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DDAS Accident Report

Accident details

Report date: 06/03/2004	Accident number: 402
Accident time: 11:25	Accident Date: 20/07/2001
Where it occurred: MNB West, Rasa Koshare: Dossier W02-37, MF 305	Country: Kosovo
Primary cause: Inadequate survey (?)	Secondary cause: Management/control inadequacy (?)
Class: Missed-mine accident	Date of main report: 26/07/2001
ID original source: Bol: 009/2001: TKG	Name of source: KMACC
Organisation: Name removed	
Mine/device: PMA-2 AP blast	Ground condition: woodland rocks/stones
Date record created: 05/03/2004	Date last modified: 05/03/2004
No of victims: 2	No of documents: 1

Map details

Longitude:	Latitude:
Alt. coord. system: GR 34T DN 3450 0255	Coordinates fixed by:
Map east:	Map north:
Map scale:	Map series:
Map edition:	Map sheet:
Map name:	

Accident Notes

inadequate investigation (?)
inadequate equipment (?)
inadequate metal-detector (?)

Accident report

What follows is the original Board of Inquiry report, edited for anonymity and with excess pictures removed.

REPORT FOR ACCIDENT INVESTIGATION BOARD OF INQUIRY – No 009/2001

Mine Accident that occurred in MNB West on Friday 20 July 2001 in which [Demining group] Section Leader [The Victim] was injured.

Introduction

1. In accordance with the Mine Action Co-ordination Center (MACC) Standard Working Procedure No 4, the MACC Programme Manager issued a Convening Order on Friday 20 July 2001 for an Accident Investigation Board of Inquiry. Annex A details the Convening Order.
2. This is a comprehensive report by the Board of Inquiry into the mine accident that occurred on Friday 20 July 2001. Based on the investigation, interviews, statements from [Demining group] personnel involved in the accident, visits and photos of the accident site, this accident is considered to be non-preventable.
3. This finding is based on the fact that at the time of the accident the Section Leader [the Victim] was walking in a manually cleared area conducting her duties as Section Leader. The manual clearance of this lane had been cleared according to [Demining group] clearance procedures and also in accordance with the [Demining group] Threat Assessment for this minefield, which is excavation to a depth of 5cm. This mine was at a depth of 16cm. This minefield is nearing completion and all previous blast mines found in this minefield have been located within this depth of 5cm.
4. The accident occurred at one of the Rasa Koshare minefield's, Task Dossier Number W02-37, minefield number 305, GR 34T DN 3450 0255 on 20 July 2001 at 1125 hours.

Events leading up to the Accident

5. [Demining group] have one manual clearance team conducting operations at minefield number 305. This minefield has three rows of mines that consist of PMR2A anti-personnel fragmentation mines, as well as PMA1 and PMA2 anti-personnel blast mines. This team employs a two man one lane drill whereby one person works whilst the other rests. [The Victim] is a Section Leader in this team. Her duties and responsibilities require her to be in the clearance lanes supervising the deminers in her section.
6. On the morning of the accident a pile of mines were discovered at the base of a large tree approximately 7 metres before the seat of the explosion, this pile consisted of 8 x PMR2A, 1 x PMA1 and 1 x PMA2. [The Victim] had disarmed these mines and they were removed. The clearance lane then continued. In this lane there is a large rock, and beside this rock a PMR2A was discovered as well as 3 x PMA2. These mines were all disarmed and removed. The deminer was continuing with the clearance of this lane when [the Victim] came into the lane and was in the process of erecting mine marking tape when she stepped on what is believed to be a PMA2 blast mine. As a result of the explosion her right foot was traumatically amputated, and she was thrown to the ground. The force of the explosion was such that it blew her foot 30m up the hill and onto the road, along with her right boot. The deminer that was working in this lane was 2m from the blast, and he received a superficial injury to his shoulder. Immediately after the blast [the Victim] was carried from the lane up to the road where she was given first aid treatment and stabilised. From here she was taken by ambulance to await the arrival of the CASEVAC helicopter at HLS – Red 26, 2km down the hill.
7. The helicopter arrived at the HLS at 1159hrs, [the Victim] was loaded and the helicopter departed arriving at the Italian KFOR Hospital in Peja at 1207hrs. She was in the operating theatre within the hour of the accident.

- This is the fifth mine accident that [Demining group] have had since May of this year, although it is the first for this particular minefield.

VIEWS OF ACCIDENT SITE



VICTIM'S RIGHT BOOT



The Victim's [ROFI] vest was cut from [the Victim] by the medics during the first aid treatment. The helmet (with a long visor) was shown with the visor unmarked but with blood stains on the top of the helmet.

