

4-6-2001

# DDASaccident371

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# DDAS Accident Report

## Accident details

<b>Report date:</b> 15/03/2004	<b>Accident number:</b> 371
<b>Accident time:</b> 10:55	<b>Accident Date:</b> 06/04/2001
<b>Where it occurred:</b> Grebnik, S.E. Klina	<b>Country:</b> Kosovo
<b>Primary cause:</b> Field control inadequacy (?)	<b>Secondary cause:</b> Other (?)
<b>Class:</b> Excavation accident	<b>Date of main report:</b> 18/04/2001
<b>ID original source:</b> MF/LL/AH/JF No.001/2001	<b>Name of source:</b> KMACC
<b>Organisation:</b> Name removed	
<b>Mine/device:</b> BLU-97 submunition	<b>Ground condition:</b> agricultural (recent) grass/grazing area soft trees
<b>Date record created:</b> 21/02/2004	<b>Date last modified:</b> 21/02/2004
<b>No of victims:</b> 2	<b>No of documents:</b> 2

## Map details

<b>Longitude:</b>	<b>Latitude:</b>
<b>Alt. coord. system:</b> 47434 14820	<b>Coordinates fixed by:</b>
<b>Map east:</b> GR 34T	<b>Map north:</b>
<b>Map scale:</b>	<b>Map series:</b>
<b>Map edition:</b>	<b>Map sheet:</b>
<b>Map name:</b>	

## Accident Notes

inadequate communications (?)  
visor not worn or worn raised (?)  
safety distances ignored (?)

## 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 Friday 06<sup>th</sup> April 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 UXO accident that occurred on the 06<sup>th</sup> April 2001. Based on the investigation, the [Demining group] internal report, the statements from [demining group] personnel involved in the accident (see Annex B), visits to the accident site and the photos from the accident site, no definite conclusion can be made with regards to the reason for the uncontrolled detonation.
- 3) The information provided by the [Demining group] to the MACC Headquarters in the "Accident Report", attached as Annex C is confirmed. The accident occurred at approximately 10:55 hrs on 06<sup>th</sup> April 2001, in a sub-munition contaminated area in a cherry orchard at Grebnik. Grebnik is located South-East of Klina at GR 34T 67434 14820 (seat of detonation). Annex D details a map of the general area.

### Events leading up to the Accident

- 4) Three [Demining group] BAC Teams were working on the clearance site at Grebnik, BAC Team No's 2, 6 and 7. BAC Team No 2 were conducting dense vegetation clearance in an area to the South-East of the accident site and BAC Team No 6 were conducting sub-surface clearance in an area to the East of the accident site. Both these two BAC Teams were not directly involved in the accident that later occurred.
- 5) BAC Team No7 were working in the West of the contaminated area, conducting sub-surface BAC in a 60 x 48m search and clearance block. The BAC Team were clearing in blocks in a Westerly to Easterly direction within the contaminated area, and clearing in 4m wide lanes in an Easterly to Westerly direction within the search and clearance blocks. Annex E details the [Demining group] BAC Grebnik site map. {Not made available.}
- 6) The search and clearance block had been dissected at the half way point (24m) and marked with a 60m-red/white area marking rope. Red/white area marking ropes had also been laid out on the West and East sides of the search and clearance block. The outer corners of the search and clearance block were marked with yellow flags, and the search lanes were marked with white flags. Each 4m wide search and clearance lane was marked out with white pickets on the North and South boundaries.
- 7) Prior to the accident the team had been working in two large loop detector sections, the section commanded by the Team leader was working the Easterly half and the section commanded by the Section Commander was working in the Westerly half of the search and clearance block.
- 8) Each section had cleared a total of 3 search and clearance lanes (12m each section), and the remaining 3 search and clearance lanes in each section area had been marked out with plain white search and clearance ropes ready for sub-surface clearance. A total of 3 Bomb Live Unit (BLU)-97 sub-munitions had been located in the area that had been previously searched, these sub-munitions had been excavated, exposed, appropriately marked and awaiting disposal, once the whole search and clearance block had been searched. The previous sub-munitions had been located at depths of 10 – 15 cm below the surface.
- 9) Just before the accident, the rest break was called by the means of a whistle blast and the team made their way to the rest area, which is to the North of the working area. BAC Deminers [Victim No.1] and [Victim No.2] had just finished laying the last search and clearance rope in their sections area of responsibility and were making their way back to the rest area through the search and clearance block.

10) At approximately 10:55hrs an uncontrolled detonation occurred in the search and clearance block (9m south of the Northerly base line and 13m West of the Easterly red/white area marking rope). [Victim No.1] was decapitated during the uncontrolled detonation and his body was located 12m to the North West of the seat of detonation. [Victim No.2] suffered serious fragmentation injuries to his head, face and left shoulder and arm. His was located 2.5m to the North of the seat of detonation. There were no other personnel involved in the accident. Annex F details a schematic diagram of the accident area/scene.

