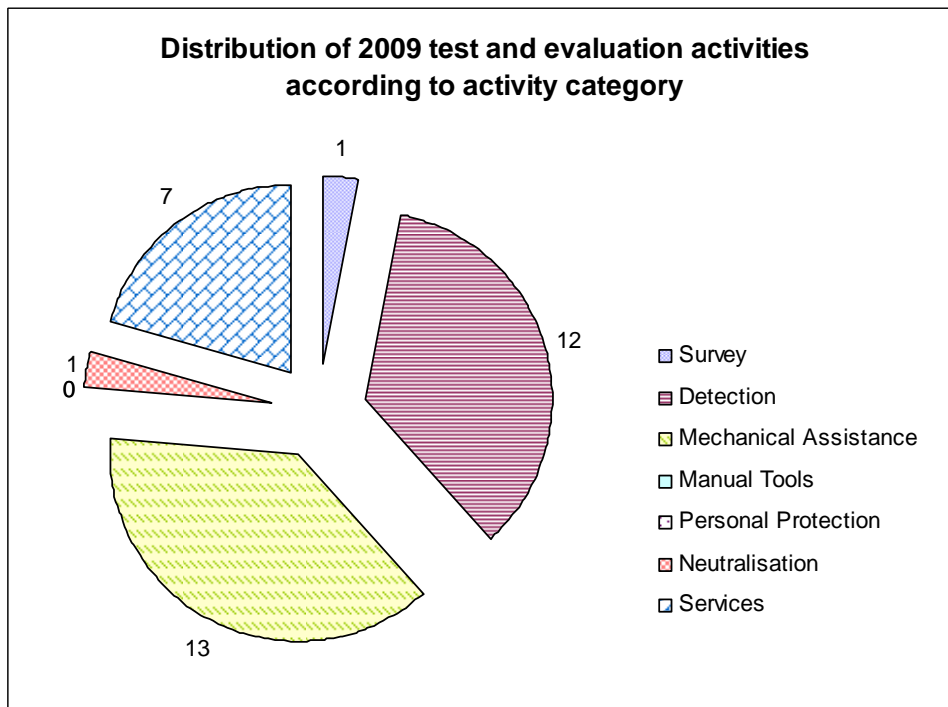
The ITEP Work Plan 2009 reflects the ongoing and planned national or collaborative projects among the ITEP Participants. It is complemented by the ITEP Work Plan 2000 – 2008, which summarises (including conclusions) all test and evaluation activities by the ITEP Participants since the creation of ITEP, and that were completed by the end of 2008.

For clarity and management purposes, the Work Plan is divided into six technical programs: survey, detection, mechanical assistance, personal protection, manual tools and neutralisation. A separate program has been added to cover services provided by the ITEP Secretariat or some ITEP project management groups. The Services program includes, amongst others, capacity building activities, involving mainly training and advice on test methodology to entities in mine affected countries.

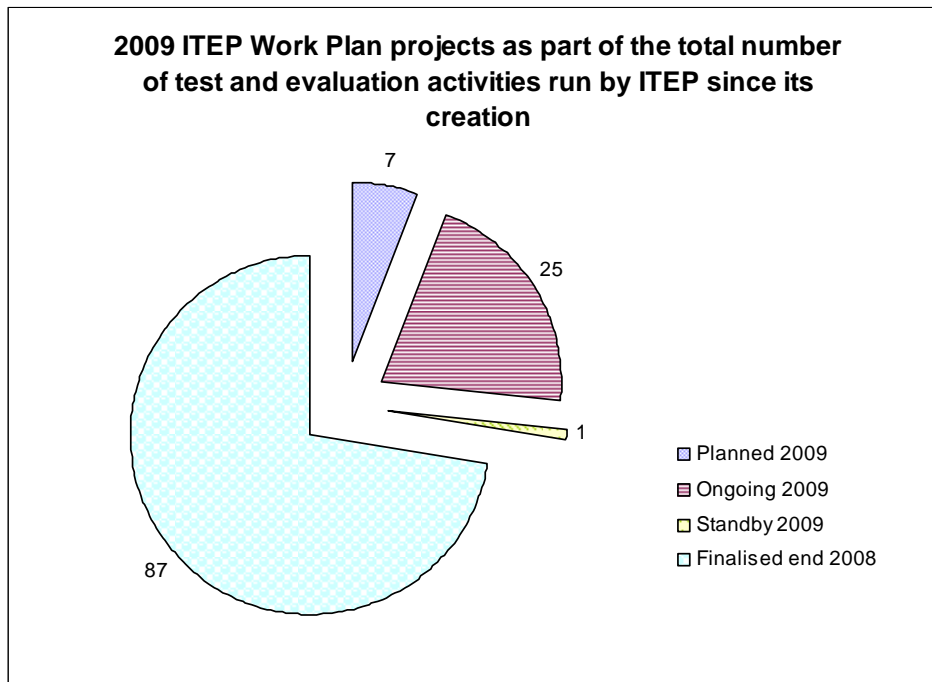
The following graphs provide an idea of the number of ongoing and planned projects for this year (*Graph 1*) and their proportional grouping into the different technical programs (*Graph 2*). *Graph 3* shows the 2008 ITEP Work Plan projects as part of the total number of test and evaluation activities run by ITEP since its creation.



Graph 1



Graph 2



Graph 3

ITEP also maintains a close working relationship with the UNMAS and GICHD, and ITEP Participants are also encouraged to outreach into the user community to seek feedback on the Work Plan and identify user needs.

The ITEP Work Plan documents are available at the ITEP website (<http://www.itep.ws/>) and distribution is also assisted by the UNMAS and GICHD. All ITEP project descriptions can also be consulted via a searchable web database ([http://www.itep.ws/activities/itep\\_workplan/search\\_workplan.php](http://www.itep.ws/activities/itep_workplan/search_workplan.php)), which is frequently updated with new project information provided by the ITEP Participants. It is therefore recommended to consult the ITEP Work Plan database whenever the latest information on ITEP test and evaluation activities is required.

## 2 OVERVIEW OF 2009 TEST AND EVALUATION PROJECTS

### 2.1 Summary statistics

Category	Planned	Ongoing	Standby	Total	
				Number	Percentage
Survey	0	1	0	1	3
Detection	4	8	0	12	35
Metal detector	1	1	0	2	
GPR	1	1	0	2	
Trace explosives	0	0	0	0	
Multi-sensor	1	5	0	6	
Others	1	1	0	2	
Mechanical Assistance	3	10	0	13	38
Manual Tools	0	0	0	0	0
Personal Protection	0	0	0	0	0
Neutralisation	0	1	0	1	3
Services	0	6	1	7	21
Total	7	26	1	34	100

## 2.2 *Projects time scale*

### 2.2.1 SURVEY

Nr	Project	Lead	Partners	2008	2009	2010
1.1	<b>Methodology</b>					
1.2	<b>Test and Evaluation</b>					
1.2.5	Test and Evaluation of the generic SMART methodology <i>Ongoing</i>	BE	HCR - CTRO (Croatia), Faculty of Geodesy - University of Zagreb (Croatia)	*****	*****	*****

### 2.2.2 DETECTION

#### *Metal detector*

Nr	Project	Lead	Partners	2008	2009	2010
2.1.1	<b>Methodology</b>					
2.1.1.5	Metal Detector Performance Project (MDPP). <i>Ongoing</i>	BE	CA	*****	*****	*****
2.1.2	<b>Test and Evaluation</b>					
2.1.2.6	In-soil and in-country performance evaluation of vehicle-mounted metal detection systems. <i>Planned</i>	NL	TBD		*****	*****

**Ground Penetrating Radar**

Nr	Project	Lead	Partners	2008	2009	2010
2.2.1	<b>Methodology</b>					
2.2.2	<b>Test and Evaluation</b>					
2.2.2.3	NIITEK Ground Penetrating Radar system (Mine Stalker). <i>Ongoing</i>	US	Halo Trust, Mines Advisory Group (MAG)	*****	*****	*****
2.2.2.7	Test and evaluation of stand-alone ground penetrating radar systems <i>Planned</i>	DE	TBD	****	*****	*****

**Trace Explosives**

**Multi-sensor**

Nr	Project	Lead	Partners	2008	2009	2010
2.4.1	<b>Methodology</b>					
2.4.1.3	Develop and validate test guidelines for dual-sensor mine detectors consisting of a metal detector and a ground penetrating radar <i>Ongoing</i>	DE	BE, CA, The NL, SE, US, Japan Science and Technology Agency ( <a href="#">JST</a> ) - Tohoku University	*****	*****	*****
2.4.1.4	Soil influence on dual-sensor detection of landmines and UXO <i>Ongoing</i>	DE	CA (Defence Research and Development CA - <a href="#">DRDC</a> ), Japan ( <a href="#">Tohoku University</a> )	*****	*****	*****
7.2.13	Construction of a facility for Metal Detector, Ground Penetrating Radar and Dual-Sensor mine detector testing <i>Ongoing</i>	DE			*****	**

<b>2.4.2</b>	<b>Test and Evaluation</b>								
2.4.2.9	Discriminating Mine Detector (DMD) <i>Ongoing</i>	US		*****	*****	*****	*****		
2.4.2.13	Evaluate the performance of dual-sensor detector in humanitarian demining as compared to stand-alone metal detectors <i>Planned</i>	DE	TBD	****	*****	*****	*****		
2.4.2.11	Handheld STAnd-off MIne Detection System (HSTAMIDS) Long Term Operational Evaluations. <i>Ongoing</i>	US	<a href="#">Halo Trust</a> , Mines Advisory Group ( <a href="#">MAG</a> ), Cambodian Mine Action Centre ( <a href="#">CMAC</a> ), Thailand Mine Action Centre ( <a href="#">TMAC</a> )	*****	*****	*****	*****		

*Others*

Nr	Project	Lead	Partners	2008	2009	2010
<b>2.5.1</b>	<b>Methodology</b>					
<b>2.5.2</b>	<b>Test and Evaluation</b>					
2.5.2.7	Magnetic clutter reduction quantification. <i>Planned</i>	The NL	Cambodian Mine Action Centre ( <a href="#">CMAC</a> ), Norwegian People Aid ( <a href="#">NPA</a> )	*****	*****	*****
3.2.38	Robotic Mine Detector (100 Bot). <i>Ongoing</i>	US	Cambodian Mine Action Center (CMAC)	*****	*****	*****

