

# DDAS Accident Report

## Accident details

<b>Report date:</b> 19/05/2006	<b>Accident number:</b> 312
<b>Accident time:</b> 11:45	<b>Accident Date:</b> 17/06/1999
<b>Where it occurred:</b> Maganja da Costa Airstrip, Zambezia	<b>Country:</b> Mozambique
<b>Primary cause:</b> Field control inadequacy (?)	<b>Secondary cause:</b> Management/control inadequacy (?)
<b>Class:</b> Missed-mine accident	<b>Date of main report:</b> 20/06/1999
<b>ID original source:</b> GZ/AVS2001:MZ01	<b>Name of source:</b> HT (field)
<b>Organisation:</b> Name removed	
<b>Mine/device:</b> PMN AP blast	<b>Ground condition:</b> grass/grazing area hard trees
<b>Date record created:</b> 20/02/2004	<b>Date last modified:</b> 20/02/2004
<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>	<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

no independent investigation available (?)  
inadequate metal-detector (?)  
disciplinary action against victim (?)  
incomplete detonation (?)

## Accident report

The demining NGO involved made available their internal investigation report during 2001. The report is reproduced below, edited for anonymity.

### 1. General

1.1 The airstrip at Maganja da Costa was a target for RENAMO attacks during the Civil War. As a result the FRELIMO forces stationed at the small barracks at the end of the airstrip laid a protective anti-personnel minefield in front of their trench line and along the edges of the airstrip. For task site location, see map copy at Annex A [Annex A not made available].

1.2 The [demining NGO] has been demining at the site since June 1994. The clearance plan has been in 3 distinct phases. Phases 1 and 2 are completed, with work currently taking place on phase 3 along the eastern edge of the airstrip. This current period of work started on 12 January 1999 and is being conducted by Team 1 of [the demining NGO in] Zambezia.

1.3 In the past there have been 2 accidents at the site during demining activities. On 6 March 1995 a deminer accidentally detonated a PMN and subsequently died of his injuries the next day in hospital. On 7 March 1999 the [then] programme manager accidentally detonated a PMN during his investigation of the previous days accident. As a result he lost his right hand and foot. At 11:45 hours on 17 June 1999, a Deminer accidentally detonated an explosive device. Fortunately he did not sustain any serious injuries.

1.4 The internal accident investigation was conducted on Saturday 19 June 1999 and involved the following internal NGO personnel: Nampula/Niassa Programme Manager, Trainee expatriate, Zambezia Programme Manager, Mozambique Operations Manager, Zambezia Provincial Operation Manager.

1.5 As well as detailed scrutiny of the accident site, interviews were conducted with the following personnel involved: Team 1 Supervisor, Trainee Supervisor and a Team 1 Deminer.

For relevant statements regarding the accident, see Annex D. [Annex D was not made available.]

### 2. The accident

2.1 Team 1 began this phase of clearance of this task on 12 January 1999. The Team Supervisor took up his position four weeks prior to this report. During phases 1 and 2, two x anti group mines, 126 x anti personnel blast mines and three items of UXO were destroyed. To date, during phase 3, one Type 72A anti personnel blast mine and two items of UXO have been destroyed.

2.2 The victim was working on an area on the eastern side of the minefield. For details, see detailed site sketch map at Annex B. [Not made available.] The method of clearance was with a detector as is the group's normal practice. The detector being used was an Ebinger 535. On the morning of 17 June, the victim had completed clearance of a one 5m area on the front right edge of his lane. He then started clearance of the front left side of the lane. At this stage he had not had the 5m recently completed checked by the assistant supervisor assigned to monitor this particular section of the minefield. This essential second check is part of the demining NGO's Standard Operating Procedure (SOP). Work on the left lane was obstructed by a tree so the victim cleared 1x1m boxes from the side of the right lane.

2.3 At 10:45, the victim was nearing completion of the 3<sup>rd</sup> box, and was just standing up to remove some grass that he had cut, when an unplanned explosion took place at his feet. It transpired that he had inadvertently detonated an explosive device.

