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Humanitarian Demining Accident and Incident Database

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DDAS Accident Report

Accident details

Report date: 19/05/2006	Accident number: 332
Accident time: 11:55	Accident Date: 08/05/2001
Where it occurred: Ward 7, Minefield No 0475, Kabul	Country: Afghanistan
Primary cause: Unavoidable (?)	Secondary cause: Inadequate equipment (?)
Class: Excavation accident	Date of main report: 12/06/2001
ID original source: DDG/MAPA No: 02/2001	Name of source: IGM
Organisation: Name removed	
Mine/device: PMN AP blast	Ground condition: grass/grazing area metal fragments
Date record created: 20/02/2004	Date last modified: 20/02/2004
No of victims: 1	No of documents: 2

Map details

Longitude:	Latitude:
Alt. coord. system:	Coordinates fixed by:
Map east:	Map north:
Map scale: not recorded	Map series:
Map edition:	Map sheet:
Map name:	

Accident Notes

inadequate equipment (?)
handtool may have increased injury (?)
no independent investigation available (?)

Accident report

Access to the accident data was denied by the MAC programme manager. A brief summary of the accident was provided by a professional researcher who had access to some of the original documents. That summary is reconstructed below. The Summary is followed by the International Demining group's own internal investigation (made available on request).

Accident report 1

A survey of the accident area had been completed on 22 April 1998. The Victim had been a deminer since 20 Sept 1999. He was working for a foreign based NGO (not UN controlled directly).

The accident area was described as "Grazing land". The accident occurred one hour before work was due to stop for the day. The Victim had previously found 80 mines in this field.

The Victim had just replaced his partner after 30 minutes rest. His metal detector gave 5 readings within a metre of the mine (which was "normal" for this field). The accident occurred while the Victim was prodding using a bayonet on a hillside in a grassy part of the minefield.

The victim suffered "traumatic injury to left hand, including partial amputation of forefinger and ring-finger. Middle finger broken but complete. Right hand, open fracture on forefinger, and some skin damage. Other fingers had minor wounds. Chest, anterior. Pain in upper breast and shoulder of right side. Pain in left side. Chest and body pains were believed to be due to pressure from the blast. Ears – some tinnitus and pain in right ear. His face, head and neck were undamaged – and believed to have been protected by his visor."

The investigators suggested that the mine had tipped onto its side as a result of one or more of the following:

being on a slope

because of rain and snow

because UXO had previously been exploded 75 cm away.

The Victim's PPE worked as designed and was believed to have provided essential protection. The Victim's left glove disappeared and his right glove was shredded. His bayonet and trowel were "lost".

[The PPE used was not recorded. The visor is believed to have been a long full-face version and the group are known to usually wear frontal body armour, so this is assumed in this instance.]

Conclusion

The investigators concluded that the accident was unavoidable.

It was suggested that supervision could have been better because the Section Leader was not present at time of the accident. It was also suggested that the Victim was tired (an assertion disputed by the Victim himself).

Accident report 2

An internal accident investigation dated June 12th 2001 was made freely available by the Demining group involved in the accident. (See also Related papers). The following report has been edited for anonymity.

1. Objectives

The objectives with the current report are:

1. To establish a plausible cause to the accident.
2. Evaluate and review relevant SOPs within [the Demining group].
3. Produce beneficial information to the demining community within MAPA.

2. General Information

Team/Site description: Section 1, Team 1, Kabul.

Location of accident: Minefield No. 0475, Ward-7

Date & Time: 08 May 2001, 11.55 local time.

Particulars of injured person: [the Victim]

Cause to the accident: High Order of AP while prodding.

Brief description of injuries: Traumatic amputation of three fingers and partial amputation of thumb of left hand.