**2.2.3 MECHANICAL ASSISTANCE**

Nr	Project	Lead	Partners	2008	2009	2010
<b>3.1</b>	<b>Methodology</b>					
3.1.4	Methodology for the test and evaluation of mobile robotics for the detection of AP mines. <i>Ongoing</i>	BE	International Advanced Robotics Program (IARP)	*****	*****	*****
3.1.6	Update of the CEN Workshop Agreement on Test and Evaluation of Demining Machines (CWA 15044:2004) <i>Ongoing</i>	CA	SE, GICHD, IS		*****	***
<b>3.2</b>	<b>Test and Evaluation</b>					
3.2.6	Tempest <i>Ongoing</i>	US	Accelerated Demining Program Mozambique (ADP), Thailand Mine Action Centre (TMAC), Cambodian Mine Action Centre (CMAC), Mines Advisory Group (MAG), Halo Trust, National Demining Center of Ecuador	*****	*****	*****
3.2.9	Test, evaluate and upgrade the Mini-Mulcher (MAXX). <i>Ongoing</i>	US	National Mine Action Coordination Centre of Guinea Bissau, People Against Landmines (MgM)	*****	*****	*****
3.2.31	Mini-Mulcher (MAXX+) <i>Ongoing</i>	US	Mines Advisory Group (MAG), People Against Landmines (MgM)	*****	*****	*****



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3.2.13	HALO Trust mechanical equipment development. <i>Ongoing</i>	US	<a href="#">HALO Trust</a>	*****	*****	*****	*****		
3.2.20	Multi-Tooled Excavator <i>Ongoing</i>	US	Cambodian Mine Action Centre (CMAC) , <a href="#">Chilean National Demining Commission</a> , <a href="#">HALO Trust</a> , Mines Advisory Group (MAG)	*****	*****	*****	*****		
3.2.39	Rapid Area Preparation Tool (RAPTOR) <i>Ongoing</i>	US	<a href="#">HALO Trust</a>	*****	*****	*****	*****		
3.2.40	Severe Terrain Off Route Menzi-Muck (STORM) <i>Ongoing</i>	US	<a href="#">HALO Trust</a>	*****	*****	*****	*****		
3.2.46	Flail fundamentals <i>Ongoing</i>	CA	TBD	*****	*****	*****	*****	*****	*****
3.2.48	Test and Evaluation of the MV4 Tiller <i>Planned</i>	SE				*			
3.2.49	Test and Evaluation of the Bozena 5 Flail and Tiller <i>Planned</i>	SE	CA				*		
3.2.50	Test and Evaluation of Scanjack 3500 with Single Flail and Tiller <i>Planned</i>	SE					*		

**2.2.4 MANUAL TOOLS**

**2.2.5 PERSONAL PROTECTION**

**2.2.6 NEUTRALIZATION**

Nr	Project	Lead	Partners	2008	2009	2010
<b>6.1</b>	<b>Methodology</b>					
<b>6.2</b>	<b>Test and Evaluation</b>					
6.2.11	Explosive Harvesting System (EHS) <i>Ongoing</i>	US	<a href="#">Golden Humanitarian Foundation</a> , Cambodian Mine Action Centre ( <a href="#">CMAC</a> ), Mines Advisory Group ( <a href="#">MAG</a> ), <a href="#">Halo Trust</a>	*****	*****	*****

**2.2.7 SERVICES**

Nr	Project	Lead	Partners	2008	2009	2010
<b>7.1</b>	<b>Input</b>					
7.1.2	Collect test reports and information on national programs. <i>Ongoing</i>	IS	All ITEP Participants and other entities producing HD demining equipment test reports	*****	*****	*****
7.1.3	Establish contacts with mine action partners world wide. <i>Ongoing</i>	IS	All ITEP Participants	*****	*****	*****
7.1.4	Lessons learned from test and evaluation. <i>Ongoing</i>	IS	All ITEP Participants	*****	*****	*****
<b>7.2</b>	<b>Output</b>					
7.2.1	Follow up on requests for advice on test and evaluation procedures. <i>Standby</i>					
7.2.2	Maintenance and upgrade of the ITEP website. <i>Ongoing</i>	IS	All ITEP Participants.	*****	*****	*****
7.2.3	Humanitarian Demining Research and Development	US		*****	*****	



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	technologies information materials and website. <i>Ongoing</i>								
7.2.5	Support to the Geneva International Centre for Humanitarian Demining (GICHD) detection and mechanical equipment catalogues. <i>Ongoing</i>	IS	All ITEP Participants	*****	*****	*****	*****	*****	*

(\*) **Partners:** BE = Belgium, CA = Canada, DE = Germany, NL = The Netherlands, SE = Sweden, US = United States, IS = ITEP Secretariat

## 2.3 DESCRIPTION OF ONGOING AND PLANNED PROJECTS

### 2.3.1 SURVEY

Project No.:	<b>1.2.5</b>
Title:	<b>Test and Evaluation of the generic SMART methodology</b>
Description:	The SMART methodology is a wide area survey methodology that was developed during a European Commission (EC) Information Society Technology (IST) project and rigorously validated over a test area of 50 km <sup>2</sup> in Croatia. The system is based on fusion of sensor data (SAR, multispectral, color IR), expert knowledge, data from the mine information system and contextual information. In-house developed, as well as COTS image and data processing tools are used and human interpretation is also included in the processing-analysis-decision loop. The system, however, was not fully developed and integrated. The current project foresees further development, integration and the deployment of the system in three new areas.
Aim:	Validation of the system in preparation for its deployment in Croatia.
Request:	Centre for Testing, Development and Training ( <a href="#">CROMAC-CTRO</a> , Croatia), Croatian Mine Action Centre ( <a href="#">CROMAC</a> )
Category:	Survey
Type:	Test and Evaluation
Equipment:	SMART (version 05 and additional software modules)
Development:	Prototype/Demonstrator
Time Frame:	2008-01-01 to 2009-12-31
Place:	HCR-CTRO (Croatia), Faculty of Geodesy - University of Zagreb (Croatia), Royal Military Academy (RMA, Belgium)
Lead Nation:	Belgium
Partners:	HCR - CTRO (Croatia), Faculty of Geodesy - University of Zagreb (Croatia)
Point of contact:	Yann Yvinec
E-mail:	<a href="mailto:yvinec@elec.rma.ac.be">yvinec@elec.rma.ac.be</a>
Status:	Ongoing
Comments:	<ul style="list-style-type: none"> <li>• The presentations of the workshop <a href="#">Inventory and analysis of operationally validated results related to mine action space - and airborne surveys</a> (Zagreb, Croatia, 30.11.2005), are available via the ITEP website.</li> <li>• The SMART methodology will be deployed in three new test sites in Croatia: Gospić, Drniš and Bilje. Flight campaigns are foreseen in 2009.</li> <li>• Deployment of the SMART methodology outside of Croatia is also planned, probably in Bosnia and Herzegovina.</li> <li>• The HCR-CTRO organised a <a href="#">Workshop on the Introduction and training of a decision support system for mine action managers</a> in January 2009 in the framework of the related project <i>Deployment of the Decision Support System for Mine Suspected Area Reduction</i>.</li> <li>• A feasibility study on the use of <a href="#">Pleiades and COSMO-SkyMed satellite data</a> confirmed that the application of the latter high spatial resolution satellite images</li> </ul>

	instead of airborne data would be possible.
Results/Conclusions:	The latest results are expected to be presented at the Humanitarian Demining Symposium 2009, in Sibenik, Croatia

### 2.3.2 DETECTION

#### Metal detector

Project No.:	<b>2.1.1.5</b>
Title:	<b>Metal Detector Performance Project (MDPP).</b>
Description:	<p>MDPP is a tentative program to establish an objective and systematic T&amp;E procedure of metal detectors that will allow to predict capabilities of detectors in a specific environment for a specific threat with a specific operational procedure (SOP) and against a specific Statements Of Requirements (SOR). The results could be useful to propose improvements to the <a href="#">CEN Workshop 7</a>. It puts emphasis on understanding by answering not only which detector performs better but also why. It aims to provide more precise answers in specific scenarios of interest for a given user. It also stresses the need for modeling and well-chosen measurements in order to reach maximum re-usability of the performed measurements. This is mandatory to obtain answers for the huge diversity of scenarios encountered and is the only solution to guarantee the high reliability called for in humanitarian demining with a realistic number of measurements.</p> <p>The major underlying hypothesis is that the different components, soil, target, metal detector and operator may be decoupled to a certain extent allowing for independent measurements on the targets, soils, detectors and operators of interest. The limits of the latter hypothesis will be studied and in some cases, limited coupling will have to be considered. The model will predict the detection depth for a given detector, for a given target, in a given soil, as a function of the horizontal relative position of the target and the detector. Then taking into account a model of the scanning path, it will predict a detection depth statistics for an operator. The model will further be validated for a limited number of detectors, targets and environmental conditions (soil types). The final report will include a description of the developed methodology for performance assessment, its evaluation and plans for further developments.</p>
Aim:	Development and validation of a model to predict metal detector performance based on knowledge of the environment, the target characteristics and the demining procedure used. Definition of a limited number of well-chosen measurements needed as input.
Request:	Belgium
Category:	Detection - Metal detector
Type:	Methodology
Equipment:	N/A
Development:	N/A
Time Frame:	2003-06-01 to 2009-06-31
Place:	Belgium, Canada
Lead Nation:	Belgium
Partners:	Canada
Point of contact:	Pascal Druyts
E-mail:	<a href="mailto:pascal.druyts@rma.ac.be">pascal.druyts@rma.ac.be</a>

Status:	Ongoing
Comments:	<ul style="list-style-type: none"> <li>• This modelling effort is performed in the scope of a Ph.D. thesis funded by the Belgian Ministry of Defence (BEMAT project). The thesis is co-promoted by <a href="#">UCL</a> and <a href="#">RMA</a> and <a href="#">Defence Research and Development (DRDC)</a> acts as a scientific advisor.</li> <li>• The project could constitute the first phase of a systematic program aiming to evaluate mine detection systems through a limited set of experimental data and a good understanding of the detection physics. The prediction will be evaluated by comparing with measurements performed on real targets and in real soil during related measurements campaigns.</li> <li>• The project is planned to finish in 2009 and the results will be published in the corresponding PhD thesis which will be made available at the RMA website.</li> </ul>
Results/Conclusions:	<ul style="list-style-type: none"> <li>• Intermediate results of the project can be found in a <a href="#">SPIE 2006</a> and a <a href="#">EUCAP 2006</a> publication as well as in the <a href="#">presentation</a> given at the Cranfield Soil Magnetism Workshop 2008.</li> <li>• Further results are also presented in the paper <b>Modelling the Response of Electromagnetic Induction Sensors to Inhomogeneous Magnetic Soils with Arbitrary Relief</b>, which has been accepted for publication in an IEEE Transactions on Geoscience and Remote Sensing 2009 issue.</li> </ul>

