

# DDAS Accident Report

## Accident details

<b>Report date:</b> 11/01/2004	<b>Accident number:</b> 8
<b>Accident time:</b> 10:30	<b>Accident Date:</b> 24/09/1997
<b>Where it occurred:</b> Tewaran MA, Periska Village, Qaladiza District, Sulymania Province	<b>Country:</b> Iraq
<b>Primary cause:</b> Field control inadequacy (?)	<b>Secondary cause:</b> Inadequate training (?)
<b>Class:</b> Missed-mine accident	<b>Date of main report:</b> 25/09/1997
<b>ID original source:</b> SB	<b>Name of source:</b> MAG
<b>Organisation:</b> [Name removed]	
<b>Mine/device:</b> PMN AP blast	<b>Ground condition:</b> electromagnetic
<b>Date record created:</b> 11/01/2004	<b>Date last modified:</b> 11/01/2004
<b>No of victims:</b> 1	<b>No of documents:</b> 3

## Map details

<b>Longitude:</b>	<b>Latitude:</b>
<b>Alt. coord. system:</b>	<b>Coordinates fixed by:</b>
<b>Map east:</b>	<b>Map north:</b>
<b>Map scale:</b> not recorded	<b>Map series:</b>
<b>Map edition:</b>	<b>Map sheet:</b>
<b>Map name:</b>	

## Accident Notes

inadequate equipment (?)  
no independent investigation available (?)  
inadequate training (?)  
pressure to work quickly (?)  
mine/device found in "cleared" area (?)  
inadequate metal-detector (?)

## **Accident report**

The demining group was operating a three-man team with a two-man drill at the time of the accident. One man used the detector, marked any readings, and another man came forward to excavate the reading, feel for tripwires and cut any undergrowth. A third man at any one time was resting.

An internal investigation was made available by the demining group. Its content is summarised below (see also Related papers). It stated that the ground at the site was hard, flat and had "medium metallic contamination". The area where the accident occurred had been cleared the previous day by two named deminers.

At 10:30 the victim was walking through the area to reach the rest area when he stood on a mine, thought to be a PMN buried to a depth of about 5cm. The victim suffered a below knee amputation to his left leg and minor injuries to both arms and legs.

The Schiebel detector used to search the area was checked and found to be in good order.

An internal demining group investigation was carried out by two staff and dated 25th September 1997. It stated that work at the minefield had been in progress for about three weeks during which time several PMNs had been found. At the time of the accident the regular Team Supervisor was filling another position, the normal Team Leader had become "Acting Supervisor" and a Deminer Grade 1 was acting as Team Leader.

The investigators carried out a quality control check at the site and found several large pieces of metal. The detector originally used to search the area was subjected to three one hour tests and found to be working normally. They decided from examining the crater that the mine had been buried no more than 5-8cm deep.

One of the deminers responsible for clearing the accident area said that the supervisor did not carry out quality assurance checks that day or any other. He said that the metallic ore in the ground made the detector read constantly whenever the search head was in contact with the ground, so the deminers kept the head raised by 2-4cm. At the time they missed the mine, strong winds were making it difficult to hear the signals but they stopped when they could not hear at all. He thought they missed the mine because the wind was drowning out the signal and because they had rushed the clearance. He added that PMNs are easy to detect and that the rows of mines were easy to identify, so he did not think there were any mines in the area of the accident (no row of mines had been found).

## **Conclusion**

The investigators concluded that the team was not supervised effectively because of the inexperience of the Acting Supervisor and because the Acting Team Leader was too "familiar" with the deminers. They decided that the search was not carried out correctly because the detector head was being raised off the ground. Also that the Acting Supervisor failed to carry out quality control checks.

## **Recommendations**

The investigators recommended that deminers should not be promoted to Team Leader without receiving full training. Also that QA checks should be carried out and that "severe disciplinary action" should be taken against the Acting Supervisor and the two deminers who "cleared" the area.