3. Chronological Overview of the Accident

Following describes the action taken and the instructions given directly after the accident:

- The deminer is prodding in his lane using his bayonet, an AP goes High Order released by the bayonet while prodding at the hillside in a grassy portion of the minefield. **0**
- The [Team Leader] 1 contacts Training Control Officer (who is at the rest area with the Medical Supervisor) by VHF and announces that an accident has happened in Section 1, Team 1. Training Control Officer instructs the ambulance to evacuate the injured from Pick Up Point C (Annex G). **+15 sec.**
- Field Operations of both teams (1 and 3) are immediately stopped and all field personnel are instructed to remain in their positions until further orders. **+25 sec.**
- The [Section Leader] 1 announces by VHF the name of the involved deminer and that he is injured. **+40 sec.**
- The [Section Leader] 1 instructs the nearest two deminers to perform first aid to the injured. **+1 min.** The injured is in a cleared area and further clearance around the injured is not necessary.
- The [Section Leader] 1 calls the nearest [Paramedic] to perform additionally first aid. The [Paramedic] releases the two deminers performing first aid and begins his treatment. **+3 min.**
- The ambulance, Training Control Officer, Medical Supervisor and the [Paramedic Supervisor] arrive at the Pick Up Point and continue on foot to the Accident Point in order to evacuate the injured, who is located 15 meters from the Pick Up Point. **+5 min.**
- Training Control Officer informs the [Operations Centre] about the accident. **+5 min.**
- [The International Demining group]'s Islamabad office is informed about the accident. Both Kabul and Islamabad offices are kept informed of the situation. **+6 min.**
- The [Paramedic] is applying life saving procedures and first aid while Medical Supervisor arrives. The [Paramedic] and Medical Supervisor with the help of a deminer carry the injured to the ambulance after the completion of the first aid process which takes 10 minutes. **+15 min.**
- The ambulance with Training Control Officer, Medical Supervisor, [Paramedic] and 1 deminer drives to Karti-Se Hospital and reaches there in 18 minutes. **+33 min.**
- Both Kabul and Islamabad offices are informed about the condition of the injured by HF during the evacuation to the hospital.
- Before departure of the evacuation party the [Team Leader] 3 is assigned to transport the personnel and equipment to the Site Compound. He is specifically instructed to collect the equipment of the injured for further investigations.
- Before departure to the hospital, the [Team Leader] 1 is instructed to control no access to the accident point until the arrival of the [Explosive Ordnance Disposal Officer], the [Operations Officer] and Training Control Officer for initial investigation.
- A+35 an immediate accident report is sent to RMAC Kabul. **+35 min.**

- Initial information and technical evidence relevant to the accident was collected at the accident point in the minefield. **+135 min.**

5. Injuries of the Casualty

The deminer has the following injuries:

Left Hand:

- Fracture on distal phalanx bone of thumb, lost distal part with nail.
- Forefinger, Traumatic amputation from 2/3 Laterally Metacarpal bone.
- Medium finger, this finger is remaining but its Metacarpal bone has fracture and it is internally stabilized by K.Wire. It has also Longitudinal Traumatic incision on dorsal side.
- Ring finger Traumatic amputated from Lateral and Metacarpal bone.
- Little finger, Traumatic amputated with Metacarpal bone from Proximal Metacarpal articular surface.
- Loss of Hypotenar muscle completely with skin, fascia, nerves, vessels and tendons both sides e.g. completely lost of a triangle shape from middle side of proximal articular medium Metacarpal phalangeal joint to lateral Picefarno metacarpal joint.

Right Hand:

- Without Forefinger it has open fracture on lateral phalanx internally fixed by K.wire and some skin damages on fracture area dorsal side. Rests of the right hand fingers have no fracture and dislocation.
- Middle and Ring fingers have mini traumatic skin damages (wounds)
- On dorsal view at Middle metacarpal location of right hand has superficial wounds (only skin damages).

