

10-8-2003

# DDASaccident441

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# DDAS Accident Report

## Accident details

<b>Report date:</b> 17/03/2007	<b>Accident number:</b> 441
<b>Accident time:</b> 11:00	<b>Accident Date:</b> 08/10/2003
<b>Where it occurred:</b> Talailmannar Pier East, Mannar District	<b>Country:</b> Sri Lanka
<b>Primary cause:</b> Unavoidable (?)	<b>Secondary cause:</b> Field control inadequacy (?)
<b>Class:</b> Missed-mine accident	<b>Date of main report:</b> 11/10/2003
<b>ID original source:</b> SF, MF, CH: MAN/03/002	<b>Name of source:</b> Private
<b>Organisation:</b> [Name removed]	
<b>Mine/device:</b> Type 72 AP blast	<b>Ground condition:</b> building rubble electromagnetic hard metal fragments metal scrap residential/urban rocks/stones soft
<b>Date record created:</b> 17/03/2007	<b>Date last modified:</b> 17/03/2007
<b>No of victims:</b> 1	<b>No of documents:</b> 1

## Map details

<b>Longitude:</b>	<b>Latitude:</b>
<b>Alt. coord. system:</b> WGS 84	<b>Coordinates fixed by:</b> GPS
<b>Map east:</b> 79°43'50.70 E	<b>Map north:</b> 09°06'22.70 N
<b>Map scale:</b> TALAIMANNAR	<b>Map series:</b> ABMP
<b>Map edition:</b> 1	<b>Map sheet:</b> 11
<b>Map name:</b>	

## Accident Notes

no independent investigation available (?)  
metal-detector not used (?)  
mine/device found in "cleared" area (?)

## Accident report

Two versions of an internal investigation were made available in 2006. The first is a preliminary report and the second is a more complete final report. Both are reproduced below, edited for anonymity.

### PRELIMINARY INVESTIGATION REPORT

#### Part 1 – Description of the Incident

[A picture of the accident site – inside a rubble-strewn building – is shown below. The mine crater is alongside the fallen visor.]



Narrative: During the removal of rubble, sand and rubbish in a holding area inside a building (area has been cleared with metal detector and excavation drills in April 2003 by [the same demining group]), the deminer was walking backwards and reaching the rear wall to fill his shovel again, as an uncontrolled detonation occurred. The detonation caused the traumatic amputation of his left foot.

The area is located in front of a doorway inside a building, which was used since April 2003 as holding area for rubble, sand, rocks and vegetation. The area had been cleared in April 2003 under the supervision of [Name removed].

The crater was around 12 cm deep and 30 cm wide some parts of plastic body of the mine were found inside and around the crater. Due to the nature of the ground inside the building – sand mixed with rubble – it was quite difficult to determine the exact depth and diameter of the crater.

[Parts of the mine are shown below.]



The weather was clear and hot. There was no vegetation. The ground was mixed, “As the ground is a mix of sand and rubble, consequently it can be classified from soft to hard.”

The last external QA was on 23<sup>rd</sup> September by DMAO Vavuniya personnel.

The Victim had completed his basic deminer course in November 2002.

The team had been working at the site for eight months, working 149 days.

On the day of the accident they had been working for 3 hours and 45 minutes.

The Victim was wearing PPE and visor, and there was "no damage on PPE/Visor resulting to the blast or projection of plastic parts of the mine body".

[The Victim's left shoe is shown below.]



It took four minutes for medics to start treatment which went on for 15 minutes before the Victim was taken to hospital in a journey that took 21 minutes. The ambulance arrived 11:40 AM in the Mannar Govt hospital and the treatment was terminated by 14:00 PM.

## **Internal Investigation Report: MAN/03/002**

### **Introduction**

This accident report has been written in accordance with the terms of reference supplied by Mrs. [Name removed] [Technical Advisor] District Mine Action Office Vavuniya assigned by [Name removed] [Senior Advisor & Secretary National Steering Committee on Mine Action]. A copy of the terms of reference is attached as Annex a.

