

3-5-2007

# DDASaccident566

Humanitarian Demining Accident and Incident Database  
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# DDAS Accident Report

## Accident details

<b>Report date:</b> 15/02/2008	<b>Accident number:</b> 566
<b>Accident time:</b> 09:53	<b>Accident Date:</b> 05/03/2007
<b>Where it occurred:</b> MF: 356, Nr Mazraat Al Aarqoub Village, Jessine Sth, Jenoud District	<b>Country:</b> Lebanon
<b>Primary cause:</b> Unavoidable (?)	<b>Secondary cause:</b> Field control inadequacy (?)
<b>Class:</b> Excavation accident	<b>Date of main report:</b> 08/03/2007
<b>ID original source:</b> 003/2007	<b>Name of source:</b> UNMAS
<b>Organisation:</b> [Name removed]	
<b>Mine/device:</b> No.4 Israel AP blast / frag	<b>Ground condition:</b> metal scrap rocks/stones
<b>Date record created:</b>	<b>Date last modified:</b> 15/02/2008
<b>No of victims:</b> 1	<b>No of documents:</b> 2

## Map details

<b>Longitude:</b>	<b>Latitude:</b>
<b>Alt. coord. system:</b> UTM 734192 - 3699306	<b>Coordinates fixed by:</b>
<b>Map east:</b>	<b>Map north:</b>
<b>Map scale:</b> UNIFIL UNTSO-OGL	<b>Map series:</b>
<b>Map edition:</b> Feb 2007	<b>Map sheet:</b>
<b>Map name:</b>	

## Accident Notes

squatting/kneeling to excavate (?)  
visor not worn or worn raised (?)

## Accident report

The report of this accident was made available in February 2008 as a collection of files and pictures. Its conversion to a DDAS file means that some of the original formatting has been lost. The substance of the report is reproduced below, edited for anonymity. The original files are held on record. Text in [ ] is editorial.

## **BOARD OF INQUIRY (BOI) REPORT 003/2007**

on [International demining company] INTERNATIONAL LIMITED DEMINING ACCIDENT that occurred on the 05th March 2007 in which a [International demining company] Deminer was injured

Ref No. 03/2007

Agency: UNMACC SL, Name: [Name removed]; Position: QA Officer

Location: Tyre, Lebanon Date: 06 March 2007

Agency Involved: [International demining company] INTERNATIONAL LIMITED

### **1. Introduction**

In accordance with the National Technical Standards and Guidelines (NTSG), the MACC SL Programme Manager, [Name removed] and Lt.Col. [Name removed], NDO Representative, issued a Verbal Convening Order on Monday the 05th March 2007, for an accident investigation Board of Inquiry (BOI). The MACC SL Board members are Capt. [Name removed] LAF QA Officer MACC SL, [Name removed] QA Officer MACC SL and Dr [Name removed] Medical QA Officer

This is a comprehensive report by the Board of Inquiry (BOI) team into the [International demining company] Demining Accident that occurred on 05th March 2007 which is based on the MACC SL investigation, statements from [International demining company] personnel involved in the accident and evidence from the accident site. The accident is considered as Unpreventable.

The [International demining company] internal investigation report was forwarded to the MACC SL BOI team on 13th March 2007 and is at Annex E. The accident occurred at 0953hrs (local time) on the 05th March 2007 in Area 6-003 MF (Minefield) 356 (Sowaida Position) which is situated near the village of Mazraat Al Aarqoub, UTM 734192 – 3699306 (accident site).

The BOI is an impartial investigation conducted by the MACC SL on behalf of the National Demining Office (NDO) Lebanon. The primary objective of the BOI is to examine evidence in order to conclude the cause of the accident and make recommendations for the prevention of further accidents.

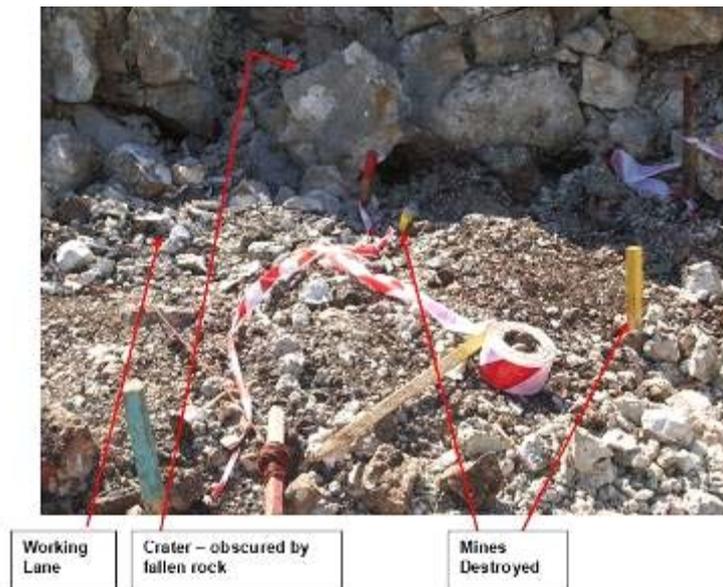
### **2. Executive Summary**

On 05 March 2007, 0935 hrs (local time), [the Victim], a [International demining company] Deminer, inadvertently caused a Israeli No4A Anti Personnel mine to activate while removing rocks from the front of his demining lane during manual mine clearance operations at Minefield (MF) 356, 3.5 km north-east of Nabatiyah.

The MACC SL BOI team concludes that the accident was not a result of incorrect or unsafe procedures.

The mine explosion resulted in [the Victim] sustaining injuries to his left arm, hand and head which, was principally caused by the blast from the mine and secondary fragmentation from rocks.

MF 356 is a challenging mine clearance task with increased hazards to working Deminers due to the steep rocky terrain and mine types (No4A incorporating the No9 fuze). Extreme vigilance, good disciplined and close supervision is therefore essential.



Based on the evidence gathered at the accident site, medical reports and interviews conducted by the MACC SL BOI team during the course of the investigation; it is of the opinion of the BOI team that the mine was positioned in the uncleared area to the front of the demining lane. It had been buried in the ground or covered by rocks and had been initiated as a result of direct pressure from one or more rocks falling from the rocky slope above.

[The Victim] was working in accordance to the [International demining company] Standard Operating Procedures (SOP) and the National Standards and Technical Guidelines Lebanon. The accident is therefore, considered as Unpreventable.

During the course of the investigation the MACC SL BOI team received full cooperation from [International demining company].

[International demining company] has subsequently cleared up to and around the crater site and, no additional evidence was located in or around the crater.

[International demining company] have completed one day of refresher training for MCT 5 and 6 pertaining to manual mine clearance operations, in particular procedures for working in mountainous and rocky areas.

Consideration shall be made prior deploying Deminers in difficult areas (e.g. undulating and rocky terrain) in the close proximity of recent demolitions.

If it is believed that demolitions may result in a disturbance / damage to mines / ERW or the surrounding area, then a sufficient period of time should be allowed for a complete examination of the area to be conducted and a 'soak time' imposed prior to commencing work in the immediate area.

### 3. Location of Incident

Task No / Team No: Area 6-003 MF 356, (Sowaida Position): [International demining company] MCT 05

Village / Dist / Prov: Mazraat Al Aarqoub, Jessine Sth, District-Jenoud, Lebanon.

