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DDAS Accident Report

Accident details

Report date: 19/05/2006	Accident number: 379
Accident time: 14:00	Accident Date: 13/06/2002
Where it occurred: M/F 505, Bal'awin, Bayt Yahun	Country: Lebanon
Primary cause: Inadequate training (?)	Secondary cause: Management/control inadequacy (?)
Class: Demolition accident	Date of main report: 17/07/2002
ID original source: BOI:No004/2002	Name of source: MACC SL
Organisation: Name removed	
Mine/device: No.4 Israel AP blast / frag	Ground condition: bushes/scrub grass/grazing area rocks/stones
Date record created: 22/02/2004	Date last modified: 23/03/2004
No of victims: 1	No of documents: 1

Map details

Longitude:	Latitude:
Alt. coord. system:	Coordinates fixed by:
Map east:	Map north:
Map scale: M/F 505	Map series:
Map edition:	Map sheet:
Map name:	

Accident Notes

inadequate investigation (?)
mine/device found in "cleared" area (?)
incomplete detonation (?)
inadequate training (?)

Accident report

A summarised MACC BOI report was made available in 2003. It is reproduced below, edited for anonymity. The commercial demining company involved was asked to supply the internal report referenced in this document in March 2003.

Introduction

1. At the time of the accident a Manual Clearance Team were operational on M/F 505 clearance site, at Bal'awin, Bayt Yahun. The Manual Clearance Team had been operational on M/F 505 since the 24th May 2002. A total of 1 x breaching lane (base lane), 2 x exploration lanes and the main clearance lanes had been cut into M/F 505 during the previous 17 x days clearance activities, resulting in the location of the minefield mine rows, as per the M/F records.
2. Prior to the accident all demining operations had actually ceased and the Team were in the process of destroying the days located mines and UXO (63 x Israeli No.4 Anti-Personnel mines, 2 x 60mm Mortar Bomb and 1 x 52mm Mortar Bomb). The Team Leader had prepared the explosive charges using approximately 2oz of Gelatine Explosives for each mine, all linked with a detonating cord "Main Line"; the Gelatine Explosive being directly compressed on to the Detonating Cord with no "Branch Lines" being used. For the first demolition serial, a total number of 32 Israeli No.4 Anti-Personnel mines were prepared.
3. At approximately 13:43 hours, the signal "Fire in the Hole" was passed from the Team to [commercial demining group] base location and the demolition serial was conducted. Following a short time period, to allow the debris to stop falling and the smoke to dissipate the Team Leader moved forward alone to check for complete detonation of the serial, systematically checking each crater in turn.
4. At approximately 14:00, hrs an uncontrolled detonation in a previously cleared area occurred, whilst the Team Leader was checking the area. Initially the Team Leader thought that the uncontrolled detonation was a rifle shot, as local hunters had been operating the general area. He then felt a pain in his buttocks and on investigation found that his buttocks were bleeding. He then made his way out of the minefield to the Command Post where his injuries were treated by Team Medic.

Medical details

5. The Team Leader suffered bruising and minor abrasions to both buttocks. Treatment was conducted on-site and at [commercial demining group] base location. The Team Leader was also taken to Bint Jubayl hospital for an Anti-Tetanus injection.

Conclusions

6. Based on the investigation, the statements and visits to the site, the BOI concludes the following:
 - There was a surface uncontrolled detonation of an Israeli No.4 Anti Personnel mine Igniter, the Igniter detonated after the Team Leader inadvertently stood on it.
 - Prior to the uncontrolled detonation of the Israeli No.4 Anti Personnel mine Igniter, during the demolition serial there was a partial detonation of the Israeli No.4 Anti Personnel mine. Evidence shows that the crater was relatively shallow, no lifting had formed around the edges and a large quantity of the mine body and mine explosives were recovered by the BOI.
 - The reasons for the partial detonation are:
 - The Gelatine explosive (Nitro-Glycerine based) has a high "Brisance" (Shattering effect), this being ideal for quarrying applications but not ideal when the transfer of the detonation wave from a donor charge to a mine / UXO is required.
 - Using a single piece of detonating cord to try and ensure that the detonating wave is transferred to any donor charge is insufficient; it simply lacks the secondary high explosive concentrated enhancement, that is required to ensure the wave transfer.