1. Following persons investigated the circumstances surrounding the mine incident:

[Names removed]

- 2. When, where, how and why the accident occurred**

The accident occurred Wednesday 08th October 2003 at approximately 11:00 am on the demining site in Thalaimannar Pier (Mannar District of Northern Province of Sri Lanka; Long/Lat E79° 43' 50.70" / N09° 06' 22.70"). There were several witnesses while the accident occurred, such as the supervisor, team leader, section leader and one deminer.

### **Progression of accident**

During the removal of spoil (rubble, sand, metal pieces, rubbish) out of the holding area inside a building (area has been cleared with metal detector and excavation drills in April 2003), the deminer was walking backwards and reaching the rear wall to fill his shovel again, as an uncontrolled detonation occurred. The detonation caused the traumatic amputation of his left foot.

### **The minefield in general**

The minefield is situated between the Navy base (3m high wall) and the main road in Talaimannar Pier. The minefield contains a number of abandoned buildings, is clearly fenced off and has been used over the past years as a rubbish dump. Its purpose was to protect the Navy base against an attack from east and has a clear pattern. On the beach side the mines were laid in a 4-row mine belt. The remaining part of the minefield contains more than 20 abandoned buildings where the mines were in front of doorways, below windows and on the

backside (east side) of the buildings. As such the team working in Talaimannar was well aware of the critical spots of this minefield. By the end of September the team had cleared over 12,000 m<sup>2</sup> and 1,165 AP mines.

### **The accident site**

In April 2003 the team still carried out technical survey. The main objective was to obtain the required access throughout the entire minefield. Since the area was restricted by heavy vegetation, there was a need for temporary holding areas. The supervisor in charge decided the building (shop) would be an appropriate site for rubble, sand, metal pieces and vegetation. Consequently the inside of the building has been entirely cleared with metal detector and excavation drills in April 2003 and 3 mines (Chinese Type 72 A) were found. The supervisor decided to tape off the short corridor adjacent to the shop – to be cleared later. Nevertheless, the supervisor, the team leader and deminer visually inspected the corridor from the doorway, as such standing on the spot, where the accident happened. During the period April to October the site has been used intensively as holding area – left side for vegetation and right side for rubble, sand and metal pieces – consequently the ground has been walked over countless times.

### **Observations**

Following observations are clear evidence that [Demining Group]'s worksite (minefield Talaimannar Pier east) has undergone a certain level of intrusion, because:

1. the local population did not consistently stop throwing rubbish into the area after [Demining Group] started the clearance operations;
2. evidence of disturbance / destruction of the permanent fence around the minefield;
3. recently, in 2 cases where we cleared access to abandoned buildings, the team and section leaders checked the inside of the building and as well visually through the windows and all doors if there is any evidence of mines. They did not find anything. A couple of days later as they did the planning for the clearance around these buildings, they found 2 AP mines (Chinese Type 72 A) laying close to a doorstep and outside in front of a window. It was very obvious these mines were placed and/or thrown there, as they would have been visible before.
4. in one of these two buildings we found evidence that local were using the building as access to collect coconuts during our absence.

The incidents were reported to the respective authorities and the locals were asked not to enter the area unless [Demining Group] has completed the clearance. Mine Risk Education (MRE) is an ongoing process executed by the local NGO called CTF.

### **Conclusions / possible options**

By taking into consideration all facts and talk over various scenarios the internal investigation team came to the following options regarding the mine in previous cleared ground, which then caused the uncontrolled detonation.

**Option 1)** [Demining Group] missed the mine during the previous clearance in April 2003

The entire building has been cleared by detector and where necessary by excavation drills. Especially the area close to the doorstep – where the uncontrolled detonation happened – was cleared purely by excavation due to the high metal contamination, the close presence of the reinforced concrete wall and red bricks in the corner, which eliminated the proper use of the metal detector. The inside of the building has been used as holding area and has been walked over countless times. The spoil carried into the building was the result of excavation in areas near by; consequently it is impossible to miss an item of the size 7.8 x 3.8 cm in green colour.

=> Therefore Option 1 unlikely

**Option 2)** While clearing the corridor the mine was dislodged and rolled down into the area where the accident happened

Very unlikely since the 4 mines found in the corridor were buried and additionally covered (approx. 30 – 40 cm) by rubble. If the mine rolled down, the deminer who assisted (the casualty) to clean the rubble, would have seen the mine laying on the surface because his position / view was directed all the time towards the rear wall / doorstep.

