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DDAS Accident Report

Accident details

Report date: 15/03/2004	Accident number: 326
Accident time: 11:20	Accident Date: 22/05/2001
Where it occurred: Rasa Koshare, Kosovo/Albania border	Country: Kosovo
Primary cause: Field control inadequacy (?)	Secondary cause: Field control inadequacy (?)
Class: Missed-mine accident	Date of main report: 29/05/2001
ID original source: TG/CC/JF No 005/2001	Name of source: KMACC
Organisation: Name removed	
Mine/device: PMA-3 AP blast	Ground condition: leaf litter rocks/stones soft woodland
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: GR 34T DN 3509 0156	Coordinates fixed by:
Map east:	Map north:
Map scale:	Map series:
Map edition:	Map sheet:
Map name:	

Accident Notes

inadequate area marking (?)
mine/device found in "cleared" area (?)
inadequate metal-detector (?)
metal-detector not used (?)

Accident report

The following is the accident report supplied by the MACC, edited for anonymity.

Introduction

1. In accordance with the Mine Action Co-ordination Centre (MACC) Standard Working Procedure No 4, the MACC Programme Manager issued a Convening Order on Tuesday 22 May 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 Tuesday 22 May 2001. Based on the investigation, interviews, statements from [the demining group involved] 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 deminer [Victim] was following [the demining group's] clearance procedures in accordance with their Threat Assessment for this minefield. [The demining group was a collaboration between two.]
4. The accident occurred at one of the Rasa Koshare minefield's, Task Dossier Number W02-37, minefield number 315, GR 34T DN 3509 0156 on 22 May 2001 at 1120 hours.

Events leading up to the accident

5. [The demining group] have one manual clearance team conducting operations at minefield number 315. This team employs a two man one lane drill whereby one person works whilst the other rests. [The victim] was paired up with a deminer who informed their section leader that he was not feeling well during his shift. The Section Leader sent him to see the medic in the rest area, and this lane was then closed for the remainder of the shift. [The victim] returned to work in this lane on the next shift.
6. The section leader [No.1] returned to the rest area for lunch whilst the second section leader, [No.2] remained in the minefield to supervise. [Section Leader No.2] was about to give the order to start work when he heard an explosion. He was approximately 35 metres from [the Victim's] lane and he moved down to him. [The Victim] was sitting in the safe lane looking down at his leg. His left foot had been completely blown off from the explosion. There were no witnesses to the actual explosion, however [the Victim] was walking back to the end of his clearance lane when he stepped on the mine at the entrance to his lane. The mine (PMA-3) was at a depth of 24cm in soft ground and positioned on a rock. This caused the force of the blast to be concentrated upwards with maximum force, thereby resulting in the severity of the injury sustained by [the Victim].
7. [Section Leader No.2] then called the Task Site Leader (TSL) by radio and informed him of the accident, and requested that the medical team be sent to their site from the control point. [Section Leader No.2] then arranged for [the Victim] to be stretchered down the hill to the road where the medics were waiting to give first aid.
8. [The Task Site Leader] informed the [demining group] base location that there had been a mine accident. He gave the name of the casualty as well as the extent of injury. He then consulted the medical team leader after they had stabilised the casualty, who told him they would transport the casualty by road to the Italian KFOR Hospital in Peja, which would take approximately 50 minutes. [The Task Site Leader] then informed the [demining group] base location of this. The [demining group] base radio operator then contacted [another callsign] and requested that KFOR (Kilo Foxtrot) be informed of this.
9. The Operations room manager questioned this decision to transport the casualty by road due to the condition of the road and the time it would take to get the casualty to Peja Hospital. He then radioed the Operations Officer who had arrived at the site, and it was then decided to request a helicopter evacuation. 52 then called 51 with the change of plan and requested a helicopter evacuation for HLS Red – 26. This call was made at 1140hrs, approximately 20 minutes after the accident. HLS Red - 26 is located next to the team site control point.

10. The helicopter arrived at the HLS at 1205hrs and the casualty was loaded and the helicopter departed at 1210hrs arriving at the Italian KFOR Hospital in Peja at 1220hrs. The patient was in the operating theatre within the hour of the accident.

View of accident lane

Lane indicating tape in accordance with present [demining group] operating procedure. There is potential for this tape to be moved into uncleared ground, thereby creating a situation for someone to inadvertently step into this uncleared area.



View of steep access to the accident site from the road, also the site of the previous [other demining group] accident.



Work History of the Casualty

11. [The victim] has been working for [The demining group] as a deminer since September 1999.

Past History of the Area

12. The accident site is Task Dossier W02 – 37, at minefield number 315. 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.
13. [Another demining NGO] conducted clearance operations in this minefield from July – November 2000. On 18 November 2000 one of the deminers had an accident whereby he initiated a PMA-3 blast mine when using his sapping tool to remove vegetation. The subsequent blast caused minor injury to his hands and legs. The conclusions of this accident were that the deminer was applying an incorrect clearance procedure and there was inadequate supervision on site.

