

DDAS Accident Report

Accident details

Report date: 03/01/2008	Accident number: 455
Accident time: 10:30	Accident Date: 02/05/2006
Where it occurred: Khoshal Khan Hostel Complex, Dasht-i-Padola, Chehelstoon, Kabul City	Country: Afghanistan
Primary cause: Field control inadequacy (?)	Secondary cause: Unavoidable (?)
Class: Mechanical excavation	Date of main report: 29/05/2006
ID original source: Ops-27/266/06	Name of source: UNMACA
Organisation: [Name removed]	
Mine/device: M-19 AT blast	Ground condition: dry/dusty
Date record created: 03/01/2008	Date last modified: 03/01/2008
No of victims: 0	No of documents: 2

Map details

Longitude:	Latitude:
Alt. coord. system: WGS 84	Coordinates fixed by: GPS
Map east: 06915881 E	Map north: 3445088 N
Map scale:	Map series:
Map edition:	Map sheet:
Map name:	

Accident Notes

dog missed mine (?)
mechanical detonation (?)
protective equipment not worn (?)
non injurious accident (?)
inadequate survey

Accident report

The report of this accident was made available in August 2007 as a PDF file. Its conversion to a text file for editing means that some of the formatting has been lost. The substance of the BoI report is reproduced below, edited for anonymity. The original PDF file is held on record.

A single report covered two accidents (one on 2nd and one on 4th) that occurred at the same site. Where appropriate, the detail of the accident is repeated in the two records held in this database.

Text in [] is editorial comment.

Internal report

Mechanical Demining Accident at Chilston - 2 May 2006

1. Summary

1.1. At approx 1030 on 2 May 2006 an anti-tank mine detonated under the Gill bucket of a [Demining group] Case 721 wheeled loader. The loader was engaged in clearing an anti-tank minefield at Chilston (7km south of Kabul). There were no injuries and damage was minimal.

1.2. The [Demining group] has now carried out its internal investigation. The evidence suggests that the operator had failed to maintain the correct depth (30cm) with his bucket.

2. Background.

2.1. The minefield at Chilston dates from fighting between Jamiat and Hizb-i-Islami in the early 1990s. Some time after the fighting a rectangular wall was built, enclosing 181,000m² of gently sloping ground; however it is likely that the mineline extends beyond these walls. The current task, which is high impact/[Demining group] priority 1A, is restricted to the area inside the walls where a large secondary school is under construction.

2.2. Local builders are still working on the school, between 08:00 and 16:00 each day. The area immediately around the school buildings is covered in building materials, so cannot be cleared at present; the area under the buildings/foundations cannot be cleared at all.

2.3. Before construction of the school began, the area was cleared by [Demining dogs]. Since then there have been a number of AT mine accidents. In December 2005 UNMACA tasked [Survey group] to resurvey the task; and, having determined that mechanical clearance was most appropriate, asked [Demining group] to re-clear the site. [Demining group] is awaiting further details of the [dog] clearance (number, type and depth of mines) from UNMACA.

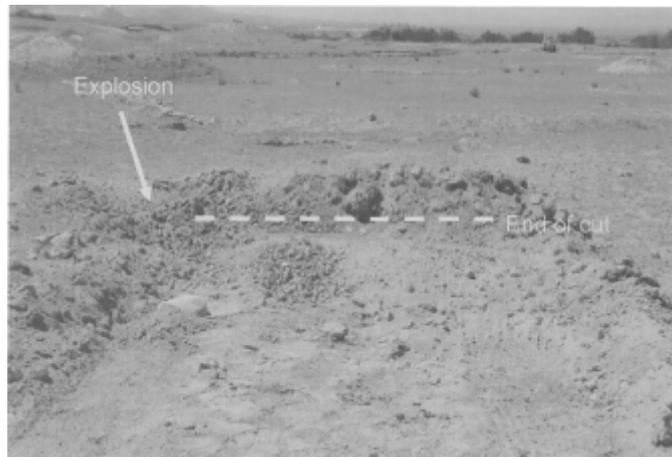
2.4. Clearance began on 17 April 2006, with two loaders (one Volvo, one Case 721) working double shifts (06:00-18:00). To date clearance has been by Gill bucket to clear cross-lanes, prior to the deployment of rippers and manual teams.

