

DDAS Accident Report

Accident details

Report date: 17/05/2006	Accident number: 159
Accident time: 10:40	Accident Date: 31/12/1998
Where it occurred: Trapeing Phlong, Ponhea Krek, Kampong Chan Province	Country: Cambodia
Primary cause: Unavoidable (?)	Secondary cause: Inadequate equipment (?)
Class: Excavation accident	Date of main report: 15/01/1999
ID original source: TL/DL (date inferred)	Name of source: CMAC
Organisation: Name removed	
Mine/device: M14 AP blast	Ground condition: bushes/scrub dry/dusty electromagnetic hard hidden root mat trees
Date record created: 14/02/2004	Date last modified: 14/02/2004
No of victims: 2	No of documents: 1

Map details

Longitude:	Latitude:
Alt. coord. system: MF: M2648	Coordinates fixed by:
Map east:	Map north:
Map scale:	Map series:
Map edition:	Map sheet:
Map name:	

Accident Notes

victim ill (?)
inadequate metal-detector (?)
request for better PPE (?)
inconsistent statements (?)

request for clearance with explosive charge (?)

safety distances ignored (?)

disciplinary action against victim (?)

squatting/kneeling to excavate (?)

Accident report

At the time of the accident the demining group operated in a two-man drill whereby one deminer used the detector and marked any signals while the other looked for tripwires, cut undergrowth and excavated any detector readings. The team member not working was intended to "control" the other.

Accident reports were prepared for the UN supported MAC by two ex-pat Technical Advisors. The following is a summary of both reports.

The demining platoon had been working in the area since July 1998 and had cleared 18,120m², finding 450 mines and 177 UXOs before the accident. All the mines had been M16 and M14s, with the M14s "tending" to be placed in a ring about a metre from M16s.

The victim's section started work at 07:30. The weather was "sunny, hot and dry". The mined area was characterised by having a "heavy laterite" soil that had been "hardened by dry weather". The STA reported that the laterite soil was "on occasions" more than the MineLab F1A4 detector could "deal with". The vegetation included "young trees, bushes and some vines" with a dense root structure to a depth of 5-15cm. The team had found three mines before the accident.

At the time of the accident, Victim No.1 was excavating a detector reading. Victim No.2 was the detector man and had paused on his return to the safe area because he felt unwell and so had not left the vicinity when the mine initiated. Victim No.1 was excavating with a "trowel" [a locally made excavating tool] (after prodding) when (at 10:40) he initiated a mine. He had been a deminer for 13 months.



[The picture shows the type of "trowel" used by the victim.]

After the detonation Victim No.1 was in the safe area "lying on his side and screaming , 'help me....my eyes...my hand'." The supervisor saw that "his left eye, chin and right arm were very seriously injured". Victim No.2 was also injured but "not much". A witness reported that he was standing shouting, "Help, I have been hit on my face". First aid was given by the Platoon Commander's deputy and Victim No.1 was carried to the Control Point and a waiting medic and ambulance. The ambulance left the site at 10:55, also carrying two deminers with the same blood group as Victim No.1. Victim No.2 was not evacuated.

The investigators examined the working lane and found no metal contamination. They checked the detector and found it to be working properly. At the accident site they found a small crater (about 30cm diameter and 15cm deep) next to a small tree. The shape of the crater was thought to suggest that the blast was angled "slightly" towards the victim. There were several torn roots around the crater and one (about 15mm diameter) that cut across the crater and had been broken in a manner that implied the mine had been between two roots (top and bottom). The growth of tree roots over pressure plates was thought to explain some apparently spontaneous detonations reported by locals.

Close to the accident site were two exposed and marked M14 mines located by the victim. The investigators examined the excavations around those mines and found that the victim had done the work properly "by forming a ramp as taught". The tools being used by the victim were photographed.

The victim was kneeling and prodding/excavating when the accident occurred. He was wearing the demining organisation's protective "goggles" [spectacles]. A photograph of the left lens indicated that the spectacles broke up. One investigator described the lens as "completely destroyed" and used the same phrase to describe Victim No.1's left eyeball. They observed that "some" [presumably a metal fragment] of Victim No.1's excavating tool had been recovered from his face (above his eye) and that the rest of the tool-head had plastic along the edge. They took this to indicate that it "was blown directly at the glasses of the deminer" when the handle separated. [See also the accident that occurred on 17th March 1998 in Cambodia.] The investigators mentioned that "the detector man was also slightly injured on the face. He was eleven metres away when the explosion occurred" and "received minor fragmentation injuries".

The Section Commander gave some of the detail in the above and also stated that the Victims were treated by the Platoon Commander, his second in command (2IC) and the Section Commander. The stretcher was carried by the Platoon Commander and his 2IC.

