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DDAS Accident Report

Accident details

Report date: 15/03/2004	Accident number: 366
Accident time: 10:15	Accident Date: 16/11/2001
Where it occurred: Stajke Village	Country: Kosovo
Primary cause: Inadequate equipment (?)	Secondary cause: Unavoidable (?)
Class: Missed-mine accident	Date of main report: 24/11/2001
ID original source: TKG	Name of source: KMACC
Organisation: Name removed	
Mine/device: PMA-3 AP blast	Ground condition: bushes/scrub rocks/stones route/path woodland (light)
Date record created: 21/02/2004	Date last modified: 21/02/2004
No of victims: 1	No of documents: 1

Map details

Longitude:	Latitude:
Alt. coord. system: DM 64484 71767	Coordinates fixed by:
Map east:	Map north:
Map scale: GR 34T	Map series:
Map edition:	Map sheet:
Map name:	

Accident Notes

inadequate metal-detector (?)
mine/device found in "cleared" area (?)
mechanical follow-up (?)

Accident report

The following is the Kosovo MACC's accident report, edited for anonymity. A few pictures have also been removed in order to keep the file a reasonable size.

Introduction

In accordance with the Mine Action Co-ordination Centre (MACC) Standard Working Procedure No 4, the MACC Programme Manager issued a Convening Order on Friday 16 November 2001 for an Accident Investigation Board of Inquiry. Annex A details the Convening Order.

This is a comprehensive report by the Board of Inquiry into the mine accident that occurred on Friday 16 November 2001. Based on the investigation, interviews, statements from [Demining group 1] personnel involved in the accident, visits and photos of the accident site, this accident is considered to be non-preventable.

This finding is based on the fact that the mine although in a previously cleared area was under a large rock and was at a depth of 25cm below ground level. The rock was not sitting directly on top of the mine, but placed in such a way as to have a gap between the mine and the rock. The depth of the mine, the thickness of the rock and the gap between, meant that this mine was effectively at a depth much greater than 25cm and was therefore not located with the metal detector.

The accident occurred at Task Dossier Number S20-38, Dangerous Area Number 3826, GR 34T DM 64484 71767 on 16 November 2001 at 1015 hours.

Events leading up to the Accident

Two manual clearance teams from [Demining group 2] have been conducting clearance at this site since June 2001, and two [Demining group 1] manual clearance teams commenced clearance at this site 15 October 2001. Although both clearance organisations are conducting mine clearance in the same minefield, each has its own defined area of responsibility. The Bozena is also flailing in this minefield.

On the morning of the accident at approximately 10:15hrs the [Victim] was walking down the track and stepped on a large rock. This rock that was laid over the PMA3 blast mine moved and in so doing detonated the mine. The track that [the Victim] was walking along was an area that had been cleared by his team four days previously. As a result of the blast [the Victim] suffered relatively minor injuries to his left foot with no loss of toes. There was no blood and no broken skin, however there was a lot of swelling. It appears that the large rock above the mine absorbed the bulk of the blast thereby saving [the Victim] from any initial serious injuries.

The team medic provided first aid treatment, and the [Demining group 1] International Supervisor who was on site was notified of the accident by the team leader. A CASEVAC helicopter was requested through [Demining group 1] HQ. After the casualty was stabilised he was then stretchered to the ambulance and driven to the HLS at the nearby Gorazup School.

The helicopter arrived at the HLS at 10:48hrs and the casualty was then airlifted to the German KFOR Hospital in Prizren. X-rays were taken of the injured leg and [the Victim] has suffered numerous broken bones in his left foot.

The seat of the explosion was at a distance of 80cm from the centre of the track and plainly inside the cleared area. There are numerous rocks and boulders within this area, and on investigation of the blast hole it was apparent from the indentation in the ground that the rock was approximately 40cm x 40cm. It could not be determined how thick the rock was, as it had been completely destroyed.