2.5. There being no indication of deep-buried mines, the Gill operators were instructed to cut at 30cm depth. This is the standard depth for Gill buckets, based on over ten years experience of mechanical mine clearance in Afghanistan, and conforms to [Demining group] Mechanical SOP C.5.2: "Depth of Cut: The operator shall excavate to a minimum depth of 20 cm and should attempt to keep the cut to a maximum of 70 cm (unless advice says otherwise from the survey) to prevent excess soil removal".

2.6. Two Iranian M19s were found on 18 April — both of which were visible just below the surface.

3. Description of accident

3.1. At approx 10:30, [Name removed], an operator with five years experience on the Case 721, was taking a cut when an AT mine exploded at the left front edge of his Gill bucket (see below).



3.2. The precise location was 34'26'48.6" N, 069°09'29.7"E.

3.3. There were no casualties. The damage to the bucket was minimal — specifically the left-hand tooth was snapped off, and landed 180 metres away;

3.3.2. The mole board was bent back about 5 cm out of true:



3.3.3. Two small welds were broken: one attaching the Gill system to the inside of the bucket (top left), and one attaching a lifting eye on the left side of the bucket.

3.4. Immediately after the accident the operator reversed the loader about 5 metres, where it remained parked pending the arrival of the [Demining group] investigation team. (This should not have happened.)

4. Accident Investigation

4.1. The [Demining group] internal investigation was carried out on 2-3 May 2006 by [Name removed] (Expat Officer (Central)) and [Name removed] (Regional Operations Officer (Central)), in consultation with [Name removed] (Programme Mechanical Officer), who was at

Chilstoon when the accident happened, and [Name removed] (Mechanical Manager (Central)).

4.2. An UNMACA accident investigation will follow.

5. Observations

5.1. From the limited damage to the bucket and from the position of the crater relative to the lane, it seems likely that the mine detonated in front of the bucket rather than below it — possibly as a result of indirect pressure.

5.2. It appears that the depth of the cut was less than the 30cm minimum that had been ordered: a measurement taken 1.5 metres back from the seat of the explosion suggested that the actual depth of the cut was around 21 cm. The ground on the site, whilst soft, is slightly undulating, which makes it more difficult for operators to maintain the correct depth. In this case, the loader had just crossed a road of hard-packed earth, and it is possible that the operator had failed to regain the correct depth before he encountered the mine.

5.3. There is no evidence to suggest that this mine was buried below 30cm. A local policeman who witnessed the accident offered the information that three or four AT mines had been found during the excavation of foundations for the school, and suggested that at least one of these may have been at 40cm depth. However there is no other evidence to corroborate this view.

5.4. The loaders are operating close to the building site, and Kuchis [nomads] frequently pass through the area. Moreover, when mechanical ripping commences, manual deminers will be working on the same site. [Demining group] Mechanical SOP G.1.3 states that "minimum mechanical safety distance is 100 metres, unless adequate cover is provided by man-made shelter or natural features". The fact that the tooth flew 180 metres from the blast suggests that this safety distance should be increased.

6. Recommendations

6.1. The operator has been interviewed and warned that any repetition will result in disciplinary action.

6.2. Loader operators and team leaders must ensure that the minimum depth of cut is 30cm below the original ground level. Where the ground is sloping or uneven the depth of cut should be greater than 30cm to allow sufficient margin for error. The Chilstoon site includes a number of trenches and ditches which may have been partly filled in since the mines were laid; team leaders are to take particular care when excavating these.

6.3. A manual supervisor will be appointed to take overall charge of the task. His main role will be ensure that mechanical teams do not operate with 200 metres of unprotected personnel. With careful planning and control this should be possible. A Technical Survey team has been tasked to produce an accurate scale map to assist in this process.

6.4. Mechanical team leaders are to be reminded that in the event of an accident the machine must NOT be moved until the investigation is complete.

Independent investigation report

M19 AT mine detonated under Gill bucket of a [Demining group]-99 wheeled loader, the loader was engaged in clearing anti-tank minefield.

History of the Minefield

This MF locates at Dashti Padula of Chelstone, Ward -7, Kabul city and have been enclosed by the walls of under construction Khoshal Khan Khatak Secondary School Hostel as it covers 181,000 sqm area. It has been appraised as a high impact area. It was fighting front line between Jamiat and Hezb Islami fighters in the years 1992 to 1996.