Project No.:	<b>2.1.2.6</b>
Title:	<b>In-soil and in-country performance evaluation of vehicle-mounted metal detection systems.</b>
Description:	This project is a follow-up of the <a href="#">ITEP Project 2.1.2.5</a> . The detection performance of COTS vehicle-mounted metal detection systems will be assessed for mine-like objects buried in different soil types. This phase of the project will be done under controlled conditions where the systems under test are mounted on a special measurement bridge. In the in-country test phase, the systems will be tested under (simulated) operational conditions. The systems will be mounted on a vehicle, exposed to the local climate and tested on mine-like objects and indigenous clutter.
Aim:	Assessment of the detection performance of COTS vehicle-mounted metal detection systems for a limited number of soil types and in a limited number of mine-affected countries.
Request:	<a href="#">GICHD</a>
Category:	Detection - Metal detector
Type:	Test and Evaluation
Equipment:	<a href="#">Schiebel</a> VAMIDS, Ebinger MD array and Minelab <a href="#">STMR</a>
Development:	COTS
Time Frame:	TBD
Place:	<a href="#">TNO</a> , The Hague, The Netherlands; mine-affected countries (TBD)
Lead Nation:	The Netherlands
Partners:	Canada
Point of contact:	Arnold Schoolderman
E-mail:	<a href="mailto:arnold.schoolderman@tno.nl">arnold.schoolderman@tno.nl</a>
Status:	Planned

Comments:	<ul style="list-style-type: none"> <li>• The start and execution of this project depends on the results and experiences of the in-air and limited in-soil performance evaluation of vehicle-mounted metal detection systems carried out by Defence Research and Development Canada - DRDC (<a href="#">ITEP Project 2.1.2.5</a>).</li> <li>• DRDC (<a href="#">ITEP Project 2.1.2.5</a>) will make the Minelab STMR array available to the Netherlands for further testing</li> <li>• Proposal is submitted under reservation of national funding.</li> </ul>
Results/Conclusions:	

### Ground Penetrating Radar

Project No.:	<b>2.2.2.3</b>
Title:	<b>NIITEK Ground Penetrating Radar system (Mine Stalker).</b>
Description:	The Mine Stalker system is a 2.4-meter Ground Penetrating Radar antenna integrated on a remote control platform. The system is computer controlled with GPS tracking. It allows for real time detection and marking of anti-tank landmines. The 2006 and 2007 project developed a ruggedized field ready system based on the lessons learned during the Angola operational field evaluation in November 2005. The current version has incorporated new discrimination algorithms for increased detection capability and better clutter rejection.
Aim:	Integrate, test and evaluate the NIITEK Ground Penetrating Radar (VISOR GPR array) as a mine detector. Outcome - Prototype hardware and test report.
Request:	Users and donors.
Category:	Detection - GPR
Type:	Test and Evaluation
Equipment:	<a href="#">NIITEK VISOR GPR</a> , <a href="#">Mine Stalker</a>
Development:	Prototype/Demonstrator
Time Frame:	2002-03-01 to 2009-12-01
Place:	United States, CECOM-RDEC, NVESD, Namibia, Angola, Cambodia
Lead Nation:	United States
Partners:	Halo Trust, Mines Advisory Group (MAG)
Point of contact:	Lee Offen
E-mail:	<a href="mailto:lee.offen@nvl.army.mil">lee.offen@nvl.army.mil</a>
Status:	Ongoing
Comments:	<ul style="list-style-type: none"> <li>• <a href="#">A field trial in Angola</a> of the smaller initial prototype system occurred in fall 2005.</li> <li>• The Mine Stalker completed testing in Cambodia against anti-tank mines found in South East Asia at an extensive field test site constructed with 6 different soils from all over Cambodia by the U.S. Humanitarian Demining Program (U.S. HDP).</li> <li>• The Mine Stalker system is now on its way to Angola for an operational field evaluation with Halo Trust in 2009.</li> </ul>
Results/Conclusions:	<ul style="list-style-type: none"> <li>• <a href="#">Some results</a> of the first field evaluation were made available in spring 2006. The initial prototype Mine Stalker system achieved a Probability of Detection of 99.6 % operating against a variety of threats which included the challenging low-metal anti-tank mines.</li> </ul>

	<ul style="list-style-type: none"> <li>• Results of the 2008 three-week Cambodia trial are very encouraging. The system has achieved a Probability of Detection of 100% including testing with vegetation, pot holes and uneven terrain. False alarm rates per square meter range from 0.007 to 0.2 depending on the soil type. More details can be found in a <a href="#">SPIE 2008 presentation</a>.</li> </ul>
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Project No.:	<b>2.2.2.7</b>
Title:	<b>Test and evaluation of stand-alone ground penetrating radar systems</b>
Description:	Test and evaluate a stand-alone ground penetrating radar as a follow-up sensor to a metal detector.
Aim:	Evaluate the usefulness of a stand-alone ground penetrating radar as a follow-up detector to a metal detector as an alternative to a dual-sensor mine detector.
Request:	UNMAS
Category:	Detection - GPR
Type:	Test and Evaluation
Equipment:	Geological Prospecting <a href="#">MIRADOR</a> and <a href="#">GEOSCOPE</a> GPR systems, ERA Technology GPR system
Development:	COTS
Time Frame:	2008-03-01 to 2009-12-31
Place:	Technical Center for Protective & Special Technologies WTD 52, Oberjettenberg
Lead Nation:	Germany
Partners:	Belgium, Canada, The Netherlands, GICHD
Point of contact:	Joachim Sigmund
E-mail:	<a href="mailto:JoachimSigmund@bmvg.bund.de">JoachimSigmund@bmvg.bund.de</a>
Status:	Planned
Comments:	<ul style="list-style-type: none"> <li>• This trial will be executed together with the German ITEP dual-sensor detector trial (<a href="#">ITEP Project 2.4.2.13</a>) at the end of September - beginning of October 2009.</li> <li>• This trial was originally also planned to be executed as a sub-trial of the cancelled 2007 BAM/ITEP dual-sensor detector trial (<a href="#">ITEP Project 2.4.2.12</a>)</li> </ul>
Results/Conclusions:	

## Trace Explosives

### Multi-sensor

Project No.:	<b>2.4.1.3</b>
Title:	<b>Develop and validate test guidelines for dual-sensor mine detectors consisting of a metal detector and a ground penetrating radar</b>
Description:	<p>The project is planned to be carried out in two phases:</p> <ul style="list-style-type: none"> <li>• The first phase includes the preparation of a first version of an optimal reliability test design for dual sensor mine detectors based on previous trial experiences with handheld close-in detection systems and recommendations from the ITEP Working Group on</li> </ul>

	<p>Multi Sensors (ITEP WGMS).</p> <ul style="list-style-type: none"> <li>The second phase consists of the finalisation of the proposed draft test guidelines taking into account lessons learned from validation testing of commercially available (without restrictions) dual-sensor mine detectors in controlled conditions (<a href="#">ITEP Project 2.4.2.13</a>).</li> </ul>
Aim:	Compile final test test guidelines for dual sensor mine detectors
Request:	Manufacturers, Mine Action Authorities, GICHD, UNMAS
Category:	Detection - Multi-sensor
Type:	Methodology
Equipment:	Commercially available dual sensor detectors (Vallon MINEHOUND TM, ALIS and Ebinger EBEX/TRGEO)
Development:	COTS, Prototype/Demonstrator
Time Frame:	2006-10-01 to 2009-12-31
Place:	<a href="#">BAM</a> , Centre for Testing, Development and Training (CROMAC-CTRO - <a href="#">Benkovac test facility</a> (Croatia), Technical Center for Protective and Special Technologies - WTD 52 (Germany). The latter is a new test facility constructed specifically for dual-sensor testing ( <a href="#">ITEP Project 7.2.13</a> )
Lead Nation:	Germany
Partners:	Belgium, Canada, The Netherlands, Sweden, United States, Japan Science and Technology Agency ( <a href="#">JST</a> ) - Tohoku University
Point of contact:	Joachim Sigmund
E-mail:	<a href="mailto:JoachimSigmund@bmv.g.bund.de">JoachimSigmund@bmv.g.bund.de</a>
Status:	Ongoing
Comments:	<ul style="list-style-type: none"> <li>A BAM/ITEP field trial to validate the first version of the developed dual-sensor test guidelines was planned from the 17th of September to the 19th of October 2007 at the Benkovac test site in Croatia (<a href="#">ITEP project 2.4.2.12</a>). However, this trial had to be cancelled at the last moment due to the short term unavailability of two of the COTS dual-sensor detector systems.</li> <li>From the 22nd to the 26th of October 2007, several dual-sensor mine detector systems developed by the Japanese Science and Technology Agency (<a href="#">JST</a>) were tested by the Croatian Mine Action Centre - Centre for Testing Development and Training (<a href="#">CROMAC-CTRO</a>) in co-operation with the JST using the draft trial protocol, developed by BAM for the cancelled ITEP dual-sensor detector trial. ITEP representatives from Canada (DRDC) and Belgium (RMS) attended the trial to observe, comment and evaluate the test procedures used (<a href="#">ITEP Project 7.2.12</a>). This trial can be considered as a first step in the validation process of the proposed test guidelines for dual-sensor detectors.</li> <li>Further changes to the proposal guidelines for reliability tests of dual-sensors in humanitarian demining were discussed in the ITEP Working Group on Test and Evaluation of Multi Sensor Detectors (ITEP WGMS) in 2008 and will be used as a living framework guideline document for the ITEP 2009 dual-sensor detector trial in Germany (<a href="#">ITEP Project 2.4.2.13</a>).</li> </ul>
Results/Conclusions:	