### **Work History of the Casualties**

11) Mr. [Victim No.1] had been working for the [Demining group] since 04 August 2000 and Mr. [Victim No.2] had been working for the [Demining group] since 06 March 2000. Both had completed the [Demining group] basic deminers and the BAC conversion courses. Both BAC deminers were considered by the [Demining group] to be competent and trustworthy employees, disciplinary action had never had to be taken against them.

### **Past History of the Area**

12) The area had previously come under direct NATO air attack during 1999. A Vojska Jugoslavije (VJ) tank unit had occupied the immediate area with other units including a Surface to Air Missile (SAM) 6 unit occupying the quarry area to the South. The accident site is a MACC task dossier No W08-08. The task dossier contains several Dangerous Areas (DA's) which detail BLU-97 sub-munition contamination in the area. To the South West of the accident area, surface contamination also existed from a destroyed VJ M-80 Main Battle Tank.

### **Sequence, Documentation and Procedure of Tasking**

13) The task dossier No W08-08 was re-issued to the [Demining group] on the 01<sup>st</sup> March 2001 and up to the time of the accident 155,770 m/sq. had been cleared sub-surface resulting in the disposal of 71x BLU-97 sub-munitions. [A commercial demining group] initially identified the contaminated area in August 1999 during a survey operation. This was then confirmed by a Wolf's Flat survey in January 2000.

14) The International Committee for the Red Cross (ICRC) reported a previous accident in the area in March 2000. The accident involved three national Kosovo Albanians; 1 person died and 2 were injured, no further details were available.

15) The [Demining group] conducted surface clearance of the area during 2000, clearing a total of 581,050 m/sq. and disposing of 22 x BLU-97 sub-munitions and 1 x 125mm HE tank projectile. Both the surface and sub-surface areas cleared by the [Demining group] to date are detailed at Annex F.

### **Geography and Weather**

16) The task site is located in an open area on the North West slope of Grebnik Mountain. Access to the site is via a stone laid road from road/route No 9 (Pec – Pristina main road). The area consists of a cherry orchard laid out in a series of rows, some areas of the orchard have been recently cut down. The soil is compacted in those areas in-between the rows of trees (tractor paths), and less compact in the slightly raised areas in-between the tree rows. The weather at the time of the accident was fine with a temperature of approximately 10 to 15 degrees Celsius.

### **Site Layout and Marking**

17) The site layout and marking as previously described, was in accordance with the [Demining group] BAC SOPs.

## **Management Supervision and Discipline**

18) The [Demining group] BAC operation in Kosovo is supervised by an international supervisor. A national supervisor was in overall charge of Grebnik task site; a national team leader and section commander supervised each one of the three BAC teams working in the area. There are no reports of disciplinary action being taken to [demining group] personnel on the Grebnik task.

## **Quality Assurance and Quality Control**

19) The [Demining group] Internal Quality Control and Quality Assurance is achieved through a system of on-site checks by both national and international staff to ensure adherence to the BAC SOP's. The MACC QA teams conduct external Quality Assurance. The last MACC QA visit was on the 05<sup>th</sup> April 2001 where Setting Up and BAC was evaluated, both the evaluation results were good.

## **Communications and Reporting**

20) Communications in-between the Grebnik task site and the [Demining group] base location at Dubrava is maintained via HF vehicle Codan radios and VHF hand-held Motorola radios, the VHF radio communications to [Demining group] base location is not good due to the area being in a notoriously known "Bad Spot" . On site communications in-between teams is maintained via the VHF system. On the day of the accident the site had proper and appropriate communications and managed to pass all relevant accident information back to the [Demining group] base location.

21) Communications in-between the [Demining group] base location and MNB(W) KFOR callsign "Kilo Foxtrot" is maintained via the VHF system on Channel 4, which is the MNB(W) channel. Communication problems did exist in-between the [Demining group] base location and "Kilo Foxtrot" on the day of the accident. Fortunately the problems did not have a direct effect of the subsequent casualty evacuation, due mainly to the location of the site and a good road network. This however could have had very serious consequences if the accident had occurred in a more remote location and a helicopter evacuation was required. Annex G details the [Demining group] radio communication log for the 06<sup>th</sup> April 2001.

## **Medical Details**

22) BAC deminer [Victim No.1] was killed (decapitation) and BAC deminer [Victim No.2] suffered very serious injuries to his head, face and left shoulder and arm following the accident. Medical treatment and stabilisation was administered on-site to [Victim No.2] by two [Demining group] medics. Casualty evacuation by road to Pec KFOR military hospital then took place. Following further treatment the casualty was then transferred by helicopter to Pristina KFOR military hospital and then onto Pristina civilian hospital, where at the time of writing this report, he had been operated on but was still very seriously ill.