Chest - Anterior view:

- Right side: The patient has complained of pain form Upper the breast on shoulder gilder due to the direct positive pressure from mine.
- Left Side: Due to the main pressure from the blast, the patient feels pain in the chest below the breast laterally.
- Posterior view: **OK**

General Condition of the injured :

Head: **OK**, protected by the visor

Eyes: **OK**, Protected by the visor

Face: **OK**, Protected by the visor

Ears: After the accident he feels tinnitus during hearing and pain on his right ear.
Left ear is **OK**.

Mouth and Teeth: **OK**.

Neck: **OK**

Abdominal: **OK**

Inguinal: **OK**

Lower Extremity: **OK**

The conditions of the Karta-e-Se Hospital were observed as poor. Thus, it was decided to transfer the injured to the EMERGENCY Hospital supported by Italian in Shahr-e-Naw, Kabul, which has good facilities and qualified doctors.

Presently the injured is hospitalized in Quetta to receive a skin transplantation on his injured hands.

6. Equipment Damage and Technical Evidence

Equipment Damage (see Annex E1, E:2, E:3 and F): [Annexes not made available.]

Protective Suit:

- The main blast pressure of the mine hit the deminer at left side of the chest under the breast. Small Bakelite fragments penetrated only in the nylon cover of the protective suit while a metal fragment approximately about 1sq. cm penetrated into 8 out of 15 layers of Carbon Fibre.
- The mine had also effect on the right shoulder of the protective suite, small Bakelite fragments had only penetrated into the nylon cover and were stopped by the Corduroy.

Visor:

- The visor was not broken but had a slight effect of pressure on the right upper corner and the headband was broken due to the blast pressure.

Bayonet:

- The bayonet was lost and not found.

Trowel:

- The trowel was lost and not found.

Gloves:

- The glove of his left hand disappeared completely and the right hand glove had blast effect and is torn on the upper side of the fingers.

Technical Evidence (see Annex A and B): [Annexes not made available.]

Type of AP - Pieces of Russian PMN AP mine including the black rubber cover of led plate were lying around the crater of the accident point. As usual in this minefield, this type of mine was buried.

7. Evaluation

In order to accumulate experiences within the SOPs of the [International Demining group] it is of great importance to evaluate and review all actions taken during and after the accident.

Following SOPs are relevant to evaluate and review with regards to the current accident:

- Demining SOP,
- Medic SOP,

Additionally the [International Demining group] will as earlier mentioned forward the present report to the demining community within MAPA. It is hereby the intention of the [International Demining group] to contribute in a constructive and critical manner with our experiences of the current accident. Doing so we will hopefully eliminate or reduce risks, which are common in the process of demining, faced by fellow demining organizations.

Demining SOP

Relevant factors:

- The injured has been working with [the Demining group] since 20 Sept 1999 and he is 26 years old.
- The injured is an experienced deminer and has located app. 80 mines in this mine field during his employment with the [International Demining group].
- The injured was wearing all proper and correct protective equipment,
- The injured had just replaced his partner in the lane after having his 30 min. break and was, according to the injured himself, not a victim of fatigue,
- The accident occurred app. 1 hour before closing down the minefield for the day,
- In a radius of 1 m. of the Accident Point the injured registered app. 5 readings from his metal detector prior to the accident. In this particular minefield this amount is normal,
- The ground around the Accident Point is rocky and almost free of vegetation,
- The hillside at the Accident Point is sloping by 15 degrees,
- An UXO (a mortar) had previously detonated app. 75 cm from the Accident Point.

Injured person's own version of the accident :

The injured was in a fairly good and stable condition and was able to answer some questions related to the accident. The following describes the demining process up till the accident from the injured's own point of view:

How did the accident happen?

"I replaced my partner and then started to work. I worked for ten minutes and was using the mine detector. It gave me a reading at the point where the accident happened. As you are aware we are doing 15-20 CM excavation due to the fragmentation problem in the area. I started the prodding with the bayonet and then suddenly the accident happened. This was approximately around the 80th mine I was trying to find and destroy in the same minefield but unfortunately it injured me".

