Taming the Minefields

Davor Druzijanic

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Taming the Minefields

Demining is a dangerous, labor intensive and costly process. An underlying precept of successful demining operation is a perfect safety record. The question is, how can a perfect safety record be achieved while the overall cost of the demining operation be reduced at the same time? It is not an easy or simple task, but with a good tool box and a skilled management team this can be accomplished.

Development of any plan entails an assessment of available demining capabilities including mechanical mine clearing machines, mine detecting dogs (MDDs), skilled deminers with metal detectors and prodders, and in the near future, some new methods or instruments for detection, location and detonation of mines. Machines can improve safety and productivity in demining, especially in areas covered with dense vegetation. The use of demining machines, in combination with other methods, has proven to be the most successful, as no single method can guarantee 100 percent effectiveness if used alone. Another advantage of mechanical mine clearance is the ability to treat the soil to the depth of 20 cm, unlike prodders and metal detectors. In areas of dense vegetation, slopes along rivers or along artificial water channels, an excavator with an armored cab and vegetation cutter on an extended crane combined with manual demining may assure effectiveness and safety. For safety reasons, it is recommended that the excavator base be located only in safe or previously cleared areas.

Demining in Croatia

For demining of areas near Novast, located close to Vinkovci City, three teams of deminers were employed. Each team had one team leader and four deminers. Each deminer was equipped with a metal detector, a prodder, a ballistic watercooler and a holocut. Based on the mine reports, manual demining began at three different parts of the field, respecting the safety distances, to preparing for machine access. After mines had been located, some of them were destroyed in situ and others were rendered safe at the place designated for destroying the mines. The area was then cleared by RHINO, with the exception of the channel at the east and higher slope at the west. The channel and the high slope (areas with trees and dense vegetation) were cleared mechanically by excavator MVB006 (rented for this task). The whole area was controlled by deminers with metal detectors and prodders, followed by four dog handlers with eight MDDs. Dogs work in pairs checking the area.

Main facts about the demining tasks:

- Starting date: April 22, 2003
- Fifteen deminers worked for 12 working days
- RHINO cleared 150,000 sq m in 14 days
- MVB006 cleared 9,500 sq m in 12 days
- Fifteen deminers controlled 78,962 sq m in 12 days
- Four demining dog teams controlled 58,286 sq m in 10 days
- Completion date: May 25, 2003
- Cleared area: 177,298 sq m in 33 days

Machines Involved in Demining

There are two basic types of demining machines: remote controlled and directly controlled. Remote controlled demining machines can be used on flat terrain, without bigger slopes and tall trees. Directly controlled demining machines can be used on the fields where operator response should be quick and precise, depending on terrain and vegetation or other. Demining machines with a flat tool can be used on rocky areas. Demining machines are not able to operate effectively in swampy areas.

About AKD MUNGOS Ltd.

AKD MUNGOS Ltd. was established by the government of the Republic of Croatia, on March 28, 1996, for performing mine-clearance activities on the territory of the Republic of Croatia. The company has been performing mine clearance tasks since June 1, 1996. The Croatian Mine Action Center has coordinated the mine clearance activities since 1998. In accordance with the changes of the Croatian law, mine clearance activities have become completely commercialized. Thus, Mungos Ltd. was introduced to the market, along with few other firms, as undoubtedly the biggest firm in the country.

At the beginning of its activities, AKD MUNGOS Ltd. had only 80 employees compared to the current 266:

- 186 pyrotechnics
- 34 medical personnel — 10 medical teams, consisting of a doctor, a driver and an ordinary, for each group of pyrotechnicians engaged in field operations
- 6 dog handlers with 12 mine detection dogs
- 40 technical and logistic personnel

The company owns:

- 70 motor vehicles
- High-quality protection equipment and a corresponding number of
mines, detectors, and other equipment necessary for effective performance of field operations.

- Warehouses for explosives
- Explosive transportation vehicles
- A RHINO—mine clearance machine purchased from Rheinmetall Landsysteme GmbH, Kiel, Germany
- Armored excavator Hydrema W60n M1520 and M1000, both with vegetation cutter MVF1000, purchased from Franjo Vukic, Zagreb, Croatia

The most valuable assets of the firm are not only equipment and machinery, but highly qualified personnel with years of real experience in mine clearance and unexploded devices removal pending the five-year Patriotic War in Croatia. AKD Mungos' deminers constantly attend different professional courses. Thus, the firm has special teams for:

- Underwater operations
- Alpine mountain operations
- MIDs with the training center and a capacity for dog training
- Experts for every kind of activity in demining
- Professors at the Deminers' Education Center in Zagreb

Projects

AKD MUNGOS Ltd. has located, rendered safe or destroyed more than 7,500 different kinds of AP and AT mines as well as more than 22,000 different UXO. AKD MUNGOS Ltd. has the capacity to perform demining all over the world in peace and in an emergency situation, and to manage corresponding education and training courses.