23) The body of [Victim No.1] remained at the accident site until he was pronounced dead by the [Demining group] compound Doctor. The body was then taken to Pec civilian hospital morgue where the UNMIK police were informed. The UNMIK police Regional Investigation Unit (RIU) was subsequently informed and the investigating judge ordered a death investigation. The death investigation took place at 16:00hrs on the day of the accident and the body was released to the family at 18:56hrs that evening. The RIU then moved to the accident area to continue with their investigation.

24) Annex H details the medical report from the MACC QA Medical Officer and the Appendices to the Annex detail the [Demining group] casualty report, the various hospital reports, UNMIK police report and Mr. [Victim No.1]'s death certificate. It should be noted that are various inaccuracies with the UNMIK police report. {Reports not made available.}

## Personnel

25) A list of all personnel and their duties is detailed at Annex B. Written statements from [demining group] personnel involved in the accident and the [Demining group] internal report form part of the Appendices to the Annex.

## Dress and Personal Protective Equipment (PPE)

26) At the time of the accident both BAC deminers were wearing protective jackets, it is not known, nor is it possible at this time to conclude whether the BAC deminers were wearing their visors. This however has no bearing on the investigation, as the break had been called and in accordance with [Demining group] SOPs, visors can then be removed.



[Photographs showed damaged armour but visors undamaged, therefore not worn.]

## Tools and Equipment

27) Neither of the casualties was using any tools or equipment at the time of the accident.

### Details of UXO Involved

28) The Cluster Bomb Unit (CBU) – 87 combined effects munition was developed to provide the American Air Force with a multi-purpose cluster bomb to be used in the ground support role. The CBU-87 contains 202 x BLU-97 sub-munitions. The BLU-97 has three basic kill mechanisms which make it an ideal weapon for use against a wide variety of targets including tanks, light armour, munition dumps, exposed personnel etc. The three basic kill mechanisms are:

- a) Anti-armour shaped charge.
- b) Anti-personnel pre-cut fragmented steel body.
- c) Incendiary effect (Zirconium sponge).

[The picture below shows recovered fragments from the crater.]



29) The BLU-97 sub-munition contains a fuzing system that provides a primary firing system for direct impact and a secondary firing system for “all-ways” impact. The quantity and type of explosive is 308g of RDX, which is a secondary high explosive main charge.

30) At between .45 and .8 of a second after release from the cluster bomb, the sub-munition fuzing system is armed when the Ram Air Decelerator (RAD) or Air Inflatable Device (AID) is inflated. This action reduces the forward velocity, provides in-flight stabilisation and pulls the main shaft in the fuzing mechanism to start the arming sequence. On impact with the target either one or both of the fuzing systems will function causing detonation of the main charge. On detonation the fragmented steel body will disintegrate to produce Omni-directional fragmentation, the shaped charge will form into a plasma jet and furthermore the Zirconium sponge will break up and burning incendiary particles will saturate the area. The shaped charge can penetrate up to 125mm of armour plate.

### **Account of Activities**

31) 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:

#### **06/04/01**

10:50 – A rest break is called on the clearance site.

10:52 – 10:55hrs – Uncontrolled detonation at Grebnik BAC site.

11:00hrs – [Demining group] Dubrava informed via the on-site ambulance driver.

11:03hrs – Confirmation radio call to [Demining group] Dubrava of the accident by Grebnik site supervisor, all relevant details given.

11:05hrs – Road move of casualty [Victim No.2] to Pec KFOR military hospital.

11:05 – 11:30hrs – Communications problems exist between [Demining group] Dubrava and KFOR callsign “Kilo Foxtrot”.

11:15 hrs – All [Demining group] clearance operations were shut down.

11:25hrs – Confirmation received to KFOR callsign “Kilo Foxtrot” from [Demining group] Dubrava, that no helicopter evacuation is required and that the casualty is being taken to Pec KFOR military hospital.

11:30hrs – Report to the MACC from callsign 64B that a possible accident has occurred.

11:30hrs – Arrival of casualty [Victim No.2] at Pec KFOR military hospital.

11:35hrs – Arrival at Grebnik of [Demining group] manual demining supervisors.

11:45hrs – Report to the MACC from callsign 53A that an accident has occurred.

12:00hrs – Initial [Demining group] on-site investigation starts.

12:15hrs – Helicopter move of casualty [Victim No.2] to Pristina KFOR military hospital.

12:24hrs – [Demining group] BAC supervisor and location manager move to Pristina to RV with the casualty [Victim No.2].