The 2IC said that he carried the stretcher and medical kit to the site of the accident when he heard the explosion. He administered first aid for 2-3 minutes then helped carry the victim to the "Control point" where the medic was waiting with an ambulance.

A member of the team working alongside stated that he knew the Victims well and did not think they were unwell at the time of the accident.

Victim No.2 was interviewed shortly after the accident and said he was feeling unwell and "scared" [shocked]. He said he had been feeling unwell all that morning, but that he was not too sick to work so did not report it. He had felt dizzy after placing the marker that Victim No.1 was investigating, so he had rested on his way back to the safe lane. He watched his partner and saw that he prodded first, then used his trowel to excavate. When the mine went off he was hit in the face by "stones" and temporarily blinded because he had taken off his safety spectacles to rest.

Victim No.1 was interviewed by the Senior Technical Advisor on 7th January 1999. He was the first person from the demining group to visit the victim following the accident.

Conclusion

The investigators observed that this was the second accident in the same mined area within three months, and that the accidents were similar because both mines were M14s, both detonated during excavation, both were close to M16 mines. In both cases the victim was aware of the presence of the mine and in both cases the victim lost an eye. [See accident that occurred on 5th October 1998 in Cambodia].

The investigators concluded that the damage suffered by the deminer proved that safety "goggles" [spectacles] did not protect eyes. The position of the mine "bridged" by a root meant that the deminer could have been working entirely correctly, and they thought that he was. There were contradictory stories over why Victim No.2 was in the vicinity, and the investigators offered no opinion over which was true. The Senior Technical Advisor decided that Victim No.2 "bears responsibility for his injuries" because he did not withdraw to the safe distance required.

The combination of hard, laterite soil, heavy fragmentation, thick vegetation and a "very high" density of mines made this an especially dangerous area. The investigators were satisfied that the accident was caused by the mine being under (or entangled in) roots.

Recommendations

The investigators recommended that targets underneath roots should be marked and investigated later by using "explosive to clear or soften the soil" before "normal... investigation of targets should proceed". They also recommended that the need for extreme caution be stressed; that no "pressure for increased productivity" be applied; that protective visors be issued "to all deminers involved in prodding/excavation" [full face polycarbonate visors were purchased for this purpose by one Technical Advisor and issued to this group only during January 1999]; that Victim No.2 and the Section Commander be disciplined for "failing to ensure the correct safety distances were applied"; that water should be used as an aid to excavation more frequently; that the quality of the metal in the excavation tool be investigated; that the use of surface charges to detonate mines in dangerous positions be considered; that SOPs for follow-up after an accident be "developed and followed"; and that accident investigation procedures should be clarified.

Victim Report

Victim number: 203	Name: Name removed
Age:	Gender: Male
Status: deminer	Fit for work: no
Compensation: not made available	Time to hospital: 4 hours 15 minutes
Protection issued: Safety spectacles	Protection used: Safety spectacles

Summary of injuries:

INJURIES

minor Arm

minor Face

severe Eye

AMPUTATION/LOSS

Eye

COMMENT

See medical report.

Medical report

First aid was administered by the Platoon 2IC at the accident site and Victim No.1 was "stabilised" at the control point. He was evacuated from site by ambulance at 10:55.

A Memo from the demining group's manager dated 5th January 1999 stated that Victim No.1 arrived at Kampong Cham Hospital at 14.55. It listed the injuries of Victim No.1 as: "Left eyeball completely; Right forearm in size of approximate 10-12cm x 4cm x 1.5cm depth and the chin part..."

Victim Report

Victim number: 204	Name: Name removed
Age:	Gender: Male
Status: deminer	Fit for work: yes
Compensation: not made available	Time to hospital: not recorded
Protection issued: Safety spectacles	Protection used: Safety spectacles

Summary of injuries:

INJURIES

minor Eye

minor Face

COMMENT

The victim was "slightly injured" by fragmentation to the face and eyes but was not evacuated for treatment. No medical report was made available.

Analysis

The primary cause of this accident is listed as "*Unavoidable*" because the main victim appears to have been working as directed, and in a way that is commonly accepted as adequate. He was in breach of SOPs because he was not lying down to excavate, but this breach was "normal" for that demining group and his field superiors had approved it.

There was also a significant failure of management manifested by the issue of inadequate safety spectacles - a failure compounded by having gone uncorrected over the life of the demining group.

The failure of the tool demonstrates the importance that should be attached to ensuring that hand-tools do not separate in a blast. The tool was long, but not fixed together adequately and may not have been made of suitably pliable steel. The secondary cause is listed as "*Inadequate equipment*".

There was a further failure of control because the supervisors did not correct Victim No.2's failure to maintain safety distances, or ensure that he wore his safety spectacles while still in the danger area.