

DDAS Accident Report

Accident details

Report date: 15/03/2004	Accident number: 370
Accident time: 11:45	Accident Date: 27/09/2001
Where it occurred: Kurvala region, Albania/Kosovo border	Country: Kosovo
Primary cause: Unavoidable (?)	Secondary cause: Field control inadequacy (?)
Class: Excavation accident	Date of main report: 09/10/2001
ID original source: BOI: No 015/2001	Name of source: KMACC/TKG
Organisation: Name removed	
Mine/device: PMA-3 AP blast	Ground condition: grass/grazing area rocks/stones
Date record created: 21/02/2004	Date last modified: 21/02/2004
No of victims: 1	No of documents: 2

Map details

Longitude:	Latitude:
Alt. coord. system: DN 2944 0742	Coordinates fixed by:
Map east: GR 34T	Map north:
Map scale:	Map series:
Map edition:	Map sheet:
Map name:	

Accident Notes

squatting/kneeling to excavate (?)

visor not worn or worn raised (?)

Accident report

What follows is the report of a Board of Inquiry investigation made available in January 2002. The report has been edited for anonymity.

REPORT FOR ACCIDENT INVESTIGATION BOARD OF INQUIRY – No 015/2001

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 Thursday 27

September 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 Thursday 27 September 2001. Based on the investigation, interviews, statements from the Demining group personnel involved in the accident, visits and photos of the accident site, this accident is considered preventable.

3) This finding is based on the fact that at the time of the accident the Victim was conducting prodding drills in order to investigate a reading from his metal detector. At the time of detonation he was in the kneeling position prodding into an uphill slope. Whilst in this position the angle of prodding would have been increased to an angle closer to 90 degrees instead of the 30 degree angle as stated in the MACC Guidelines and Technical Standards.

4) The accident occurred at minefield number 431, Task Dossier number W01-43, GR 34T DN 2944 0742 on 27 September 2001 at 11:45 hours.

Events leading up to the Accident

5) The Demining group team callsign 13M have been conducting manual clearance in the Kurvala region along the Albanian border for the past three weeks and have been living on site in a field camp. The location is very remote and mountainous and requires a 40-minute walk up to the site from the nearest road. There are four minefields within the Task Dossier W01-43. The minefield number 431 contains PMR2A fragmentation mines with PMA3 blast mines as keepers. Within the vicinity of the accident site approximately 40 PMA3 blast mines and three PMR2A fragmentation mines have been removed and destroyed.

6) Due to the previous mine accident two days before, minefield 431 was not operational the day prior to this accident. Therefore this was the first day of clearance at this minefield since the accident on 25 Sep 01. On the day of the accident at approximately 11:45hrs, the Victim was commencing a clearance lane up the side of a hill. He was investigating a reading from his metal detector by prodding, and was in the kneeling position at the time. Whilst prodding he detonated a PMA3 anti-personnel blast mine. The resulting blast covered the inside of his protective visor with dirt and dust and caused injury to both eyes. He suffered no injury to his hands. The message passed to the MACC during the time of the accident was that he was unconscious throughout the CASEVAC. This was later proven to be false, as he was conscious the whole time.

7) The Victim was working on a slope and the initial blast caused him to fall backwards and roll a little way down the hill. The team leader witnessed the explosion and then assisted the Victim to the rest area where they then awaited the arrival of the team medic. [The control group] was notified of the accident and a helicopter CASEVAC was requested. When the medic arrived he applied first aid treatment to his eyes. He was then assisted to the helicopter winch area by the medic and the remainder of the team and awaited the arrival of the CASEVAC helicopter. There were no time delays and confusion with this CASEVAC as there was with the previous mine accident at this site. When the helicopter landed the German doctor on board assessed the injuries. It was apparent there was damage to both eyes and it was then decided to take the casualty directly to the Russian Hospital in Pristina. The Russian Hospital has an eye specialist that is able to best give treatment.

8) It is a possible that the angle of the prodder when the Victim was investigating the detector reading was not at 30 degrees. Given that he was prodding up hill into a slope in the kneeling position meant that the angle of his prodder to the ground would have more likely been at an angle greater than 30 degrees and probably nearer 90 degrees. Another possibility is that mine may have been face onto him and therefore detonated when he prodded into it.

