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DDAS Accident Report

Accident details

Report date: 07/12/2019	Accident number: 824
Accident time: 07:19	Accident Date: 01/07/2009
Where it occurred: Yohmor Village, Nabatiyeh District, South Lebanon	Country: Lebanon
Primary cause: Unavoidable (?)	Secondary cause: Unavoidable (?)
Class: Excavation accident	Date of main report: 01/07/2009
ID original source: 03/2009	Name of source: LMAC RMAC- Nabatiyah
Organisation: [Name removed]	
Mine/device: Submunition	Ground condition: agricultural (abandoned); hard; rocks/stones
Date record created:	Date last modified: 07/12/2019
No of victims: 1	No of documents: 1

Map details

Longitude:	Latitude:
Alt. coord. system: UTM 36S 0734957 - 688412	Coordinates fixed by:
Map east:	Map north:
Map scale: LAF Youhmo: version: 2009	Map series:

Accident Notes

squatting/kneeling to excavate (?)

inadequate equipment (?)

incomplete detonation (?)

Accident report

A report of this accident was made available by the national mine action authority in 2019. Some of the original formatting has been removed but the original report is held on file. The substance of the report is reproduced below, edited for anonymity. Text in square brackets [] is editorial.

REGIONAL MINE ACTION CENTRE (RMAC) SOUTH LEBANON

Ref No. 03/2009

BOARD OF INQUIRY (BOI) INVESTIGATION REPORT

Report Category: Accident: BAC, SUBMUNITION

Cause: Uncontrolled detonation of mine/UXO by: Human

Report Compiled By: [Name removed], QA Officer, RMAC-Nabatiyeh and [Name removed], QA Officer

Location: Nabatiyeh, Lebanon Date: 1 July 2009

Casualty(s): Human

Agency Involved: [International demining organisation]

Annexes [Not made available]

A Area Map – location of CBU-681

B RMAC BOI Witness Statements

C [International demining organisation] Demining Accident Report

D IMSMA Demining Accident Report (Pending)

E IMSMA Casualty Report

F IMSMA DA Report

G Medical report

1. Introduction

In accordance with the National Technical Standards and Guidelines (NTSG), the RMAC Programme Manager, [Name removed], issued a Verbal Convening Order on Wednesday the 1st of July 2009, for an accident investigation Board of Inquiry (BOI). The Board members are [Name removed] RMAC QA Officer and [Name removed] RMAC QA Officer.

This is a comprehensive report by the Board of Inquiry (BOI) team into the [International demining organisation] BAC Accident that occurred on 1st July 2009 which is based on the RMAC investigation, statements from [International demining organisation] personnel involved in the accident and evidence from the accident site.

The accident occurred at 0719hrs (local time) on the 1st July 2009 in Area 6-005

CBU 681 UTM 36S 0734957 – 688412, which is situated near the village of Yohmor.

The BOI is an impartial investigation conducted by the RMAC on behalf of the Lebanon Mine Action Center (LMAC) 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 1st July 2009 at [International demining organisation] BAC Task CBU-681, a detonation of a US M series submunition occurred while [the Victim] an [International demining organisation] Searcher ID No. LS 444 was conducting subsurface search and excavating the signals. [The Victim] sustained injuries in his left arm, little finger.

Based on all available evidence, the BOI team concludes that the immediate response to the accident by the team leader and the treatment by the medic enabled an effective casevac and subsequent medevac from the task to Najdeh hospital in Nabatiyeh. Supervised by both the TFM and Site Supervisor.

There is no conclusive evidence to suggest that incorrect procedures contributed to the accident and it is therefore concluded that [the Victim] was working in accordance with

[International demining organisation] Lebanon SOP BAC 09.11 and National Technical Standards and Guidelines (NTSG) at that time.

The RMAC BOI investigation team consider that it is conclusive that the accident was unpreventable.

3. Location of Accident / Incident

Task No / Team No: Area 6-005, CBU 68: MAT 3
Yohmor Village, Nabatiyeh District, South Lebanon
Grid Ref / UTM: 734897-3688249 (Accident Site)
Map Ref: LAF Youhmo: version: 2009.