12:35hrs – Confirmed arrival of casualty [Victim No.2] at Pristina KFOR military hospital.

12:51hrs – Accident confirmed to the MACC by callsign 54A.

13:15hrs – Arrival of [Demining group] compound Dr at accident site.

13:20hrs – [Demining group] compound Dr pronounces [Victim No.1] dead.

13:30 – 14:00hrs – The body of [Victim No.1] is taken to Pec civilian hospital morgue.

14:10hrs – Arrival of [Demining group] BAC supervisor and location manager at Pristina KFOR military hospital.

14:30hrs – Accident marking equipment arrives at the accident site.

14:55hrs – Accident area is marked out and [Demining group] demining supervisors move to [Demining group] Dubrava.

15:00hrs – Arrival of the body of [Victim No.1] at Pec civilian hospital morgue.

16:00 – 18:00hrs – Arrival of UNMIK police death investigation team at Pec civilian hospital mortuary and on-site investigation at Grebnik is conducted.

16:00hrs – MACC PM set up Board of Inquiry.

17:00hrs – Road move of casualty [Victim No.2] to Pristina civilian hospital.

17:35hrs – Confirmation between the [Demining group] and the MACC regarding the Board of Inquiry and RV details of personnel at the accident site the following day.

1856hrs – The body of [Victim No.1] is released to the family.

### **Insurance Details**

32) Both [Victim No.1] and [Victim No.2] were covered by the standard HALO Kosovo insurance for all National personnel in mine/UXO clearance activities. All insurance policies for the [Demining group] are through Lloyds of London.

### **Conclusions**

33) Based on the investigation, the statements and visits to the site, the Board of Inquiry conclude the following:

- There was a sub-surface detonation of a BLU-97 sub-munition. Evidence shows that the crater had heavy blackening to the sides, was of a bulbous shape with fragmentation lining the sides. Also a camouflet had formed 360 degrees around the edges, with the debris on the North Western side spread farther out than on the other sides (direction of the plasma jet). The crater size was 70 cm in diameter and 45cm at the deepest point. This is considerably larger than a crater that would be formed by a surface detonation of a BLU-97 sub-munition.
- The plasma jet of the BLU-97 sub-munition decapitated and subsequently killed [Victim No.1] as it moved out from the seat of detonation in a North Westerly direction. It was also the concentrated directional blast effect from the plasma jet that lifted his body and carried it the distance of 12m, to the North West location where it was later found.
- [Victim No.2] injuries were sustained from primary fragmentation, resulting from the disintegration of the BLU-97 sub-munition fragmented steel body, on the detonation of the high explosives.



- There is no evidence to date to prove that prior to the accident, the [Demining group] SOPs were being infringed or that the proven work procedures were not being adhered to.
- The medical treatment and subsequent evacuation of the casualty [Victim No.2] by the on-site medics was very good, given the severity of his injuries.
- The casualty evacuation time was well within the “Golden Hour” time period.
- The medical support from both KFOR units was very good.
- The marking of the accident site was carried out in accordance with current SOPs.
- Communication problems did exist in-between the [Demining group] Dubrava and KFOR callsign “ Kilo Foxtrot”.
- The preliminary (later revised) [Demining group] accident report was not made available to the MACC until the 13<sup>th</sup> April 2001.
- Due to this being the first clearance fatality in Kosovo, there exists a procedural void between the UNMIK police, the MACC and the clearance organisations.
- The on-site post accident investigation by UNMIK police RIU Pec, was conducted without the knowledge of the MACC, and without mine clearance support. It was extremely dangerous and could have led to further casualties.

34) The Board of Inquiry disagrees with the following points as detailed in the [Demining group] Accident Report:

- The [Demining group] radio operator stated that the MACC QA inspector, callsign 61F actually helped in the passage of information to KFOR. A taped recording of the MNB(W) channel 4 will also substantiate this fact.
- If the sub-munition was inverted, this does not mean that no fragmentation injuries would be sustained below the waist.
- As no [demining group] personnel were present when the crater was excavated, it is difficult to understand why it is stated that “a substantial amount of BLU-97 fragmentation was found on the west inner side of the crater, at approx. 15cm below the surface”. In fact, the fragmentation was evenly spread on the inner surface of the crater and also within the debris that had fallen back into the crater.

35) At present, no definite conclusion can be made regarding the reason why the sub-surface BLU-97 sub-munition detonated, as no witness actually saw both men immediately prior to the uncontrolled detonation. The only person who could now possibly give that information is [Victim No.2], who at the time of writing this report is still in a very seriously injured condition in Pristina civilian hospital.