Grid Ref UTM: 0734192-3699306

Map Ref: UNIFIL UNTSO-OGL: Version - Feb 2007

**4. Date and Time of Incident**

05 March 2007, 0953hrs (local time)

**5. Reported By**

[International demining company], [Name removed] Radio operator

**6. Reported To**

MACC SL, [Name removed] Communicator.

**7. Person(s) Involved**

[The Victim], Deminer ZIM [ID No. removed]

**8. Vehicle(s) or Machine(s) Involved**

None

**9. Investigation Team**

[Name removed] LAF QA Officer

[Name removed] MACC SL, QA Officer

[Name removed] MACC SL, Medical QA Officer

**10. Location of Investigation**

Task No / Name: Area 6-003 MF 356, Mazraat Al Aarqoub, Jessine Sth, District-Jenoud, Lebanon

Grid Ref: 0734060-3699435 Bench Mark: UNIFIL UNTSO-OGL, Version: Feb 2007

**11. Date and Time of Investigation**

06 March 2007, 1030hrs (local time)

**12. Execution of Investigation**

**Approach to Site**

The accident site is at MF 356, approximately 3.5 Km north-east of Nabatiyah town.

The MACC SL investigation team was accompanied to the accident site by [Name removed] ([International demining company] MCT Area 6 Supervisor), [Name removed] ([International demining company] MCT 06 Supervisor), [Name removed] (BATEC MCT 6 Team Leader) and [Name removed] ([International demining company] MCT 6 Medic).

Three 4x4 vehicles were used for the investigation and the team drove on the main paved road heading north-east from the [International demining company] office Nabatiyah for approximately 2.5 km, via Kfar Roummane town and then north-west along a dirt/gravel ascending for approximately 1 km to MF 356 Control Point.

The duration from [International demining company] office to the accident site was 10 minutes by vehicle.

MF 356 is situated on the north side of a former Israeli military defensive hill position. The accident site was on the side of the mountain at the foot of a steep incline. The general area is mountainous, rocky with sparse vegetation and the immediate accident area is rocky with remnants of razor wire and vehicle tyres above. The geographical information on the map indicates that the highest point in the area is 562 metres above sea level.

Process: visual

## **13. Evidence Ground**

### **Accident Site**

The general area where the accident occurred is on the side of a rocky, steep hill which was a former Israeli military defensive position. According to the IMSMA Minefield Report and [International demining company] Operations Map, there were five separate mined areas around the Israeli position.

The immediate accident site is to the front of a manual mine clearance working lane at a point where the gradient of ground increases significantly. The working lane is fairly flat, comprising soil, covered with small to medium size loose rocks with a steep rocky outcrop containing large boulders to the south and immediately in front of the working lane. The front of the accident lane is marked with one red topped wooden stick to the right. Red / white mine tape had been attached to this picket and additional pickets by [International demining company] post accident, to cordon the area pending the investigation. To the front and above the lane are remains of razor wire fencing.

The immediate area to the right (west) of the working lane has been cleared by [International demining company] using manual mine clearance procedures and contains two yellow topped wooden sticks which mark the location of mines destroyed by [International demining company]. The immediate area to the left is uncleared.

### **Crater**

It was not possible to get close to the crater during the investigation on 06 March 07, as the accident lane had not been cleared at the time of the investigation. Photographic evidence was therefore gathered from various positions from a minimum distance of three metres from the crater.

The ground is hard and rocky and the seat of the explosion is at the base of a rocky outcrop comprising a large boulder partially concealing / obstructing the view of the crater. The large boulder appears to have been severed from the outcrop immediately above. It was not possible to confirm the dimensions of the crater however, some charring and splintering is evident around the walls. There are loose rocks / fragments to the left side of the crater.

## **13.2 Vehicle(s) and Equipment**

### **Ambulance**

According to [International demining company] personnel interviewed during the investigation process; two 4x4 wheel drive dedicated medical vehicles had been at the task at the time of the accident and had been utilised during the casevac / evacuation procedure.

### **Demining Tools**

Photographs taken of the accident site during the initial investigated conducted by [Name removed] (MACC SL Chief of QA) and Capt [Name removed] (LAF QA Officer) on 05 March 2007, confirm that the demining tools and F3 Minelab detector were positioned in the adjacent cleared lane to the right of the accident lane. According to information received during the interview process, the tools and detector had been moved by [International demining company] during the casevac process. These were undamaged.

### **Personal Protective Equipment (PPE)**

#### **Ballistic Visor**

The ballistic visor had been positioned in the adjacent lane (near the demining tools and detector) by [International demining company] during the casevac process. The visor was

examined at the site by the MACC investigation team on 05 March and by the BOI team on 06 March 2007, at the [International demining company] office in Nanbatiyah. The visor is still complete with the headband in place. The exterior of the lens is covered in shallow indentations / scuff marks which it is believed was caused by rock fragments from the explosion. The exterior of the lens is covered in a thin layer of dirt / dust. The interior of the lens is slightly dirty / dusty which is more evident on the left side. There are no holes or cracks in the visor. **The condition of the visor indicates that it was being worn correctly at the time of the accident.**



[The Visor: see Analysis.]

### **Ballistic Body Armour**

The body armour is a one-piece 'apron style' design and comprises Kevlar protective material which covers the neck, chest, abdomen and groin regions of the body. The apron is peppered with black dirt which is more apparent around the shoulder and neck region and in particular, the left side of the neck. There is a vertical tear along the seam on the left side at the waist region revealing the Kevlar material. Apart from a small indent, the Kevlar appears to be intact. Some loose rock fragments were visible around this area and, according to the [International demining company] MCT Area 6 Supervisor a rock fragment had been removed from this hole and from the collar.

**The condition of the apron indicates that it had been worn correctly and that the left side took the brunt of the explosion. The PPE is in compliance with IMAS.** [See Analysis.]

### **Mine / UXO**

According to IMSMA Minefield reports, Israeli No 4A Anti Personnel mines were laid in the area; 272 in MF 356. The [International demining company] operations board indicates that they had located 304 No 4A mines out an expected 862.

Four No 4 mines had been located and destroyed by [International demining company] at task MF 356 on 02 March 2006, two of which were in the adjacent lane to the accident site. In addition, one 52mm mortar was destroyed. The following information regarding the last four No4A AP mines located and destroyed on 02 March 2007 at MF 356 was received from [International demining company] during the interviews process:

- Two mines were in the adjacent lane to the right of the accident site.
- One of these mines was located through excavation at a depth of 52cm.
- Three mines were not in the 'normal' laid position (pressure plate not uppermost).
- Two mines had broken bodies.

Plastic fragments from a No 4 mine body had been recovered by [International demining company] on 05 March 2007 after the accident in the adjacent cleared lane. It is inconclusive as to whether they are from the mine which caused the accident and unknown as to the mine's position in the ground.

#### **13.4 Casualty(s) (position, clothing, injuries)**

##### **Casualty's Position**

It is not possible to confirm the exact position of the casualty at the time of the accident, however, according to information received from [International demining company] during the investigation, the Deminer had been in the kneeling position facing the rock face prior to the explosion and was turning to his right and in the process of standing up at the time of the explosion. The evidence based on his injuries sustained and damage to PPE indicates that this may be the case.