4. Date and Time of Accident / Incident: 1st July 2009, 0719hrs (local time).

5. Reported By: [International demining organisation], [Name removed], Security Coordinator.

6. Reported To: RMAC, [Name removed], Radio Operator.

7. Person(s) Involved: [the Victim], [International demining organisation] Searcher MAT 3, ID Number; LS 444.

8. Vehicle(s) or Machine(s) Involved: none.

9. Investigation Team: [Name removed], RMAC QA Officer; [Name removed], RMAC QA Officer.

10. Location of Investigation: Area 6-005, Yohmor Village, Nabatiyeh District, South Lebanon. Grid Ref / UTM: 734897-3688249 (Accident Site); Map Ref: LAF Youhmo: version: 2009

11. Date and Time of Investigation: 1st July 2009, 0900hrs (local time)

12. Execution of Investigation

Approach to Site

The accident site is located at IMSMA Task number CBU 681 which is approximately 6 Km North of Nabatiyeh. The RMAC investigation team drove to the accident site from the RMAC Base. The task is situated in the middle of Yohmor village. The CP is in a house inside Yohmor village and away approximately 300m from the site. The RMAC BOI personnel arrived to the CP; they were briefed by the supervisor, and then moved to the accident site.

13. Evidence

13.1 Ground

Accident Site

The ground is rocky and covered with vegetation, the area consist olive terraces from the road to the accident site. The accident place is 64m away from the road. It was marked with red topped wooden sticks; these were replaced after the accident. Red/white mine tape had been attached to these pickets; marking is in accordance with [International demining organisation] SOP 08.40.



[The accident site.]

Crater: There is evidence of a crater around 35cm across and 10cm deep, and explosive residue caused by an explosive device.

Vegetation: The majority of grass and bushes have been cut within the cleared area. According to the [International demining organisation] Team Leader this had been conducted by [International demining organisation] during the clearance procedure. There are piles of recently cut vegetation within the cleared area.

13.2 Vehicle(s) and Equipment

Ambulance: One ambulance and medic were located at CBU-681 CP at the time of the accident.

Detector: Minelab F1 A4 Detectors had been used to assist with the subsurface BAC procedure. The detector had no direct connection with the accident.

Demining Tools: Vegetation cutting / removal tools (shears), prodder and small shovel had been used during the subsurface BAC process. The prodder had a direct connection with the accident.



Personal Protective Equipment (PPE): According to information gained during the interview process, [the Victim] had been wearing his PPE (helmet / visor and body armour) prior to the accident.

Ballistic Helmet / Visor: There is one partial penetration to the light-weight demining visor which can be attributed to the effects of an explosion and there's some minor scratches on the visor lens caused from dust and small rocks due to the explosion.



Ballistic Body Armour: The body armour is a one-piece 'jacket style' design and provides protection for the vital organs (chest region) and a flap to protection the groin region. There is one evidence of damage from the effects of an explosion. [Picture showing the lightly damaged cover of the body armour removed.]

13.3 Explosive Ordnance: The IMSMA Dangerous Area report for CBU-681 details that in Sep 2006 the LAF disposed of 211 submunitions in-situ. [International demining organisation] has located 147 US M77 and 6 US M42 (dual purpose anti-armour / anti-personnel) submunitions at CBU-681 to date. See Annex D –IMSMA DA Report. [Annexes not made available.]

13.4 Casualty(s) (position, clothing)

Casualty's Position: According to witness statements [the Victim] was on his knees when the detonation occurred. The injuries sustained are consistent with all witness statements.

Casualty's Clothing: Damage to the left hand glove.



13.5 Interviews:

The following [International demining organisation] personnel were interviewed in this sequence by the RMAC BOI team on 1st July 2009 at CBU-681. See Annex B – Witness Statements [not made available].

[Name removed], Site supervisor

[Name removed], Medic MAT 3, LS 455

[Name removed], Driver, LS 485

[Name removed], Searcher, LS 444

14. Casualty Information

The following information regarding [the Victim]'s injuries was obtained by the BOI team during the interview process at the accident site: Medic's diagnosis at accident site 1st July 2009: Left arm. Broken finger in third bottom section of left phalanx in left hand.

The following information regarding [the Victim]'s injuries was obtained from the medical report by Dr. [Name removed] submitted by [International demining organisation] on 1st July 2009. (See Annex I - medical report [not made available]).

15. Incident Details (Circumstances / Sequence of Events)

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

On 1st July 2009 at 719hrs, [the Victim], a [International demining organisation] BAC Searcher was involved in a BAC Accident at [International demining organisation] Task CBU 681 which resulted in injuries to his left hand small finger. The accident was reported by the [International demining organisation] headquarters in Nabatiyeh to the RMAC Operations in Nabatiyeh by Radio/Telephone/fax.