Work History of the Casualty

- [The Victim] has been working for [Demining group] since September 1999. She is considered to be a very diligent and trustworthy Section Leader, and carries out her duties and responsibilities in a professional manner.

Past History of the Area

10. The accident site is Task Dossier W02 – 37, at minefield number 305. The minefields in this task dossier are all in the Rasa Koshare area, which is on the Kosovo – Albanian border. There was heavy fighting in this location during the war and there are numerous minefields along this border area. The minefields contain anti-personnel mines of both fragmentation and blast, and are predominantly laid in very high densities.
11. The [Another demining group] conducted clearance operations in this minefield from July – November 2000.

Sequence, Documentation and Procedure of Tasking

12. The Task Dossier No W02-37 was issued to [Demining group] on 17 February 2001. As stated this was a minefield that Halo Trust had previously conducted clearance in, although had not completed.

Geography and Weather

13. The area in general is the Kosovo – Albanian Border approximately 25km NW from Gjakova. The border region around this area is mountainous and covered with forest and bush. The road access to this site is through the village of Junik. The route from here is a 12km very uneven gravel road which winds its way up to the minefield. The weather at the time of the accident was fine with a temperature of approximately 25 degrees celsius.

Site Layout and Marking

14. The site layout and marking at the site was in accordance with the [Demining group] SOPs for mineclearance. This minefield is on a hillside, and the lane in which the accident occurred is approximately 30m below the main dirt road that makes its way to the top of the mountain. According to the Vojska Jugoslavije (VJ) minefield record, there are three mine rows containing PMR 2A fragmentation mines with PMA1 and PMA2 blast mines as keepers. The mine rows are running generally up the hill and were laid across the main dirt road and then continue up the hill.

Management Supervision and Discipline

15. [Demining group] direct supervision on site is achieved by having a National Team Site Supervisor. There is a National Senior Demining Supervisor that over-see the supervision of all demining sites, and managing all [Demining group] clearance operations is an International Operations Officer.

Quality Assurance and Quality Control

16. [Demining group] Quality Control is achieved through a system of on-site checks by the Section Leaders and Team Leaders to ensure adherence to the mineclearance SOP's. 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

17. At the time of the accident there was effective communication by VHF hand-held Motorola radios between the section leaders and team site supervisor on their internal net. There was further communication by hand-held VHF radios from the team site, and [Demining group] base situated in Hereq also on the [Demining group] internal net. The communications between callsign 52 ([Demining group] base), callsign 51 and callsign kilo foxtrot (KFOR) is on the MNB (W) VHF channel 4.

18. At the time of the accident the MACC QA Team Leader was in the region and he monitored all communications in regards to the accident on the MNB(W) channel.

Medical Details

19. [The Victim] has had her right foot amputated. She also suffered minor injury to her right hand as a result of the blast. She has a slight injury to her right eye, which was caused by her helmet when she fell to the ground after the explosion. Annex E details the medical report from the MACC QA Medical Officer.

[There were in fact two victims of this accident. The second person received a small shoulder injury – as explained in the MACC medical report on the treatment given – which is reproduced under “Medical report” for Victim No.1 at the Victims tab.]

Personnel

20. A list of personnel and their duties is detailed at Annex D to the [Demining group] Preliminary Investigation Report. Written statements from the personnel involved in the accident form the Appendices to this Annex.

Dress and Personal Protective Equipment (PPE)

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

Tools and Equipment

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

Details of Mine Involved

23. PMA2 AP Blast Mine [large picture removed].
24. The mine involved is believed to be a PMA2 anti-personnel blast mine. It has a plastic body which encases 100gm of TNT explosives and has a friction-sensitive chemical fuse and detonator. A minimum pressure of 5 kg is required to initiate this mine.

Account of Activities

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

Tuesday 22 May 2001

- 1125hrs – Time of accident.
- 1125hrs – Team reports accident to [Demining group] base (callsign 52) that they have an accident on their site with one section leader who has a traumatic amputation of the foot. They request a helicopter CASEVAC at HLS Red-26.
- 1126hrs – 52 calls 51 (senior partner MNB(W)) and reports the accident detail.
- 1127hrs – 51 calls KFOR, MNB (W) callsign kilo foxtrot (KF) and reports that there is a mine accident and a helicopter CASEVAC is required at HLS Red-26. KF acknowledges.
- 1131hrs – 51 requests from KF the arrival time of the helicopter to the HLS. KF did not provide an answer.
- 1137hrs – 51 once again requests from KF the arrival time of the helicopter.

- 1140hrs – KF enquires as to the injuries of the casualty. 51 replies that the casualty has an amputation of the foot.
- 1149hrs – KF requests the name of the casualty, 51 gives it as [the Victim].
- 1153hrs – KF confirms that the helicopter will arrive at the HLS in five minutes.
- 1159hrs – The helicopter arrives at the HLS.
- 1207hrs – The helicopter arrives at the Italian Field Hospital in Peja.