##### **Casualty's Clothing**

###### **Gloves**

The Deminer was wearing Kevlar gloves at the time of the accident. The gloves are dirty, primarily on the palms and fingers although, undamaged.

###### **Trousers**

The Deminer's trousers are undamaged and with blood stains evident, particularly in the left thigh area. The Deminer suffered no injuries to his lower body which indicates that the blood stains are from injuries sustained to his left arm or hand.

#### **13.5 Interviews**

The following [International demining company] personnel were interviewed in this sequence by the MACC SL BOI team on 06 March 2007 - *See Annex C – Witness Statements.*

[Name removed] MCT 6 Supervisor

[Name removed] MCT 6 Team Leader

[Name removed] MCT 5 Medic

[Name removed] MCT Area 6 Supervisor

[The Victim] MCT 6 Deminer

#### **14. Casualty Information**

The following information regarding [the Victim]'s injuries and treatment was extracted from the Hammoud Hospital Discharge Summary which, was forwarded by [International demining company] to the MACC SL on 11 March 2007:

##### **Diagnosis 05 March 07**

1. Multiple wounds to forehead.
2. Laceration to left forearm.
3. Dorsally 7 x 6 x 6 cm with exposed lacerated muscles.
4. Sizeable foreign body 10cm proximity to the wound, palpable through the soft tissues.
5. Well fracture base of IV metacarpal bone, left hand.
6. B.P. 130/70, Pulse 100, Respiratory 24.

7. Glasgow Coma Scale (GCS) 15.

**Treatment 05 March 07**

Taken to O.R. where all wounds were debrided, irrigated thoroughly and closed partially over Penrose drain.

**Treatment 07 March 07**

The drain was retrieved and all wounds were dressed properly.

Discharged and given a course of medicine.

**Follow Up**

Return on 10 March 07.

Retain the posterior splint on his left forearm for 4 weeks.

**15 Incident Details (Circumstances / Sequence of Events)**

A preliminary Accident Investigation was conducted by [Name removed], MACC SL Chief of QA and Capt [Name removed], LAF QA Officer at MF 356 on 05 March at 1020 hrs.

The following information is based on an assessment of the evidence obtained by the MACC SL BOI team at the accident site and from witness statements:

On 05 March 2007 at 0953 hrs, [the Victim], a [International demining company] Deminer was involved in a Demining Accident at [International demining company] Task MF 356 (Sowaida position). [The Victim] was removing a rock from the front of his lane during the course of the manual mine clearance operations when an explosion occurred, resulting in injuries to his left arm, hand and head.



At 0742 hrs, MACC SL Operations in Tyre received a radio call from [International demining company] Operations in Nabatiyah, informing them that Mine Clearance Teams (MCT) 5 and 6 had commenced work at the task MF 356. Each MCT team comprised two Team Leaders and eight Deminers and the task was managed by two Supervisors. In addition, [Name removed], the MCT Area 6 Supervisor was at the task at the time of the accident.

Prior to commencing operations a brief was conducted at the Control Point by the Supervisors, pertaining to Manual Mine Clearance procedures and in particular, care when removing rocks from the uncleared area. The remaining area to be cleared was too small to safely deploy more than one Deminer at a time; therefore, the daily working routine consisted of one Deminer working for a period of sixty minutes under the supervision of a Team Leader.

In accordance with [International demining company] Manual Mine Clearance Standard Operating Procedures, supervision was conducted from a minimum distance of 25 metres with both personnel wearing full PPE (ballistic visor and body armour).

The first demining shift commenced at 0815 and during this period medical training was conducted for the remaining personnel. Two Medics and ambulances were collocated at the Control Point at a minimum distance of 100 metres from the working lane.

On completion of the first shift, a changeover took place and the initial Deminer was replaced by [the Victim] at 0915 and the Team Leader by [Name removed]. At the time of the changeover the Area 6 MCT Supervisor was conducting Minelab detector trials and was away from the Control Point.

[The Victim] was working in a one metre wide Demining Lane clearing up to the face of the rocky hillside. The adjacent area to his right had been cleared and the area to his left was unclear. To safely and effectively investigate the ground for mines it was necessary to remove loose rocks prior to conducting the excavation process. [The Victim] was Demining in the kneeling position and had already removed some rocks from the front of his lane to the cleared area behind him. The Supervisor was at a position to the rear and right-side of the Deminer at a distance of approximately 25 metres at a lower level on the hill.

At 0953 hrs, [the Victim] picked up a rock with his hands from the uncleared area to the front of his lane and was turning to his right and standing when a No 4 anti personnel mine detonated immediately to the front of his lane. The Team Leader did not hear the sound of the explosion, although, explained that he immediately saw smoke. The Deminer's immediate reaction was to walk back along the lane. On seeing this, the Team Leader informed him to sit down and assisted him in doing so. The Team Leader informed the Supervisor, [Name removed], by radio, that there had been an accident. On receiving an additional message from the Team Leader that the casualty was in a clear area, the Supervisor instructed the Medics to deploy with two ambulances to the designated medical point. The Team Leader applied a bandage to the casualty's left arm.

[Name removed] was at the CP and was alerted to the accident by the sound of a 'muffled explosion'. He allowed the Supervisor to manage the casevac / evacuation process and immediately informed [Name removed], Area 6 Operations Manager of the situation.

The first Medic to arrive at the accident site was [Name removed] who noticed that a bandage had been applied to the casualty's arm. He continued treating the casualty by applying a bandage to his left hand, fitting a cervical collar and administering oxygen. The casualty was moved to the designated medical point and the second Medic assisted with the preparation of an IV infusion.

Once the casualty was stabilized and loaded into the ambulance he was evacuated from MF 356 at 1006 hrs, by road to Nejde Chaabiyi Level 1 hospital in Nabatiyah. The casualty arrived at the hospital at 1010 hrs and after ensuring that he was stabilized, he was subsequently transferred to the Hammoud Hospital in Saida, which is a Level 3 facility. The MACC SL Operations in Tyre received the initial Situation Report from the [International demining company] Operations Nabatiyah, at 1007 hrs.

### **Chronology of Events**

#### 05 March 07

0730 MCT Teams 5 and 6 departed the [International demining company] base in Nabatiyah.

- 0735 MCT Teams 5 and 6 arrived at Task 356.
- 0742 MACC CL Operations received radio message that operations had commenced at task MF 356. Briefing was conducted by Supervisors.
- 0815 First Demining shift commenced - MCT 5 Deminer and Team Leader.
- 0905 MCT Area 6 Supervisor arrived at task for detector tests.
- 0915 Changeover; second shift commenced – MCT 6 Deminer and Team Leader.
- 0953 Accident occurred.
- 1000 Ambulance and medics arrived at accident site.
- 1006 Casualty evacuated by ambulance from task.
- 1007 Initial SITREP sent by [International demining company] to MACC SL Operations.
- 1010 Casualty arrived at Nejde Chaabiyi hospital, Nabatiyah. Casualty stabilized and transferred by road to Hammoud Hospital, Saida.
- 1020 MACC SL Chief of QA informed of accident.
- 1200 MACC SL Preliminary investigation conducted at MF 356.

