

DDAS Accident Report

Accident details

Report date: 25/05/2008	Accident number: 572
Accident time: 10:23	Accident Date: 12/09/2007
Where it occurred: CBU 1038, Near Sidiqin village, Sur District	Country: Lebanon
Primary cause: Field control inadequacy (?)	Secondary cause: Field control inadequacy (?)
Class: Vegetation removal accident	Date of main report: 24/09/2007
ID original source: DS	Name of source: [Name removed]
Organisation: [Name removed]	
Mine/device: DPICM M42 submunition	Ground condition: agricultural (abandoned) bushes/scrub hard rocks/stones
Date record created:	Date last modified: 25/05/2008
No of victims: 1	No of documents: 1

Map details

Longitude:	Latitude:
Alt. coord. system: Not recorded	Coordinates fixed by:
Map east:	Map north:
Map scale:	Map series:
Map edition:	Map sheet:
Map name:	

Accident Notes

inadequate area marking (?)
inadequate communications (?)
metal-detector not used (?)
no independent investigation available (?)

Accident report

The report of this accident was made available in April 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.

Introduction

1. An accident occurred at CBU 1038 which is located approximately one kilometre to the west of As Sidiqin a village in Sur District at 1023hrs on Wednesday 12th September 2007.
2. One person, [the victim]; aged twenty-seven was injured in the accident whilst conducting an intrusive visual surface search within allocated and marked boundaries as part of a Battle Area Clearance operation. After the accident he was transported to the Jabel Amel Hospital in Tyre where he was admitted and treated before being discharged after twenty – eight hours.
3. The [Demining group] Operations Manager assisted the UNMACC – SL, Board of Inquiry to complete the external accident investigation and concurrently conducted the Internal Accident Investigation.

Sequence, Documentation and Procedures of Tasking

4. The task was selected for clearance as part of the UNMACC – SL task dossier, 7-009. CBU 1038 was opened on the Friday the 7th September 2007; the team spent this day, Monday 10th & Tuesday 11th September 2007 on site setup and did not start actual clearance until Wednesday 12th September 2007 at 0900hrs.
5. Work on the site is regulated by the UNMACC – SL Clearance Plan (Annex A) issued as part of the task dossier, [Demining group] SOPs & NTSGs.
6. On Thursday the 6th September 2007 a local informant reported seeing sub-munitions in the area of CBU 1038 he had seen them whilst passing through the area. As Team 2 had completed clearance of 286 the team was redeployed to start work on this CBU as the sub-munitions are preventing workers carrying out agricultural activities in the area.

Geography

7. The accident occurred near to the village of As Sidiqin in Sur District; some 23 kilometres east of Tyre and 56 kilometres south of Nabatieh.
8. The general area of the accident site is at the bottom of a re-entrant which opens out into a wide valley to the west and North West. The floor of the re-entrant and valley is planted with Olive groves with the valley sides being densely vegetated with grass and bushes, in addition there are many rocks and boulders intermingled with the vegetation.
9. The soil in the area is red clay containing numerous stones.
10. An un-surfaced track dissects the area giving adequate access to 4x4 vehicles.
11. The weather conditions on the day of the accident were dry, sunny and humid; with little or no wind. These conditions had prevailed throughout the previous months.



Priority of Task

12. The sub-munitions at CBU 1038 are remnants of the war fought last year between July – August 2006. There are no hazard warning signs or other fencing around this site; the surrounding land is mainly planted with Olive and Fig trees which have not been tended or harvested since the end of the war as the local population are aware of the presence of sub-munitions and other items of UXO in the area.

13. The purpose of the clearance is to allow the owners of the trees safe access to the plants to tend and gather the harvest. This area is prioritised as “medium”.

Site Layout and Marking

14. The CBU is located in a re-entrant that is bounded to the north and south by low hills and which opens out in to a larger valley to the west and to the east the re-entrant fades out at the outskirts of Sidiqin. There is no perimeter marking or other hazard warning signs to identify the area as a CBU.

15. The [Demining group] marking system was in place at the time of the investigation this included the box perimeter tape and the ropes used to delineate the individual search lanes. As the site was in the process of being setup and access lanes were in the process of being searched through the area only one box was marked. See sketch map attached at Annex B.[Annex not made available.]

16. The marking in the search lane where the accident occurred was present although the rope to the left of the search lane had been moved during the course of the accident and subsequent casualty extraction. This included the blue start of work picket.

17. All other marking was in place with the exception of some of the identification signs for various locations on the site namely Rest Area & Parking Area, this is a problem that the management were aware of and had ordered replacement signs.



[Accident site showing inadequate marking which may have been moved after the event.]