9) An on scene investigation of the accident site revealed that the inside the Victim's protective visor was covered in dust and dirt from the blast. The outside of his visor was clean and did not have any such evidence. This obviously indicates that the blast from the explosion was directed up under the visor and into the eyes. In order for this to occur, the visor could not have been worn correctly coupled with the fact he was in the kneeling position and above the blast. If the Victim was in the prone position whilst prodding, the angle of the prodder would tend to be more naturally at the correct angle. If there did happen to be an

uncontrolled explosion whilst prodding in the prone position the blast would not have been directed under his visor.



The picture above shows the accident site on a hillside.

The picture below shows the victim's right glove and prodder.



There is no damage to the prodder or to the right glove. The Victim did not suffer any injuries to his hands.

Work History of the Casualty

10) The Victim has been with the Demining group since 1996, and commenced working in Kosovo 13 June 2001.

Past History of the Area

11) The accident site is Task Dossier W01-43, at minefield number 431. The minefields in this task dossier are all in the Kurvala Mountain Range and were laid by the VJ Army along the Kosovo – Albanian Border. There are a number of minefields along the border with Albania and the majority have a high density of mines. The minefields contain both anti-personnel fragmentation and blast mines.

Sequence, Documentation and Procedure of Tasking

12) The Task Dossier No W01-43 was issued to the Demining group on 3 September 2001. There are four minefields detailed in this dossier, 418, 431, 434 and 436. Minefields 434 and 418 have been completed and work continues on 436, with 431 yet to be started.

Geography and Weather

13) The Kurvala region is situated in the West of Kosovo along the Albanian border and approximately 5Km South East of the Montenegrin border. It is a remote mountainous area with heights exceeding 2600m in places. The height of this minefield is at 2300m. Access to these minefields is either by foot or helicopter with no vehicle access. The nearest road is a 40 minute walk. The local populous from both Kosovo and Albania use these high plateaus for summer grazing of their livestock. The weather at the time of the accident was slightly overcast with variable winds and a temperature of approximately 15 degrees Celsius.

Site Layout and Marking

14) The site layout and marking at the site was in accordance with the Demining group's SOPs for mine clearance. According to the Vojska Jugoslavije (VJ) minefield record, there are three mine rows containing PMR2A fragmentation mines with PMA3 blast mines as keepers.

Management Supervision and Discipline

15) The Demining group is a commercial mine clearance company that employs Zimbabwean Deminers, Team Leaders and Operations Officers. As such there is no local demining capability within the company in Kosovo. The Operations Officer has operational responsibility for the Demining group demining teams, with the team leaders directly responsible for the day to day supervision on site of their respective teams. Each of the Demining group's demining team consists of a Team Leader, four manual deminers and a team medic.

Quality Assurance and Quality Control

16) The Demining group Internal Quality Control (QC) is achieved through a system of on-site checks by the Team Leader to ensure adherence to the mine clearance SOPs. The normal procedure for QC is for the team leader to conduct a 10% check of the clearance lanes using the same detector that the deminer used for the clearance. The MACC QA teams conduct external Quality Assurance on a regular basis, normally each site is visited a minimum of once per week. An external QA inspection had been conducted two days prior to the accident by a MACC QA team. Prior to this a number of visits by the MACC COO, Ops Offr and QA Offr had been conducted to this site on a regular basis.

Communications and Reporting

17) At the time of the accident there was effective communication by VHF hand-held Motorola radios between the team site and call sign 56 (the Demining group Gjakova) on the Kosovo wide net as well as the team site and [another group] on the MNB(S) net. This team site also has effective HF communications to all of the other [Demining group] call signs operating in Kosovo.

18) The initial notification was reported to the MACC on the Kosovo wide net within five minutes of the accident. This report was received from call sign 56 (The Demining group Gjakova). However the message received was that The Victim was unconscious throughout the entire CASEVAC. This transpired to be false. At no stage did he lose consciousness.

Medical Details

19) The initial injuries that [the Victim] suffered were dirt and dust in both eyes with no other apparent injuries. He was taken to the Russian Hospital in Pristina for treatment and has since been transferred to the German Hospital in Prizren. It has now become apparent that he has also suffered some damage to the hearing in his right ear.

Personnel

20) Written statements from the Demining group personnel involved in the accident are at Annex E. [Not made available.]

Dress and Personal Protective Equipment (PPE)

21) At the time of the accident the Victim was wearing personal protective equipment. However due to the injury to his eyes and the dirt and dust inside his protective visor, it is clear that it was not worn correctly.