Project No.:	<b>2.4.1.4</b>
Title:	<b>Soil influence on dual-sensor detection of landmines and UXO</b>
Description:	Soils can negatively affect the performance of electromagnetic detectors (metal detectors and ground penetrating radars). Therefore the determination of the physical properties of different soil types with different parent materials is important. This project measures the absolute values, frequency dependency and spatial variability of the physical soil properties. The investigations comprise physical properties as well as geoscientific aspects.
Aim:	The aim is to quantify the physical parameters and to relate them to soil types, soil development and their parent material. This will lead to a soil classification system which can be used to estimate soil influence on detector performance.
Request:	German Armed Forces
Category:	Detection - Multi-sensor
Type:	Methodology
Equipment:	N/A
Development:	N/A
Time Frame:	2007-04-01 to 2009-12-31
Place:	Hannover (Leibniz Institute for Applied Geophysics, <a href="#">LIAG</a> ) and the Technical Center for Protective & Special Technologies WTD 52 test facility in Oberjettenberg, Germany + worldwide soil samples
Lead Nation:	Germany
Partners:	Canada (Defence Research and Development Canada - <a href="#">DRDC</a> ), Japan ( <a href="#">Tohoku University</a> )
Point of contact:	Joachim Sigmund
E-mail:	<a href="mailto:JoachimSigmund@bmvg.bund.de">JoachimSigmund@bmvg.bund.de</a>
Status:	Ongoing
Comments:	<ul style="list-style-type: none"> <li>• This project is a continuation of the archived <a href="#">ITEP Project 2.1.1.4</a>, which was led by Canada. The Defence Research and Development Canada (DRDC) is now supporting the current work by providing additional Canadian developed equipment (UTEMIS) to measure the magnetic susceptibility spectrum of a subset of the world soil samples archived at the Leibniz Institute for Applied Geophysics (LIAG).</li> <li>• A collaboration has also been agreed with the Japanese Tohoku University during which seasonal variations of soil properties and GPR performance will be studied with as main objective to better understand the soil influence on the performance of a dual-sensor detector.</li> <li>• The LIAG has carried out previous soil characterisation work for the STEMMD project (<a href="#">ITEP Project 2.1.2.3</a>) and the Humin/MD project (<a href="#">ITEP Project 2.1.1.7</a>). The results are available in a series of reports: <a href="#">Ispra test lanes</a>, <a href="#">Moamba test lanes</a>, <a href="#">Benkovac natural soil</a>, and <a href="#">a frequency dependent complex magnetic susceptibility analysis</a>.</li> <li>• Soil samples from <i>uncooperative soil</i> sites around the world are welcome for further analysis in the LIAG, Hannover.</li> </ul>
Results/Conclusions:	<ul style="list-style-type: none"> <li>• Some initial findings of the project are discussed in a <a href="#">June 2008 Geotimes article</a>.</li> <li>• Further results can be found in <a href="#">a presentation</a> given at the <a href="#">August 2008</a></li> </ul>

	<p><a href="#">Workshop on Soil Magnetism</a> in Cranfield, UK. The latter presentation includes amongst others a soil classification system and a map for Angola depicting the likely influence of soil on metal detectors. More details on the latter soil classification for Angola can be found in the <a href="#">presentation</a> given at the 2009 ITEP Work Plan meeting.</p>
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Project No.:	<b>7.2.13</b>
Title:	<b>Construction of a facility for Metal Detector, Ground Penetrating Radar and Dual-Sensor mine detector testing</b>
Description:	Germany is preparing a new facility for testing of metal detector, ground penetrating radar and dual-sensor mine detectors (MD/GPR/DS). This facility is specifically designed to be able to evaluate dual-sensor mine detectors according to ITEP test guidelines for dual-sensor mine detectors ( <a href="#">ITEP Project 2.4.1.3</a> )
Aim:	Design and construct a MD/GPR/DS test facility for military and humanitarian purposes.
Request:	German Armed Forces
Category:	Detection - Metal detector, GPR, Multi-sensor
Type:	Output
Equipment:	N/A
Development:	COTS
Time Frame:	2008-01-01 to 2009-08-31
Place:	Technical Center for Protective & Special Technologies WTD 52, Oberjettenberg
Lead Nation:	Germany
Partners:	
Point of contact:	Joachim Sigmund
E-mail:	<a href="mailto:JoachimSigmund@bmvg.bund.de">JoachimSigmund@bmvg.bund.de</a>
Status:	Ongoing
Comments:	<ul style="list-style-type: none"> <li>• The test facility is currently under construction and includes 12 test lanes (see <a href="#">map</a>) with soils representing a wide range of electromagnetic characteristics, ranging from low magnetic susceptibilities and low frequency dependency of the magnetic susceptibility to very high values of the latter two soil characteristics.</li> <li>• This test facility will be accessible to NATO – Partnership for Peace (PfP) partners, ITEP partners and equipment manufacturers (charge required) - starting in November 2009.</li> </ul>
Results/Conclusions:	

Project No.:	<b>2.4.2.9</b>
Title:	<b>Discriminating Mine Detector (DMD)</b>
Description:	This project will design and develop a handheld detector using the hardware/software enhancement components and lessons learned from the HSTAMIDS. Accelerometers to aid in training will be part of the improved system.
Aim:	Develop, test and evaluate an enhanced dual sensor detector. Outcome - Prototype



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	hardware and a test report.
Request:	Users, Donors, NMAAs
Category:	Detection - Multi-sensor
Type:	Test and Evaluation
Equipment:	N/A
Development:	COTS
Time Frame:	2006-01-01 to 2009-12-31
Place:	United States, US CECOM-RDEC, NVESD, Countermine Division, Ft. Belvoir, VA, Humanitarian Demining Test Facility, and other countries (TBD).
Lead Nation:	United States
Partners:	
Point of contact:	Lee Offen
E-mail:	<a href="mailto:lee.offen@nvl.army.mil">lee.offen@nvl.army.mil</a>
Status:	Ongoing
Comments:	Trials are ongoing
Results/Conclusions:	

Project No.:	<b>2.4.2.11</b>
Title:	<b>Handheld STAnd-off MIne Detection System (HSTAMIDS) Long Term Operational Evaluations.</b>
Description:	This project deploys the current Handheld STAnd-off MIne Detection System (HSTAMIDS) for Long Term Operational Evaluations in a variety of humanitarian demining locations. Long Term Operational Evaluations have taken place in Afghanistan and Thailand, are ongoing in Cambodia and are planned to start in Angola. During these evaluations, the system is operationally employed as the primary detector by local deminers in minefields for an extended period (up to a year) by local deminers. Data is collected on system and operator performance.
Aim:	Long Term Operational Evaluations of the Handheld STAnd-off MIne Detection System (HSTAMIDS) handheld detector. Outcome - Test and evaluation report.
Request:	Users, Donors, NMAAs
Category:	Detection - Multi-sensor
Type:	Test and Evaluation
Equipment:	Handheld STAnd-off MIne Detection System ( <a href="#">HSTAMIDS</a> )
Development:	COTS (fielded military system, to be used in humanitarian demining by special arrangement with the U.S.Department of Defense)
Time Frame:	2006-03-01 to 2009-12-31
Place:	Thailand, Afghanistan, Cambodia, Angola
Lead Nation:	United States
Partners:	<a href="#">Halo Trust</a> , Mines Advisory Group ( <a href="#">MAG</a> ), Cambodian Mine Action Centre ( <a href="#">CMAC</a> ), Thailand Mine Action Centre ( <a href="#">TMAC</a> )



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Point of contact:	Lee Offen
E-mail:	<a href="mailto:lee.offen@nvl.army.mil">lee.offen@nvl.army.mil</a>
Status:	Ongoing
Comments:	<ul style="list-style-type: none"> <li>• This project is complementary to the Handheld STAnd-off Mine Detection System (HSTAMIDS) Operational Field Trials and Demonstration project (<a href="#">ITEP Project 2.4.2.6</a>).</li> <li>• For an extended period (nearly 2 years) the system has been operationally employed in more than 50 minefields as the primary detector by local deminers managed by the Halo Trust. The operations with the Halo Trust, the lead NGO for HSTAMIDS fielding, have led to the development of new time and cost saving operating procedures and demining team organisational structures that take advantage of the HSTAMIDS superior probability of detection and remarkable clutter rejection capability.</li> <li>• The Long Term Operational Field Evaluations have been completed in Afghanistan (May-July 2006) and Thailand (September 2006 - March 2007) with the Halo Trust and TMAC respectively. The operational field evaluation is still ongoing in Cambodia. The system is now in use by the Halo Trust (since April 2006), MAG (since December 2007) and CMAC (since December 2008).</li> <li>• The Halo Trust has acquired an additional 50 HSTAMIDS units of their own to support its field operations in Cambodia, Afghanistan and Angola, and has established an HSTAMIDS training site in Cambodia to support Halo Trust operations in mine impacted countries in Asia and Africa.</li> </ul>
Results/Conclusions:	<ul style="list-style-type: none"> <li>• Results are available in presentations given at the <a href="#">SPIE 2007 conference</a>, the <a href="#">2008 ITEP Work Plan meeting</a> and the <a href="#">2009 ITEP Work Plan meeting</a>.</li> <li>• An <a href="#">article</a> in the Journal of Mine Action (Issue 12.1, summer 2008) gives an overview of the HSTAMIDS operational field evaluation with the HALO Trust. Operational results are presented for the period March 2006 to June 2008.</li> <li>• Operational results are also available in the U.S. Humanitarian Demining Research and Development Program (HDP) <a href="#">HSTAMIDS fact sheet</a>.</li> </ul>

Project No.:	<b>2.4.2.13</b>
Title:	<b>Evaluate the performance of dual-sensor detector in humanitarian demining as compared to stand-alone metal detectors</b>
Description:	The trial will consist of a reliability trial in which the performance of commercially available dual-sensor detectors (probability of detection and false alarm rate) will be assessed and compared to the corresponding stand-alone metal detectors.
Aim:	Assess the ability of the added ground penetrating radar system in a dual-sensor mine detector as well as its capacity to reduce the false alarm rate in comparison to the corresponding stand-alone metal detectors (MD). Evaluate detector efficiency criteria.
Request:	German Ministry of Foreign Affairs, German Armed Forces, Mine Action Authorities, GICHD, UNMAS
Category:	Detection - Multi-sensor
Type:	Test and Evaluation
Equipment:	Dual sensor detectors available for testing ( <a href="#">MINEHOUND TM</a> , <a href="#">ALIS</a> and Ebinger EBEX/TREO)
Development:	COTS, Prototype
Time Frame:	2008-03-01 to 2009-12-31

Place:	Technical Center for Protective & Special Technologies WTD 52, Oberjettenberg
Lead Nation:	Germany
Partners:	Belgium, Canada, The Netherlands, GICHD
Point of contact:	Joachim Sigmund
E-mail:	<a href="mailto:JoachimSigmund@bmvg.bund.de">JoachimSigmund@bmvg.bund.de</a>
Status:	Planned
Comments:	<ul style="list-style-type: none"> <li>• The execution of the trial is planned for the end of September - beginning of October 2009. The test facility is currently being prepared (<a href="#">ITEP Project 7.2.13</a>).</li> <li>• The project will serve to validate the methodology and procedures proposed in the dual-sensor test guidelines (<a href="#">ITEP Project 2.4.1.3</a>) for particular local conditions and available techniques.</li> <li>• This project is the trial which was previously planned to be executed in 2007 in Croatia ( <a href="#">ITEP Project 2.4.2.12</a>) and later cancelled, but the trial methodology was revised during 2008 - 2009 by the ITEP Working Group on Test and Evaluation of Multi Sensors (ITEP WGMS). The German Armed Forces took over the responsibility from the German Institute for Materials Testing (<a href="#">BAM</a>) for the execution of this project at the end of 2007 when BAM ceased all activities related to test and evaluation of humanitarian demining equipment.</li> <li>• Trial director: <a href="#">Dr. Henche</a>, Technical Center for Protective and Special Technologies (WTD 52).</li> </ul>
Results/Conclusions:	