Note: A comparison blowing up of a AP mine type 72 A buried 5 cm inside the building (carried out 14.10.) resulted to the same extend of crater, consequently the investigation team concludes the mine had to be buried.

=> Therefore Option 2 unlikely

**Option 3)** Someone discarded the mine after we had cleared the area

**Option 4)** Someone purposely planted the mine after we had cleared the area

Particular observations (described above) indicate the direction of options 3 and 4. Nevertheless, the investigation team is not able to give a clear statement whether option 3 or 4 is more likely the truth.

=> Therefore Option 3 or 4 in all probability

### **Recommendations**

(1) The investigation team considers the time factor – start of task till handing over – as one of the critical issues regarding the clearance site Talaimannar Pier east. On the one hand [Demining Group] should have pushed handing over the cleared area part by part as a ongoing process, consequently to limit the risk to be liable by resettle people as soon as possible. On the other hand and for the future [Demining Group] must take this factor into consideration when planning clearance tasks – divide large areas into sub-areas.

(2) The local authorities have to be increasingly involved in the security and appropriate policy of such minefields. In addition all players in mine clearance and UNDP Mine Action need to discuss and propose adequate solutions regarding “secure access to minefields”. [Demining Group] will take immediate action to reinforce the fencing and set-up a single entry/exit of the remaining part of the Talaimannar Pier east minefield.

(3) The entire inside of the building (shop) must be re-excavated. All sensitive areas (backside of the buildings, doorways and outside windows) in the southern part of the minefield, which will be handed over soon, have to be re-checked. In addition all holding areas have to be re-checked.

Note: The team completed these tasks 17th October and no mines or UXO were found.

(4) The investigation team considers the process of reinforced / complete Mine Risk Education (MRE) as indispensable.

### **The cause, nature and extent of injuries caused as a result of the accident**

The deminer was walking backwards and reaching the rear wall (his left foot must have had a distance of approx. 30cm from the wall/doorway) to fill his shovel again, as he must have stepped on the AP mine (Chinese Type 72 A) and an uncontrolled detonation occurred. The detonation caused the traumatic amputation of his left foot.

### **The cause, nature and extent of damage to any property**

There was no damage caused to any [Demining Group] equipment or private property.

### **The level of training and experience of the people involved in the accident**

Both deminers, the casualty and the deminer clearing the site in April 2003, had successfully completed the [Demining Group] basic deminer course in November 2003. Consequently both had at that time 4 respectively 9 months operational experience in the field what is considered to be a good level of experience particularly after being deployed most of their time in a minefield like Talaimannar Pier east. Both deminers cleared up to date more than hundred AP mines.

### **The daily work schedule of the organisation and the specific work schedule of the day of the accident**

Work schedule according to [Demining Group] SOP (part 5, para 5.11.2 and 5.12): Deminers are not to work for more than 50 minutes and a 10-minute break.

Specific work schedule: As it gets very hot in the afternoon, the team starts as soon as there is full daylight. In general each shift is maximum 45 minutes followed by a 15-minute break. At 08:00 am the team has a 30-minute breakfast break and between 12:15 pm and 01:00 pm a 45-minute lunch break. The last shift finished at 01:45 pm consequently the cumulative productive operational time was 5 hrs 15 minutes. Following the last shift, the demolition of cleared mines and the cleaning of all equipment take place. Approx. 03:00 pm the team heads back to the field base in Pesalai.

The extend of leave and rest periods for deminers preceding the accident

The deminers have every month a long weekend (3 days) and over Christmas/ New Year [Demining Group] shuts down operations for 2 weeks.

#### **Dates of last internal QA and results of that QA**

Internal QA is an ongoing process executed by supervisor, team leader and section leader. Areas cleared by metal detector will be partly re-checked. However, the areas cleared by full excavation will not be re-excavated but the drills are continuously supervised.

#### **Dates of last external QA and results of that QA**

External QA has been carried out 3rd and 23rd of September. The results were positive and no complaints reported.