36) The Board of Inquiry conclude that there are two possible explanations why the BLU-97 sub-munition detonated:

- Either direct or indirect pressure (via a tree root) was applied on the ground immediately above, or close to, the location of the buried sub-munition, either by one or both of the casualties.
- During the period of time from when the casualties were last seen walking back to the rest area, to when the uncontrolled detonation took place, some form of activity took place and something was moved or disturbed which subsequently caused the sub-munition to detonate.

37) The first explanation may be considered as less likely, due to the following:

- This would be the first time that this type of event has occurred since sub-munition clearance began in Kosovo. A time period in which 13,318 sub-munitions have been destroyed by both KFOR units and clearance organisations (statistics as of 31<sup>st</sup> March 2001).

- The injuries sustained to both casualties, particularly the lack of injuries sustained below the waist, are not consistent with this explanation. Neither casualty sustained any injury to the feet, legs or abdomen.
- No sub-surface detonation occurred when the [Demining group] initially surface cleared the area. There were also no subsequent detonations during the intensive tree felling and ground disturbance activity conducted by the locals.

38) Further specific medical conclusions are detailed at Annex H.

### **Recommendations**

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

- No changes are necessary to the MACC Guidelines and Technical Standards for Mine/UXO Clearance.
- A radio log is maintained at all times, for all radio messages either sent or received by the [Demining group] base location.
- A step by step guide/procedure for the [Demining group] radio operator to follow is drawn up and implemented for any future casualty evacuation by road.
- A step by step guide/procedure for the [Demining group] radio operator is drawn up and implemented should communications problems exist with KFOR, during any future casualty evacuations. The recommended procedure to follow would be communications to KFOR through the senior partner initially and if that fails then through pre-designated callsign/organisations.
- The [Demining group] conducts a CASEVAC exercise with MNB (W) as soon as possible, also to include the procedure for loss of communications.
- In future, any preliminary [Demining group] accident report is made available to the MACC at the earliest possible opportunity.
- Any clearance organisation that suffers a fatality in the future during the course of work must inform the local UNMIK police unit. Arrangements should also be made for one of their medical representatives to be present at the “death investigation” at the mortuary.
- As a secondary follow-up, the MACC Liaison Officers to KFOR in MNB (W) and MNB (S) should also inform the UNMIK Police if a fatality occurs with their respective area of operations, whilst MACC Operation Branch should be responsible for informing UNMIK Police if a fatality occurs in MNB (N), MNB (C), or MNB (E).
- UNMIK Police does not conduct any on-site investigations without prior consultation with the MACC.
- The investigation remains open, until [Victim No.2] recovers sufficiently enough to be questioned.

40) Further specific medical recommendations are detailed at Annex H.

Signed: QA Team Leader

### **Annexes:**

- A. MACC convening order for accident investigation Board of Inquiry.
- B. List of personnel involved with attached statements as Appendices.
- C. IMSMA Mine/UCO accident report.
- D. Map of the general area.
- E. The [Demining group] current site map.
- F. Schematic diagram of the accident area/scene.
- G. The [Demining group] radio log.
- H. Medical report from the MACC QA Officer with [Demining group] medical reports, hospital reports, UNMIK police report and death certificate as Appendices.

### **Comments by the MACC Chief Operations Officer**

1) There is clear evidence to show that a BLU-97 sub-munition was lying, at an inverted aspect, approximately 10cm below the surface when something caused it to detonate.

2) The [Demining group] conclusion that the munition was caused to detonate by the footsteps of the victims is considered to be improbable due to the following facts:

- a) No injuries to the feet or lower limbs of either of the casualties.
- b) The extensive activity, including tree felling, which had previously occurred in the immediate vicinity of the explosion. The tree roots visible are clearly belonging to the tree stump adjacent to the crater and must have been extensively disturbed during the felling and removal of that tree.

3) According to the [Demining group] radio operator log, the time of the explosion is 10.55. According to the Witness Statement of the Team Leader, the whistle for the break was blown at 10.50. The seat of the explosion is some 34m from the Rest Area and the extreme point of the casualties work area, as determined by the length of rope, is some 100m from the Rest Area. Therefore the maximum distance that either could have walked from time of whistle to time of explosion is 56m. The Witness Statement from [name excised] states that [the Victims] had just finished deploying the ropes when the whistle blew. Why, therefore, should they take 5 minutes to simply walk this short distance? Furthermore, why did [the Team Leader] feel the need to urge them to hurry up and return to the Rest Area, a standard happening that had occurred twice that morning?

4) Neither casualty sustained injury to the abdomen or lower limbs. Whilst both suffered extensive and traumatic injuries to the head, [Victim No.1] also suffered extensive fragmentation lacerations to both hands and lower arms but none to the abdomen or chest. If he were standing upright and walking forward at the time of the explosion it would be reasonable to assume that he would have corresponding injuries to his mid abdomen, in line with his hands.