In the five months that [Demining group 2] have been working at this site they have removed and destroyed over 130 PMA-3 blast mines. Of these, six were found to have been laid under rocks. The size of these rocks were not large compared to this occasion, and the mines were at a depth of less than 5cm. These mines were detected using their metal detectors. [Demining group 2] and [Demining group 1] both use the same two types of detectors, which are the MineLab and the Vallon. In the four weeks that [Demining group 1] has been conducting clearance in this minefield, they have yet to find a PMA-3 blast mine that has been laid under a rock.



[The picture above shows the accident lane.]

Considering that the area in which this mine was laid had been cleared four days previously, it is quite possible that other people have walked over this rock without detonating the mine. There is no identifiable pattern of mines in this area of the accident site. This therefore makes it very difficult when determining where the mines could be laid.

As part of their manual clearance drill, [Demining group 1] remove rocks that are of a manageable size to ensure that there are no mines beneath them.

Work History of the Casualty

[The Victim] works for [Name excised], which is a Bosnian Mine Clearance Company that has been sub-contracted to [Demining group 1]. He has been working for [Demining group 1] in Kosovo since October 2001.

Past History of the Area

The accident site is in the area of Stajke Village, Task Dossier S20–38, at Dangerous Area Number 3826. This dangerous area is an unrecorded minefield and has been laid along a foot track that runs for approximately 2.2km in a northerly direction from the Beli Drum River. It contains PMR2A fragmentation as well as PMA3 blast mines. The track rises over 350 vertical metres from its start that is near the river to its end up at the road. The area of the track runs up a fairly steep gully and is surrounded on both sides by dense vegetation. Areas of the track are also covered with rocks and boulders.

Sequence, Documentation and Procedure of Tasking

The Task Dossier No S20-38 was issued to [Demining group 2] in June 2001. [Demining group 1] commenced clearance operations with two manual clearance teams on 15 October 2001. The Bozena flail and the [Demining group 3] EDD have also conducted clearance in this minefield.

Site Layout and Marking

The site layout and marking at the site was in accordance with the [Demining group 1] SOPs for mine clearance. [Demining group 2] and [Demining group 1] are both conducting clearance in this minefield, and both have their own clearly defined areas of responsibility (AOR). At no time does either company conduct clearance in the other's AOR.

There is no apparent pattern in the way the mines have been laid. The mines have been found anywhere from on the track to up to 15m away depending on the density of the vegetation.

Management Supervision and Discipline

All [Demining group 1] Deminers, Team Leaders and Medics are sub-contracted from the Bosnian demining company [name excised]. There is also an International Supervisor on site providing supervision.

Quality Assurance and Quality Control

[Demining group 1] Quality Control is achieved through a system of on-site checks by the Team Leaders and Task Site Supervisor to ensure adherence to the mine clearance SOPs. The MACC QA teams conduct external Quality Assurance on a regular basis, normally each site is visited a minimum of once per week.

Communications and Reporting

At the time of the accident there was effective communication by VHF hand-held Motorola radios between the Team Leaders and Task Site Supervisor on their internal net. There was further communication by hand-held VHF radios from the team site, and [Demining group 1] base situated in Prizren also on the internal net.

Medical Details

[The Victim] has suffered comparatively moderate injuries to his left foot considering he stood directly on a rock that was laid over a PMA-3 blast mine. He was initially taken to the German KFOR Field Hospital in Prizren and was examined. Due to the internal injuries in his foot it was decided that the best option for treatment was to MEDIVAC him to Sarejevo, where he would receive specialist treatment. He was consequently flown to Sarejevo by air ambulance on 18 November 2001. The [Demining group 1] Medical Insurance cover provided for this service. Annex D details the medical report from the MACC QA Medical Officer.

Personnel

Statements from personnel involved are detailed in the attached [Demining group 1] accident report at Annex E. [Not made available.]

Dress and Personal Protective Equipment (PPE)

At the time of the accident [the Victim] was wearing personal protective equipment in accordance with [Demining group 1] SOPs.