#### 06 March 07

- 1030 MACC SL BOI team arrived at [International demining company] compound Nabatiyah.
- 1045 Interviews conducted by BOI team.
- 1245 MACC SL BOI team conducted investigation as MF 356.
- 1335 BOI team departed MF 356 for Saida hospital.
- 1430 BOI team interviewed casualty as Saida hospital.

#### **1 Medical Assistance and Evacuation (procedure, treatment, equip.)**

On seeing the smoke and realization that there had been a Demining Accident, the Team Leader informed the casualty to lie down and assisted him in the process. The mine detonation had occurred to the front of the lane and the casualty was in a cleared area. The Team Leader immediately informed the Supervisor by radio and again, once he was certain that the casualty was in a clear area. He also administered some first aid by applying a bandage to the casualty's arm. The Supervisor instructed two Medics and ambulances to go to the dedicated medical point and, according to the Supervisor; they arrived there within three minutes of the accident occurring. The casualty was conscious and the first Medic on the scene dressed the injured hand, applied a cervical collar and administered oxygen. An IV infusion was administered once the casualty was at the medical point.

The ambulance was placed on a spinal board, loaded into the ambulance and transferred to the nearest medical facility (Nejde Chaabiyi Level 1 hospital in Nabatiyah – UTM 0731626 – 3697674) within 11 minutes from the time of the accident occurring. The ambulance arrived at the hospital at 1010. It had therefore taken approximately four minutes to drive from task MF 356 to the hospital.

After confirming stabilization of the casualty, he was transferred by road to Saida Level 3 hospital – UTM 0720524-0715885 for further treatment.

**Note:** During the BOI, Capt [Name removed] conducted an assessment of the evacuation scenario by following the [International demining company] ambulance from MF 356 to Nejde

Chaabiyi hospital and recording the speed and duration. He concluded that the journey had taken six minutes at a speed of up to 100 kph and **that the ambulance must have been driven at a dangerous speed during the actual evacuation process.**

## **15.2 Geography and Climate**

Task MF 356 located in a mountainous region approximately 3.5 km north-east of Nabatiyah town. Mines were laid by Israeli forces around their position which was located on a steep rocky hill. The general area is rocky and sparsely covered with clumps of bushes and grass. The UNIFIL road map indicates the highest point in the region is 562 metres above sea level. The accident site is situated on a fairly flat area on the side of the defensive hill position, comprising compact soil, covered with small to medium size loose rocks. The seat of the detonation is at a point where the gradient of ground increases significantly.

At the time of the investigation, the temperature was mild and weather was overcast and windy.

## **15.3 Demining Procedures**

Manual Mine Clearance procedures were being conducted at Task MF 356. Prior to the accident, the casualty had been removing rocks from the uncleared area prior to conducting detector search and excavation procedures in order to locate mines to a depth of 20 cm below the normal level of the ground.

[International demining company] Manual Mine / UXO Clearance SOP, Chapter 5, section 5.30 details the procedures for Mountainous rocky terrain with loose rocks areas:

It explains that in areas where the ground is mountainous and rocky and the metal detector cannot be used then, prodding and excavating drills should be used. "The checking of booby traps should be completed prior to any rocks actually being removed".

According to statements obtained during MACC SL BOI, [the Victim] had used his detector to check the rocks prior to removing them to a clear area. At the time of the preliminary investigation, [the Victim]'s detector was recorded as being located in the adjacent lane to the right of where he had been working. Apparently, it had been placed there during the casevac process. It is therefore, possible that it had been used by the Deminer as explained. Previous external MACC SL QA inspections confirm that procedures were being conducted in accordance to the organization's SOP.

It is of the opinion of the MACC SL BOI team that [the Victim] was conducting manual mine clearance procedures in compliance to the [International demining company] SOP and NTSG.

## **15.4 Demining Equipment**

The Minelab F3 Detector and standard [International demining company] manual demining tools were at the accident site. These were however, not being used by the Deminer at the time of the accident.

## **5 Communications**

VHF radios are used to communicate at the task between Team Leaders, Supervisors and Medics. VHF radios and mobile phones are used for communications between the task and operational base at Nabatiyah.

The MACC SL Operations Room had been informed by The [International demining company] Operations Room that Demining operations had commenced at Task 356 on 05 March 07.

It is of the opinion of the MACC SL BOI team that there was sufficient communications at the task.

## **6 Site Layout and Marking**

The immediate area of the accident had been marked with red / white hazardous area marking tape. The task was marked in accordance with [International demining company] Standard Operating Procedures (SOP).

### **15.7 Command and Control**

At the time of the accident only one Deminer was working (the casualty). He was being supervised by the Team Leader from a distance of 25 metres. The Team Leader was situated behind, below and to the right of the Deminer. In addition, the MCT Area 6 Supervisor, MCT Team 5 Supervisor and three Team Leaders were at the control point at a minimum distance of 100 metres from the working Deminer.

It is of the opinion of the MACC SL BOI team that although, the Team Leader could see the Deminer from where he was positioned, the distance was too great for him to see all the manual mine clearance procedures (i.e. detector search, excavation and rock removal) clearly and therefore, conduct effective supervision. The Command and Control of the task was however, in compliance to the [International demining company] SOP and insufficient supervision was not a contributing factor to the accident.

### **15.8 Quality Assurance and Quality Control**

#### **Internal QA**

Reference: [International demining company] SOP, Chapter 20 Quality Assurance.

Section 20.5 QA Team Composition.

This section details the proposed [International demining company] SL QA team structure.

Section 20.7 QA for Manual Clearance Operations.

Section 20.7.1 details the manual mine clearance methodology using metal detector and prodders / excavation.

Section 20.7.2 details the requirement for additional supervision or another asset (e.g. mechanical or MDD) in circumstances where the ground does not permit the use of metal detectors for QC.

Section 20.7.3 details that if it is possible to use metal detectors then the lanes will be checked daily by the Supervisors.

Section 20.7.5 details that when using metal detectors then no specific QA is required and that Deminers and Supervisors will walk on cleared ground many times per day.

Section 20.7.6 details the requirement for additional supervision when metal detectors are not used and only prodding / excavation is conducted; and that the area should be checked using MDD or mechanical assets.

On the day of the accident at MF 356 only one Deminer was working ([the Victim]) who was being supervised by a Team Leader from a minimum distance of 25 metres away. During the investigation [the Victim] explained that due to numerous metallic signals from the ground, it was not possible to use his detector, however, he did use it to search rocks prior to their removal by hand. During the investigation site brief conducted by [Name removed] (MCT 6 Supervisor), the BOI team was informed that due to soil movement from the hillside in the area of the accident, additional soil had been deposited on the ground and it was therefore, necessary to conduct a certain amount of excavation down to the original level of the ground when the mines had were laid.

In accordance to the [International demining company] QA SOP there is only a requirement for additional supervision when conducting excavation. The Quality Assurance conducted was therefore, in compliance to the organization SOP and NTSG.