## Victim Report

<b>Victim number:</b> 18	<b>Name:</b> [Name removed]
<b>Age:</b>	<b>Gender:</b> Male
<b>Status:</b> deminer	<b>Fit for work:</b> not known
<b>Compensation:</b> not made available	<b>Time to hospital:</b> 20 minutes
<b>Protection issued:</b> Frag jacket	<b>Protection used:</b> not recorded
Helmet	
Short visor	

### Summary of injuries:

#### INJURIES

minor Arms

minor Genitals

minor Hand

minor Legs

#### AMPUTATION/LOSS

Leg Below knee

#### COMMENT

See medical report.

### Medical report

No formal medical report was made available.

The Medic stated that the victim "lost his left leg, had not much bleeding and there was some wound in this leg... Some wounds found on his right leg, such as under his right foot and some other wounds found on the same leg. His left hand had some slight wounds due to the pieces of stones and other thing and it was slightly burnt. His penis had some wounds and burns but fortunately his right testicle and penis head had only some wounds and burnings".

### Analysis

The primary cause of this accident is listed as a "*Field Control Inadequacy*" because it seems that the deminers had been inadequately supervised and unauthorised "mine-hunting" in recognised rows had been allowed. The victim himself may have been working properly (according to the group's SOPs) but at least some of the demining group were not.

If the detector was impossible to hear in the conditions of work, it was inadequate and other equipment should have been considered or work stopped. If the victim was being pressured to work quickly, that may represent a further failure of management.

The failure to ensure that field supervisors were adequately trained represents a significant failure of senior management, so the secondary cause is listed as "*Inadequate training*".

See "Related papers" for an investigation into mines found in areas believed to have been cleared.

## **Related papers**

A "final" report on this and a non-injurious missed-mine accident in the same area was made on 25<sup>th</sup> November 1998. The report follows, edited for anonymity.

### **ADDITIONAL INFORMATION REGARDING ACCIDENT AT TEWARAN MINEFIELD AND SUBSEQUENT DISCOVERY OF MINES IN AN AREA THOUGHT TO BE CLEAR**

#### **Aim of this report**

On assuming the role of STA I discovered there was a certain amount of ill feeling amongst the ex-pat Technical Advisors regarding 2 accidents which resulted from very low standard clearance drills in the minefield at Pereska village in Qaladiza district of Sulymania.

I felt that the overall impression from the Technical Advisors was that the overall reporting and investigating of these accidents was not concluded.

I therefore thought it necessary to compile the following report to clarify the overall picture, and to ensure that everyone understood the reasons certain decisions were taken and the steps that have been taken to address the problems highlighted by these 2 accidents.

It must be remembered that this report is being written over 1 year after the first accident and 11 months after the second accident.

#### **Background**

Clearance began at Terawan minefield on 07Sept 1997.

The demining teams deployed to carry out the task were from the Dyana operations base in Erbil Governorate.

#### **First accident**

On the 24 Sept 1997 a deminer stepped on a PMN AP blast mine in a cleared area, as a result of this he suffered a traumatic amputation of the lower left leg and injury to the right leg.

As a result of this accident an investigation was carried out by the NSMS and submitted to the Senior Mines Specialist. The report was compiled and dated 25 Sept 1997. The Senior Mines Specialist added comments to the report in the form of conclusions and recommendations. These recommendations were as follows:

##### **Immediate**

1. All demining operations to be suspended.
2. 1 weeks 'refresher' training for all deminers, where SOPS are to be re-taught

##### **Intermediate**

1. A supervisors/Team leaders course is to be held involving all current supervisors and team leaders who have not yet attended the relevant course.
2. Areas of Tewateran minefield are to be re-cleared, these areas are to be identified by the NSMS.

3. The acting supervisor who was in charge of the minefield and the No 1+2 of the sub team who carried out the search of the area of the accident are to be dismissed for gross negligence.
4. A report is to be prepared by the TMS reference the calibration of the Schiebel metal detector, and the cause of deminer complacency.