### Others

Project No.:	<b>2.5.2.7</b>
Title:	<b>Magnetic clutter reduction quantification.</b>
Description:	<p>The project consists of two phases:</p> <ul style="list-style-type: none"> <li>• The first project phase objectives are to select a suitable hand-held permanent magnet for removal of metallic clutter on the minefield surface, to develop an adapted training procedure for the use of the magnet by indigenous deminers and to assess the clutter reduction factor when using a handheld magnet.</li> <li>• The second phase, planned for 2009, is a pilot implementation of the TNO adapted magnet tool in manual demining operations in a mine affected country.</li> </ul>
Aim:	Quantification of the metallic clutter reduction by the use of a hand-held magnet in humanitarian demining operations.
Request:	<a href="#">GICHD</a> , <a href="#">UNMAS</a>
Category:	Detection - Others
Type:	Test and Evaluation
Equipment:	Hand-held permanent magnet-tools: Ring magnet, Rigid Magnet Rake, Flexible Magnet Rake, Hand-Held Sweep Magnet (HSM), TNO Adapted Magnet Tool
Development:	Prototype/Demonstrator, COTS
Time Frame:	2006-08-01 to 2009-12-31
Place:	<a href="#">TNO</a> , The Hague, The Netherlands; Cambodia; Angola, Sudan
Lead Nation:	The Netherlands

Partners:	Cambodian Mine Action Centre ( <a href="#">CMAC</a> ), Norwegian People Aid ( <a href="#">NPA</a> )
Point of contact:	Arnold Schoolderman
E-mail:	<a href="mailto:arnold.schoolderman@tno.nl">arnold.schoolderman@tno.nl</a>
Status:	Planned
Comments:	<ul style="list-style-type: none"> <li>• Results of the first trial in Cambodia, which took place during the last quarter of 2006, are available in an article published in the <a href="#">Mine Action Technology Newsletter (Issue 5)</a>. Results of the Angola trials are summarised in another <a href="#">Mine Action Technology Newsletter article (Issue 8)</a>.</li> <li>• During May - June 2007 a second data acquisition phase in an area clearance operation was carried out in the Kwanza Sul province in Angola, with the assistance of Norwegian People Aid (NPA). The third and final two-month data acquisition phase in a road clearance operation, also with NPA in the Angolan Malanje province took place in October - November 2007.</li> <li>• Presentations on the magnetic clutter reduction quantification project were given at the 2007 UXO Countermine Forum 2007 (<a href="#">presentation 1</a>), the 2008 Mine Action Technology Workshop (<a href="#">presentation 2</a>) and the March 2009 ASEM Seminar on New technologies for Demining and Human Security (<a href="#">presentation 3</a>).</li> <li>• A pilot implementation of the TNO adapted magnet tool is planned for 2009 under reservation of national funding.</li> </ul>
Results/Conclusions:	<ul style="list-style-type: none"> <li>• The <a href="#">final report</a> of the first project phase is available at the ITEP reports website. It concludes that the Ring Magnet proved to be the most popular magnet-tool among the deminers due to its strength. The deminers also believed that the use of the ring magnet increased the efficiency of their demining task and made their work easier. However, the data collected during the trial did not show the perceived efficiency increase.</li> <li>• <a href="#">Annex B</a> of the final report concerns the issue raised in open source (e.g. the IGEO forum) that the Type72b anti-personnel mine could be triggered by a magnet (-tool), even when the mine battery is completely depleted. The general conclusion of this assessment is that triggering a Type72b anti-personnel mine of which the battery is completely depleted by means of a manually moved magnet is impossible, neither by charging the detonation capacitor nor by direct induced power. However, a warning is placed that when the battery is not completely depleted then there is a risk that the tilt-switch is set off.</li> <li>• Norwegian People Aid (NPA) has included the use of the ring magnet during excavation in a revised SOP, and is also considering the ring magnet for use during scanning. NPA has requested assistance from TNO for the delivery and implementation of the ring magnet in all its manual demining operations in Angola.</li> </ul>

Project No.:	<b>3.2.38</b>
Title:	<b>Robotic Mine Detector (100 Bot).</b>
Description:	The system is a remote controlled lightweight commercial tracked vehicle that detects and marks mines/UXO. It is capable of carrying various arrays and small mechanical vegetation and area reduction attachments. The system has a ground mapping and self navigation capability. The system currently has an integrated large loop metal detector for UXO and high metallic mine detection (Ebinger Large Loop UPEX 740MV array). It has also been modified to operate the HSTAMIDS and other commercial metal detectors.
Aim:	Develop, test and evaluate an enhanced detector. Outcome - Prototype hardware and a test report.
Request:	Users, Donors, NMAAs, NGOs.

Category:	Mechanical Assistance
Type:	Test and Evaluation
Equipment:	Robotic Mine Detector ( <a href="#">100-Bot</a> ), <a href="#">Ebinger Large Loop UPEX 740MV array</a>
Development:	COTS
Time Frame:	2006-01-01 to 2009-12-31
Place:	United States, US CECOM-RDEC, NVESD, Countermine Division, Ft. Belvoir, VA, Humanitarian Demining Test Facility, Cambodia
Lead Nation:	United States
Partners:	Cambodian Mine Action Center (CMAC)
Point of contact:	Lee Offen
E-mail:	<a href="mailto:lee.offen@nvl.army.mil">lee.offen@nvl.army.mil</a>
Status:	Ongoing
Comments:	The system is scheduled to deploy to Cambodia for testing in 2009.
Results/Conclusions:	

### 2.3.3 MECHANICAL ASSISTANCE

Project No.:	<b>3.1.4</b>
Title:	<b>Methodology for the test and evaluation of mobile robotics for the detection of AP mines.</b>
Description:	Establishment of detailed minimal requirements, standards and procedures for the testing of robotics systems for mine detection.
Aim:	Organisation of a multi-year test and evaluation program.
Request:	International Advanced Robotics Program (IARP)
Category:	Mechanical Assistance
Type:	Test and Evaluation
Equipment:	N/A
Development:	N/A
Time Frame:	2003-05-01 to 2009-12-31
Place:	Belgium, Royal Military Academy (RMA)
Lead Nation:	Belgium
Partners:	International Advanced Robotics Program (IARP)
Point of contact:	Yvan Baudoin
E-mail:	<a href="mailto:yvan.baudoin@rma.ac.be">yvan.baudoin@rma.ac.be</a>
Status:	Ongoing
Comments:	<ul style="list-style-type: none"> <li>• Several IARP (International Advanced Robotics Programme) workshops have been organized to date: Toulouse 1998, Zimbabwe/Mozambique 1999, <a href="#">Vienna 2002</a>, <a href="#">Prishtina 2003</a>, <a href="#">Brussels 2004</a>, <a href="#">Tokyo 2005</a> and <a href="#">Cairo 2008</a>. The Proceedings are accessible via the ITEP reports database.</li> <li>• A study of the modular architecture of a mobile robot and the operational and</li> </ul>

	<p>technical requirements for robotic systems in humanitarian demining is ongoing.</p> <ul style="list-style-type: none"> <li>• A handbook related to ongoing projects on mobile roboticised detection platforms is currently being compiled (deadline June 2009 - IARP HUDEM 2009 Workshop)</li> </ul>
Results/Conclusions:	<ul style="list-style-type: none"> <li>• A <a href="#">summary report</a> on trends, promising tools and requirements for robotic systems, including an overview of available prototype robotic platforms for HMA, was published in December 2005.</li> <li>• Although robots are promising systems for some detection tasks, only developmental and prototypes are currently available. Furthermore, only limited on-site tests have been executed (described in the proceedings of the IARP Workshops, available at the above-listed website). The definition of an official ITEP test campaign is therefore still pre-mature.</li> </ul>

Project No.:	<b>3.1.6</b>
Title:	<b>Update of the CEN Workshop Agreement on Test and Evaluation of Demining Machines (CWA 15044:2004)</b>
Description:	The CEN Workshop Agreement on Test and Evaluation of Demining Machines ( <a href="#">CWA 15044:2004</a> ) was published in July 2004, after 4 technical CEN workshops held during the period September 2003 – April 2004 ( <a href="#">ITEP Project 3.1.5</a> ). According to the CEN Workshop procedures, a published CEN Workshop Agreement requires a review after a period of 3 years. The ITEP Working Group on Test and Evaluation of Mechanical Assistance clearance Equipment (MAE), in consultation with the GICHD, decided that a minor update of the CWA 15044:2004 was required.
Aim:	Update of the CWA 15044:2004, taking into account progress in machine development and lessons learned collected during three years of ITEP trials of mechanical demining equipment according to the CWA 15044:2004
Request:	GICHD, ITEP Working Group on T&E of Mechanical Assistance clearance Equipment (MAE)
Category:	Mechanical Assistance
Type:	Methodology
Equipment:	N/A
Development:	N/A
Time Frame:	2008-07-01 to 2009-03-31
Place:	N/A
Lead Nation:	Canada
Partners:	Sweden, GICHD, ITEP Secretariat
Point of contact:	Geoff Coley
E-mail:	<a href="mailto:geoff.coley@drdc-rddc.gc.ca">geoff.coley@drdc-rddc.gc.ca</a>
Status:	Ongoing
Comments:	<ul style="list-style-type: none"> <li>• The updated CWA 15044:2004 document agreed upon by the ITEP WGMAE, and GICHD is planned to be submitted to the CEN Secretariat at the beginning of April 2009 for further processing by CEN.</li> <li>• It is hoped that an updated version of the CWA 15044: 2004 will be published by summer 2009.</li> </ul>
Results/Conclusions:	