At 0700 hrs, RMAC Operations in Nabatiyeh received a radio call from [International demining organisation] Operations, informing them that operations had commenced operations at CBU-681.

[The Victim] BAC Searcher was conducting subsurface search. After marking the signals he started to excavate; at 7:19 ,while he was using the prodder for excavation a detonation occurred.

The team leader stopped all work immediately and controlled the medical evacuation of [the Victim]. All [International demining organisation] teams stopped operation.

Immediately after the accident, [Name removed] (RMAC QA Officer) was informed about the accident at CBU 681 by the RMAC Chief of Operations. At 0900hrs [Name removed] arrived at CBU681.

Chronology of Events (According to witness statements and RMAC radio log)

1st July 2009

0700 MAT 3 commenced operations at CBU 681.

0719 Accident occurred.

0735 Ambulance departed CBU 681 with [the Victim] to Najdeh hospital in Nabatiyeh.

0746 Ambulance arrived at Najdeh hospital.

0900 [Name removed] (RMAC QA Officer) and [Name removed] (QA officer) arrived at CBU 681.

1031 BOI investigation team left CBU 681 to [International demining organisation] base Nabatiyeh.

1049 BOI investigation team arrived at [International demining organisation] base to see the casualty after he finished from the hospital.

1120 [the BOI investigators] departed from [International demining organisation] base to RMAC Nabatiyeh.

15.1 Medical Assistance and Evacuation (procedure, treatment, equip.)

On 1st July 2009, there was one medic [Name removed] at task CBU-681 who was positioned with the ambulance and driver at the control point during clearance operations.

After hearing the explosion the medic immediately called the team leader by radio in order to ascertain what had occurred and after being requested to do so, went with the ambulance to the designated medical point.

The initial casualty report was completed on site.

The team leader reported the accident to the [International demining organisation] HQ immediately after the accident had occurred.

According to statements from [International demining organisation] personnel, from the time of the accident to the evacuation of the casualty from the task took 16 minutes and the ambulance arrived at Najdeh hospital 11 minutes later. Therefore, a total time of 27 minutes had elapsed from the time of the accident to the casualty's arrival at hospital.

15.2 Geography and Climate

Task CBU 681 is located in a mountainous region in the village of Yohmor and 10 km South of Nabatiyeh. The task is within housing comprising rocky and sparse vegetation and there is evidence of cultivation (harvesting, vegetation removal and irrigation) by the local population on the olive groves. The immediate area of the accident is on a olive terraces, comprising rocky earth and vegetation. At the time of the accident the weather was sunny and the visibility was clear.

15.3 Demining Procedures

The team was conducting subsurface operations using sub surface BAC procedures. Minelab F1 A4 detectors had been used at the task. The vegetation in the cleared area was comprised of bushes and grass had been cut by [International demining organisation] during clearance.

Based on the evidence gathered during the investigation and the results of an external QA inspection performed by a RMAC QA Officer previously, subsurface BAC procedures were being conducted in accordance to the [International demining organisation] SOP and the NTSG for Lebanon.

15.4 Demining Equipment: IAW [International demining organisation] SOPs and NTSGs

15.5 Communications

VHF radios are used to communicate within the task. On 1st July 2009 there were hand-held radios at the task and a vehicle set in the ambulance. In addition the team leader and TFM had mobile phones: however, these were not required as there was full radio network coverage.

15.6 Site Layout and Marking

The control point was clearly marked; the accident place was marked with red topped wooden sticks; these were replaced after the accident. Red/white mine tape had been attached to these pickets; marking is in accordance with [International demining organisation] SOP 08.40.

15.7 Command and Control: The [International demining organisation] team composition was in accordance to their SOP, both internal and external QA reports indicate good command & control at all levels.

15.8 Quality Assurance and Quality Control

External QA: Between the period 15th January 2009 and 1st July 2009, a total of 13 external RMAC QA inspections were conducted at CBU-681. The overall conclusion of the reports was Acceptable.

16 Details of Non Compliance to Agency SOP / NTSG / IMAS: The Demining operations (surface & sub surface BAC) at CBU-681 are in compliance to the [International demining organisation] SOP, NTSG and IMAS.