The investigation found that the accident had occurred in an area where large fragments had been discovered by the NSMS and the TMS on their initial visit to the site, not only in the immediate vicinity of the accident site but throughout the minefield.

Therefore the SMS instructed the NSMS to realign the start position for re-clearance back to the original position and to re-clear the area.

In response to the accident, and following the conclusion that the deminers were lifting the head of the Schiebel off the ground to eliminate ground noise the SMS tasked me to carry out a test on the performance of the AN19/2 detector when working in 'highly contaminated' soil. The SMS was convinced that one of the major contributing factors to the original accident was that the deminers were ignoring signals which they interpreted to be from metal fragments and not mines, and were subsequently ignoring many contacts in the belief that they were only fragments

The SMS explains his concerns in the monthly report for Sept 1997.

I conducted the test with [another ex-pat TA] at Penjwin operations base on 29/30 Sept 1997. The report was submitted to the SMS on 01 October 1997.

The SMS made certain changes to SOPs based on the recommendations from this report the changes and reasons for them are laid out clearly in the monthly report for Oct 1997, I was consulted by the SMS as were members of the senior national staff and all were happy' with the changes introduced.

In response to the lack of formalised Quality Assurance reporting within N. Iraq, the SMS devised a specific form to be used by all Technical Advisors when visiting demining tasks. This form was designed to be filled in on the site and signed by the senior technical person on site as well as the site supervisor, a copy would be attached to the TA weekly report for submission to the SMS. The form was also translated into Kurdish so that supervisors could carry out QA and then submit weekly reports to the DDFM.

## **Second accident**

During preparation for the winter close down period of 1997, a mine was discovered on the other side of the minefield in an area thought to have been cleared. This mine was found after the demarcation had been moved forward from the original position to the edge of the cleared area.

This accident happened at a time when [ex-pat TA] was still under probation and the SMS was on Christmas leave. The acting SMS was [name excised].

The Technical Advisor present when the mine was found was [name excised], after informing [the acting SMS], he started to carry out an investigation into the circumstances regarding the mine found and the standard of clearance in the minefield. He found that the overall standard of clearance was extremely low in the area where the mine was found, and re-demarcated the area to include the entire area which had thought to have been cleared.

In the monthly demining report for Dec 1 1997, [the acting SMS] reported that the mine had been found.

The investigation which had been started identified large amounts of fragmentation in the 'cleared' area The Programme Director at the time [name excised] contacted the Technical Operations Manager [name excised] in the [head] office for guidance and was instructed to suspend the investigation and await the return of the SMS from leave.

## Follow up Action

On his return from leave the SMS was briefed about the accident by [the two ex-pats].

In the monthly report for January 1998 the SMS expressed concern regarding the accident and the necessity to re-clear the area shown on the sketch map attached to the January 1998 report. I have attached a copy of this sketch map to this report. He also said he would look further into this accident and the previous accident which resulted in the injury to [name excised]. He was concerned that these accidents had raised some doubts about the performance of some of the senior supervisory staff involved in the whole story of Tewaran minefield. In the January report the SMS wrote that he would conclude the investigation and submit the report to UK.

In the monthly report for February 1998 the SMS reported that 'following further investigation into the accident there is to be no further disciplinary action taken against any member of staff'.

The report also states that the investigation report is now complete and has been forwarded to the UK. To date I can find no specific separate report on this accident, therefore I assume that the SMS was referring to the original Investigation report compiled after the accident in Sept 1997.

During the period of these 2 accidents I was carrying out the duties of the Technical Training Advisor, at the time of the accident I visited the scene with the NSMS to point him in the right direction regarding accident investigation. However as I was the only Technical Advisor in Sulymania at that time I had to leave the next morning to monitor the other teams in the governorate.