5) The [Demining group] report states that [Victim No.2]'s left eye was missing. The British Army medical report states that it was his right eye. Subsequent physical inspection of the casualty by the MACC QA Medical Officer confirms that it is his right eye that is missing and his left eye is present, but injured.

6) Paragraph 7 of the [Demining group] Accident Report criticises the Italian KFOR radio operator and an UNMACC QA callsign for hindering the radio communication during the casevac. The MACC has a voice recording of the entire transmission and refutes this statement entirely. The tape clearly shows that the [Demining group] radio operator was unable to answer simple questions from KFOR and that the QA callsign recognised this and stepped in to ensure clear and correct passage of information.

7) The [Demining group] Accident Investigation report was not made available to the MACC Board of Inquiry until 13 April 2001, seven days after the accident. It is known that this report was originally compiled and sent to [Demining group] Headquarters UK, within 48 hours of the accident and that the President of the MACC Board of Inquiry was refused sight of this report at that time. Whilst the [demining group] are free to report to their Headquarters in any many they wish, it would be reasonable to expect any such report to be in accordance with the official copy of their Internal Accident Investigation report and this to be submitted to the MACC Board of Inquiry at the same time.

8) The Conclusions and Recommendations of the MACC Board of Inquiry are fully concurred with and the MACC QA Officer is to immediately start discussions with the [Demining group] regarding the implementation of all recommendations. He is also to seek written answers to paragraphs 3 and 4 above.

Signed : Chief of Operations

## Comments by the MACC Programme Manager

The conclusions and recommendations of this Board of Inquiry (BOI) are concurred with.

The BOI has concluded that there were two possible causes for the uncontrolled detonation. I fully concur that the first scenario (direct or indirect pressure caused by the two men walking past the sub-munition) is less likely than the second scenario (some action taken by either of the two men that has caused the explosion). Due to the fact that a definitive cause cannot be determined for the uncontrolled detonation, the investigation is to remain open to allow for the possibility of [Victim No.2] providing additional information that will shed further light on their actions immediately prior to the accident.

The deceased deminer, [Victim No.1] has suffered severe fragmentation injuries to both arms and hands, as well as decapitation. It would be highly unlikely to have sustained the injuries to both arms whilst in the process of simply walking past the buried sub-munition. At the very least there would be similar fragmentation injuries to the thigh and torso areas, if this were to be the case. However, these areas were conspicuously free of any type of injuries. This assessment has been also made by the UNMIK Police in their investigation (see Appendix 5 to Annex H). The investigating officer has concluded that "Based on observation of the victim, it seems he was kneeling down searching for mines and the mine exploded and damaged his head and hands." The injuries to both arms and hands is therefore a crucial element in suggesting that [Victim No.1] was doing something with his hands, close to the seat of the explosion, as opposed to simply walking past the CBU. The possibilities for this include, but are not limited to; investigating a CBU entry hole or pulling on an exposed tree root that could possibly impede clearance by the following team.

The fact that [Victim No.2] has also not suffered from any lower limb injury also suggests that neither person was standing on top of, or walking in the immediate vicinity of the sub-munition when it exploded. In addition to the primary fragmentation from the CBU itself, there would have also been secondary fragmentation such as stones, soil or tree roots that would have been a clear indication had this been the case.

In addition, there had been a great deal of activity by farmers in the area, in the months prior to the detonation. Had the CBU been so sensitive and prone to detonation that two people walking nearby could have set it off, this would have been more likely to have occurred during the tree-felling and other activities that have taken place in the area.

Therefore, as this BOI cannot conclusively state the reason behind the cause of the accident, and there is sufficient evidence to suggest that either person, but more likely [Victim No.1] was doing something near the CBU when it exploded, changes to MACC Technical Guidelines for CBU clearance procedures will not be made. However, the procedures will be subject to normal ongoing reviews based on the prevailing conditions and threat to ensure that they remain valid for the remainder of the Programme. Accordingly, any changes that the [Demining group] wish to make to their SOP should be made in consultation with the MACC Operation Branch to ensure that they conform to MACC requirements.

However, other recommendations dealing with CASEVAC procedures, rehearsals and the flow of information are to be implemented as soon as possible.

This was the first fatality that has occurred amongst clearance personnel whilst undertaking their duties. It is also the first serious accident involving humanitarian clearance personnel during the clearance of CBU. The heartfelt sympathies of the MACC staff go to the families of both deminers, along with hopes for a successful recovery for [Victim No.2].