### **External QA**

Prior to the accident, regular QA inspections had been conducted by the MACC SL at task MF 356. The last QA conducted was on 28 Feb 2007 which resulted in an Acceptable report. The QA Officer's comments were as follow:

*Good command and control on Site. All procedures and safety distances as per SOP.*

It is of the opinion of the MACC SL BOI team that the QA was in compliance to the [International demining company] SOP and NTSG.

### **16 Planning**

#### **Planning**

Minefield reports were entered into the IMSMA data base on 29 May 2000 for the following confirmed minefields:

MF 346, 357, 415, 1581 and 1603.

These reports are included in Task Dossier 6-003 which was issued to [International demining company] by the MACC SL in Feb 2007.

#### **Accreditation**

[International demining company] MCT Teams 5 and 6 received Provincial Accreditation on 07 Jan 07 and Full Operational Accreditation on 21 Feb 07 from the MACC SL.

#### **Training**

All MCT 5 and 6 personnel have completed pertinent training courses. The last task casevac exercise was conducted at MF 356 on 28 Feb 07.

### **17 Details of Non / Compliance to Agency SOP / NTSG / IMAS**

Demining operations at MF 356 were conducted in accordance to the [International demining company] SOP, NTSG and IMAS.

### **18 Conclusions**

MF 356 is a challenging mine clearance task with increased hazards to working Deminers due to the steep rocky terrain and mine types (No4A incorporating the No9 fuze). Extreme vigilance, good disciplined and close supervision is therefore essential.

There have been several accidents in the area involving other demining agencies which highlights the dangers associated to clearance there.

[The Victim], a [International demining company] Deminer, inadvertently caused an Israeli No4A Anti Personnel mine to activate while removing rocks from the front of his demining lane. It is of the opinion of the BOI team that the mine was positioned in the uncleared area to the front of the demining lane.

The mine had been buried in the ground or covered by rocks and had been initiated as a result of direct or indirect pressure from one or more rocks falling from the rocky slope above.

It is not possible to confirm the exact position of the casualty at the time of the accident, however, according to information received from [International demining company] during the investigation, the Deminer had been in the kneeling position facing the rock face prior to the

explosion and was turning to his right and in the process of standing up at the time of the explosion. The evidence based on his injuries sustained and damage to PPE indicates that this may be the case.

The yellow topped mine sticks marking the location of mines destroyed during demining operations and the crater suggest that the mine was in the general proximity of where it had been laid. Without accurate information and mine records this is however, inconclusive and it possible that the mine was not in its original position and may have moved due to subsidence.

It is not possible for the MACC SL BOI team to conclude whether the rock or rocks were disturbed after [the Victim] removed adjacent rocks or whether the rocks were in a precarious position already and fell without assistance. The BOI team however, concludes that the accident was not a result of incorrect or unsafe procedures.

[The Victim] had been conducting manual mine clearance procedures in compliance to [International demining company] Standard Operating Procedures (SOP) and the National Technical Standards and Guidelines (NTSG) Lebanon.

[The Victim] had been wearing his Personnel Protective Equipment correctly at the time of the accident

There was sufficient communications at the task.

The task was marked in accordance with [International demining company] Standard Operating Procedures (SOP) and NTSG.

It is of the opinion of the MACC SL BOI team that although, the Team Leader could see the Deminer from where he was positioned, the distance was too great for him to see the all the manual mine clearance procedures (i.e. detector search, excavation and rock removal) clearly and therefore, conduct effective supervision. The Command and Control of the task was however, was in compliance to the [International demining company] SOP and NTSG. There is no evidence to suggest that insufficient supervision was a contributing factor to the accident.

The QA at the task was in compliance to the [International demining company] SOP and NTSG.

The immediate response to the accident by the Team Leader and Supervisor was good. The medics arrived at the accident site within five minutes. The casualty was evacuated from the task within 15 minutes.

The medical treatment was correct and in accordance to the [International demining company] SOP and NTSG.

Based on the assessment conducted during the investigation involving the [International demining company] ambulance driving from MF 356 to Nabatiyah hospital; the BOI team is of the opinion that the ambulance carrying the casualty was driven at a dangerous speed from the task to the hospital.

The accident is considered to be Unpreventable.

During the course of the investigation the MACC SL BOI team received full cooperation from [International demining company].

The following factors may have contributed to the accident:

The mine may have been damaged or in an unstable condition due to earth / rock movement.

The mine may have been damaged or in an unstable condition due to demolitions conducted nearby during demining operations.

The rocks above / adjacent to the mine may have been damaged due to earth / rock movement or from demolitions conducted during demining operations, leaving them in an unstable condition. Two mines had been located and destroyed in the adjacent lane, the closest within 1 metre of the mine.

## **19 Further Actions and Recommendations**

- a. The MACC SL requested that [International demining company] clear up to and around the crater site pending an inspection of the area for any additional evidence. This was completed on 09 March 07 and no additional evidence was located in or around the crater.
- b. [International demining company] shall conduct a one day of refresher training for MCT 5 and 6 pertaining to manual mine clearance operations, in particular procedures for working in mountainous and rocky areas. This was conducted on 07 March 07.
- c. At the conclusion of all demolitions, the immediate area shall be checked for evidence of mines / ERW and damage to the surrounding area.
- d. Consideration shall be made prior to deploying Deminers in difficult areas (e.g. undulating and rocky terrain) in the close proximity of recent demolitions.
- e. If it is believed that demolitions may result in a disturbance / damage to mines / ERW or the surrounding area, then a sufficient period of time should be allowed for a complete examination of the area to be conducted and a 'soak time' imposed prior to commencing work in the immediate area.
- f. Areas identified as being too hazardous for manual Deminers to operate shall be marked and reported to the MACC SL. This will be followed by a site assessment by the MACC SL Operations Officer and pertinent organization representative to discuss an alternative clearance plan.
- g. Additional procedures for working in difficult areas containing rocks or other obstacles should be considered, for example; pulling drill, mechanical demining (it is understood that this would not be possible for the area of the accident).
- h. The current [International demining company] SOP specifies a mandatory safety distance of 25 metres from working personnel during mine clearance operations; this includes supervision and QA inspections. The MACC SL and [International demining company] have agreed that with the introduction of a waiver, MACC SL QA personnel may encroach this distance in order to perform their duties.
- i. [International demining company] should amend their SOP regarding the 25 metre safety distance rule to allow pertinent personnel closer to working personnel for supervisory and QA purposes. The MACC SL BOI team is of the opinion that it is not possible to conduct adequate supervision from a distance of 25 metres as the person supervising is unable to observe demining procedures accurately from this distance. The primary purpose of supervision is to ensure that procedures are being conducted correctly and that Deminers are working safe and effectively. Allowing the supervisor nearer to working personnel should promote vigilance, increase the confidence of Deminers and prevent accidents.

- j. [International demining company] shall ensure that all pertinent personnel understand that the evacuation process must be conducted in a safe manner; the ambulance must drive to the road conditions and within the national speed limit

## **20 Task Status**

Current: Start Date (31 Jan 2007)

## **21 Background Information**

### **Task History**

Minefield 356 is one of five minefield reports included within Task Dossier 6-003. There have been a number of unconfirmed mine accidents around Sowaida Position and one confirmed demining accident in June 2006 involving a [different demining group] Deminer who was injured after initiating a No4, while conducting manual mine clearance procedures.