Supervision and Discipline on Site

18. The total strength of the team is 11 personnel; however on the day of the accident there was one man sick (on site) one man attached with the Operations Manager marking and mapping CBU 286. This left a total of 9 team members on site including a Site Supervisor and a Deputy Site Supervisor (both of whom are UNMACC accredited as Site Supervisors) the medic and the ambulance driver.

19. The [Demining group] management team visit all sites daily this may be one of the two Technical advisors or the Operations Manager. At the time of the accident an international Technical Advisor was on site and prior to this the Operations Manager had visited the site.

20. The last time that the searcher had been visited by a supervisor was approximately four minutes before the accident occurred.

Quality Assurance

21. The management, supervision and Quality Assurance of the work at the task site is the responsibility of the Site Supervisor the Site Supervisor is expected to conduct a minimum of 10% QA of the total area of the land cleared that day which is recorded in the Task Folder.

22. In addition to the above mentioned checks the Site Supervisor and Deputy Site Supervisor constantly patrol the task site visiting all team members; this would normally be at least four visits per shift. During these visits the Supervisors will check the drills being carried out by the searchers the use of equipment and tools and they would also issue instructions as to the direction and speed of the search. These procedures as described above are relevant to an intrusive visual search that was being carried out on the day of the accident.

23. The last reported visit to the searcher involved in the accident was conducted by the Deputy Site Supervisor and took place approximately four minutes before the accident occurred. The Deputy Site Supervisor reports that there were no variations to the taught drills and that the searcher work was proceeding normally.

24. In addition to the [Demining group] internal QA checks the UNMACC – SL carryout regular visits by the Operations and Quality Assurance cells. The last external QA visit to the site took place on Monday 10th September 2007 and all was acceptable. See attached External QA report at Annex C. [Annex not provided.]

Communications

25. The on site communications network is based on VHF vehicle and handheld radio sets; in addition there is a mobile phone that is kept by the team medics for external contacts.
26. Regular communication checks are made in and between the teams throughout the day, normally at the start of each work shift. In addition checks are routinely made with [Demining group] Nabatieh.
27. The teams report to the [Demining group] HQ in Nabatieh to inform them when they start work on the sites and when they finish work at the end of the day.
28. On the day of the accident all radio and mobile telephone communications went well between teams and HQ in Nabatieh.

Medical and Emergency Support

29. All [Demining group] BAC teams deploy with an appropriately equipped Ambulance (with dedicated driver), and a qualified medic as part of the team, equipped with a comprehensive trauma kit. In addition the each searcher undergoes 20hrs of medical training as part of the BAC training course. The medical and emergency support provided to the team involved in the accident was satisfactory.
30. Due the terrain a 4 x 4 pickup was situated in the rest area so that in the event of an accident the vehicle could reverse down the dirt track and collect the casualty and transport him to the top of the hill and rendezvous with the ambulance and medic at the designated pickup point.
31. On Monday 10th September the team ambulance, driver and medic carried out a route reconnaissance from the site to the Jabel Amel hospital in Tyre.
32. On the morning of the accident the team was engaged in the site setup and did not start search operations until 0900hrs. The Site and Deputy Supervisor report that they were preparing to conduct a casualty evacuation exercise when the accident occurred.
33. Immediate Response: All team members report that the casualty extraction and evacuation went well and in accordance with the [Demining group] SOPs and rehearsals which had been carried out prior to entering the work site. This is also supported by a Technical Advisor and Operations Manager who witnessed the whole or part of the evacuation.
34. The first team members to arrive on the accident site were [Name removed 1] and [Name removed 2] immediately followed by [Name removed 3] the Deputy Site Supervisor [Name removed]. On arrival the casualty was standing unassisted approximately two metres away from the point of the detonation. At this stage searcher [Name removed 1] approached the casualty and told him to sit down, which he did. The Deputy Site Supervisor instructed searcher [Name removed 3] to collect the spine board and the Supervisor had tasked searcher [Name removed 4] to collect the 4 x 4 vehicle from the rest area; under the supervision of the Site Supervisor searcher [Name removed 1 and 2] removed the casualties vest and dressed the wounds to his arms and legs. This complete the casualty was moved on the spine board to the 4 x 4 vehicle which then transported the casualty to the pickup point at the top of the ridge.
35. The team medic [Name removed] was waiting for the casualty at the pickup point and prepared to dress the casualty's wounds, however, as the injuries were relatively minor and with the blood flow appearing to be under control the casualty was placed in the ambulance

along with two searchers with the same blood group and immediately departed for the hospital.

36. The Ambulance driven by [Name removed] left the site for the Jabel Amel hospital in Tyre at 1030hrs and arrived at 1050hrs.

37. As a result of the detonation of a sub-munition, [the Victim] sustained fragmentation wounds to the arms, legs and one small fragment to the neck see attached medical report Annex D. [Annex not made available.]