Signed: Programme Manager

## Victim Report

**Victim number:** 475

**Name:** Name removed

**Age:**

**Gender:** Male

**Status:** deminer

**Fit for work:** DECEASED

**Compensation:** not made available  
(insured)

**Time to hospital:** not appropriate

**Protection issued:** Long visor  
Short frontal vest

**Protection used:** Short frontal vest

### **Summary of injuries:**

INJURIES

severe Arms

severe Hands

severe Head

severe Shoulder

FATAL

COMMENT

Victim was effectively decapitated. See medical report.

### **Medical report**

The photograph below shows destruction of Victim No.1's head. Others showed severe hand and arm injuries.



The following medical report was made available and has been edited for anonymity. It covers both victims in this accident.

### **Medical report concerning Grebnik BAC accident 06/04/01 10.52 am**

#### **Introduction**

This report is based on interviews with the following staff members from [Demining group]:  
Medic [Name excised], Medic [Name excised] and Dr [Name excised].

Attachments; Medical reports : Casualty report [Demining group], Italian Field Hospital Peja,  
British Field Hospital Pristine, Pristine Public Hospital

#### **Summary**

Victims: Deminer [Victim no.1] instantly killed. Declared dead by Dr Ali Kuqi at 1.20 PM.

Deminer [Victim No.2] seriously injured

At the time of the accident there were two qualified medics with their medical equipment and one ambulance at the site, the victim [No.2] was placed on a stretcher and he received First Aid within approximately two min after the accident occurred.

Following injuries were identified by the above mentioned medics [Victim No.2]:

- Minor wounds to the left over arm.
- A severe laceration wounds to the left side of face.
- Severe scalp lacerations to the left side of skull.
- Open depressed skull fracture to the forehead.

The following assessments/actions were taken by the above mentioned medics:

- Airway: airway control.
- Breathing: [Victim no.2] was breathing spontaneously. Oxygen was not administered.
- Circulation: The medics did not check the blood pressure but they could feel pulse at artery radials which indicated that the patient had at least 90 mm/hg systolic BP. IV line was established 18 gauge, Infusion Gelofusine 500ml+500ml was administered on the CCP and during CASEVAC to Italian Field Hospital. Actions were taken to prevent bleeding (dressings).
- Disability: [Victim no.2] was unconscious but responded to pain stimuli, right pupil reacted to light, Isuf did not move right arm and right leg which indicated that he suffered from a severe brain injury.
- Pain: 5 mg of Nubain was administered IV during CASEVAC.

The victim arrived at the Italian Field Hospital approximately 11.30 am where he was stabilised and the airways were secured by intubation. At 12.15 PM he was MEDEVACed by helicopter to the British Field Hospital Pristine, at 17.00 PM he was transferred to Pristine University Hospital for further treatment.

### **Conclusions**

- The CASEVAC was performed according to S.O.P.
- Oxygen was not administered on CCP/CASEVAC.
- According to the Pre Hospital Trauma Life Support concept the minimum size of I.V. canule 16 gauge is recommended to be used on all trauma patients.
- "On scene time" was less than one hour before the patient was at a higher level of medical care which follows the rule of "the Golden Hour"

### **Recommendations**

- Always administer oxygen as soon as possible to all trauma patients to prevent anaerobic metabolism, which can result in brain oedema and cellular death.
- If possible use I.V. canule minimum size 16 gauge to trauma patients.
- Psychological support to the relatives.
- Debriefing/psychological support for the staff who was involved in the accident.

Signed: QA Medical Officer, UNMACC

## Victim Report

<b>Victim number:</b> 476	<b>Name:</b> Name removed
<b>Age:</b>	<b>Gender:</b> Male
<b>Status:</b> deminer	<b>Fit for work:</b> not known
<b>Compensation:</b> not made available (insured)	<b>Time to hospital:</b> 1 hour 40 minutes
<b>Protection issued:</b> Long visor Short frontal vest	<b>Protection used:</b> Short frontal vest

### Summary of injuries:

#### INJURIES

severe Arm

severe Eye

severe Face

severe Head

severe Shoulder

#### AMPUTATION/LOSS

Eye

#### COMMENT

See medical report.

### Medical report

The following was translated by a Data Entry Clerk (Medical student) for the MACC and is reproduced verbatim.

University Clinical Centre, Clinics of Anesthesiology and Intensive Care

Medical report of the patient [Victim No.2]

The patient was admitted as an emergency case and was brought in from the British KFOR since the patient received wounds from explosives (mines).

Patient was brought from the Emergency Centre in the Intensive Care Unit unconscious, intubated, under sedatives, and it was hard defining the condition of the bulbuses (due to the injuries), his face and head is in bandages, patient has also got the neck stabilizer.

Thorax and Lungs – movement of the thorax is symmetric, with bronchial breathing.

Cardiovascular System – heart rate is rhythmic. Pulse is 100 per min; Arterial Pressure 150/90.