What do you think caused the accident?

"I was using the bayonet at the correct angle (30 degrees). I think the position of the mine had changed from a flat to a tilted condition due to rain, snow and also due to the detonation of a mortar approximately 75 cm near the accident point".

Summary

Summarizing all factors mentioned above no procedures or regulations have been violated according to the current Demining SOPs within the [International Demining group]. Consequently the accident has not given any direct cause to change existing Demining SOP within the [International Demining group]. However, it will be taken into consideration to adjust the existing procedures with regards to the duration of the breaching party's work shifts. To deviate from current static procedures into more flexible ways of having these work shifts, will optimise the efficiency and concentration of the deminers.

E.g. would the working periods during the morning be longer and shorter during the last part of the day. This should be up to the respective Team Leader to decide depending on the weather, spirit and moral etc.

Medic SOP

Relevant factors

- All deminers within the [International Demining group] have received a basic first aid course,
- The [Paramedic] was situated app. 25 m. from the Accident Point,
- Medical Supervisor was present in the rest area when the accident happened.

To put the medical treatment given after the accident in right perspective it is relevant to give an overview of the [International Demining group] reporting SOP with regards to an accident:

The [Section Leader] calls the [Team Leader] to announce an accident has taken place (where and a.s.a.p. who),

- The [Team Leader] orders, "STOP" in the entire minefield,
- The [Team Leader] orders the [Paramedic Supervisor] to the nearest Pick-up Point,
- The [Team Leader] orders the nearest the [Paramedic] to the Accident Point
- The [Team Leader] orders the nearest breaching party to clear the area around the injured and hereafter to start life saving first aid. If the injured is situated in a cleared area the breaching party starts performing first aid directly after arrival,
- The [Team Leader] moves to the Accident Point.

Treatment

The 2 deminers (the breaching party), [Deminers 1 and 2] performed first aid, stabilized and prepared the injured for evacuation - more specifically:

- Stopped bleeding,
- Bandaged the wounds,
- Stabilized the arms,
- Prevented shock (liquid drip, elevation of legs),
- Injected various painkillers,
- Performed mentally first aid.

The whole process of medical treatment and stabilization from the time of the accident to the hospital took 33 minutes.

Summary

The medical treatment and evacuation was adequate and contributed to keep the patient in a good and stable condition up to and during the evacuation to the hospital.

However, Medevac and Casevac exercises will take place continuously to obtain the highest possible level of individual medical skills without any interference from the Medical Supervisor.

Review and Briefing of the accident to the organization

On April 9th [International Demining group] staff conducted evaluation and briefing sessions in the site compound and in the cleared area near the minefield. The objectives for conducting such type of sessions were:

- To review in details what happened during and after the accident,
- To establish the probable cause to the accident,
- To show the impact of the blast on the protective equipment,
- To inform about the medical treatment given to the injured,
- To emphasize that SOPs, especially Medic and Demining SOPs, have to be strictly followed and respected,
- To retrain the personnel in prodding methods in various kinds of ground.

8. Conclusion

Following is the conclusion made by the [International Demining group]:

Accident

The accident was purely accidental and no SOPs were violated by the deminer.

Cause

A plausible cause to the detonation of the AP is that its position had been changed from a flat condition to a tilted condition in addition to the 15 degrees sloping hillside. The deminer, while prodding, hits the AP directly on the top.

The repositioning of the AP was probably due to factors such as:

- The natural environment (rain, snow)
- The detonation of a UXO/mortar 75 cm from the accident point.

The AP was a Russian PMN.

Medic

As a whole the medical treatment and evacuation was conducted and performed satisfactory.

Protective Equipment

The protective equipment proved its use as adequate and satisfactory. The deminer would probably have been seriously injured, or even dead, if the issued equipment not had been worn.

Reporting

Reporting was carried out in a correct and efficient way.