When the second accident occurred I was on holiday and on my return in Jan 1998, I had to immediately commence the Winter training programme in Dyana operations base. This period carried on at Qaladiza until the restart of operations in early March 1998.

Although I did not have a chance to visit the site of the second accident, I did have the situation described to me by [ex-pat TA] and the SMS.

I discussed the situation at Tewaran minefield on numerous occasions with the SMS and agreed with his decisions to re-clear the areas and that emphasis should be placed on improving a more disciplined approach to Quality Assurance.

The training period carried out in early 1998 was designed to improve the skills of the current team leaders and supervisors, and to carry out an assessment of their capability to carry out their duties and responsibilities.

In the monthly report for Jan 1998, the SMS expresses his concern over these 2 accidents occurring in the same area in short succession, and points out that the areas which had thought to have been cleared by the demining teams had in fact been subjected to a very poor clearance standard, and that when the clearance had been carried out, the resident ex-pat TA was actually on leave, this was at a time when there was insufficient TAs to cover all areas fully.

The task had been supervised by the national staff only, and the SMS saw this poor standard as an indication of how standards will fall if there is no ex-pat TA presence in country.

The SMS instructed the TA for Qaladiza to re-clear the area outlined in the attached sketch map on the resumption of operations in March 1998.

The SMS left the programme in March 1998 and I assumed the duties and responsibilities of the STA.

In March 1998 [a new TA] joined the programme as the new Technical Training Advisor. I tasked him to set up a new minefield clearance recording system and to look at improvements that could be made in Quality Assurance. He undertook this task enthusiastically and the improvements made in these areas have gone a long way in making [the] programme more professional. Unfortunately [the new TA] had to leave the programme shortly after his arrival.

## **Conclusions**

- 1 After the accident the clearance teams were concentrated on the upper portion of the minefield where the accident had occurred. Prior to the accident the team had been split between the upper and lower parts of the minefield. Therefore the lower part of the minefield was initially not identified for re-clearance or if it was this was not recorded.
2. The second accident actually came about when a deminer asked for the area on the lower side of the minefield to be quality checked after the demarcation had been moved. When questioned why he wanted this area re-checked, he said it was because the sub team involved in the accident had also worked in this area.
3. There appears to have been some confusion over the areas to be re-cleared following the accident and the areas to be considered as still clear. I believe this is largely due to the poor system of minefield clearance recording in operation at the time, the initial investigation report should have also included a sketch map clearly indicating the areas to be re-cleared.
4. The immediate response to the accident and subsequent action has addressed most of the problems associated with these 2 accidents. However the investigation report was lacking an accurate recording of the re-clearance required, therefore the fact that the lower area was suspect was not recorded.
5. These accidents highlighted the importance of accurate recording and record keeping of minefield clearance, and the requirement of high standards of quality QA procedures.
6. The disciplinary action taken against the deminers who were dismissed becomes questionable as it would appear from the subsequent re-clearance of the area that they were not the only ones carrying out low standards of clearance. Therefore the performance of the team as a whole could have been subject to disciplinary action.
7. The lack of a written conclusion to the discovery of the mine in the second accident, led to confusion and suspicion amongst the Technical Advisors.

## **Recommendations**

I firmly believe that lessons have been learnt from these 2 accidents and that the current QA procedures minefield recording systems and training have lowered the chances of a repeat of such accidents happening again. However the following recommendations should be applied.

- 1 No members of the national staff should be tasked to carry out 'accident reporting' until formalised training has been undertaken, this should include a practical exercise.
2. All accident investigation reports are to include a copy of the minefield working map showing all areas clearly marked. This map is to include areas cleared and if necessary areas to be re-cleared.
3. The accident report is to list all Quality Assurance checks carried out by date, and with the name of the person who carried it out.
4. As these accidents both happened over 1 year ago this report should be seen as the final conclusion.
5. In relationship to the question of the disciplinary procedure to be applied in these areas, I believe that further guidance from UK should be sought. I believe that the Technical Operations Manager should examine the disciplinary process in such cases to ensure that the procedure is uniform throughout [the Demining group.]