Sequence, Documentation and Procedure of Tasking

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

Geography and Weather

15. 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

16. The site layout and marking at the site was in accordance with the [demining group] SOPs for mine clearance. This particular minefield is on a very steep hillside, which has a stream running down it. According to the Vojska Jugoslavije (VJ) minefield record there are five mine rows containing PMR-2A fragmentation mines with PMA-3 blast mines as keepers. The mine rows are running generally up the hill, with the stream bisecting the minefield. The accident site is very close to the stream.
17. Prior to [the demining group] commencing operations in this minefield the Operations Officer carried out a preliminary risk assessment for this site.

Management Supervision and Discipline

18. [The demining group's] direct supervision on site is achieved by having a National Team Site Supervisor. There is a Senior Demining Supervisor, that oversees the supervision of all demining sites, and managing all [the demining group] clearance operations is the Operations Officer.

Quality Assurance and Quality Control

19. [The demining group's] Quality Control is achieved through a system of on-site checks by the Section Leaders and Team Leaders 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

20. 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 [the demining group] base situated in Hereq also on the [demining group] internal net.
21. At the time of the accident the MACC QA Officer was in the region and monitored all radio traffic concerning the accident on the MNB (W) channel.

Medical Details

22. [The victim] has had his left leg amputated approximately 10cm below the knee.

Personnel

23. A list of personnel and their duties is detailed at Annex D to the [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)

24. At the time of the accident [the victim] was wearing personal protective equipment in accordance with [the demining group's] SOPs. [From other accidents involving the group, it is known that the approved PPE consisted of a helmet, short visor and frontal apron.]

Tools and Equipment

25. [The victim] was not using any tools at the time of the accident as he was walking back to the end of his clearance lane to commence work when the accident occurred.

Details of Mine Involved

[A large picture of a PMA-3 has been removed here.]

Account of Activities

26. The following is a description of the events before and after the accident. The information from the investigation forms the basis of the description of events:

Tuesday 22 May 2001

- 1120hrs – Time of accident.
- 1125hrs – Callsign 52(G) reports accident to [the demining group] base (callsign 52) that they have an accident on their site with one deminer who has a traumatic amputation of the foot. They will be evacuating him by ambulance to the Italian KFOR Hospital in Peja, with an estimated travel time of 50 minutes.
- 1127hrs – 52 calls 51 (senior partner MNB(W)) and reports the accident detail.
- 1128hrs – 51 calls KFOR, MNB (W) callsign kilo foxtrot and reports that there is a mine accident and that the casualty will be evacuated by ambulance to Peja Hospital, with an ETA of 50 minutes.
- 1135hrs – [The demining group] Operations Room Manager contacts the Senior Demining Supervisor to ascertain if a helicopter is required for the casevac. He confirms this from the accident site.
- 1136hrs – 52 calls 51 and requests a helicopter casevac for HLS Red – 26.
- 1137hrs – 51 calls kilo foxtrot and requests a helicopter casevac for 52 at HLS Red – 26.
- 1139hrs – kilo foxtrot requests the name of the casualty, which 51 replies that this is not important at this stage, as they want to know the ETA of the helicopter at the HLS. Kilo foxtrot replies the ETA will be 30 minutes.
- 1140hrs – 51 relays the ETA of the helicopter to 52, and 52 gives the name of the casualty to 51.
- 1142hrs – Kilo foxtrot calls 51 and requests the grid reference to HLS Red – 26. 51 confirms as DN 350 – 014.
- 1144hrs – Kilo foxtrot calls 51 and asks for the name of the doctor and the injured person. 51 replies that they only have the name of the injured person, which is then passed. Kilo foxtrot then inquires if the doctor is on site with the patient. 51 calls 52 to confirm if there is medical support on site to which 52 replies yes. 51 then requests from 52 the name of the medic on site. 52 gives the medic's name. 51 relays this onto kilo foxtrot.
- 1148hrs – 51 calls kilo foxtrot and inquires if there is further information required. Kilo foxtrot replies no.
- 1150hrs – Kilo foxtrot calls 51 and informs the helicopter will be arriving in about 15 minutes. They also request that they be informed when the helicopter arrives at the HLS and departs from the HLS. 51 relays this information to 52.
- 1158hrs – Helicopter departs Gjakova Airfield for HLS Red – 26.
- 1205hrs – 52 informs 51 the helicopter has arrived at the HLS.
- 1208hrs – 51 informs kilo foxtrot the helicopter has arrived at the site.
- 1208hrs – 52 informs 51 the helicopter has departed the HLS with the casualty. 51 relays this to kilo foxtrot.
- 1220hrs – Helicopter arrives at Italian KFOR Hospital, Peja.