- The 2 oz Gelatine donor explosive charge used is insufficient to ensure that the detonating wave is transferred to an explosive charge in a mine (the detonating pressure of Gelatine is less than half of PE4).
- The bruising and abrasions to the Team Leader's buttocks was due to both primary and secondary fragmentation resulting from the part disintegration of the Israeli No.4 mine Igniter, on the detonation of the primary high explosive fill.
- The post-accident marking of the accident site was carried out in accordance with current SOPs.
- The passage of information in between the accident site, [commercial demining group] base location and the MACC SL was very good, with all relevant information being passed in a timely manner.
- The BOI agrees and accepts [commercial demining group] Accident and IMSMA Reports.
- The number of mines cleared by Team No 4 to date by far exceeds the number of mines as reported on the IF record and MACC SL Minefield Report. M/F 505 may not actually be the correct designation of this minefield.

Recommendations

7. The following are recommendations based on the BOI conclusions:

- When using detonating cord as an intermediary charge and prior to it being placed in the main explosive charge, 300mm should be folded back and a double knot be tied at the end. This concentration of PETN will ensure that the detonating wave is transferred to the main explosive charge. The main explosive charge should be broken down into 1/3 and 2/3 segments, the knotted detonating cord should then be placed into the 2/3 segment and then the 1/3 segment compressed on top. In order to ensure that the majority of the detonating wave is directed towards the mine, the 2/3 segment should be placed as close to the mine (see overleaf). If TNT blocks are being used then a minimum of 4 x detonating cord turns around the block should be used in order to ensure the transfer of the detonating wave.
- [Crude computer sketch deleted.]
- "Branch Lines" should be used, when conducting demolitions using either the "Main Line" or "Ring Main" detonating cord principles.
- Main Line junctions should be made with a clove hitch, detonator clip or 100mm intimate tape contact.
- [Crude computer sketch deleted.]
- Note that the same principle is applied to "Ring Mains", whether they be outer or inner "Ring Mains".
- During the post-demolition serial check, Team Leaders are to check each and every seat of detonation systematically at a safe distance, should doubt exist that there has not been a complete detonation then the immediate area should be systematically cleared using normal manual clearance drills.
- Amendments be made to [commercial demining group] SOPs to include the above 3 x recommendations.
- No further issues of the Gelatine explosives be made, until further notice.
- No amendments are necessary to the National TSG's for Mine/UXO Clearance.
- The conclusions detailed in this report be distributed and discussed among all [commercial demining group] Operational Field Staff.
- MACC SL to investigate the correct M/F designator.

Victim Report

Victim number: 496	Name: Name removed
Age:	Gender: Male
Status: supervisory	Fit for work: yes
Compensation: Not made available (insured HMT)	Time to hospital: not recorded
Protection issued: Not recorded	Protection used: not recorded

Summary of injuries:

INJURIES

minor Legs

COMMENT

No medical report was made available.

Analysis

The primary cause of this accident is listed as "Inadequate training" because the Victim prepared a demolition in a manner that was unlikely to be successful. The Victim was a Team Leader and seems to have been inadequately prepared for his tasks, so the secondary cause is listed as a "Management/control inadequacy".

The accident report is noted as "inadequate" because the "summarised" report does not include sufficient detail in critical areas. It is possible that the full report would correct these failings. The summarised report does not record the time taken for the Victim to receive hospital treatment or what PPE was being worn. The report does not specify the fuze type found on other mines in the area, so identifying which type of No.4 fuze was likely to have been involved in the accident. Further, the report does not include the demining group's internal report or witness statements which can help when wanting to later assess and confirm the chain of events.