At first time this area had been surveyed by [Survey group] Sur-09 on 06 April 1997. The survey team had divided this area to four minefields (MF# 353, 387, 392, and 395). The minefields of this area were cleared by [Mine Dog group] at the same year. After clearance of these tasks by [Mine Dog group], in this area about 9 accidents on local people have been occurred of which two accidents has been recorded, investigated by AMAC, Kabul investigation team and reported to UNMACA of 05 April 2006. One accident occurred on 12-12-2005 at 11:00 am, as a result an Eight Cylinder truck was blown up. The second accident erupted on 12 Feb. 2006 at 15:30 hrs, as a result a Hino truck was blown up. Due to occurrence too many accidents and possibility of more mines with uncertified depth in this area, Area Manager of AMAC, Kabul decided for re-clearance of this area by mechanical teams. Therefore the AMAC area Manager contacted [Demining group] as the [Demining group] agreed. As it has been reported to UNMACA in the mentioned investigation report.

As construction of hostel has already been started in this area some more activities will also be conducted in the remaining area of the SHA, in order to clear the SHA at the soonest convenient time, it requires using machinery system. The issue has been verbally discussed and coordinated with [Demining group] and they are willing to use their VTF funded machinery system for the clearance of this SHA.

Since clearance of this task has been started by [Demining group], two anti tank Iranian M-19 mines were also discovered by [Demining group] in this task. The depth of the two mines was less then 30 cm.

LIAT has been tasked to cover this area as new SHA for the community

Description of the incident/accident

The type of the mine was M-19. Details of the incident are explained as bellow:

1. One anti tank mine blasted on 02 May 2006 at approximately 10:45 hrs. This incident caused no casualties and the damage to the bucket was minimal (just one left side tooth of the loader bucket was snapped off). The broken tooth of the bucket immediately was changed with new one and next day the loader started to work normally. The type of the mine was M-19 and depth of this mine was less then the assigned 30 cm clearance depth (21 cm).

Site conditions (at the time of the incident/accident). The terrain was described as uneven, confined hillside. The soil was medium, dry. The weather was clear, warm and calm. There was no vegetation.

Team and task details: QA check has not been conducted, since the team has come to this task on 13th April 2006. The team works in two shifts: shift one from 6:00 am to 12:00 noon. Shift two from 01:00 pm to 5:00 pm. There is a break from 09:30 to 09:45. The hand-tool used was a "trowel".

Conclusions

1. The operator worked alone in two shifts from 06:00 am to 17:00 pm. based on verbal information we got from team leader of MC-05.

2. The mine exploded under a tooth of the bucket as the top of the mine was open so the mine pressure spread out in the open area so it caused minimum damage.
3. The depth of the cut was less than the minimum assigned 30 Cm excavation depth. The maximum assigned depth which is 70 Cm, but as we saw the site it has not been considered during excavation.
4. Technical survey has not been carried out and accurate scaled map was available in the site with the team.

Recommendations

1. Technical survey should be conducted at first in order to collect more and precise information about the site situation, depth of mine; mine type etc prior to starting clearance operation.
2. Since the area is uneven, the team leader should prepare a free hand map with highlighted critical points and show in it the clearance depth of the site different parts
3. The team leader based on his experience is to consider and examine each part of the ground and ensure that the required depth during excavation is considered.
4. For each loader working in the MF is to be appointed two operators, especially for those working in two shifts.
5. The team should meet clearance depth from original ground surface.

STATEMENTS

Statement and Witness Report

[Mechanical Officer (controlling the team), working in demining since 1998.]

Data of the person making the statement / witness report

Questions:

1. Please explain how the incident occurred?
2. How many mines have been detected by your team in this task so far and what is the type of the detected mines?
3. Please say about the depth of the mine caused the incident and also say how much excavation depth has been assigned for this task?
4. Daily, how many hours the team works in the site and whether the team members have opportunity for rest during work or not?
5. Please say the date and time of the incident?
6. Please explain the work procedure of [Demining group] mechanical teams.
7. In your opinion, what mistakes have caused the incident?