## **Statements**

The following statements are reproduced as presented (edited for anonymity). The English is sometimes confusing.

### **Deminer No.2 [Victim's partner]**

While we were working in Tewaran minefield on 24/09/97 at 10:30 a mine exploded and when I went to the accident site I found that the mine was left, so if it was due to an offence or due to a wire cut of the Schiebel when one of us working and the mine was left resulting in the accident.

At the accident time, when changing at 10:30 I was standing by the metal markers, calling at [the Victim]. He came to give me the (ballistic jacket and tile helmet), about 7m and the mine exploded, I didn't see anything because of the dust and smoke. I changed my place one step to the left, finding [the Victim] fell down and shouted it is an accident.

I went to him finding his leg cut, after bringing the stretcher we brought him outside. After that I went to the accident site of the MF, finding that the place was of last week [the Victim himself and two others] were working in.

Q. Did the supervisor carry out a quality assurance check the day prior to the accident

A. No

Q. When did the supervisor last carry out quality assurance checks

A. Never

Q. Are you familiar with the exact site of the accident.

A. Yes

Q. Was the area where the accident happened within your sub teams area of responsibility.

A. Yes

Q. Did you have any difficulty in locating the previously found mines in the minefield.

A. No problem

Q. Did you have any difficulties while carrying out clearance inside the minefield.

A. Yes, there was a strong wind which some times made it difficult to hear the noise of the detector signal

Q. Did you inform the supervisor of this problem.

A. No

Q. Did you stop working during the strong winds.

A. We stopped working during the time of a gust of wind and then carried on.

Q. Was the metal contamination causing any problems to the clearance.

A. Yes, the metallic ore in the ground caused the detector to give out a constant reading when the search head was in contact with the ground.

Q. What action did you take to counter act the constant signal being given from the ground.

A. We raised the search head off the ground until there was no sound.

Q. At what height off the ground was the search head when the signal was not heard.

A. 34cm

Q. Had you ever had any problems with the detector that you used to clear the area of the accident.

A. We had one problem about 1 week before the accident while I was working the detector stopped working, I realised that it was a fault with the batteries and stopped working to check the battery compartment, where I saw that one of the spring battery terminals was depressed therefore there was no contact so I pulled the spring out a little to make the contact better and then carried on working.

Q. What do you think the reason is for missing the PMN mine.

A. 1) Because we were rushing the clearance  
2) Maybe because the wind drowned out the noise of the signal

Q. What do you mean when you say you were rushing the clearance.

A. We were sweeping the ground quickly with the search head, because the PMN mine is easy to detect, and also the rows of the mines were easy to identify so we did not think there was any mines in the area of the accident.

Q. Had you ever been told to stop working by the no2 or supervisor for not carrying out the correct drills or procedures while working in Tewaran minefield.

A. No

Signed:

#### **Team Leader (acting supervisor)**

On 23.9 this area was cleared by both deminers [names excised] but due to the leaving of PMN mine under earth in depth of 20-25 cm. led to the leg cut of deminer [the Victim], this is due to either the mine detector didn't detect it or it was detected but left by them.

To be informed on 23.9 due to the absence of deminer [name excised], they were working as a sub-team of 2 members in which [the third member. Name excised] was not there.

**Note:** Many times we face problems of fastening in work due to that [two names excised] informed the team if finishing this MF (Tewaran), they'll be returned to Dyana. That was one of the motives behind the accident.

Q. How long had you been acting supervisor.

A. One month

Q. Had you received any training or briefing reference the duties and responsibilities of a supervisor.

A. No

Q. When supervising the team how do you cover the whole team.

A. I split the team into two halves, I watch one half and the team leader watches the other half

Q. When halving the team did you supervise the same half of the team everyday.

A. Yes, but I use my binoculars to check the other half two or three times a day.

Q. The day prior to the accident did you carry out quality assurance checks.

A. No, as I was too busy carrying out the demolitions.

When do you carryout quality assurance checks.

