What Use is a Database of Demining Accidents?

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NOTES FROM THE FIELD

What Use is a Database of Demining Accidents?

The author has maintained a database of demining accidents for four years. It contains records of many of the explosive accidents that deminers suffer while going about their work. This article explains the uses and limitations of the database and the software developed to contain it.

by Andy Smith, AVS Mine Action Consultants

I first published a database of accidents in humanitarian demining (HD) in 1998. In my experience, it was unique because it attempted to contain the source material as well as the conventional "spreadsheet" style summaries that characterize most databases. There have been several releases on CD since 1998, and the latest was recently completed with backing from the Geneva International Centre for Humanitarian Demining (GICHD). It was originally called the "Database of Demining Incident Victims" (DDIV). At GICHD's request, the latest version has been renamed the "Database of Demining Accidents" (DDAS).

Original accident reports (edited for anonymity) are included when possible. These may include photographs and usually include some medical details about the victim's injuries and treatment. The 1999 edition of the DDIV contained details of 319 victims. The current release contains an additional 160 and also many extensions to old entries, such as medical reports and interviews concerning the ongoing situation of victims. Some of the additional data records accidents that happened some time ago. For example, there is now some data about accidents in the British sector of Kuwait after the Gulf War (some for other sectors).

Principal Uses

It has been argued that the database provides a stick with which to beat the HD industry. While it could not be used to target an individual or demining group, it could be used to criticise, but only if you subscribe to the belief that people only learn through pain. It is perfectly possible to use the lessons that can be derived in a positive way, as described below.

Research

By providing "snapshot" of activities surrounding accidents, the database can be used as an introduction to how demining is actually carried out. This is often at variance with published standard operating procedures (SOPs), and recent records are frequently very well detailed. Researchers developing new equipment have used it, and I recommend its use when preparing Technical Advisors (TA) for field deployment. This might be especially useful when a TA has experience in one area and is being sent to another.

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Apart from my own research, paper based on the database have been presented by Colonel Alistair McAaslan (ex-GICHD, now Director, Cranfield Mine Action) and De Verno Joynt (ex-MEChem, now CSIR in South Africa).

Training Aid

As a training aid, real events can be used to show the importance of a whole range of demining rules. These include the need for good training, appropriate field control, open management, appropriate medical and communications equipment, etc. With real examples, these issues come to life, which is a matter of opinion.

Several demining non-governmental organizations (NGOs) have asked for the medical details in the database for use when training their field medics.

Reference

The database proved invaluable during the revision of some parts of the International Mine Action Standards (IMAS) because the range of opinion was very broad and based on heartfelt individual experience. The ability to refer to a broad overview derived from global experience was useful, especially when the protagonists held positions of authority and had made previous decisions based on incomplete knowledge.

In this context, reference to the database established the prevalence of severe hand injury and showed which mines and demining accidents posed the greatest threat. It also showed that over-protection with ineffective personal protective equipment (PPE) extra was neither desirable nor necessary.

De-mystifying

Demining engenders myths of danger, heroism and the "black art." The database explodes many of the myths—and shows how simple demining actually is. It also shows how digital data can introduce new dangers by imposing their ignorance. The most obvious myth that the database exposes is that deminers lie prone when excavating mines. Even in the few places where the SOPs demand it, lying prone is so rare that it is certainly the exception rather than the rule.

Identifying Causes

Perhaps most significant, the evidence clearly indicates that deminer error is an infrequent cause of an accident and that failures in the control chain are far more common. When seeking to reduce the number of accidents and/or the severity of resulting injury, understanding why accidents occur is essential. When the person studying the database is a contributory cause, that can be a deeply uncomfortable lesson.

Archive

It is never possible to know what information will be needed in the future. The database provides an archive to ensure that data is preserved. With the closure of the Kosovo Mine Action Coordination Centre (MACC), the lessons derived from their accident investigations would be very hard to access if they were not included in the DDAS. Also, a dataset of incidents in Mozambique was recently returned to the Mine Action Centre (MAC) in Mozambique, where the original records had been lost. In Cambodia, most of the records that have survived are held in Khmer, so the DDAS provides an English language translation for those wanting to learn from past accidents.

The database is a useful source of information for managers and a very relevant training tool for field use. Examples can be found to support safety requirements that deminers may think unnecessary, and the reports themselves can be used to promote best practice in accident investigations. The standard of investigation varies as much as the experience of those carrying them out, and frequently, an opportunity to learn from mistakes can be obscured or lost in the reporting procedure.

Acceptance and Rejection

While demining NGOs such as Mines Advisory Group (MAG) and People Against Landmines (MgM) requested copies very early on and have issued the database to field groups as a resource, other equally famous groups have failed to cooperate with data acquisition and refused to accept the most compelling inferences that can be drawn from the data amassed about their own accidents. Because some players in the industry have been less than honest in their reporting and less than open in sharing their experience, the DDB can never be presented as "complete." I think that there are about 65 percent of the accidents since 1996 in the database, but I cannot be sure. With records of close to 500 victims, it includes complete data for some countries in some years; Mozambique, Kosovo, Boum, Angola, Cambodia and Afghanr are examples. The data made available for the Khari War is only just becoming available, so the data sometimes stochs back in time. Interestingly, the patterns that emerge in countries where all data is available do not differ significantly from patterns based on in-country data. This seems that the inferences can be generally applied. Certainly, until a more complete dataset is compiled, there is no reason not to use the best evidence we have to work extending it.