Answers:

1. It is routine that the mechanical teams works are checked by [Demining group] responsible personalities. One day ago, mechanical manager had come and in the incident day I came to check and control the work process. At first I controlled work of MC-11 working adjacent to MC-5, then I moved toward MC-05, along the way I heard the voice of explosion. Being the first person reached to the incident point, assured the team member by VHF of the health of operator and intactness of the machine. Then the team nurse with ambulance reached to the incident point. The operator was completely normal, one rear indicator and one teeth of the machine bucket was broken. When we checked the mine I saw that the depth of digging was less then as compared with the required depth. After that I informed all the [Demining group] authorities about the incident, as operations officer and other authorities of [Demining group] also came and observed the site, took necessary photos then the machine was shifted to a proper place for repair. One day after, the machine bucket was changed and the backhoe started to work.
2. Till now we have found two Iranian M-19 Anti Tank mines, the mine caused the accident was the third mine.
3. The excavation depth for the [Demining group] mechanical teams is from 20 cm to 70 cm, but in this task the excavation depth has been assigned 30 cm, but to say anything about the exact depth of the exploded mine is difficult.
4. The team works in two shifts, in shift one operation commences at 6:00 am and ends at 12:00 noon; the second shift commences at 1300 hrs and ends at 1700 hrs. The team has two loader operators as they are working periodically.
5. The incident erupted on 02 may 2006 at 10:30 am.
6. The [Demining group] mechanical teams have two kinds work procedures. As you better know, the mechanical machines almost gets out of order during the work as sometimes its repair due to shortage of expert mechanics and spare parts takes long time. In order to avoid the mechanical teams' idleness, the mechanical teams always work daily in two shifts. If the mechanical equipments are fully available in the team, the teams work daily one shift. The teams working in shifts have two breaks, one break takes half an hour and the other takes 15 minutes.
7. If due to shortage of mechanical machines the work is carried out in two shifts the team has just one 15 minutes break. As one team work from 6 to 12 and then the second team comes and works with the same machine of the first team in the second shift from 1 to 5 pm.

Statement and Witness Report 2

Data of the person making the statement / witness report

[Team Leader – on leave at time of accident. Experienced since 1997.]

Question:

1. Dear Commander although you were not present in the field while the accident occurred after you returned to duty in your opinion what will be the cause of the accident?
2. From the technical point of view we know that during the excavation first the bucket teeth must touch the ground therefore due to this reason first the bucket teeth must be destroyed and then the body of the bucket but in this case the bucket teeth is completely save and the center of the bucket frame got damaged would you like to say what will be the cause of the accident?

3. Dear commander to avoid from such accidents in the future and solve the same problem what is your idea and recommendations?

Answer:

Dear sir I would like to state in my opinion as the excavation is done as per norm of SOP (30 cm) and the depth of mine was more than 30 Cm so, the accident has happened due direct pressure on the mine.

2. Since the excavation is done as per the norm of SOP and the mine was deep therefore it seems that during the excavation pressure has been brought on the mine and the pressure on the mine has caused the explosion it is worth mentioning to state during the excavation the bucket teeth is move a little bit to the back and the weight of the bucket it self plus the excavated soil is caused the explosion.

3. As per my observation long period has passed from the time of plantation of these mines and they have plant these mines very deep and unprofessional. The two previous accidents which have occurred in the area seem the depth of the mine was deeper from the SOP norm so my recommendation is to increase the depth of the excavation from the current depth which is 30 Cm.

Analysis

The primary cause of this accident is listed as a "Field control inadequacy" because the investigators determined that the operator was not processing the ground to the required depth. If the mine had not detonated it would have been left behind. The secondary cause is listed as "Unavoidable" because the uneven ground and the improvised machine may have combined to make it unrealistic to expect the operator to be able to maintain an even depth. If this is the case, those responsible for giving the task to a machine that was unable to conduct would be demonstrating a "Management control inadequacy".

The fact that the area had already been "cleared" using dogs and was being subjected to a second inefficient "clearance" method raises some questions about whether quality is being sacrificed for speed, and whether mines are still being left behind.

The "Inadequate survey" referenced under Notes is mentioned because the investigators recommended that a Technical Survey to determine the depth of the mines be conducted.

The quality of the demining group's internal investigation report was unusually high.