Insurance details

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

Conclusions

28. 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 [The demining group] Operations Officer was that all mine rows are to be located, and excavation would be carried out to a depth of 5cm. [The area was considered unsuitable for the use of metal detectors.]
- All PMA-3 blast mines located in this minefield (over 100 to date) have been within the excavated depth of 5 cm.
- The accident occurred in a clearance lane in very close proximity to the stream that bisects the minefield. The depth of the mine was 24cm, however this was not the true ground level, but the effects of the nearby stream during the spring floods, which washed soil and leaves etc into the mine row. This mine may also have been washed down from further upstream to its position before the accident.
- If the clearance drill was to excavate to the full 20cm depth then this mine would still have probably been missed.
- [The victim] was returning to the end of his clearance lane when he stood on the mine that was located just inside the left-hand edge of his lane indicating tape.
- There were no witnesses to the accident.
- The clearance lane that [the victim] was working in was approximately 4m long, however according to [the demining group] SOPs there are no clearance lane sticks put in place until a 5m lane has been cleared. This means that the lane indicating tape is not secured except by the start of lane pegs and the base stick. Although it was not a factor in this particular situation, this leaves the tape free to possible movement either side of the actual cleared ground. This has the potential for someone to inadvertently step into an uncleared area.
- The medical supervisor on site decided to transport the casualty by road to the Italian Hospital in Peja, giving an estimated travel time of 50 minutes. Given the terrible state of the road down the hill to Junik and from there the heavy traffic congestion to Peja, a time of 50 minutes was very optimistic. The reason given by the medical team leader on site for the ambulance casevac was that the patient was in a stable condition. This condition would probably have changed for the worse had the decision to casevac by road been taken. Further to this the more realistic travel time by road to Peja Hospital would have been 80 minutes, meaning the patient would not have arrived at the hospital until well outside the 'golden hour' and probably not in the same stable condition.
- The Operations Officer intervened and changed the casevac from an ambulance to a helicopter. Twenty minutes was lost before this change of plan was made, nevertheless the casualty still arrived at the hospital within the hour.
- KFOR had the helicopter on site at the HLS within 20 minutes of being notified.

Recommendations

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

- Suspend all clearance in the close vicinity of the stream until [the demining group] re-evaluate the threat assessment to take into consideration the affect the stream has had with the build up of soil on the true ground level.
- All clearance lanes that have been completed in the vicinity of the stream are to be re-cleared in accordance with the re-evaluated threat assessment.

- Continual re-evaluation of the threat should be an on going procedure that is employed by all demining organisations.
- [The demining group] amend their SOPs to include the procedures to be taken if there is evidence to suggest that the area to be cleared has been affected by soil build up. The depth of clearance will need to be determined as a result of the threat assessment.
- [The demining group] amend their SOPs to include the placing of clearance lane sticks (approximately 30 – 50cm in length) every meter when deminers are conducting clearance. This will clearly define the edge of the cleared lane as they progress toward the 5m mark where they then place the longer danger sticks and tape.
- [The demining group] implement defined criteria for all medical staff and site supervisors to establish the means of casualty evacuation for each clearance site in order to avoid unnecessary delay and stress when transporting casualties to a medical facility.

Signed: Quality Assurance Officer

Annexes: [See Related papers]

- 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. [The demining group] Threat Assessment for minefield number 315.
- E. Medical report from the MACC QA Officer.

Comments by the MACC Chief Operations Officer

Whilst unfortunate, this accident serves to highlight the need to continually evaluate the prevailing terrain and adjust the Threat Assessment accordingly. This should be a continuous process and drills should be adjusted appropriately.

I have visited this site, since the accident, and the BOI recommendations are already implemented. This reevaluation, ongoing terrain analysis and subsequent adjustment of drills has resulted in the location and removal of a further PMA-3 AP mine 24cm below the surface.

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

Signed: Chief of Operations

Signed: MACC Programme Manager

Victim Report

Victim number: 410	Name: Name removed
Age:	Gender: Male
Status: deminer	Fit for work: yes
Compensation: not made available	Time to hospital: 1 hour
Protection issued: Helmet	Protection used: Frontal apron, Helmet, Short visor
Frontal apron	
Short visor	

Summary of injuries:

INJURIES

minor Leg

AMPUTATION/LOSS

Leg Below knee

COMMENT

See medical report.

Medical report

The following report was made by the MACC QA Medical Officer. It has been lightly edited for anonymity.

QA report

This report is based on interviews/statements with the following staff members of [the demining group].

- Medical Coordinator
- Deputy Medical Coordinator
- Medical Team Leader
- Medic
- Chief Surgeon Italian Field Hospital Peja

Injuries:

Transtibial traumatic amputation of the left leg approximately at 2/3 distal of tibia with concomitant destruction of the surrounding tissues.