A. At the end of the day.

Q. How much area do you check.

A. One sub team per day.

Q. Did you carryout quality control checks on the half of the team which you were not supervising.

A. No, the team leader carries out the checks.

Q. Do you think that the clearance rate of the minefield was high.

A. Yes.

Q. Why

A. Because it was there was low metal contamination, and because some of the sub teams had heard a rumour that when they finish Taweran minefield they would be posted back to Dyana operations base.

Q. Do you think that while clearance rate was so high that the deminers could have been carrying out the correct clearance drills.

A. They carried out their drills correctly, except for their use of the Schiebel.

Q. In what way were the team not using the Schiebel correctly.

A. The search head of the detector was raised off the ground 34 cm

Q. How deeply buried were the mines which the team were finding.

A. Approximately 5cm

Q. Had the detector which was used to search the area of the accident broken down while working on Tewaran minefield.

A. No

Q. Why do you think the sub team did not detect the mine.

A. Probably because they did not use the Schiebel correctly, and were not paying enough care and attention to what they were doing.

### **Deminer [No.3 in sub-team]**

We were ([the Victim] and me) when entering the MF at 10:30, [the Victim] went out, during changing he became about 7 m. away from me, hearing a sound and finding [the Victim] fallen down, I directly ran towards him and calling [name excised] whom he stopped work, the place was cleared, the day before I was there with [name excised], working there on 23.9, it was not my place. I was working in another team.

[The Victim] lost his left leg.

After stopping work for 20 min. the medic was doing the necessary first aid for him, then he was referred to Qaladiza hospital and from there to Sul.

Since we were working in Tewaran MF, I don't doubt my work, the accident happened last week but I was working with down sub-team since the 22nd of the month. On 23rd I with [name excised] came to the place, working the next day, that is on 24.9, I, [the Victim and another] working there till the time of the accident happened.

I haven't known how that mine was left, is it due to haste or due to wire-cut of Schiebel or due to storm...

Q. Did the supervisor carryout quality assurance checks the day prior to the accident.

A. No

Q. Did the supervisor ever carryout quality assurance checks.

A. No

Q. Are you familiar with the exact location of the accident.

A. Yes

Q. Was the area of the accident within the area of responsibility of your sub team.

A. Yes

Q. Did you have any difficulty in detecting the previously found mines.

A. No

Q. Did you have any other difficulties when carrying out clearance.

A. Yes there was lots of bullet cases, and old food cans.

Q. How did this cause difficulties.

A. Because the above items have high metal content the detector gave off a large signal, which we thought was a mine. So when we dug down we found that it was not a mine but only a piece of metal, and this affected our morale.

Q. How did this affect your morale.

A. Because the PMN is an unstable mine and easily functioned, when we thought the reading was not a mine we would excavate the ground quickly only to find a PMN, and this made us realise that we could have been injured. There was also some deeply buried cans which took up to 1 hour to uncover and in hot weather this affected the morale.

Q. How deeply buried were the mines you had located during other days clearance.

A. The deepest was approximately 10cm.

Q. How long had you been working with the detector which you used the day prior to the accident.

A. About three weeks

Q. Had you any problems with the detector during that time.

A. None

Q. When sweeping the ground with the detector how far off the ground do you raise the search head.

A. 2cm

Q. If you receive a constant signal from the ground at 2cm what do you do.

A. Raise the search head until the noise disappears

Q. What is the maximum height that you would raise the search head off the ground.

A. I don't know exactly in centimetres but I continued to raise the search head until the signal disappeared.

Q. Have you or [your partner] ever been warned about incorrect clearance drills.

A. I have *never* been warned, but [my partner] had been warned many times for working too quickly by myself, the team leader and supervisor.

Signed