**The suitability of PPE** worn by deminers and the demining equipment being employed on the site. Determine the extend to which the use of PPE assisted in the reduction on injuries to the deminer

The deminer was wearing his personal protective equipment – vest and visor. This protective equipment will not prevent or reduce the injury of such an accident.

**Dates of last refresher training** for the team and if the team involved in the accident attended that training

The last refresher training was carried out by the end of June 2003 (after the occurrence of [Demining Group]'s first accident in Talaimannar Pier east) on the following issues:

Action “on signal reading and investigation” including immediate reporting to supervision staff in case of any problems or difficulties occur; “full excavation drill and using detector in areas heavily contaminated by metal”

Note: The action on “full excavation drill and using detector in areas heavily contaminated by metal” was re-trained by re-clearing the entire beach area where the first accident happened.

**The level of medical support** and evacuation available on that day of the accident and the extend of training and preparation prior to the accident

One (1) ambulance and 2 trained medics with fully equipped trauma kit were available on site. The medics and ambulance reached the deminer within approximately 4 minutes of the detonation. He was immediately given first aid and evacuated to Mannar Base Hospital, in accordance with the casualty evacuation drill. The medic acted professionally, quickly and in accordance with his training.

**Determine whether the injury was contributed to or caused by:**

#### **1. An error in SOP of the organisation**

The accident was neither contributed to nor caused by an error in the SOP.

#### **2. An error in application of SOP by the deminer involved**

As the deminer was cleaning in a previously cleared area no error or breach of the SOP occurred from the side of the deminer.

#### **3. A failure or weakness in the command and control structure imposed by the agency**

No obvious failure in the command and control structure imposed by [Demining Group].

#### 4. Environmental conditions – terrain, vegetation, weather

No, the weather was good at the accident time no strong wind or unusual temperature was reported.

#### 5. Any other cause

Most likely a disposed, relocated or re-laid through a third party.

#### The report is to make conclusions on the following:

a) The key factors contributing to the accident; this may include any shortfalls in training, procedures, equipment or management

No specific key factors contributing to the accident.

See Para 2a) for observations, conclusions and recommendations

#### The report is to make recommendations on:

a) Modifications of training or procedures

No modifications of training or procedures are required.

b) Modifications to equipment

No modifications to equipment are required.

c) Corrective action required for management (command and control) of the minefield site

It is recommended to secure access for third parties into the minefield. {Demining Group} will immediately reinforce the fencing of the remaining un-cleared area. Planning and clearance of large tasks must consider the partitioning as a key factor.

For more details, see Para 2a) for observations, conclusions and recommendations

d) Any other immediate or longer-term action that should be taken to prevent such accidents occurring in the future.

No. See Para 2) for observations, conclusions and recommendations

Signed: [Demining Group] Programme Manager and Senior Technical Advisor

[Scanned versions of witness statements are held on file.]

### Victim Report

**Victim number:** 588

**Name:** [Name removed]

**Age:** 24

**Gender:** Male

**Status:** deminer

**Fit for work:** yes

**Compensation:** Not made available

**Time to hospital:** 40 minutes

**Protection issued:** Frontal apron

**Protection used:** frontal apron, Long visor

Long visor

#### Summary of injuries:

AMPUTATION/LOSS: Leg Below knee



COMMENT: See Medical report.

## **Medical Report**

The following is the content of a Medical report from "Base Hospital, Mannar", dated 14<sup>th</sup> October 2003, summarised for anonymity.

The victim was admitted at 11:40 on 8<sup>th</sup> October 2003. The below knee (left) amputation is done. I am of the opinion that he needs about three months bed rest and physiotherapy.

Signed: District Medical Officer

In 2006, it was reported that the Victim had been re-deployed by the Demining Group but had subsequently left their employment.

## **Analysis**

The primary cause of this accident is listed as "*Unavoidable*" because the mine was either placed after clearance or missed during clearance some months before, so the Victim was not searching in the area. The secondary cause is listed as a "*Field Control inadequacy*" because the investigators recognised that the delay in completing this section of the site may have contributed to the accident by "inviting" the public to place devices in the ruined building, so recommended changes to site management.

Despite the fact that the accident reports are "internal", they appear to have been carried out with a view to determining and reporting the real causes, which is unusual enough to be worthy of note.