Victim Report

Victim number: 418	Name: Name removed
Age: 26	Gender: Male
Status: deminer	Fit for work: not known
Compensation: not made available	Time to hospital: 33 minutes
Protection issued: Frontal apron Long visor	Protection used: Frontal apron, Long visor

Summary of injuries:

INJURIES

minor Body

minor Hands

minor Hearing

minor Shoulder

AMPUTATION/LOSS

Fingers

COMMENT

See medical report.

Medical report

The following is extracted from the internal Accident Report.

The deminer has the following injuries:

Left Hand:

- Fracture on distal phalanx bone of thumb, lost distal part with nail.
- Forefinger, Traumatic amputation from 2/3 Laterally Metacarpal bone.
- Medium finger, this finger is remaining but its Metacarpal bone has fracture and it is internally stabilized by K.Wire. It has also Longitudinal Traumatic incision on dorsal side.
- Ringfinger Traumatic amputated from Lateral and Metacarpal bone.
- Little finger, Traumatic amputated with Metacarpal bone from Proximal Metacarpal articular surface.
- Lost of Hypotenar muscle completely with skin, fascia, nerves, vessels and tendons both sides e.g. completely lost of a triangle shape from middle side of proximal articular medium Metacarpal phlangeal joint to lateral Picefarmo metacarpal joint.

Right Hand:

- Without Forefinger it has open fracture on lateral phalanx internally fixed by K.wire and some skin damages on fracture area dorsal side. Rests of the right hand fingers have no fracture and dislocation.
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Chest - Anterior view:

- Right side: The patient has complained of pain form Upper the breast on shoulder guilder due to the direct positive pressure from mine.
- Left Side: Due to the main pressure from the blast, the patient feels pain in the chest below the breast laterally.
- Posterior view: OK

General Condition of the injured:

- Head: OK, protected by the visor
- Eyes: OK, Protected by the visor
- Face: OK, Protected by the visor
- Ears: After the accident he feels tinnitus during hearing and pain on his right ear.
Left ear is OK.
- Mouth and Teeth: OK.
- Neck: OK
- Abdominal: OK
- Inguinal: OK
- Lower Extremity: OK

The demining group was contacted in October 2001 and inquiries over the "pressure" injuries to the chest were made. The group explained that the expressions used in the report were those of the local medic. When asked directly, the Country Manager replied that the victim had no difficulty breathing and no bleeding from lungs, nose or mouth. "The "pressure" injuries disappeared after a few days."

Analysis

The primary cause of this accident is listed as "*Unavoidable*" because the Victim was apparently working as directed to approved SOPs when the accident occurred. The secondary cause is listed as "*Inadequate equipment*" because the short AK bayonet in use by the deminer put the victim's hands unnecessarily close to the seat of detonation. [Probably 15cm for the right hand and less than 10 for the left.]

The provision of inappropriate tools was a serious "*Management/control inadequacy*". The attempt to compensate by providing gloves was predictably unsuccessful because, at that distance from a blast, even heavy Kevlar gloves would have been of little use.

The demining management stated on 31st October 2001 that their first concern after the Victim was treated was to identify suitable and safer handtools, so showing that they had recognised the need to replace the bayonet prodder.

Note that the investigators made a mistake and Carbon Fibre is not used in any ballistic clothing – its properties are not appropriate for blast or fragmentation protection.

Related papers

The demining group involved circulated a letter to all demining organizations operating in Afghanistan. The letter included their accident investigation and the following covering letter (dated 20/06/01).

From: Programme Manager

Subject: [Demining group] KABUL MAY 2001

Dear All

Within the demining community too many accidents happen in our combined effort reducing the threat from mines and UXOs in Afghanistan. Although [Demining group] is new on the arena, we feel it is important to share experiences even when things go wrong. Last month [Demining group] had an accident in one of our minefields outside Kabul. Attached please find the report that hopefully could be useful in order to avoid further accidents and to optimise the preparedness for action taken by the medical set-up.

Best Regards.