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Project No.:	<b>3.2.6</b>
Title:	<b>Tempest</b>
Description:	The Tempest is a small commercial-off-the-shelf remote controlled system for medium vegetation clearance, metal debris reduction, tripwire elimination and engaging the ground to initiate landmines in anti-personnel minefields. It is produced locally in Cambodia by the Development Technology Workshop ( <a href="#">DTW</a> ). The planned 2009 upgrade to the Mk 7 variant offers improvements in the remote control system, hydraulics and has tracks instead of wheels, which are improving mobility and availability in a variety of challenging locations as well as lowering the force of the system footprint.
Aim:	In country operational field trail of the Tempest. Outcome - Test report.
Request:	Users, Donors, NGOs, NMAAs
Category:	Mechanical Assistance
Type:	Test and Evaluation
Equipment:	<a href="#">Tempest</a>
Development:	COTS/Prototype
Time Frame:	2002-03-01 to 2009-12-31
Place:	Thailand, Mozambique, Cambodia, Ecuador
Lead Nation:	United States
Partners:	Accelerated Demining Program Mozambique (ADP), Thailand Mine Action Centre ( <a href="#">TMAC</a> ), Cambodian Mine Action Centre ( <a href="#">CMAC</a> ), Mines Advisory Group ( <a href="#">MAG</a> ), <a href="#">Halo Trust</a> , National Demining Center of Ecuador
Point of contact:	Lee Offen
E-mail:	<a href="mailto:lee.offen@nvl.army.mil">lee.offen@nvl.army.mil</a>
Status:	Ongoing
Comments:	<p>The current Tempest system is a product of several years of development and test and evaluation:</p> <ul style="list-style-type: none"> <li>• 1999 - Contractor development of Tempest Mk1&amp;2 prototypes attracted NV sponsorship (Exploratory)</li> <li>• May 2000 - Vegetation clearance rates and blast survivability documented (Proof of Performance)</li> <li>• Oct 2000 -Two units deployed to TMAC. Development of Mk4 (Operational Field Evaluation)</li> <li>• 2001 - New Mk4 unit trialed with automotive performance testing and additional design refinement in Cambodia (Limited Functional-Technical)</li> <li>• Jan 2002 - Mk 4 redeployed to Thailand (Operational Field Evaluation)</li> <li>• Jan 2002 - Mk4 deployed to Mozambique (Accelerated Demining Program). Development of MK5 (Operational Field Evaluation)</li> <li>• Jul 2004 - Tracked Mk5 planned deployment to Mozambique (Operational Field Evaluation)</li> <li>• Oct 2004 - Planned product improvements for Thailand and Mozambique</li> <li>• 2005/2006 - Thailand and Cambodia (Operational Field Evaluation)</li> <li>• 2006/2007 - Operational field evaluation with Mines Advisory Group (MAG)</li> <li>• 2007/2009 – Ongoing operational field evaluations of the Tempest Mk 6 in Cambodia (with MAG and Halo Trust), Thailand and Ecuador.</li> </ul>



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Results/Conclusions:	
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Project No.:	<b>3.2.9</b>
Title:	<b>Test, evaluate and upgrade the Mini-Mulcher (MAXX).</b>
Description:	The MAXX Mini-Mulcher is a remote controlled excavator based system for medium vegetation clearance. It has been deployed for operational field trials in Rwanda and Namibia after which it was upgraded and deployed in Guinea-Bissau for an operational field evaluation. The system will be refurbished during 2009.
Aim:	Upgrade, test and evaluate a mini-vegetation clearance system in-country. Outcome - Enhanced Mini-Mulcher unit and test report.
Request:	Users, Donors, NGOs, NMAAs
Category:	Mechanical Assistance
Type:	Test and Evaluation
Equipment:	<a href="#">HEC MAXX Mine Clearance Multi Tool</a>
Development:	COTS/Prototype
Time Frame:	2002-04-01 to 2009-12-31
Place:	United States, CECOM-RDEC, NVESD, Namibia
Lead Nation:	United States
Partners:	National Mine Action Coordination Centre of Guinea Bissau, People Against Landmines ( <a href="#">MgM</a> )
Point of contact:	Lee Offen
E-mail:	<a href="mailto:lee.offen@nvl.army.mil">lee.offen@nvl.army.mil</a>
Status:	Ongoing
Comments:	<p>The Mini-Mulcher MAXX is a product of several years of development and test and evaluation:</p> <ul style="list-style-type: none"> <li>• 2003 - Concept exploration performed on the MAXX+ (Exploratory)</li> <li>• March 2004: Namibia trial (Limited Functional - Technical)</li> <li>• Summer 2004: Proof of Performance</li> <li>• October 2004 - October 2005: Namibia and Rwanda Operational Field Evaluations</li> <li>• Since January 2006 - December 2008: Operational Field Evaluation in Guinea Bissau</li> <li>• The system is en route to the U.S. for refurbishment.</li> </ul> <p>The research and development section of the <a href="#">MgM website</a> and the <a href="#">HEC website</a> provide an overview of the development history of the MAXX multi-tool system, as well as information on the 2005 operational field evaluation in Rwanda.</p>
Results/Conclusions:	



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Project No.:	<b>3.2.13</b>
Title:	<b>HALO Trust mechanical equipment development.</b>
Description:	This is an ongoing HALO Trust partnership with the Mechanical Assistance Equipment (MAE) developing community. As a part of this project, an operational field evaluation of the Rotary Mine Comb in Angola is ongoing as is the operational field evaluation of the Tempest system in Cambodia ( <a href="#">ITEP Project 3.2.6</a> ). The rotary mine comb is capable of extricating and removing anti-tank mines from the soil and pushing them to the side of the vehicle path.
Aim:	Modify, test and evaluate mechanical equipment with HALO Trust. Outcome - Prototype hardware and test report.
Request:	Users, Donors, NGOs, NMAAs, Developer, Manufacturer, HALO Trust
Category:	Mechanical Assistance
Type:	Test and Evaluation
Equipment:	<a href="#">SETCO tires</a> , <a href="#">Rotary Mine Comb</a> remote control and host platforms.
Development:	COTS/Prototype
Time Frame:	2003-03-01 to 2009-12-31
Place:	United States, CECOM-RDEC, NVESD, Angola, Cambodia
Lead Nation:	United States
Partners:	<a href="#">HALO Trust</a>
Point of contact:	Lee Offen
E-mail:	<a href="mailto:lee.offen@nvl.army.mil">lee.offen@nvl.army.mil</a>
Status:	Ongoing
Comments:	<ul style="list-style-type: none"> <li>• The Rotary Mine Comb began an operational field evaluation in Angola in the fall of 2006. This operational field evaluation is still ongoing. An <a href="#">article</a> in the Journal of ERW and Mine Action (Issue 12.2, Winter 2009/09) provides more information on the Rotary Mine Comb and how it has been deployed in Angola to uncover minimal-metal anti-tank mines.</li> <li>• The Tempest is still undergoing an Operational Field Evaluation in Cambodia (<a href="#">ITEP Project 3.2.6</a>)</li> </ul>
Results/Conclusions:	The Rotary Mine Comb has shown promising results in developmental testing (see <a href="#">ITEP Project 3.2.5</a> ) for safely removing mines from the road bed for which there are numerous applications in Africa and Asia. Basic information on the Rotary Mine Comb performance can be found in the <a href="#">Rotary Mine Comb test report</a> and <a href="#">MANTIS test report</a> accessible via the ITEP website.

Project No.:	<b>3.2.20</b>
Title:	<b>Multi-Tooled Excavator</b>
Description:	The <a href="#">system</a> is an armored medium sized excavator with various COTS digging and sifting attachments
Aim:	Armour a medium sized excavator and evaluate multiple modified commercial attachments. Outcome - Prototype hardware and test report based on operational field evaluations in several countries.



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Request:	Users, Donors, NGOs.
Category:	Mechanical Assistance
Type:	Test and Evaluation
Equipment:	Armoured medium excavator with attachments (VTN rubble sifter, ALLU shredder-screener, Standard digging bucket, Bertani clamshell bucket, Northern Track riddle sifter, Rocklands sifter, Remu bucket, Rotary Riddle bucket, Vaned rake, Trommex sifter).
Development:	COTS
Time Frame:	2004-01-01 to 2009-12-31
Place:	United States, CECOM-RDEC, NVESD Humanitarian Demining Test Facility, Cambodia, Afghanistan, Iraq, Honduras, Chile
Lead Nation:	United States
Partners:	Cambodian Mine Action Centre ( <a href="#">CMAC</a> ) , <a href="#">Chilean National Demining Commission</a> , <a href="#">Halo Trust</a> , Mines Advisory Group ( <a href="#">MAG</a> )
Point of contact:	Lee Offen
E-mail:	<a href="mailto:lee.offen@nvl.army.mil">lee.offen@nvl.army.mil</a>
Status:	Ongoing
Comments:	<ul style="list-style-type: none"> <li>• This is a follow-on of the Humanitarian Demining Sifting Excavator project (<a href="#">ITEP Project 3.2.14</a>).</li> <li>• Some of the attachments have undergone an operational field evaluation in Honduras and Cambodia. An operational field evaluation in Chile is ongoing. Information on which attachment was tested where can be found in the <a href="#">2009 ITEP Work Plan meeting presentation</a> on the Multi-Tooled Excavator.</li> </ul>
Results/Conclusions:	

Project No.:	<b>3.2.31</b>
Title:	<b>Mini-Mulcher (MAXX+)</b>
Description:	The MAXX+ is a small, remote-controlled, excavator-based mechanical system for medium vegetation clearance and soil sifting in various environments. The system has an extensive set of interchangeably tools. It can operate with a mulcher, sifting fork, rotar bucket, and standard construction style bucket. Its “reach-in” configuration places tools at the end of a 360 rotating articulating arm to clear vegetation with a 5 meter reach.
Aim:	Test and evaluate a mini-vegetation clearance system in-country. Outcome - Test report.
Request:	Users, Donors, NGOs, NMAAs
Category:	Mechanical Assistance
Type:	Test and Evaluation
Equipment:	<a href="#">HEC MAXX+ Mine Clearance Multi Tool</a>
Development:	COTS/Prototype
Time Frame:	2005-07-01 to 2009-12-31
Place:	United States, CECOM-RDEC, NVESD, Sri Lanka, Cambodia



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Lead Nation:	United States
Partners:	Mines Advisory Group ( <a href="#">MAG</a> ), People Against Landmines ( <a href="#">MgM</a> )
Point of contact:	Lee Offen
E-mail:	<a href="mailto:lee.offen@nvl.army.mil">lee.offen@nvl.army.mil</a>
Status:	Ongoing
Comments:	<ul style="list-style-type: none"> <li>• June 2005 - August 2006: Operational Field Evaluation in Sri Lanka with the Sri Lankan army.</li> <li>• December 2006 - December 2009: Operational Field Evaluation in Cambodia with MAG.</li> <li>• The <a href="#">research and development section of the MgM website</a> and the <a href="#">HEC website</a> also provide an overview of the development history of the MAXX multi-tool system</li> </ul>
Results/Conclusions:	

Project No.:	<b>3.2.39</b>
Title:	<b>Rapid Area Preparation Tool (RAPTOR)</b>
Description:	This project will develop a new system based on the lessons learned from the MANTIS deployment in Nicaragua ( <a href="#">ITEEP Project 3.2.5</a> ) using an armoured reverse station COTS Fendt 918 farm tractor with a suite of commercial and specialized attachments for area reduction and preparation. The Rotary Mine Comb is one of the attachments that will be integrated with this system. It is anticipated that the system will be developed and ready for an operational field evaluation by Halo Trust in 2009.
Aim:	Develop, test and evaluate an enhanced mechanical area preparation and reduction system. Outcome - Prototype hardware and a test report.
Request:	Users, Donors, NMAAs, NGOs.
Category:	Mechanical Assistance
Type:	Test and Evaluation
Equipment:	<a href="#">RAPTOR</a> (tyres: Setco Jelly Belly Solid Rubber, Attachments: Rotary Mine Comb, Rock Bucket, Utility Bucket, Cultivator, Chisel Plow, Grapnel Bucket, Vegetation cutter, Power Harrow/magnet and Area reduction roller)
Development:	COTS
Time Frame:	2006-01-01 to 2009-12-31
Place:	United States, US CECOM-RDEC, NVESD Humanitarian Demining Test Facility, and other countries (TBD).
Lead Nation:	United States
Partners:	<a href="#">HALO Trust</a>
Point of contact:	Lee Offen
E-mail:	<a href="mailto:lee.offen@nvl.army.mil">lee.offen@nvl.army.mil</a>
Status:	Ongoing
Comments:	Trials are ongoing and there will probably be an operational field evaluation with Halo Trust in 2009.