Insurance Details

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

Conclusions

27. Based on the investigation, interviews, the statements and visits to the site, the Board of Inquiry concludes the following:
- The threat assessment made for this minefield by the [Demining group] Operations Officer and agreed to by the MACC QA Officer, was that all mine rows are to be located, and excavation would be carried out to a depth of 5cm.
 - All blast mines located in this minefield (over 100 to date) have been within the excavated depth of 5 cm.
 - This mine was not located during the excavation drill as it was at a depth of 16cm.
 - There have been instances in the past whereby mines have been located at depths of greater than 20cm in the Rasha Koshare minefields. However this was only in mine rows in close proximity to streams where soil had built up as a result of floods. This was not a factor in this case.
 - There are normally two blast mines as keepers for each fragmentation mine in this minefield. In this instance three PMA2 blast mines were located next to a PMR2 fragmentation mine. This third blast mine was not consistent with the pattern that had been established in this minefield. The fourth blast mine followed this inconsistency and was at a greater depth than the other three.
 - There were no breaches of [Demining group] procedures.
 - This is the fifth mine accident that [Demining group] have had in the Rasha Koshare minefields since 22 May this year.
 - The helicopter CASEVAC procedure went well, and was a vast improvement from the previous accident. The major concern in the past being the communications problem due to the English speaking ability of the KFOR radio operator.
 - KFOR had the helicopter on site at the HLS within 32 minutes of being notified.

Recommendations

28. The following are recommendations based on the Board of Inquiry conclusions:
- In light of the fact that this is the fifth mine accident that [Demining group] have had in the past eight weeks, all [Demining group] clearance operations are to be suspended for a period of no less than one week. This time is to be utilised to re-evaluate all clearance plans for all minefields that [Demining group] are responsible for. It is also to be used as a period for [Demining group] as an organisation to regain composure and refocus before continuing.

- The clearance depth for the Rasha Koshare minefields are to be amended to take into consideration the depth of this mine that has been proven to be greater than 5cm.
- [Demining group] are not to commence clearance operations until the MACC QA Officer has ratified the amended clearance depth.

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

Annexes:

- A. MACC convening order for accident investigation Board of Inquiry.
- B. Map of the general area.
- C. Schematic diagram of the general accident area.
- D. [Demining group] Threat Assessment for minefield number 305. [Not made available.]
- E. Medical report from the MACC QA Officer. [See Medical report at the Victim tab.]

Attachment:

[Demining group] Preliminary Investigation Report

Comments by the MACC Chief Operations Officer

This accident is considered to be unfortunate but non-preventable. It is more a reflection of the technical difficulties and heavy density of the mines in this area.

The Threat Assessment for this area was valid, was based on current information and indicators and simply now needs to be adjusted to take into account the changing circumstances.

The Conclusions and Recommendations of the Board of Inquiry are fully endorsed and concurred with.

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

Comments by the MACC Programme Manager

The conclusions and recommendations of this BOI are concurred with.

The threat assessment made by [the Demining group] for this minefield is considered to be valid, however this accident has subsequently proven that even with supposedly reliable records, anomalies can occur. It is highly unusual for the PMA-2 mine to be buried at such a depth, if indeed it was a PMA-2. The lack of evidence at the accident site makes it extremely difficult to draw firm conclusions.

If it was a PMA-2, this would be the first instance that this has been encountered in Kosovo, and there have been more than 5,000 PMA-2 cleared to date. Regardless of the mine type however, it is not possible to determine whether it was deliberately buried at this depth, or this was caused by natural factors. The fact that the mine was so out of place with the pattern and the record is also a fact that is difficult to explain.

Therefore the recommendation to stop current activities to enable a complete reassessment to be conducted is fully warranted at this time. Once this has occurred and a revised plan agreed upon, activities can commence in this area.

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

Victim Report

Victim number: 518	Name: Name removed
Age:	Gender: Female
Status: supervisory	Fit for work: not known
Compensation: not made available	Time to hospital: 47 minutes
Protection issued: Frontal apron Helmet Long visor	Protection used: frontal apron, helmet, long visor

Summary of injuries:

INJURIES

minor Arm

minor Eye

minor Hand

AMPUTATION/LOSS

Leg Below knee

COMMENT

See medical report.

Medical report

The following medical report was made available. It is the first mention of a second victim of this accident.

Medical report concerning Rasa Koshare accident 20/07/01.