Tools and Equipment

22) The Victim was investigating a reading from his metal detector with his prodder at the time of detonation. There was no damage to either his detector or prodder.

Details of Mine Involved

23) [An illustration of a PMA-3, including disarming instructions was included.]

Account of Activities

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

Thursday 27 September 2001

11:45hrs – Uncontrolled detonation at minefield number 431 involving the Victim.

11:46hrs – [Control group] and callsign 56 (the Demining group) notified of the accident and CASEVAC helicopter requested.

11:50hrs – MACC notified of the accident.

11:55hrs – Casualty taken to helicopter winch area.

12:25hrs – CASEVAC helicopter arrives at winch area and German doctor gives further treatment.

13:00hrs – Helicopter departs with casualty for Russian KFOR hospital in Pristina.

Friday 28 September 2001

11:00hrs – MACC QA Officer and the Demining group's Programme Manager (ITF Contract) conduct scene examination of accident site.

Insurance Details

25) All The Demining group staff involved in mine clearance activities in Kosovo are covered by the standard Demining group insurance through Lloyds of London.

Conclusions

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

There was an uncontrolled detonation of a PMA3 anti-personnel mine on Thursday 27 September 2001 in [the Demining group's] minefield number 431 situated in the Kurvala region of Kosovo. The Victim was investigating a reading from his metal detector and has then detonated the mine with his prodder.

As a result of the uncontrolled detonation deminer The Victim suffered injury to both eyes as well as damage to the hearing in his right ear.

It is apparent from the injury to the eyes and the dirt and dust inside the face of the visor that The Victim was not wearing his visor correctly.

It is highly likely that given the steepness of the slope the Victim was working on, the angle of the prodder would have been greater than 30 degrees to the ground. It is the view of the board that this was the major contributing cause of the uncontrolled detonation.

As a result of the explosion the Victim fell backwards and rolled a short distance down the hill. This obviously is a danger when working in a mined area. If he were in the prone position this likely would not have occurred.

The position of the mine involved in the accident was part of a clear and obvious mine row, and was also consistent with the regular spacing of the mines. This mine should therefore not have been unexpected, and with correct drills and due care should have been identified and removed safely.

Receiving notification of the mine accident in the MACC HQ in very short time is laudable, although as it turned out the casualty was not unconscious at anytime during the CASEVAC as was reported by the Demining group. The information given needs to be accurate as it could lead to unnecessary actions and further complicate and confuse the procedure.

Recommendations

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

The Demining group amend their SOPs to state that when conducting prodding on a slope, all deminers must carry this out in the prone position, and ensure that the angle of the prodder remains at 30 degrees to the ground at all times.

The correct wearing of personal protective equipment is to be strictly enforced by the Demining group management and supervisory staff.

The Demining group management and supervisory staff are to re-emphasise to their deminers the need to maintain concentration and due care whilst conducting manual clearance drills. The Demining group team leaders are to be extra vigilant to ensure their deminers are conducting their clearance drills effectively and safely.

The Demining group team leaders are to ensure deminers are made aware of identified patterns of mine rows and that necessary precautions and care is taken.

The Demining group is to ensure the correct information is given when reporting mine accidents or incidents.

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

Annexes: [not made available]

- A. MACC convening order for accident investigation Board of Inquiry.
- B. Map of the general area.
- Schematic diagram of the general accident area.
- IMSMA Mine Accident Report.
- Witness Statements.
- Medical report from the MACC QA Officer.
- The Demining group Internal Report

Victim Report

Victim number: 474

Name: Name removed

Age:

Gender: Male

Status: deminer

Fit for work: not known

Compensation: not made available
(insured)

Time to hospital: More than 1 hour 15
minutes

Protection issued: Frontal apron
Long visor

Protection used: Frontal apron, Long
visor

Summary of injuries:

INJURIES

minor Hearing

severe Eyes

COMMENT

No medical report was made available.

Analysis

The primary cause of the accident is listed as “Unavoidable” because it is possible that the deminer was working according to authorised SOPs when the accident occurred. The investigator thought it likely that he was prodding too steeply because he was on a slope and kneeling. If this is true and the deminer was following SOPs, those SOPs may have been inappropriate. If this was the case, the levels of management that devised and approved the SOPs may have been at fault.

The fact that the deminer’s prodding tool, glove and hand were not damaged in the blast imply that they were not directly over the mine as they would have been if he was prodding too steeply.