Results/Conclusions:	
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Project No.:	<b>3.2.40</b>
Title:	<b>Severe Terrain Off Route Menzi-Muck (STORM)</b>
Description:	This project will include modification and testing of the <a href="#">COTS Menzi Muck high mobility mechanical excavator</a> , identified as STORM. The system is capable of working on very uneven terrain and on slopes of up to 70 degrees. The modifications to the COTS system include an armored cab, blast resistant tires and a suite of commercial attachments. The suite of tools include vegetation removal, soil sifting, soil grinding, and material handling attachments.
Aim:	Develop, test and evaluate STORM. Outcome - Prototype hardware and a test report.
Request:	Users, Donors, NMAAs NGOs.
Category:	Mechanical Assistance
Type:	Test and Evaluation
Equipment:	<a href="#">STORM</a>
Development:	COTS
Time Frame:	2006-01-01 to 2009-12-31
Place:	United States, US CECOM-RDEC, NVESD Humanitarian Demining Test Facility, Cambodia
Lead Nation:	United States
Partners:	<a href="#">Halo Trust</a>
Point of contact:	Lee Offen
E-mail:	<a href="mailto:lee.offen@nvl.army.mil">lee.offen@nvl.army.mil</a>
Status:	Ongoing
Comments:	Since the beginning of January 2009, STORM is undergoing an Operational Field Evaluation in Cambodia with Halo Trust.
Results/Conclusions:	

Project No.:	<b>3.2.46</b>
Title:	<b>Flail fundamentals</b>
Description:	Investigating interaction of such factors as chain length, hammer shape and weight, rotational speed, forward speed, power consumption, etc.
Aim:	To understand the factors influencing flail performance.
Request:	Canada, Defence Research and Development Canada - Suffield (DRDC-Suffield)
Category:	Mechanical Assistance
Type:	Test and Evaluation
Equipment:	Generic flails
Development:	Research/Development

Time Frame:	2006-06-01 to 2010-12-31
Place:	Canada, Defence Research and Development Canada - Suffield (DRDC-Suffield)
Lead Nation:	Canada
Partners:	
Point of contact:	Geoff Coley
E-mail:	<a href="mailto:geoff.Coley@drdc-rddc.gc.ca">geoff.Coley@drdc-rddc.gc.ca</a>
Status:	Ongoing
Comments:	The Canadian Chain Flail Evaluation Platform (CCFEP) is used to evaluate the effectiveness of various flail configurations. Over the summer of 2008, 75 different configurations were tested and are currently being evaluated to determine the optimal configuration. More information on the CCFEP and first data collection period is available in an <a href="#">ITEP 2009 Work Plan meeting presentation</a> .
Results/Conclusions:	

Project No.:	<b>3.2.48</b>
Title:	<b>Test and Evaluation of the MV4 Tiller</b>
Description:	Test and evaluation of the performance and survivability of the DOK-ING d.o.o. MV4 tiller according to the CEN Workshop Agreement on Test and Evaluation of Demining Machines ( <a href="#">CWA 15044: 2004</a> )
Aim:	To establish baseline CWA 15044 performance and survivability characteristics of the DOK-ING d.o.o. MV 4 with tiller unit.
Request:	Manufacturer, UNMAS
Category:	Mechanical Assistance
Type:	Test and Evaluation
Equipment:	DOK-ING d.o.o. MV4 with tiller unit
Development:	COTS
Time Frame:	2009-05-11 to 2009-05-20
Place:	SWEDEC test site Norra Kulla, Sweden
Lead Nation:	Sweden
Partners:	GICHD
Point of contact:	Anders Tengbom
E-mail:	<a href="mailto:anders.tengbom@mil.se">anders.tengbom@mil.se</a>
Status:	Planned
Comments:	
Results/Conclusions:	

Project No.:	<b>3.2.49</b>
Title:	<b>Test and Evaluation of the Bozena 5 Flail and Tiller</b>

Description:	Test and evaluation of the performance and survivability of the WAY Industry Bozena 5 flail and tiller tool according to the CEN Workshop Agreement on Test and Evaluation of Demining Machines ( <a href="#">CWA 15044: 2004</a> )
Aim:	To establish baseline CWA 15044 performance and survivability characteristics of the WAY Industry Bozena 5 with tiller unit.
Request:	Manufacturer, UNMAS
Category:	Mechanical Assistance
Type:	Test and Evaluation
Equipment:	WAY Industry Bozena 5 with flail and tiller unit
Development:	COTS
Time Frame:	2009-08-24 to 2009-09-02
Place:	SWEDEC test site Norra Kulla, Sweden
Lead Nation:	Sweden
Partners:	Canada, GICHD
Point of contact:	Anders Tengbom
E-mail:	<a href="mailto:anders.tengbom@mil.se">anders.tengbom@mil.se</a>
Status:	Planned
Comments:	
Results/Conclusions:	

Project No.:	<b>3.2.50</b>
Title:	<b>Test and Evaluation of the Scanjack 3500 with Single Flail and Tiller</b>
Description:	Test and evaluation of the performance and survivability of the Scanjack AB Scanjack 3500 tiller according to the CEN Workshop Agreement on Test and Evaluation of Demining Machines ( <a href="#">CWA 15044: 2004</a> )
Aim:	To establish baseline CWA 15044 performance and survivability characteristics of the Scanjack AB Scanjack 3500 with tiller unit.
Request:	Manufacturer, Swedish Armed Forces
Category:	Mechanical Assistance
Type:	Test and Evaluation
Equipment:	Scanjack AB Scanjack 3500 with single flail and tiller unit
Development:	COTS
Time Frame:	2009-09-21 to 2009-10-09
Place:	SWEDEC test site Norra Kulla, Sweden
Lead Nation:	Sweden
Partners:	The Netherlands, GICHD
Point of contact:	Anders Tengbom
E-mail:	<a href="mailto:anders.tengbom@mil.se">anders.tengbom@mil.se</a>



Status:	Planned
Comments:	
Results/Conclusions:	

### 2.3.4 MANUAL TOOLS

### 2.3.5 PERSONAL PROTECTION

### 2.3.6 NEUTRALIZATION

Project No.:	<b>6.2.11</b>
Title:	<b>Explosive Harvesting System (EHS)</b>
Description:	The initial <a href="#">Explosive Harvesting System</a> is a three 20 foot ISO container based, three stage facility to allow for the safe harvesting of TNT explosives from AT mines, large caliber projectiles, air dropped bombs and recasting it into disposal charges and specialized items such as platters, shaped and bulk linear charges for in-situ mine neutralization. A follow on mobile <i>fly away</i> system with the same capability has also been developed. The EHS is currently providing new bulk explosives for evaluation by Mines Advisory Group (MAG), Halo Trust and the Cambodian Mine Action Centre (CMAC) in Cambodia.
Aim:	Test and evaluate the explosive harvesting facility in-country. Outcome - test report.
Request:	Users, Donors, NGOs, NMAAs
Category:	Neutralization
Type:	Test and Evaluation
Equipment:	Explosive Harvesting System (EHS)
Development:	COTS/Prototype
Time Frame:	2005-01-01 to 2009-12-31
Place:	Cambodia, Afghanistan
Lead Nation:	United States
Partners:	<a href="#">Golden West Humanitarian Foundation</a> , Cambodian Mine Action Centre ( <a href="#">CMAC</a> ), Mines Advisory Group ( <a href="#">MAG</a> ), <a href="#">Halo Trust</a>
Point of contact:	Lee Offen
E-mail:	<a href="mailto:lee.offen@nvl.army.mil">lee.offen@nvl.army.mil</a>
Status:	Ongoing
Comments:	<ul style="list-style-type: none"> <li>Partnership between the U.S. Humanitarian Demining Research and Development Program, Golden West Humanitarian Foundation and CMAC</li> <li>Site located at CMAC Kampong Chhnang Training Center. Site assessment in Feb 2005, and demonstration to delegations from S.E. Asia, the U.S., and Japan in Aug 2005</li> <li>Mobile <i>fly away kits</i> are being evaluated in Afghanistan.</li> <li>Results as of January 2009: 4101 items processed, 13355 kg of total explosive recovered and 91958 charges provided to HALO (38767), CMAC (52561) and MAG (633). Total scrap metal returned: 24923 kg.</li> </ul>

Results/Conclusions:	<ul style="list-style-type: none"> <li>• At the beginning of the project regular newsletters were distributed providing an update on activities and results:               <ul style="list-style-type: none"> <li>- <a href="#">September 2005</a>,</li> <li>- <a href="#">November 2005</a>,</li> <li>- <a href="#">June 2006</a></li> </ul> </li> <li>• More information on the project can also be found in articles published in the <a href="#">Mine Action Technology Newsletter, issue 5</a> and the <a href="#">Journal of Mine Action, Issue 10.2</a></li> <li>• Full details on the EHS and the <i>Fly Away</i> Unit are available at the <a href="#">Golden West Humanitarian Foundation EHS webpage</a>.</li> </ul>
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### 2.3.7 SERVICES

Project No.:	<b>7.1.2</b>
Title:	<b>Collect test reports and information on national programs.</b>
Description:	The Secretariat has been tasked to collect, maintain and distribute information on test reports and national programs.
Aim:	To collect and maintain a working database of relevant test reports and national programs.
Request:	ITEP Executive Committee
Category:	Services
Type:	Input
Equipment:	N/A
Development:	N/A
Time Frame:	2000-07-31 to 2010-07-31
Place:	Secretariat ITEP
Lead Nation:	ITEP Secretariat
Partners:	All ITEP Participants and other entities producing HD demining equipment test reports
Point of contact:	ITEP Secretariat
E-mail:	<a href="mailto:secretariat@itep.ws">secretariat@itep.ws</a>
Status:	Ongoing
Comments:	
Results/Conclusions:	<ul style="list-style-type: none"> <li>• The collected test reports and publications are available on the <a href="#">ITEP Reports website</a>.</li> <li>• Information on the national test and evaluation activities of the ITEP Participants can be found in the <a href="#">ITEP Work Plan</a>.</li> </ul>