Abdomen – in the level of the thorax, soft in palpation. Liver and spleen not palpated.

Urogenital System – p.v ( an urinal catheter is inserted).

Extremities – with no deformities. Arterial line – in the left arm.

Skin and mucosa – slightly pale.

Computed tomography of the head, neck, lungs and pelvis is conducted. In the upper part of the neck fragmentation is seen in the soft tissues, bilateral maxillar sinuses are filled with haemorrhagic exudate.

In the left side of the temporal region there is a fragmentation visible with perifocal frontal contusion. Taps of the mechanical ventilation – controlling type, FiO<sub>2</sub>=0,4

Patient is in possession of the medical document provided by KFOR; it was stated that the patient had injuries in face, loss of cerebral substance in the frontal region.

Neurosurgeon and the ophthalmologist are consulting.

On date 8.04.01 a surgical intervention is conducted: Op – Craniotomia Osteoplastica reg.FT.sin.

Evacuatio fragm. Ossei imprem: Retroorbital. Et Plastica durae matris.

Preoperative diagnosis is: Vulnus Explosivum faciei at Capitis penetrans

Transorbitalis. O.S. (ante dias II). Corpus Alieni metalici intracerebralis reg temp. sin cum haematoma intracerebralis. Oedema cerebri gravis. Cerebrorrhoea orb.sin. Hemiplegia lat.sin.

The ophthalmologist's diagnosis is: O.D. Vulnus perforans sclerae, Haemophthalmus. Revisio et sutturae Vulnus sclerae.

Patient is still in mechanical ventilation – controlling type, under sedatives.

During his stay in the Intensive Care – patient is treated with antibiotics (cephalosporin – Longaceph, Aminoglycosides, mtronidazol, H<sub>2</sub> Blocators, blood and its derivatives: antiedematous therapy and enteral fluid). Patient is febrile, not reacting in the right side. (Hemiplegia lat.dex.)

This medical report is handed in by the request of the medical coordinator from the Mine Action Coordination Centre.

Dg; Vulnus explosivum faciei et capitis penetrans transorbit.sin. Corpus alieni intracerebralis reg parietalis sin. Hemiplegia lat.dex. Haemophthalmus, Haematoma retrobulbare.

The following medical report was made available and has been edited for anonymity. It covers both victims in this accident.

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### **Recommendations**

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- If possible use I.V. canule minimum size 16 gauge to trauma patients.
- Psychological support to the relatives.
- Debriefing/psychological support for the staff who was involved in the accident.

Signed: QA Medical Officer, UNMACC

### **Analysis**

The primary cause of this accident is listed as “*Field control inadequacy*” because, as the investigators concluded, the victims were close to the submunition when it detonated, and low to the ground. Their arms were very probably extended towards it. Even if not actually excavating it, they were very probably investigating it and they were not wearing visors. This error was not corrected by their field supervisors, which implies that other errors may have gone similarly uncorrected.

At the time of the accident report, Victim No.2 was still unable to explain what had happened. His head injuries were severe, making it uncertain whether he will ever be able to explain – but it is possible that something unforeseen occurred, so the secondary cause is listed as “Other”.

## **Related papers**

These comprise annexes to the MACC accident report.

### **Annex 1**

#### **CONVENING ORDER FOR ACCIDENT INVESTIGATION BOARD OF INQUIRY.**

1. The Programme Manager of the Mine Action Co-ordination Centre hereby appoints the following members to form a Board of Inquiry to investigate a UXO accident that occurred on the 06<sup>th</sup> April 2001
  - a. President - MACC QA Team Leader.
  - b. Member - MACC QA Medical Officer.
  - c. Member - MACC QA Assistant.
2. [The demining group's] Programme Manager is requested to provide an observer and assistance to the Board of Inquiry.
3. The Board of Inquiry is to carry out a full investigation and provide a written report to the MACC by 08:00 Saturday 14<sup>th</sup> April 2001. The report is to be written in the English language.
4. The Report of the Board of Inquiry is to consider the details attached at Appendix 1 to this Annex.
5. 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, 06<sup>th</sup> April 2001

**Annex B:** Demining group personnel – omitted for anonymity.

**Annex C:** IMSMA MINE/UXO ACCIDENT REPORT – not in file [not digitized appropriately].

**Annex D:** MAP OF THE GENERAL AREA – omitted to conserve data space.

**Annex E:** The demining group's site map – omitted for anonymity.

**Annex F:** DIAGRAM OF THE ACCIDENT SCENE – omitted to conserve data space.

**Annex G:** Demining group's radio LOG – not in file.

**Annex H:** QA MEDICAL OFFICERS REPORT – go to Victims tab and click the Medical report button for Victim No.2.

[Omitted documents are held on file.]