Personalities Involved

38. Site Supervisor	[Name removed]
Deputy Site Supervisor	[Name removed]
Searcher 1	[Name removed]
Searcher 2	[Name removed]
Searcher 3	[Name removed]
Searcher 4	[Name removed]
Searcher 5	[Name removed]
Searcher 6	[Name removed]
Medic	[Name removed]
Driver	[Name removed]

39. All team members have been trained by the [Demining group] and have passed accreditation by the UNMACC – SL for their relevant positions within the team; the last refresher training was held on the 27th August 2007. See Annex E, the qualification page from the training record book of the injured searcher.

Personal Protective Equipment and Tools

40. The PPE issued to the searchers by the [Demining group] in Lebanon is manufactured by ROFI of Norway (www.rofi.com). This PPE conforms to UN Mine Action Standards Paragraph 4 - 10.30.

41. Visor. The visor worn by [the Victim] was struck four times by fragmentation as a result of the explosion. One of the fragments passed through the visor leaving a hole of approximately 2mm in circumference (it is thought that the fragment went through the visor and caused the wound on [the Victim's] neck). Photographs of the Visor are attached at Annex F. [Annexes not made available: photograph sourced separately.]



[The picture above shows the small hole in the lower part of the blast visor. The visor is not designed to protect against fragmentation, only blast.]

42. **Vest.** The vest escaped relatively unscathed; there is minor fragmentation damage to the left shoulder, the right lap pad and three on the inside of the lower collar which suggests that [the Victim] must have been bent over very low at the time of the explosion. Photographs attached at Annex G. [Annexes were not made available.]

43. **Shears.** The shears are purchased locally for use in the cutting of visually or instrument assisted visually searched vegetation on the sites. The shears are damaged on the tips of the two blades, and were in close proximity to the explosion. [The Victim] stated that he was using the shears at the time of the accident. Photographs attached at Annex H. [Annexes were not made available.]



[Photograph sourced elsewhere. The short-bladed shears are not purchased locally but are part of a tool-kit sourced from Zimbabwe.]

44. **Saw.** The saw is purchased locally and is used for cutting bushes or trees that have been previously searched within the search lane. The saw shows no sign of damage that may have been caused by the explosion, although it had been in use earlier in the work shift. Photographs attached at Annex H. [Annexes were not made available.]

45. **Detectors.** Although this team is issued with; four Ebinger 421 GC and four Schondstat 72cd; it is worth noting that there was no detector found in the vicinity of the accident lane. When asked why? the Site Supervisor informed me that the searcher was not

using one due to the vegetation being encountered, which was sparse grass with high thorny bushes. See photograph [of site earlier in this report].

Details of Sub-munitions Involved

46. During the investigation of the crater several pieces of fragmented metal were recovered, although it is not possible to determine the exact sub-munition involved it is believed that it was an M42. This assumption is based on the fact that there have been four M42s removed from the area in the past.

47. The M42 is a DP grenade or bomblet designed as a ground burst sub-munition containing 31 grams of explosive; with both the shaped charge and high fragmentation effects.



M42

48. Analysis of the crater suggests that the item was either partially or fully on the surface of the ground as with the majority of the items that have been found in the area. The crater clearly showed the path of the cone / shaped charge from the site of the detonation.



Photograph of Crater



Fragments Recovered from the Crater

Detailed Account of Activities on the day of the Accident

49. The searchers reported for work by 0640 (on site) as there were still a number of jobs to complete regarding the setup of the site all team members were employed with these tasks until 0900 when a break was called. The men were stood down for ten minutes until 0910 at which time they started clearance operations on the site; all searchers were conducting an intrusive visual search through dense vegetation.

50. At 0950 the second break was called the team rested until 1000, at which time they continued clearance; at this time an international Technical Advisor arrived on site.

51. At 1023 an unplanned explosion was heard (see Annex B for locations of personnel).

52. On hearing the explosion searcher [Name removed 1] approached the scene of the accident closely followed by searchers [Two names removed] and supervisors [Two names removed]. At this stage [the Victim] was on his feet approximately two metres from the accident site. [Name removed 1] told him to sit down which he did and under the supervision of [Name removed] his vest was removed and his wounds dressed.

Concurrently searcher [Name removed] was instructed to collect the spine board and [Name removed] to collect the 4x4 vehicle at the rest area.

53. The Technical Advisor on site was [Name removed], whilst the national staff dealt with the extraction of the casualty he coordinated communications with relevant parties such as Operations Manager and [Demining group] office Nabatieh.

54. All personnel assisted with placing [the Victim] onto the stretcher and to carry him to and load him on to the 4x4. The vehicle proceeded up the hill toward the pickup point where the ambulance with medic and driver were waiting. As the vehicle reached the rest area the Operations Manager and [Demining group] Community Liaison Officer (CLO) met the 4x4 on the way up the hill.