Several small superficial abrasions of the frontal surface of the right tibia.

Surgical procedures carried out at Italian Field Hospital Peja.

Debridement and closure of the left foot amputation.

The medics arrived at the scene within 5 minutes and started to provide the Victim with first aid treatment according to the Pre Hospital Trauma Life Support concept. The Victim was then CASEVACED by helicopter to the Italian Field Hospital Peja. "On scene time" was approximately 55 minutes which goes very well with the rule of "Golden Hour".

The below mentioned assessment/therapy was carried out at the scene of accident:

Primary survey:

Glasgow Coma Scale 4-6-5 =15

Airways: Intact and open.

Breathing Respiratory pattern and rate within normal rate.

Circulation: Blood pressure /pulse within normal rate/limits. The bleeding was assessed as not extensive and controlled by application of compressive dressings, elevation of stump and finally an Esmarh roller was applied.

Disability: A cervical collar "Stiffneck" applied after manual stabilization of head/neck.

Second Survey:

Therapy at the scene of accident:

IV line*2 (Both arms) 18 gauge.

500 ml Ringer solution*2 Infusion.

Oxygen therapy via face mask with reservoir 15 l/min.
10 mg of morphine IV was administered.
Two additional doses of 5mg Morphine was administered due to pain.

Conclusions

CASEVAC was performed according to S.O.P

On scene time was less than one hour.

The treatment/assessment that the Victim received by the medical team at the scene of accident was carried out in a very professional way.

Recommendations:

If possible use IV canula with minimum size of 16 gauge to all trauma patients.

Signed: MACC Quality Assurance Medical Officer.

[Demining group] Medical report

An internal [Demining group] medical report gave little further detail.

Timing

Stabilization Phase Time: approximately 18 minutes

Transporting time: from calling of Helicopter to arrival in KFOR Hospital approximately 35 minutes

Arrival Time to Italian KFOR Hospital in Peja: 12.20

Overall CASEVAC time: approximately 55 minutes

Wound description:

29. Transtibial traumatic amputation of the left leg approximately at 2/3 distal of tibia with concomitant destruction of the surrounding tissues.
30. Several small superficial abrasions of the frontal surface of the right tibia.

Patient's Destination: Italian Military KFOR Hospital Peja

Surgical Procedures: Debridement and closure of the left foot amputation.

In December 2001 the MACC reported that the Victim had a temporary prosthesis and was undergoing rehabilitation in Kosovo and Denmark while waiting for a permanent prosthesis. He was still employed by the demining group.

Analysis

The primary cause of this accident is listed as a "*Field control inadequacy*" because the investigators determined that the threat assessment at the site was inadequate and clearance was not carried out to an appropriate depth in the area where the accident occurred. Clearance was being achieved by excavation, with metal-detectors not in use.

There is some question over whether the area marking was adequate.

It is not clear how the investigators determined the depth of the mine.

Given that mine "hunting" – following recorded rows – is accepted and common in this theatre, it is possible that this kind of accident with mines that have been moved is

“Unavoidable”. However, the presence of a stream should have been a clue to the possibility of mine movement and unusual depth.

As with most reports from the Kosovo MACC, the accident report demonstrates an unusually thorough and critical approach to accident investigation. The Mine Action Co-ordination Centre that carried out the investigation was not engaged in demining, and this may (in part) explain the unusually objective nature of their investigations.

Related papers

The related papers are annexes to the original report. In the interests of maintaining the database at a manageable size, photographs are only included to illustrate the main accident report.

Annex A:

CONVENING ORDER FOR ACCIDENT INVESTIGATION BOARD OF INQUIRY

The Programme Manager of the Mine Action Co-ordination Centre hereby appoints the following members to form a Board of Inquiry to investigate the Mine Accident that occurred on Tuesday 22 May 2001:

- a. President - MACC QA Officer,
- b. Member - MACC QA Medical Officer,

The Board of Inquiry is to carry out a full investigation and provide a written report to the MACC Programme Manager by 0800hrs Wednesday 30 May 2001. The report is to be written in the English language.

The Report of the Board of Inquiry is to consider the details attached at Appendix 1 to this Annex.

The Board of Inquiry is to issue an information bulletin to members of the mine/UXO clearance community in Kosova, to inform them of the accident and any relevant information and actions that should be taken by them immediately.

Signed: Programme Manager, UN MACC, 24 May 2001

ANNEX B:

MAP OF THE GENERAL AREA [not provided]

ANNEX C:

Accident site sketch, annotated – omitted to preserve anonymity.

ANNEX D:

Threat assessment document – not made available.

Annex E:

QA medical Officer's report (reproduced under the Victims tab and the Medical report button).