Whatever the facts about the prodding angle, the fact that the deminer was allowed to work with his visor raised was a “Field control inadequacy”, so the secondary cause is listed as that.

Related papers

Comments by the MACC Chief Operations Officer

[This accident is mentioned in a report accompanying the Inquiry into another accident with this demining group three days later. This Accident is “B” below.]

Reference:

- Accident Report, 25 Sep 01
- Accident Report, 27 Sep 01
- Accident Report, 30 Sep 01

Three separate mine clearance accidents occurred over a 5 day period in the same minefield and involving the same mine clearance team. Whilst the technical cause of each accident is different and is addressed in three separate Mine Accident Investigation Reports, they are all inter-linked with the underlying origins of increased hazard, due to density and location of minefield, and subsequent requirement for more vigilant supervision and pro-active management support. Therefore, for ease of reference and objective conclusions, they will all be grouped together and commented on below.

1) The first accident, as detailed at Reference A, may be clearly attributed to a lack of attention on the part of Deminer [name excised]. He had either failed to detect a PMA-3 and unknowingly moved his base stick close to or on top of it, or he was so distracted by the proximity of the PMR-2 that he inadvertently moved his base stick further forward than

normal. This in a confined area that a significant number of mines had already been located in.

- 2) The initial Medevac request was for the wrong location and the resulting confusion and time delays may have proved critical if the casualty had sustained a more serious injury.
- 3) This accident should have indicated a definite requirement for closer management supervision of this technically difficult and remote site.
- 4) The second accident, as detailed at **Reference B**, following on as it did from the first, should not have been allowed to cause such an injury. If the injured deminer, [name excised], had been paying the necessary attention to detail, wearing his visor correctly and adopting the prone position whilst prodding onto a probable PMA-3 mine, it is likely that, should the accident still have occurred, he would have sustained only slight injuries as he would have been offered the full protection of his facial PPE.
- 5) The fact that he was not should have, again, highlighted an urgent requirement to review the supervisory and management oversight of this remote and technically difficult site. Additionally, once again, incorrect and critical information was passed during the Medevac request.
- 6) The third accident, detailed at Reference C, is clearly attributable to negligence on the part of deminer [name excised]. At the time of writing, at least another two PMA-3 mines have been located in adjacent cleared areas and this conclusively underlines the lack of close supervision and management support required to operate at this location.
- 7) The demining group] have built a reputation, in Kosovo, based on professional competency, operational effectiveness and the sheer hard work of their deminers. This reputation is fully justified and endorsed by the MACC; it was for precisely this reason that [the demining group] were selected to work on this demanding site. These accidents, coming as they do at the end of a long two years of sustained operations and nearly 4000 mines safely found and destroyed, should not detract from the credit due to the [Demining group] deminers or [the demining group] as an organisation. Rather they should serve as an unfortunate reminder of the constant need to remain vigilant and to sustain supervisory and management oversight during this final, intense, stage of the mine clearance programme in Kosovo.

The Conclusions of the Board of Inquiry are fully concurred with. The Recommendations are also endorsed and are to be implemented immediately. Whilst future accidents may be a probability, one attributed to the same, or similar, causes is unacceptable.

Related papers 2

As a result of the accidents involving this demining group, the MACC issued combined conclusions of those accidents as a separate paper stressing the need for improved site management.

ACCIDENT 25 SEP 01

Conclusions

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

There was an uncontrolled detonation of a PMA3 anti-personnel mine on Tuesday 25 September 2001 in [the Demining group] minefield number 431 situated in the Kurvala region of Kosovo. It appears [the Victim] inadvertently placed the outside of his left foot on the mine as he was turning to take up his metal detector.

Deminer [the Victim] initially suffered deep lacerations and broken bones to his left foot as a result of the uncontrolled detonation. He has since had two toes of his left foot amputated by the German KFOR doctors in Prizren.

Initial confusion and time delays resulted from relaying the CASEVAC information from the accident site to [name excised] through callsign 56 (Demining group Gjakova), despite effective communications from the accident site directly to [name excised]. This confusion was compounded when the first grid reference given was to callsign 56B1 location instead of 13M.

The exact position of the base stick in relation to the uncontrolled detonation can not be determined as it was destroyed in the blast. However the fact that it was destroyed indicates that it must have been in very close proximity to the explosion.