There have also been reports of several accidents involving the No4 mine in other areas of Lebanon. The No4A mine is fitted with the No9 fuze (cocked striker mechanism incorporating a spring assisted striker retained by a recessed firing pin). These mines are frequently located during demining operations in an extremely sensitive condition, which may be the result of soil / rock movement or the displacement of the mine itself.

The IMSMA Minefield report for Task MF 356 indicates that 272 No4A AP mines were laid in 1997 around Sowaida Position and at least one accident involving the Lebanese Armed Forces (LAF) occurred during clearance operations. There were apparently, 800+ AP mines laid in the area, however, it is unconfirmed as to whether these were laid by the Israeli Armed Forces (IAF) or a combination of IAF and LAF.

### **Execution of Task**

[International demining company] commenced Demining operations at MF 356 on 31 January 2007. According the [International demining company] Task operations board, 304 mines had been located out of an expected 804. MACC SL clearance data indicates that [International demining company] had cleared **45 AP mines, 23 UXO and 3479 square metres** of land. Other Demining Organisations including the Syrian Armed Forces (SAF), LAF and [Name removed] had conducted mine clearance operations in the area and [International demining company] were tasked with clearing the remaining uncleared area. On 05 March 2007, there were approximately, 25-30 square metres of land remaining to be cleared by [International demining company].

### **Casualty History**

[The Victim] has worked with [International demining company] in Lebanon as a Deminer from 2002-04 and Jan 2007 to the present day. According to his Supervisor and Team Leader, he is a good Deminer who understands his responsibilities. He had previously located four No4A AP mines at MF 356.

### **Report Written By:**

Capt. [Name removed], LAF QA Officer

[Name removed] MACC SL QA Officer

08 March 2007

### **From IMSMA form**

Born: 1979

Sketch records injuries only to "upper limbs"

Time hospital reached: 10:10

During the removal of loose rocks to access a mine, more rock fell from above and caused the mine to detonate.

### **From initial accident report:**

Injured: One deminer only was injured: injuries to his left arm (broken) and thumb of his left injured (possibly broken) and damages to lips (burnt). Otherwise he received non-life threatening injuries.

### **From internal report:**

... [the Victim] sustained the following injuries:

- a. Laceration to Left forearm.
- b. Laceration to back of left hand.
- c. Small Laceration over the left eye.
- d. Injury to back of scalp, as a result of falling backwards away from the detonation.

## **Internal accident report**

REPORT FOR A MINE ACCIDENT WHICH OCCURRED DURING THE CLEARANCE OF THE SOWAIDA POSITION, GRID 734183, 699312, 05TH MARCH 2007

References:

- A. Lebanon National Technical Standards and Guidelines (TSGs).
- B. International Mine Action Standards (IMAS).
- C. [International demining company] International Limited Standard Operating Procedures (SOPs).

### **Introduction**

1. The [International demining company] Area 6 BT Manager was visiting MCT 5 and 6 on the Sowaida Former IF position during the morning of 05th March 2007, at approximately 0953hrs a detonation occurred in the clearance area as a result of which deminer [the Victim] sustained the following injuries:

- a. Laceration to Left forearm.
- b. Laceration to back of left hand.
- c. Small Laceration over the left eye.
- d. Injury to back of scalp, as a result of falling backwards away from the detonation.

### **Sequence of Events**

2. MCT 5 and 6 deployed to the Sowaida position at 0720hrs, a safety brief was given which covered the process for removing loose rocks from the working lane. There was only one deminer working on the position as the work was almost complete, and safety distance precluded the deployment of any more deminers.
3. The first shift was complete and a change over had taken place at 0900hrs, the deminer Mr. [the Victim] started work at 0900hrs, he was being watched by team leader Mr. [Name removed], at approximately 0953hrs a detonation occurred in the working lane.
4. A full CASEVAC was then instigated by the Supervisor Mr. [Name removed], some difficulties were encountered with the Vertex Radio and the CASEVAC information
5. The area was sealed; [International demining company] SL personnel took photographs, and awaited the arrival of the NDO / MACC SL investigation team.
6. Mr. [Name removed] and Capt [Name removed] arrived at the [International demining company] area 6 offices, and were escorted to the Sowaida Former IF position CP where they were both briefed by the Site Supervisor. [Name removed], and the NDO / MACC SL team moved to the accident site where photographs were taken and the site supervisor and the team leader were questioned on the sequence of events leading up to the accident.

### **General Observations**

7. The accident site is located on the north east of the former IF position on a steep rocky slope very close to the area cleared by the MAG clearance teams. It should also be noted that a Number 4A anti-personnel mine was located and destroyed within approximately 0.75 meters of the mine that detonated causing the accident.
8. The location of the accident was at the base of a natural rock wall, where there was some evidence of rock movement in the immediate area of the accident. The site supervisor had covered the fact that extreme care was required by all deminers, and that all rocks moved should be placed in a cleared and safe area when moving rocks, during the morning safety brief. Several pieces of the plastic body of number 4A anti-personnel mine were located close to the site of the accident, but these can not be positively identified as coming from the mine that caused the accident, they may have come from the other mines demolished during previous clearance.
9. It would appear from the injuries to the deminer and the evidence found on the PPE that the deminer had picked up a rock and had partly turned to his right, when possibly another rock moved which caused the detonation of the mine.

### **Conclusions**

10. The area cleared and marked by MCT 5 and 6 during the clearance of the Sowaida Former IF position was conducted in some very difficult terrain and up to the point of the accident the team had encountered no problems.
11. The marking of the site was in accordance with [International demining company] SL SOPs, as were all the procedures carried out in line with accepted procedures.
12. No infringement of either TSGs or SOPs occurred during the clearance of this area were noted or viewed by the investigation team.
13. This appears to be an unfortunate accident where a rock or rocks moved after the deminer moved one rock which caused the mine to detonate which injured Mr.[the Victim].

### **Recommendations**

14. In areas similar to this a safe working practice is established on how to remove loose rocks to access mines located within these areas. This could be achieved either by remotely pulling areas of loose rocks or conducting some form of explosive removal of these areas of loose rocks.

### Victim Report

<b>Victim number:</b> 740	<b>Name:</b> [Name removed]
<b>Age:</b>	<b>Gender:</b> Male
<b>Status:</b> deminer	<b>Fit for work:</b> presumed
<b>Compensation:</b> Not made available	<b>Time to hospital:</b> 17 minutes
<b>Protection issued:</b> Frontal apron Goggles Long visor	<b>Protection used:</b> Frontal apron, Goggles, Long visor worn raised

#### Summary of injuries:

minor Neck

severe Arm

severe Face

severe Hand

COMMENT: See Medical report.

#### Medical report

Field medic: The Deminer had injuries to his left arm, hand, back of his neck, side of his face and his lips were peppered.

Hammoud Hospital Discharge Summary which, was forwarded by [International demining company] to the MACC SL on 11 March 2007:

Once the casualty was stabilized and loaded into the ambulance he was evacuation from MF 356 at 1006 hrs, by road to Nejde Chaabiyi Level 1 hospital in Nabatiyah. The casualty arrived at the hospital at 1010 hrs and after ensuring that he was stabilized, he was subsequently transferred to the Hammoud Hospital in Saida, which is a Level 3 facility.