**RHINO Mine Clearing System**

The RHINO is a perfect tool for remote demining of large agricultural areas, especially in combination with mine detecting dogs or manual demining methods.

All details about RHINO can be found in SOP RHINO upon request. So far, the RHINO cleared:

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Projects</th>
<th>Cleared Area (m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>35</td>
<td>2,499,155</td>
</tr>
<tr>
<td>1999</td>
<td>151</td>
<td>8,358,187</td>
</tr>
<tr>
<td>1998</td>
<td>84</td>
<td>7,617,669</td>
</tr>
<tr>
<td>1999</td>
<td>7</td>
<td>5,564,416</td>
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<tr>
<td>2000</td>
<td>4</td>
<td>170,400</td>
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<tr>
<td>2000</td>
<td>2</td>
<td>403,729</td>
</tr>
<tr>
<td>2000</td>
<td>2</td>
<td>122,930</td>
</tr>
<tr>
<td>2001</td>
<td>39</td>
<td>5,739,578</td>
</tr>
<tr>
<td>2002</td>
<td>4</td>
<td>8,982,337</td>
</tr>
<tr>
<td>Total</td>
<td>475</td>
<td>45,256,032</td>
</tr>
</tbody>
</table>

All graphics courtesy of the author.

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**UIDMA in Bosnia and Herzegovina**

**UIDMA in Bosnia and Herzegovina: Possibilities for Wider Use**

The Bosnia and Herzegovina Mine Action Centre (BHMAC) recognized the need for and developed a new model of the Unique Identifier of Mine Action (UIDMA). The author outlines the new model and its benefits in identifying aspects of mine action.

**by Almir Budalica, BHMAC**

**Summary**

A need for UIDMA has been recognized in the Bosnia and Herzegovina (BiH) mine action community. The purpose of UIDMA is for users to be able to identify any aspect of mine action properly, regardless of the type of information (data on risk, accident, etc.) or activity (clearance, mine awareness education, quality control, etc.). The existing model is fixed (20 digits) and does not provide any flexibility. The consequence of the lack of flexibility is that identifiers of some mine action data contain unnecessary data (two, four or even eight zeros). The new model would provide more flexibility and enable unique identification of UID of any mine action to incorporate only data that is related.

Possibilities for eventual wider use are based on the flexibility of the system and its capability to cover all the aspects of mine action in more than one country.

"Flexibility" means that UIDMA can classify all mine-related information from the countries that carry out different procedures in mine action. One of the benefits of wider use of UIDMA would be easy mine action data interchange and referencing.

**Main Problem**

BHMAC has already developed UIDMA according to the procedures performed at the time of development and according to the geo-political structure of the country. The identifier consists of 20 digits, and is quite easy to read.

Generally, UIDMA consists of two elements: geo-reference (country, district, region and municipality) and mine action data (information or activity). The mine action data elements follow the demining procedure: it consists of a General Survey ID, a Task ID, an Inspection ID and a Clearance ID. After the general survey is done, some areas are declared as risk areas and the project is prepared for demining.

Receipt of the budget, a task is created, and demining begins. Upon completion, a clearance certificate is issued. Meanwhile, there are mine awareness quality control inspections. Identifiers for certain aspects of mine action in some countries are rapidly growing; i.e. they require more digits. This problem is obvious in Bosnia.

When using a linear incremental identifier for certain aspects of mine action, it gets higher with each record added. For example, there are about 4,000 records of general survey in Bosnia. In a few years it will reach 10,000 and five-digit identifiers will be necessary. Furthermore, keeping in mind financial resources and demining dynamics, as well as survey activities, one can expect a reduction of the area for each survey activity, which will also increase the number of records.

**Consequences**

UIDMA will need one more digit (maybe two) that will change the identifier.

At an international level (information interchange and reference), this would cause confusion because all countries would have to change their UIDMA. Solutions would include:

- Re-indexing existing tables.
- Making reference tables ("Code Book") for all the crucial data types, since reference tables are the core of any classification system, including UIDMA.

**Benefits**

The following are benefits to developing a new model of the UIDMA:

- Neither structure nor the way that UIDMA is for users to be changed.
- Number of digits in UIDMA would not be higher, but rather lower (17 or 18 characters).
- With proper re-indexing of tables, there would be no need for re-designing the database.
- Sorting and searching would be performed by UIDMA.

**Potential Difficulties in Solution Implementation**

Though changing the identifier presents a "non-elegant" solution to retrospective "spending" of IDs, it is imposed as the only possible solution. On the other hand, the benefits are great and difficulties would be temporary.

**Purpose of UIDMA**

Elements that define the purpose of UIDMA include:

- Simplicity (maximum 18 characters)
- Recognizability
- Uniformity
- Mine Action Data Interchange