Tools and Equipment

[The Victim] was not using any tools at the time of the accident.

Details of Mine Involved

[Large drawing removed.]

Account of Activities

The following is a description of the events from the time of the accident until the casualty was at the hospital:

Friday 16 November 2001

10:15hrs – [the Victim] walks down the track and steps on a rock that then detonates a PMA3 blast mine.

10:16hrs – [the Victim] receives first aid treatment from the team medic. [Demining group 1] base is informed and a Helicopter CASEVAC is requested from the German KFOR based in Prizren.

10:25hrs – [the Victim] is taken by ambulance to the HLS at Gorazup School to await the helicopter CASEVAC.

10:48hrs – Helicopter arrives at HLS.

10:55hrs – Helicopter departs with casualty for German KFOR Field Hospital in Prizren.

12:00hrs – MACC QA Officer arrives on site and conducts an investigation with the [Demining group 1] Site Supervisor.

Insurance Details

[The Victim] is covered by the [Demining group 1] personal insurance it has for all staff. All insurance policies for [Demining group 1] are through HMT Insurance Brokers Limited. A copy of the insurance detail is kept in the MACC QA Office.

Conclusions

Based on the investigation, interviews, the statements and visits to the site, the Board of Inquiry concludes the following:

[The Victim] was not conducting manual clearance at the time of the accident but was walking down the track in a previously cleared area when he stepped on a rock which then caused a PMA3 anti-personnel blast mine to detonate. He received comparatively moderate injuries to his left foot and has since been MEDIVAC to Sarejevo for further specialist treatment.

The mine was at a depth of 25cm below ground level and was laid under a rock. The rock was not lying directly on the mine and must have had a gap between the bottom of the rock and the top of the mine. The thickness of the rock could not be determined as it was completely destroyed in the blast.

The depth of the mine below ground level combined with the thickness of the rock and the gap between put this mine at such a depth as to be not detectable by the metal detector.

The indentation of the rock that was above the mine could still be seen in the ground during the investigation. The approximate surface area of the rock was 40cm x 40cm. The rock took the bulk of the blast from the mine, which prevented [the Victim] from receiving serious injuries and possible traumatic amputation of his foot.

There have been a total of 238 PMA3 blast mines removed and destroyed from this minefield. Of this number six mines have been found to be laid under rocks. These six mines have been at a depth of less than 5cm below ground level and all were located by metal detectors.

It is the view of the board that this was not a re-mining accident, as there has been no evidence to substantiate this.

Recommendations

The following are recommendations based on the Board of Inquiry conclusions:

Removing all rocks is seen as a very inefficient clearance option. The number of mines found under rocks in comparison to the total number of mines located and destroyed does not merit the total removal of all rocks. However there does need to be a compromise to ensure that no further mines are missed and the efficient and effective clearance standard that is required. It is therefore recommended that [Demining group 1] continue with their method of manual clearance, however there is a need to make a more thorough appraisal of rocks that could potentially conceal a mine. These rocks will need to be investigated.

[Demining group 1] are to revisit all their areas cleared in this minefield to date and re-assess rocks that were not moved, in order to investigate potential mines that could be concealed beneath them.

Signed: UNMIK Mine Action Co-ordination Centre, Quality Assurance Officer

Annexes: [Those marked * were not made available.]

MACC convening order for accident investigation Board of Inquiry.

Map of the general area*.

Schematic diagram of the general accident area*.

Medical report from the MACC QA Officer.

[Demining group 1] Report*

Comments by the MACC Chief Operations Officer

The Conclusions of the Board of Inquiry are agreed with and the Recommendations are endorsed as valid.

This was an unanticipated event that fortunately only resulted in very minor injuries.

Signed: UNMIK Mine Action Co-ordination Centre, Chief of Operations

Comments by the MACC Programme Manager

The conclusions and recommendations of the Board of Inquiry are concurred with and endorsed.