#### Diagnosis 05 March 07

8. Multiple wounds to forehead.
9. Laceration to left forearm.
10. Dorsally 7 x 6 x 6 cm with exposed lacerated muscles.
11. Sizeable foreign body 10cm proximity to the wound, palpable through the soft tissues.
12. Well fracture base of IV metacarpal bone, left hand.
13. B.P. 130/70, Pulse 100, Respiratory 24.

14. Glasgow Coma Scale (GCS) 15.

Treatment 05 March 07

Taken to O.R. where all wounds were debrided, irrigated thoroughly and closed partially over Penrose drain.

Treatment 07 March 07

The drain was retrieved and all wounds were dressed properly.

Discharged and given a course of medicine.

Follow Up

Return on 10 March 07.

Retain the posterior splint on his left forearm for 4 weeks.

## **STATEMENTS**

“During the course of the BOI, the MACC SL BOI team conducted interviews with [International demining company] personnel regarding the BAC Demining Accident that occurred on 05 March 2007. The interviews were conducted in English as all persons involved in the process had sufficient knowledge of the language.

“The interviews were conducted by Capt [Name removed], LAF QA Officer and [Name removed], MACC SL QA Officer. Also present during the interview process was [Name removed], [International demining company] MCT Area 6 Supervisor. Dr [Name removed], MACC SL Medical QA Officer was present during the interviews at [International demining company] Nabatiyah office only.

“The information below is written with the purpose of replicating the verbal statements submitted by BAC personnel during the interview process. Written statements shall be included in the [International demining company] internal investigation report.”

### **Supervisor statement**

Date and Time: 06 March 2007, 1045 -1200hrs (local time).

Employment in Lebanon: [International demining company] Lebanon 2002-04 and Jan 07-present.

At 0730 I departed [International demining company] compound (Nabatiyah) for the task (MF-356).

I arrived at the task at 0735 and the equipment was prepared.

The two Supervisors checked the area ([Name removed] and [Name removed]). There were four Team Leaders at the Task (2 for each team, MCT 5 and 6). The four Team Leaders checked the calibration of the detectors.

The Supervisors gave the teams a safety brief which included the procedures for carefully lifting rocks, searching and excavating safely.

At 0815 [Name removed], MCT 5 Team Leader and [Deminer no.2], MCT 5 Deminer, left the Control Point (CP) for the minefield to commence the first 60 minute shift. [Name removed] explained that the reason why only one Deminer worked that there was only a small

uncleared area remaining and therefore, a lack of safety distance to deploy additional Deminers.

One Supervisor, three Team Leaders, Fifteen Deminers and two Medics remained at the CP.

At 0915 the first shift finished and a changeover took place. The MCT Team Leader and Deminer were replaced by [Name removed], MCT 6 Team Leader and [the Victim], MCT 6 Deminer.

At 0953 the accident occurred I was at the CP and the Team Leader was in the field. The Team Leader called me by radio, informing me that there had been an accident and that the casualty was in a clear area.

I therefore sent 2 Medics and ambulances to the designated area.

The Team Leader kept me updated by radio.

The Medic was at the accident site in 3 minutes and stabilized the casualty.

At 1006 the ambulance departed the minefield for the hospital.

I sent a report to the base by radio.

[Name removed], Supervisor, was at the Control during the accident.

[Name removed], Operations Manager , arrived at the site and waited for [Name removed], MACC SL Chief of QA and Capt [Name removed], LAF QA Officer to arrive.

I sealed off the area pending the investigation.

[Name removed] collected [Name removed] and Capt [Name removed] from the [International demining company] compound and directed them to the site.

At 1200 I gave a site brief prior to the investigation. Present during the brief was [Name removed], Capt [Name removed], [Name removed], and [Name removed].

The evidence (PPE and clothing) and the accident site were photographed by [Name removed].

[Name removed] also explained that prior to the accident [the Victim] had been removing rocks from the front of his lane (uncleared area) and placing them in a cleared area behind him. He also said that the previous Friday, [the Victim] had located a No 4 AP mine in the adjacent lane and that he was a good Deminer.

### **Team Leader statement**

Date and Time: 06 March 2007, 1045 -1200hrs (local time).

Employment in Lebanon: [International demining company] Lebanon 2002-04 and Jan 07-present.

I was the Team Leader for the 0915-1015 shift.

At 0855 I was informed that I would take the shift.

At 0915 I advised the Deminer, [the Victim], to be careful when moving stones, before excavation and to check the ground with the detector prior to excavating.

I was standing 25 metres from the Deminer and supervising him while he was working.

At 0953 I saw smoke and the Deminer was lying down a few metres from where he had been working. He had been in the kneeling position when working.

I called to the Supervisor by radio and walked to the Deminer.

The Deminer tried to stand up; he was 1 metre back in the cleared area.

I grabbed him by his shoulders and made him sit down.

I informed the Supervisor by radio that the Deminer was in the clear area and that the Medics should be sent.

[Name removed] explained that at he had been wearing full PPE and that the Deminer had been wearing PPE, goggles (inside the visor) and gloves. The visor lens had been down. The Deminer had picked up a rock and put it behind him and as he bent down to pick up another rock, [Name removed] had seen the smoke.

I administered first aid to the Deminer; bandaged his arm and talked to the casualty.

The Medic arrived and the area was rocky so a Deminer and I moved the casualty to a flat area. The Medic started the treatment.

The duration from the time of the accident to the ambulances' departure with the casualty was 11 minutes.

The Medic had stabilized the casualty and I gave the details of the injuries and ID number to the Supervisor.

I updated the Supervisor with the medical treatment.

The casualty was placed in the ambulance and driven to the CP.

The Deminer had located a mine in the adjacent lane at 50 cm the previous Friday. The mine was destroyed and nothing remained.

[Name removed] explained that he thought that the accident had possibly been caused by a rock which had been balancing and had fallen when another rock had been moved. He said that he could see the Deminer at all times from where he was standing and had not heard the explosion although, seen the smoke.

### **Statement – Medic 1**

Date and Time: 06 March 2007, 1045 -1200hrs (local time).

At 0800 the Supervisor briefed the team regarding the health of the Deminers, prior to them starting work.

I heard an explosion and waited for the Team Leader and Supervisor to inform what had happened. I was unsure at this time.

I prepared myself and heard the Team Leader inform the Supervisor by radio that the casualty was in a clear area.

I prepared myself, went beside the ambulance and waited for instructions from the Supervisor.

I heard the Team Leader request for Medics and the Supervisor asked the Medics to go. Two Medics and ambulances went.

The ambulances arrived at the pre-designated spot.

I left the ambulance taking the medical bag and Oxygen. I was wearing my gloves.

I noticed the bandage on the casualty's arm and the Deminer was walking one metre from the seat of the explosion.

I told him to stop and started treating him. I bandaged his hand, fitted a cervical collar and administered oxygen. Another Medic came ([Name removed]) and checked for other injuries. The Deminer had injuries to his left arm, hand, back of his neck, side of his face and his lips were peppered. I checked his airway (tongue). [Name removed] assisted with the IV.