17 Task Status: Current. Start Date (14/08/ 2008)

18 Background Information

CBU 681 is one of a number of CBU tasks within task dossier 6-005 issued to [International demining organisation] by the MACC SL in 2008 and then reissued by RMAC in 2009. In the last three days of the war in 2006, submunitions were dispensed into the area by Israeli rockets. The Dangerous Area report details that the LAF destroyed 211 submunitions in the area (See Annex D – IMSMA DA Report). MAT 16 and MAT 3 was tasked by [International demining organisation] to conduct surface and subsurface clearance at CBU-681 using surface BAC procedures.

19 Conclusions

- a. A detonation of a US submunition (M Series) dual purpose occurred while [the Victim] was doing subsurface search and excavating the signal after 19 min from the beginning of operations.
- b. The submunition was partially exploded and the remains of the shape charge was one meter away from the place of detonation.
- c. From the injuries of [the Victim] and his statement, and from the evidence on the PPE, [the Victim] was kneeling on the ground while the tool hit the mechanism of the submunition.
- d. The evidence from interviews conducted during the investigation indicate that [the Victim] was wearing full PPE (helmet / visor and body armour) at the time of the accident and there is no evidence to contradict this or that he was not wearing it correctly. The nature of his injuries and condition of the PPE shows that he was wearing full PPE.
- e. It is of the BOI team's opinion that the command and control during the clearance operations at CBU-681 was according to the [International demining organisation] SOP and NTSG.
- f. From information gathered during the interview process it can be concluded that communications from the task to the [International demining organisation] HQ was reliable at that time.
- g. The task was marked in accordance with [International demining organisation] Standard Operating Procedures (SOP) 09.11.45 and in compliance to the NTSG Chapter 03 Mine Clearance and Battle Area Clearance Marking Systems.
- h. Based on all available evidence, the BOI team concludes that the immediate response to the accident by the team leader and the treatment by the medic enabled an effective casevac and subsequent medevac from the task to Najdeh hospital in Nabatiyeh.
- i. During the course of the investigation the RMAC BOI team received full cooperation from [International demining organisation].

- j. The accident is considered to be conclusive as unpreventable.

20 Further Actions and Recommendations

- a. [International demining organisation] temporarily suspended all BAC operations and conducted two days refresher training before resuming operations on CBU-681. (Done the day right after the accident and the day after).
- b. In case of facing hard ground, SS/TL to make sure that the searchers are using water to facilitate their excavation.

Report Written By: [Name removed] and [Name removed], RMAC QA Officers, LAF RMAC

1. Comments by the RMAC Chief of QA, [Name removed], RMAC Chief QA, LAF
2. Comments by RMAC Chief of OPS, [Name removed], RMAC Chief OPS, LAF
3. Comments by the RMAC Program Manager, [Name removed], RMAC Program Manager, LAF.

Victim Report

Victim number: 1042	Name: [Name removed]
Age:	Gender: Male
Status: deminer	Fit for work: presumed
Compensation: Not made available	Time to hospital: 27 minutes
Protection issued: Vest	Protection used: Vest, Long visor
Long visor	

Summary of injuries: severe Finger

COMMENT: No medical report was made available. The Victim was in hospital less than three hours so it is presumed that the injuries were not extensive.

Analysis

The primary and secondary causes of this accident are listed as 'Unavoidable' because the investigators found nothing wrong with the procedures being used at the time. There was evidence that the PPE was being used correctly. The fact that the submunition detonated implies that the excavation may have been conducted without due caution, but there is no direct evidence of that. The light injuries that resulted imply that the unidentified submunition may have been deeply concealed with most of the fragments and the shaped charge directed away from the Victim, but may have been because the Victim was lucky and the munition did not detonate fully. The submunition involved was reported to have been 'partly exploded' with its 'remains' a meter away from the accident site. No photographs of this (which may have led to a positive ID of the munition involved) were included in the report.

There is a common misconception that the expensive helmet and visor that was used offers 'ballistic' protection. The helmet to which the visor was attached is not 'ballistic' and is not designed to offer any significant protection in the event of an explosive accident. The 5mm polycarbonate visor is intended to offer significant protection against blast and some protection against fragmentation. The helmet merely holds the visor in place.

The inadequate equipment referenced in the Notes refers to the prodder, which appears to have been a wooden handled mild-steel screwdriver. These are not designed to be blast resistant or to serve as PPE (as recommended in the IMAS). They are also not a suitable tool to allow efficient and safe excavation of hazards. However, they had presumably been detailed in the organisation's SOPs which the MAC had approved for use at the time.