In some cases, commercial and political interests have led to data being withheld. To cite a commercial example, it took me more than four years to get copies of the written reports surrounding accidents during the trials of a mechanical demining system in Mozambique. Those reports include detailed charts of the staggering percentage of mines that were not detonated and were left damaged by the machines, which may explain the protracted secrecy.

An example of "political" interests leading to secrecy is the fatal accident involving a roller system mounted on a tank outside Kabul in the early 1990s. I presume that it is fear of their own mistakes being made public that has led the UK office of the famous NGO involved to be uncooperative. They began by insisting that they did not keep records of accidents. In 1997, they corrected this and said that all their accident records

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were hard to find. Two years later, they promised that data on all their accidents would be provided if they gave the details about which of their accidents I already knew about. I did that, but after a further 18 months they have failed to provide access to records of a single accident. Fortunately, the field officer of that particular NGO are less fearful of the truth and (outside Afghanistan) have always provided all the records in their possession when I have gone to knock on their doors.

It is only fair to contrast the failures with the successes. Some MACs and NGOs have made their incident investigations readily available. The Kosovo MACC was especially helpful. It made the most thorough investigations of the record, provided them quickly and then carried out follow-up inquiries about the health of the victims.

So, if the DDAS is less than perfect because it does not contain all of the records it could, that problem will only be addressed when some major players in the industry support their up their act.

New Data, New Conclusions?

I have previously published papers on my reflections on accidents and their causes. The James Madison University (JMU) Journal of Mine Action, issue 4.2, Summer 2000, carries an article enti
tled "The Protection Needs in Humanitarian Demining" which I recom-

The increased number of database entries have very little effect on my previous conclusions. But the incompleteness of the data means that any statistical analysi

Additional records change the ratio between USO and mine accidents in HD significantly. But that ratio was never rep

representative because traditional explosive ordnance disposed (EOD) tales are often carried out by serving military who do not carry out independent investigations and do not make their own accident records available.

The rich data stream from the Balkans has changed the balance of "severed" mines in HD, but not significantly.

Defining the "severed" mines as those most frequently involved in accidents, the cur

cert (April 2002) reads:

Demining accidents in the DDAS

| AP blast | 74% |
| AP/frag | 8% |
| Fuz | 5% |
| AP/frag | 3% |
| AT | 3% |
| Sub | 3% |
| Other | 1% |

Demining accidents in the DDAS the AP/frag injuries were caused by the victim moving body armour. Deminers without body armour get away with detona
ging intact Human mine with no bodily injuries at all. While I personally like to wear frontally body armour, the database does not provide compelling evidence of its value in an AP mine blast. Blast victims in good condition and purpose-designed demining headt
tools, do make a noticeable difference.

The most common activity at the time of a blast mine incident is excavating or a suspi
cous area. This may have been found using a metal detector or a dog. excavated by a machine or may have been a part of area excavation — during which the whole surface of the soil is removed in suspicious areas where other models cannot be useful.

In an excavation, the two most common severe injuries are to the eyes and the hands/arms. The injuries may be the loss of an eye, a finger, a hand or arm—or may be the loss of func
tion in an eye, fingers, hand or arm—leading to permanent disability.

Minor injuries when excavating AP

| Amput | 4.1% |
| Severed | 6.3% |
| Severed | 1.9% |

In about 30 percent of all excavation accidents with AP blast mines, a severe eye injury occurs.

In about 42 percent of all excavation accidents with AP blast mines, a severe injury to a hand or arm occurs.

Severe chest injury occurred in only 3.5 percent of recorded excavation accidents, and in more than half of these injuries the chest injury was caused by parts of the hands. Severe chest injury is rare—suprisingly, this is true whether or not the victim was wearing body armour. Many deminers without body armour get away with detona
tions. In the past, the database, does not provide compelling evidence of its value in an AP mine blast. Blast victims with good condition and purpose-designed demining hoof
tools, do make a noticeable difference.

Causes of the injuries

Severe eye injury results from:

1) Inspecting inappropriate eye protection, such as the industrial safety spectacles

2) Inspecting vision that cannot be seen through

3) Using visors that are not down at the time of detonation

4) The use of UV-hardened visors that shatter on blast impact

Severe hand and arm injury results from:

1) Using a tool (measuring that the hand is 30cm of the mine when it detonates

2) Using an inappropriate digging method that is hard to above the mine when it detonates

3) Using a tool that shatters on detonation and the parts inflict other injuries

Hand injury also results from digging inaccuracy or from devices that are

result in long-term disability or require surgical intervention.

The AP blast mine and AP bounding-fra
gmentation mine incident occurs in the Balkans with a mine that is not a problem in most of the rest of the world (the PROM-1). Also, most of the AP blast mine incidents involve the PMN, which is not recorded at all in recorded accidents in the Balkans. It should also be noted that the majority of the orphans deaths occurred in Kuwait and Afghanistan during the post-Gulf War clean up and before any international safety standards for HD existed.

To make an analysis of injury signif

cant, I have had to draw a distinction between "minor" injuries and "severe" injuri

ies. I define the difference as:

- Minor: A minor injury is one that does not require surgical intervention and does not result in long-term disability. Severe: a severe injury is one that

particularly sensitive if the device is an AP blast mine, however, the detonation does not generally cause severe injury unless one or more of the above are true. So perhaps you will understand why my own particular technology interests in demining have been visors, handtools, appropriate PPE and training. The databa

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