A PMR2A was visible 70cm past the blast hole. This may have been a distraction to [the victim] as he was clearing toward it. It appears he has not concentrated and taken due care whilst conducting his manual clearance drill.

The German KFOR CASEVAC helicopter crew displayed exceptional flying ability to land the aircraft in adverse conditions.

Recommendations

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

The [Demining group] teams in the Kurvala region that are supported by German KFOR CASEVAC helicopters are to establish and maintain direct radio communications with [name excised] on an hourly basis during operations, and are to communicate directly with [name excised] for helicopter CASEVACs.

[The Demining group's] management and supervisory staff are to re-emphasize to their deminers the need to maintain concentration and focus whilst conducting manual clearance drills. [The Demining group] team leaders are to be extra vigilant to ensure their deminers are conducting their clearance drills effectively and safely.

The German KFOR be commended for their CASEVAC and medical support in difficult conditions.

ACCIDENT 27 SEP 01

Conclusions

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

There was an uncontrolled detonation of a PMA3 anti-personnel mine on Thursday 27 September 2001 in [the Demining group] minefield number 431 situated in the Kurvala region of Kosovo. [The Victim] was investigating a reading from his metal detector and has then detonated the mine with his prodder.

As a result of the uncontrolled detonation deminer [the Victim] suffered injury to both eyes as well as damage to the hearing in his right ear.

It is apparent from the injury to the eyes and the dirt and dust inside the face of the visor that [the Victim] was not wearing his visor correctly.

It is highly likely that given the steepness of the slope [the Victim] was working on, the angle of the prodder would have been greater than 30 degrees to the ground. It is the view of the board that this was the major contributing cause of the uncontrolled detonation.

As a result of the explosion [the Victim] fell backwards and rolled a short distance down the hill. This obviously is a danger when working in a mined area. If he were in the prone position this likely would not have occurred.

The position of the mine involved in the accident was part of a clear and obvious mine row, and was also consistent with the regular spacing of the mines. This mine should therefore not have been unexpected, and with correct drills and due care should have been identified and removed safely.

Receiving notification of the mine accident in the MACC HQ in very short time is laudable, although as it turned out the casualty was not unconscious at anytime during the CASEVAC as was reported by [the Demining group]. The information given needs to be accurate as it could lead to unnecessary actions and further complicate and confuse the procedure.

Recommendations

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

[The Demining group] amend their SOPs to state that when conducting prodding on a slope, all deminers must carry this out in the prone position, and ensure that the angle of the prodder remains at 30 degrees to the ground at all times.

The correct wearing of personal protective equipment is to be strictly enforced by [the Demining group] management and supervisory staff.

[The Demining group] management and supervisory staff are to re-emphasize to their deminers the need to maintain concentration and due care whilst conducting manual clearance drills. [The Demining group] team leaders are to be extra vigilant to ensure their deminers are conducting their clearance drills effectively and safely.

[The Demining group] team leaders are to ensure deminers are made aware of identified patterns of mine rows and that necessary precautions and care is taken.

[The Demining group] is to ensure the correct information is given when reporting mine accidents or incidents.

ACCIDENT 30 SEP 01

Conclusions

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

There was an uncontrolled detonation of a PMA3 anti-personnel mine on Sunday 30 September 2001 in [the Demining group] minefield number 431 situated in the Kurvala region of Kosovo. [The Victim] was in the process of removing a PMA3 mine when he knelt on another PMA3 that was missed by Deminer [name excised] (Deminer A).

As a result of the uncontrolled detonation [the Victim] suffered very serious injury to his left leg and consequently the German KFOR doctors amputated the leg above the knee.

Deminer A had located four PMA3 blast mines during his shift up until the time of the accident. However he did not locate the PMA3 that [the Victim] knelt on and caused the accident. The blast hole indicates that this mine was not laid at an excessive depth. The mine that was missed was clearly within Deminer A's area of responsibility for clearance and ought to have been located.

Deminer T is not at fault for the cause of the accident as his area of responsibility for clearance was not part of the area where the mine was missed.

Recommendations

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

[The Demining group] management takes the appropriate disciplinary action against Deminer A for this very serious breach of clearance standards that has caused this most unfortunate accident.

[The Demining group] management and supervisory staff are to re-emphasize to their deminers the need to maintain concentration and due care whilst conducting manual clearance drills. [The Demining group] team leaders are to be extra vigilant to ensure their deminers are conducting their clearance drills effectively and safely.