Project No.:	<b>7.1.3</b>
Title:	<b>Establish contacts with mine action partners world wide.</b>
Description:	Establish contacts with mine action partners world wide through the ITEP Secretariat

	and liaison officers.
Aim:	To collect user needs and feedback on ITEP activities.
Request:	ITEP Executive Committee
Category:	Services
Type:	Input
Equipment:	N/A
Development:	N/A
Time Frame:	2000-07-31 to 2010-07-31
Place:	Secretariat ITEP
Lead Nation:	ITEP Secretariat
Partners:	All ITEP Participants
Point of contact:	ITEP Secretariat
E-mail:	<a href="mailto:secretariat@itep.ws">secretariat@itep.ws</a>
Status:	Ongoing
Comments:	
Results/Conclusions:	

Project No.:	<b>7.1.4</b>
Title:	<b>Lessons learned from test and evaluation.</b>
Description:	ITEP Participants and the ITEP Secretariat will review on a regular basis, past, and ongoing test and evaluation and their associated procedures to draw lessons learned and improve future ITEP test and evaluation procedures and methodologies.
Aim:	Provide better test and evaluation and commonly agreed procedures.
Request:	Users, Donors, ITEP Participants.
Category:	Services
Type:	Input
Equipment:	N/A
Development:	N/A
Time Frame:	2000-07-31 to 2010-07-31
Place:	Secretariat ITEP
Lead Nation:	ITEP Secretariat
Partners:	All ITEP Participants
Point of contact:	ITEP Secretariat
E-mail:	<a href="mailto:secretariat@itep.ws">secretariat@itep.ws</a>
Status:	Ongoing
Comments:	The term <b>lessons learned</b> has been replaced by <b>experiences</b> .
Results/Conclusions:	The Database of International Experiences in support of the Test and Evaluation



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	Community (DIETEC) has been developed by the ITEP Secretariat in collaboration with the James Madison University Mine Action Information Center ( <a href="#">MAIC</a> ) and is currently available at the above mentioned website.
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Project No.:	<b>7.2.1</b>
Title:	<b>Follow up on requests for advice on test and evaluation procedures.</b>
Description:	Follow up on requests from for advice on test and evaluation procedures.
Aim:	Provide advisory service.
Request:	NMAAs, NGOs
Category:	Services - Capacity Building
Type:	Output
Equipment:	N/A
Development:	N/A
Time Frame:	2003-01-01 to 2007-12-31
Place:	Various
Lead Nation:	TBD
Partners:	TBD
Point of contact:	See comments
E-mail:	Not available
Status:	Standby
Comments:	<p>For support and advise on test and evaluation procedures, please refer to the following contact points:</p> <ul style="list-style-type: none"> <li>• Belgium: <a href="#">Michel Dirickx</a></li> <li>• Canada: <a href="#">Chris Weickert</a></li> <li>• Germany: <a href="#">Joachim Sigmund</a></li> <li>• The Netherlands: <a href="#">Leen Lagerwerf</a></li> <li>• Sweden: <a href="#">Curt Larsson</a></li> <li>• United States: <a href="#">Robert Doheny</a> or <a href="#">Lee Offen</a></li> </ul>
Results/Conclusions:	<ul style="list-style-type: none"> <li>• ITEP technical staff from the UK provided assistance at short notice in August 2004 to the the Cambodian Mine Action Centre (CMAC) Chief Technical Advisor. This assistance was in the form of providing advice on setting up the trial protocol based on ITEP methodology (ITEP Project 7.2.7)</li> <li>• CMAC representatives attended the trials of the Bozena-4 in Sweden during November 2004. This activity was financed by UK and CA.</li> <li>• On invitation by CMAC, ITEP representatives attended the Japan International Co-operation System JICS/CMAC trials of Japanese mechanical demining equipment in August 2006 and of dual-sensor detection equipment in November 2006 (ITEP Project 7.2.9)</li> <li>• In March 2006 QinetiQ provided technical consultancy to MAG (ITEP Project 7.2.8)</li> <li>• In February 2006 Germany (BAM) assisted the Japan Science and Technology Agency (JST) during the test and evaluation of Japanese dual-sensor systems in Croatia (ITEP Project 7.2.10)</li> <li>• During April 2007 Canada helped prepare and carry out the mechanical demining</li> </ul>

	<p>equipment demo at the HCR-CTRO Humanitarian Demining Conference (ITEP project 7.2.11)</p> <ul style="list-style-type: none"> <li>• During October 2007 Canada and Belgium sent observers to the HCR-CTRO/CTRO dual-sensor detector trial in Croatia (ITEP Project 7.2.12)</li> <li>• In May 2007 Germany (BAM) assisted the Egyptian UNDP Mine Action Program with the preparation and execution of a metal detector trial (ITEP project 7.2.14)</li> <li>• The HCR-CTRO was supported by Germany (BAM) during the data collection, data analysis and reporting phase of the October 2007 HCR-CTRO/JST dual-sensor trial (ITEP project 7.2.15)</li> </ul>
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Project No.:	<b>7.2.2</b>
Title:	<b>Maintenance and upgrade of the ITEP website.</b>
Description:	Maintenance and upgrade of the ITEP website.
Aim:	To keep the webpage up to date with relevant information.
Request:	ITEP Executive Committee.
Category:	Services
Type:	Output
Equipment:	N/A
Development:	N/A
Time Frame:	2000-07-31 to 2010-12-31
Place:	Secretariat ITEP
Lead Nation:	ITEP Secretariat
Partners:	All ITEP Participants.
Point of contact:	ITEP Secretariat
E-mail:	<a href="mailto:secretariat@itep.ws">secretariat@itep.ws</a>
Status:	Ongoing
Comments:	
Results/Conclusions:	

Project No.:	<b>7.2.3</b>
Title:	<b>Humanitarian Demining Research and Development technologies information materials and website.</b>
Description:	<p>Develop demining technologies information materials for dissemination to the international demining community. Additionally, a DoD Humanitarian Demining Research and Development program video will be developed to highlight equipment deemed suitable for usage in landmine detection, clearing vegetation and personal protection for deminers. Provide internet access to reports generated from testing of humanitarian demining systems via the Humanitarian Demining Program Website. Focus on improving the site to enhance sharing of demining research and development technology information. Undertake re-design of the site to accommodate queries from the demining community regarding where, to whom, and how to submit ideas, proposals, white papers, etc. pertaining to humanitarian</p>



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	demining technology.
Aim:	Develop demining technologies information materials for dissemination to the international demining community. Outcome - United States Department of Defense Humanitarian Demining Research and Development Catalogue, Video and Website.
Request:	Users, Donors, NGOs, NMAAs, Manufacturers, Developers.
Category:	Services
Type:	Output
Equipment:	N/A
Development:	N/A
Time Frame:	1996-01-01 to 2008-12-31
Place:	United States, CECOM-RDEC, NVESD.
Lead Nation:	United States
Partners:	
Point of contact:	Lee Offen
E-mail:	<a href="mailto:lee.offen@nvl.army.mil">lee.offen@nvl.army.mil</a>
Status:	Ongoing
Comments:	
Results/Conclusions:	All information is available on the above-listed website.

Project No.:	<b>7.2.5</b>
Title:	<b>Support to the Geneva International Centre for Humanitarian Demining (GICHD) detection and mechanical equipment catalogues.</b>
Description:	The Geneva International Centre for Humanitarian Demining will release regular updates of the catalogues on mechanical demining equipment and detection equipment respectively. ITEP will provide data from available test and evaluation and the ITEP Secretariat will provide assistance where needed.
Aim:	Deliver test and evaluation results to the Geneva International Centre for Humanitarian Demining (GICHD) as input to the catalogues on mechanical demining and detection equipment respectively.
Request:	ITEP Executive Committee, <a href="#">Geneva International Centre for Humanitarian Demining (GICHD)</a>
Category:	Services
Type:	Output
Equipment:	N/A
Development:	N/A
Time Frame:	2002-01-01 to 2010-07-31
Place:	Secretariat ITEP
Lead Nation:	ITEP Secretariat
Partners:	All ITEP Participants



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Point of contact:	ITEP Secretariat
E-mail:	<a href="mailto:secretariat@itep.ws">secretariat@itep.ws</a>
Status:	Ongoing
Comments:	
Results/Conclusions:	References to test reports available on the ITEP website are included in the following GICHD documents: - <a href="#">Detectors and PPE Catalogue 2009</a> , - <a href="#">Mechanical Demining Equipment Catalogue 2008</a> , - <a href="#">Guidebook on Detection Technologies and Systems for Humanitarian Demining (March 2006)</a>

### 3 ANNEX: ITEP PROJECT DESCRIPTION TEMPLATE

Title	Describes the activity as short and as explicit as possible.
Description	Provides a short but clear description of the activity, including what will be done and how.
Aim	Explains why this activity is done
Request	Lists who requested the work or who is the final customer
Category	Survey, Detection (/subcategory), Mechanical Assistance, Manual Tools, Personal Protection, Neutralization, Services.
Type	Input / Methodology / T&E / Output.
Equipment	Gives the type/brand/model of the equipment to be tested (Non Applicable in case of a non T&E task).
Development	Gives the stage of development of the equipment related to this task: COTS (Commercial Off The Shelf), Prototype/Demonstrator, Research/Development (Non Applicable in case of a non T&E task).
Time frame	Gives the time frame, starting and ending date (specify month & year).
Place	Gives the main locations where the activity will be performed, countries and facilities if already known.
Lead	Lists the ITEP Participant leading and/or responsible for the work
Partners	Lists the ITEP Participant(s) or external organizations actively engaged in the task
Point of contact	Gives the name and email address of the point of contact for this activity.
Status	Gives the status of the activity (planned, ongoing, standby, trials-tests completed, archived, postponed, cancelled)
Website	Gives links related to this activity, if available
Comments	<ul style="list-style-type: none"> <li>- Any useful information is added related to the status of the project, progress reports, and published test reports</li> <li>- In case a project has been postponed or cancelled the reasons are quoted.</li> <li>- In case a project is in the “trials completed” phase, an indication is given of the date when the test report is expected.</li> <li>- Any links and coordination activities with other projects are also documented here.</li> </ul>
Results/Conclusions	<p>In case of archived projects this field includes the following information:</p> <ul style="list-style-type: none"> <li>- test report + link to report on the ITEP Reports webpage or other website,</li> <li>- concise summary of the results taken from the test report when available, and comments on the follow-up of the ITEP activity.</li> </ul>