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

- Dr. [name excised, Demining group] Medical Coordinator.
- Mrs. [name excised] Medical Team Leader of Rrasa Koshare VIII Medical Team.
- Mr. [name excised] Medic of the Rrasa Koshare VIII Medical Team.
- Mrs. [name excised Demining group] Section Leader (Victim)
- Dr. [name excised] Surgeon at Italian KFOR Hospital in Peja

Victims:

- Mrs. [name excised] Section Leader.
- Mr. [name excised]: Deminer

Injuries:

Mrs. [Victim No.1] was taken by helicopter to KFOR Hospital in Peja and treated for:

- Traumatic amputation of right foot with concomitant destruction of surrounding tissues.
- Burn wound on the lower part of right arm.

- Hemathoma on right eyelid.

Mr. [Victim No.2] was taken care of at location for:

- Superficial cuts on the back of his right shoulder.

Attachments:

- [Demining group] Accident report by Medical Coordinator [name excised]. [Not made available.]
- The sequence of events, by Medical Coordinator [name excised].

Introduction:

At the time of the accident there was one Ambulance and two Medics with all their medical equipment at the site.

At 11:25 they where called on radio by TSL [name excised] who was close to the place of the accident. The Medical Team arrived to the line after 2 minutes, [Victim No.1] had then been carried by stretcher to a safe area.

The Medical Team Leader decided to transport the victim [No.1] by helicopter to KFOR Hospital in Peja. KFOR was contacted through NPA at 11:27 and a request for Helicopter MEDEVAC was sent.

The victim [No.1] was conscious and responsive in full and logical verbal contact, airways intact and open, respiratory pattern and rate, pulse rate and blood pressure within normal limits.

The Medics immediately started with first aid and stabilization of the victim who was bleeding and was in big pain.

The bleeding was stopped. 20mg Morphine and 1000 ml Ringer Lactate was given iv.

She also got Oxygen 15 l/min. and a Stiffneck Collar applied.

At 11:59 the Helicopter arrived to the HLS (32 minutes after the request) and the victim [No.1] was transported to Italian KFOR Hospital in Peja accompanied by the [Demining group] Medical Team.

The other victim, [N0.2, name excised] had only minor injuries on the back of his right shoulder and was taken care of at location by another Medical Team.

Order of events:

Time	Event
11:25hrs	Accident occurred.
11:27hrs	Victim No.1 receives first aid treatment at the safe area.
11:27hrs	Request for CASEVAC helicopter KFOR
11:59hrs	CASEVAC helicopter arrived at HLS.
12:02hrs	CASEVAC helicopter departed from HLS with victim No.1 onboard.
12:12hrs	CASEVAC helicopter arrives at Italian Field Hospital in Peja.

Conclusions:

CASEVAC was performed according to S.O.P.

Overall CASEVAC time was 47 min.

The treatment/assessment that [Victim No.1] received by the [Demining group] Medical Team at the scene of accident and by surgeons at Italian KFOR Hospital in Peja was carried out in a very professional way.

Recommendations:

Make arrangements for a psychological debriefing for all personnel working for the organisation.

Signed: Medical Quality Assurance Officer, MACC Kosovo

Victim Report

Victim number: 519	Name: Name removed
Age:	Gender: Male
Status: deminer	Fit for work: yes
Compensation: not made available	Time to hospital: not applicable
Protection issued: None	Protection used: not recorded

Summary of injuries:

INJURIES

minor Shoulder

COMMENT

No medical report was made available.

Analysis

The primary cause of this accident is listed as *“Inadequate survey”* because the methods being used in the minefield were incapable of finding the threat mines reliably. The investigator observed that all mines found so far had been within 5cm of the surface – but since the group was only looking to within 5cm of the surface, it follows that all found mines MUST have been inside that depth. The secondary cause is listed as a *“Management/control inadequacy”* because both the demining group and the MACC wrongly assessed the risk in the area. While the demining group’s clearance was stopped, it is disturbing to note that no immediate recommendation to re-clear the area already processed was made.

As the MACC Programme Manager observed in his comments at the end of the Accident report, it is not clear why the investigators decided the mine was a PMA-2. The severity of the injury (with a foot blown cleanly off) more closely matches that anticipated with a PMA-1, which were also known to be in the area. The fact that a second person was injured add weight to the view that the mine may have been the bigger PMA-1. Also, the PMA-2 is intended to be laid with its pressure spider above ground. The PMA-1 can be laid effectively at greater depth, so was more likely to have been more deeply concealed.

That said, it is not explained how the investigators determined the depth of the device – which is an inexact science at best when investigating very small blasts – and so it is possible that the PMA-1 was not deeply buried and was missed simply because it was out of the anticipated pattern.

The investigators omitted mention of one victim and failed to identify the mine. These failings are recorded under Notes as an “inadequate investigation”.

The demining group’s failure to deploy a metal-detector was common in the area at the time, but rested on misconceptions about the capacity of metal-detectors that have since been recognised.