Signed: UNMIK Mine Action Co-ordination Centre, Programme Manager

Victim Report

Victim number: 470	Name: Name removed
Age:	Gender: Male
Status: deminer	Fit for work: presumed
Compensation: not made available (insured)	Time to hospital: 45 minutes
Protection issued: Not recorded	Protection used: PPE worn, type not recorded

Summary of injuries:

severe Foot

COMMENT: See medical report.

Medical report

A medical report was made available by the MACC medical officer. It is reproduced below, edited for anonymity.

This report is based on interviews/statements with the following persons:

Demining group Technical Advisor.

Demining group Team Medic.
Chief Surgeon at German KFOR Hospital in Prizren.
The Victim deminer.

Injuries:

Complicated fracture on left heel with destruction of surrounding tissues.

Introduction:

At the time of the accident, two Medics with all their medical equipment were at the Control Point, approx. 400 meters from the scene of the accident.

At 10:15hrs they received information by radio that an accident had occurred and they immediately went to the scene.

On arrival the casualty had been taken to a safe area by other deminers. The Medic immediately removed the left boot examined the casualty.

Findings at first examination:

The victim was fully conscious but in a lot of pain.

The left foot was intact and there was no bleeding.

There were no other visible injuries.

Medical treatment at location:

The injury was immobilized with a splint and bandaged.

The victim was given one injection of Novalgetol (analgesic) 5 mg intramuscular.

The victim then was put on a stretcher and transported by Ambulance to the Helicopter Landing Site, approx. 15 minutes driving distance from the site. The Helicopter had already landed at the HLS when they arrived there. The Medic reported to the KFOR Doctor who took over the treatment, and the victim was taken to German KFOR Hospital in Prizren.

At KFOR Hospital Dr [Name excised] examined the victim and later recommended transfer to Sarajevo for surgical treatment in a Specialist Trauma Centre, due to severe internal injuries in the foot. [The Victim] was transferred to Sarajevo the next day.

Order of events:

10:15hrs	Accident occurred.
10:20hrs	Victim receives first aid treatment by Medic.
10:20hrs	Request for CASEVAC Helicopter.
10:35hrs	Helicopter arrives at HLS 01.
10:40hrs	Victim arrives at HLS accompanied by Medic.
10:45hrs	Helicopter departed from HLS with victim onboard.
11:00hrs	Victim receives surgical treatment at KFOR Hospital in Prizren.

Conclusions:

The treatment/assessment that [the Victim] received from the Medic at the scene of the accident have some remarks:

An intravenous cannula was not inserted.

Analgesic was given intramuscular.

No Oxygen was given.

The treatment that [the Victim] received by the surgeons in the CASEVAC Helicopter and at KFOR Hospital in Prizren was carried out in a very professional way.

The overall CASEVAC time was within the "Golden hour".

Recommendations:

In case of trauma injury:

It is preferable to give analgesic intravenous.

Always set intravenous cannula and give fluid.

Always give Oxygen.

An accident should always be followed by a debriefing with all personnel involved.

Signed: QA Medical Officer, MACC

In December 2001, the MACC reported that the Victim was still undergoing surgical treatment in Sarajevo, Bosnia.

Analysis

The primary cause of this accident is listed as "*Inadequate equipment*" because it seems that the methods and detector used were incapable of locating the mine.

The secondary cause is listed as "*Unavoidable*" because it appears that the mine was laid in an unpredictable way and at an unusual depth. This led the Victim to initiate it in a way that involved no fault.

The investigators did not detail the manner in which they determined the depth of the mine. Other mines found beneath rocks had not been deeply buried. If a large rock was above it, it is likely that the detonation would have disrupted the ground more than it would have otherwise and so the mine may not have been laid as deeply as the investigators supposed. Any PMA-3 laid at that depth would not necessarily detonate when the ground above it was traversed, so there would have been little point in laying the mine so deeply.

The crater at the accident site is shown below.