I requested for two Deminers to bring the spinal board and the casualty was lifted into the ambulance.

[Name removed] explained to Doctor [Name removed] that the casualty's level of response was normal. He also said that during the evacuation to hospital he had asked the ambulance driver the whereabouts of [Name removed], a local farmer. He informed the doctor that the casualty had small bleeding, a blood pressure of 11/7 (110/70) and a pulse of 100.

### **Statement - deminer**

Date and Time: 06 March 2007, 1045 -1200hrs (local time).

At 0900 medical training I had been conducted at the task during the first shift.

[Name removed] explained that he had been conducting detector trials with the Minelab during the period of the shift changeover and that at 1000 he had been waiting for [Name removed], Area 6 Operations Manager, to arrive at the site.

I heard a muffled explosion and within 5-6 seconds the Team Leader informed about the accident by radio.

I let the Supervisor carry on and informed [Name removed] of the situation.

The ambulances were heading north-east and I warned [Name removed] not to block their passage.

The casualty was evacuated and I took photos and sealed off the accident area.

I rendezvous with [Name removed] and [Name removed] for the investigation.

Annex F to 7020

Dated 05th March 2007

### **Statement by [the Victim]**

I [Name removed] am currently a deminer with MCT 6, and am deployed on the Sowaida former IF position.

On the morning of 05th March 2007 my team and I deployed as normal to the clearance task site where our team unloaded and prepared the equipment required for the day's task.

I and the other deminers unpacked our equipment then calibrated and tested our Minelab F3 detectors, under the supervision of the team leaders while both site supervisors visited the minefield to check the marking and plan the day's clearance.

On completion of these tests, both [Name removed] and [Name removed] returned to the CP and gave the safety brief which covered in detail the care which all deminers should exercise while conducting full excavation drill and the moving of rocks, which would be required during the day's upcoming clearance.

The first team leader ([Name removed]) and the first deminer ([Name removed]) deployed to the minefield at approximately 0815hrs to conduct the first working shift of the day. It should be noted at this point that only one deminer could be deployed due to only a small clearance area remaining on our current tasking.

At 0855hrs I was instructed to prepare for the start of the second shift with the second team leader [Name removed] we dressed in our PPE and moved towards the change over location arriving at approximately 0910hrs where I received a handover brief from [Name removed], we completed the change over and I started work at approximately 0915hrs

I was working in lane 4 of the minefield and was close to a rock face, at the base of which were some small and medium size loose rocks. I checked the loose rocks with my detector and no signal was emitted from my detector. The process of clearance was to check the rocks, then remove them, after the rocks were moved the natural ground level was then checked again with the detector, and in most cases full excavation was required due to heavy metal contamination of the ground.

I then proceeded to remove the loose rocks by hand; I picked up a medium sized rock and as I was turning to my right to place the rock behind me into a cleared area, just as I started to turn an explosion took place as I was moving from the kneeling position to the standing position.

I was blown backwards into a cleared area, the next thing I can remember is that Wilson was with me and then the medics arrived and treated me. I was then moved to the ambulance and taken to the hospital.

I do not remember seeing or hearing anything out of the ordinary prior to the explosion, and I can confirm that when I checked the area with my detector no signals were given by my detector.

Signed: 05th March 2007

### **Statement - Medic 2**

I [Name removed] am currently the team medic with MCT 5, and am deployed as one of the team medics on the Sowaida former IF position.

On the morning of 05th March 2007 my team and I deployed as normal to the clearance task site where the team unloaded and prepared the equipment required for the day's task.

I and the other site medic [Name removed] parked our two ambulances in the allotted space within the CP, after the deminers had checked their detectors and the safety brief was given, we conducted the normal morning questioning of the deminers to ensure all were fit to work, this is done by questioning the deminers to ascertain if any of them have any problems which may require medical attention.

One deminers and one team leader then deployed into lane 4 to start work at approximately 0815hrs, this shift was then changed for the second shift.

It was during the second demining shift of the day when I heard an explosion just before 1000hrs, which was not a planned demolition, I immediately moved to my ambulance thinking that this could possibly be an accident on our working site. This was confirmed when I heard over my radio from the team leader that an accident had occurred in lane 4, and that the deminer was in a safe area.

The site supervisor shouted to me to deploy immediately to lane 4, I with my driver and ambulance moved to the pre designated area where I dismounted from my vehicle and

moved along the safe route to the injured deminer [the Victim], I was not wearing my PPE as [the Victim] was in a safe area.

On arrival at the site I put on my gloves and moved [the Victim] into a more flat area to make treatment easier, the second medic then arrives ([Name removed]) we then dressed several wounds and applied a neck brace to [the Victim], EMOX was also administered, and a full head to toe examination was conducted to assess if he has sustained any further injuries. The following injuries were recorded:

1. Laceration to left forearm.
2. Cut to back of right hand.
3. Cut to the back of the scalp.
4. Cuts above left eye and to right cheek.
5. Perforation and some burning to lips.

All of these wounds were dressed and [Name removed] set up an IV system for [the Victim] and started to infuse fluids. All the time this was happening [Name removed] and I were reassuring the deminer and talking with him, he was alert and responsive, his level of pain was as such that no pain relief was administered.

Extra deminers were requested to assist with the extraction of [the Victim]. Once in the ambulance the IV lines were checked and the ambulance departed site for the hospital at approximately 1006hrs.

[Name removed] was passed using the mobile phone system. Mr. [the Victim] was taken by ambulance to Nabatiya hospital and then to the Hammoud hospital in Saida where he was treated for his injuries. Mr. [Name removed] and Mr. [Name removed] deployed to the Sowaida position CP, along with Mr. [Name removed] they started the initial [International demining company] Investigation.

## **Analysis**

The primary cause of this accident is listed as “Unavoidable” because the investigators determined that the accident site was so difficult that the initiation was caused by a falling rock.

The secondary cause is listed as a “Field control inadequacy” because the Victim was working with his visor raised and his error was not corrected. If one error is not corrected, it is possible that others were also missed.

The visor was raised because facial injuries extending to the Victim’s forehead could not have occurred if the visor has been in its correct position. The Victim’s eyes were probably saved by the fact that this demining group (uniquely at the time) wore industrial safety spectacles as well as the visor, and the spectacles were in place. They were broken in the blast and a photograph of one “arm” of the spectacles under a rock is shown below.



The demining group started to wear industrial safety spectacles underneath the visor after a series of visor failures in Lebanon. Subsequent investigation showed that the visors involved had been in service for many years and had probably been hardened by UV exposure. See Accident No. 383, for an example.

The picture above also shows razor wire, which was present at the accident site and may have made metal-detector use unreliable.

Because the investigators were at pains to stress (in bold typeface) that “The PPE is in compliance with IMAS”, and because I designed and established manufacture of the frontal apron PPE in a Technology Transfer programme in 1997, I am obliged to observe that the PPE is not in compliance with the IMAS. It was the first “apron” PPE design and is still the simplest. But it has a collar that is designed to be inside the visor as opposed to an outer collar than folds onto the visor in an accident. The material is a ballistic aramid rated at STANAG 2920 380 m/s rather than the 450 m/s required in the IMAS. It has, however, never failed in a recorded AP blast mine accident.