55. On arriving at the pickup point the Site Supervisor organised two personnel with the same blood group to accompany the casualty to the hospital and checked the other team members for injuries. The medic assessed [the Victim's] condition and deemed it acceptable for the casualty to be moved immediately to the hospital as the bleeding seemed to be under control with the dressings that had been applied by the searchers during the initial treatment at the accident site.

56. The Ambulance departed for the hospital in Tyre with the 4x4 pickup as an escort.

57. After the Ambulance had left the Site Supervisor closed the accident lane and work site in preparation for the arrival of the UNMACC - SL accident investigation team.

58. At approximately 1035 [Name removed] called the operations officer to inform the team that he would be arriving as soon as possible to conduct an investigation.
59. At approximately 1050 [Name removed] the UNMACC – SL Operations Manager for area 7 arrived on site with Lieutenant [Name removed] (LAF Officer attached to the UNMACC - SL) of the Lebanon Mine Action Centre.
60. At 1050 the CLO received a call to say that the casualty had arrived at hospital.
61. At approximately 1110 [Name removed], Chief Quality Assurance Officer arrived on site.
62. With the investigation complete all personnel were instructed to move back to Nabatieh at 1300.

Summary

63. [The Victim] was working as part of BAC Team 2, conducting an intrusive surface visual search through dense vegetation all team members were aware that four M42 sub-munitions had previously been removed from the site. In particular the Technical advisor had spent some time with [the Victim] as there was a small pile of stones on top of a large rock close to the scene of the accident and the Technical Advisor had explained to the searcher that this would probably indicate the presence of a sub-munition. [The Victim] had been visited by the Deputy Site Supervisor shortly before the accident who states that [the Victim] was adhering to drills and procedures. So during the course of the morning [the Victim] had received regular visits from the managerial staff both national and international.

Conclusions

64. The site layout and marking were good and in accordance with SOPs.
65. The command and control on site was good, with the team members receiving numerous visits from national and international staff throughout the course of the morning.
66. Although the searcher that was injured during this accident appeared to be conducting the drills and procedures correctly when visited by managerial staff it is obvious that he did not thoroughly search the last clump of grass that he cut. If he had either visually or with a detector, searched the ground properly the item would have been located.
67. The searcher did not have a locator with him in the lane at the time of the accident, although adequate amounts are available to the team, either Ebinger 421GC or Shondstats 72cd.

Recommendations

68. All members of the [Demining group] BAC operation will undergo eight hours of refresher training before returning to operations.
69. All searchers will deploy with and utilise a locator in their lanes, if [the Victim] had been using a locator he would have been forewarned of the presence of a metal signal and extra care could have been taken whilst visually searching and cutting the vegetation.

Signed: Operations Manager, Programme Manager, [Demining group] Lebanon.

Victim Report

Victim number: 748	Name: [Name removed]
Age: 27	Gender: Male
Status: deminer	Fit for work: presumed
Compensation: Not made available	Time to hospital: 27 minutes
Protection issued: Frontal apron Long visor	Protection used: Frontal apron, Long visor

Summary of injuries:

minor Neck

severe Arms

severe Hand

severe Legs

COMMENT: See Medical report.

Medical report

Jabel Amel Hospital, Date: 18.06.2007

Medical Report translation

[The Victim] was brought in an emergency case on 12.09.07 due to his injuries by fragments with deep wounds in his right palm and rupture of his finger nerve, and fragments in his right forearm, with wounds and fragments in his left forearm, as well as in his right thigh and leg, and deep wounds in his left and right legs. He needs to take treatment and rest for four weeks.

Signed Dr [Name removed]

[The neck injury is presumed to be minor because the doctor does not mention it.]

Analysis

This record will be updated if an independent MAC accident report is made available later.

The primary and secondary causes of this accident are listed as "*Field Control inadequacy*" because, despite the Victim having been visited by a supervisor only four minutes prior to the accident, he was working without a metal detector and this error was not corrected.

From the photographs made available, it is obvious that site marking was not present. If it was moved after the accident, that would have been another field-control failing. It would be stupid to move the safe-area marking in order to evacuate a victim through uncleared areas.

Sending a deminer on foot for the ambulance implies that site communications were also inadequate.

The fact that the visor was penetrated illustrates clearly that the equipment is designed for blast threats. The M42 is a combined effects munition with a very small quantity of high

explosive but very destructive fragmentation and a shaped charge capable of penetrating armoured military vehicles. The requirement to wear a visor in these circumstances may require rethinking. The visor distorts vision and this may have led to the Victim not seeing the M42 as he cut vegetation.