2.4 The explosion propelled the victim back along his lane in a safe direction. The victim then ran out from the back of his lane. When the explosion took place both the Team Supervisor and the Trainee Supervisor were in close proximity. The Team Supervisor had just passed the back of the lane and was walking away towards the eastern edge of the minefield 30m away. The Trainee Supervisor was returning to the victim's lane which he knew was due to be checked soon. The Trainee Supervisor alleges that he was at the back of the lane and

was close enough to see the explosion take place. The Team Supervisor ran towards the lane in order to investigate. He reached the victim first and performed the following actions:

- a. Radioed to Assistant Supervisor to whistle that there had been an accident.
- b. Stopped the victim as he emerged (running) from the back of his lane.
- c. Removed the victim's boots and assessed his injuries.
- d. Confirmed that the victim's injuries were not serious and then walked to the Control Point in order to report the accident to HQ.

2.5 The Team Supervisor states that during this period the paramedics had moved to a predetermined position and waited for further instructions. The deminers working either side of the victim had collected the stretcher from the paramedics and had taken it to where the victim was waiting at the back of his lane. However the victim was able walk to the Control Point under his own steam.

### **3. The accident investigation**

3.1 On Saturday 19 June 1999, the internal investigation took place. The following procedure was followed:

- a. General briefing on the task was given by the group's Mozambique Operations Officer.
- b. Interview of personnel directly involved.
- c. Detailed study of accident site.
- d. Testing of the detector used before accident.
- e. Drawing of conclusions and recommendations.

3.2 The study of the accident site revealed that:

The victim had missed 2 pieces of metal in his lane before he then missed the explosive device. The first was a brass drawer handle buried 20cm below the surface. This area had been checked by both the Assistant Supervisor and the Team Supervisor on the previous day and nothing was detected. The second piece of metal was a rusty 7cm nail which was located on the surface of the right hand lane that the victim had completed that day but had not been checked at the time of the accident.

The victim had inadvertently activated a PMN anti personnel blast mine which he had failed to detect in his lane. The seat of the blast was littered with fragments of the Bakelite body, metal operating parts and lumps of TNT explosive. This was a clear indication that the PMN had failed to function fully.

The position of the device was in an area at the edge of the lane that should been covered by the detector head from 3 different angles if the group's SOPs were being followed.

3.3 Initial testing of the Ebinger 535 detector that was used before the accident showed that it was failing to give as strong a detection signal as the Ebinger 420 that was used in the investigation.

### **4. Conclusions in relation to the accident**

4.1 Based on the evidence gained from interviews, consideration of the accident circumstances, and detailed assessment of the accident site, the following conclusions are drawn:

- a. The victim had failed to have a 5m lane check prior to moving on to further clearance. The casual manner in which the victim continued to work without having had a 5m check would suggest this is not the first time this SOP had not been adhered to. This is reason for concern.
- b. The brass drawer handle that was not picked up by the victim, or in any of the subsequent checks, gives initial indications that the detector being used by the victim was not giving a clear signal for metal fragments deeper than 15cm. This was subsequently proven to be the case for the PMN which the victim had failed to detect on three different sweeps.

- c. The fact that the victim was working beyond the seat of the blast indicates that he was probably on top of the mine for some time before it was finally compressed enough to be activated. This would lead to conclusion that the mine was deeply buried (15-20cm) and as such difficult to activate due to the hard nature of the ground.
- d. The debris left after the blast shows that only the detonator was initiated and not the main charge. This is most likely due to the deteriorated state of the explosive. Had this not been the case then it is undoubted that the results would have far worse if not fatal.
- e. The actions by the Supervisor and medical staff after the accident confirm that they have prepared well for such an eventuality. It is fortunate that further action by any of them was required in this instance.

**5. Resultant actions**

5.1 The victim's accident can be primarily attributed to his interpretation of a weak and ambiguous signal from his detector for metal objects buried deeper than 15cm. This does not however excuse the fact that the victim failed to have his lane checked after clearing 5m, but simply continued to demine. It also does not excuse the fact that DM missed a nail on the surface of the 5m lane that he failed to have checked. As a result of these circumstances the following actions will take place:

The victim is to be dismissed for failing to follow two clear demining NGO SOP's. Failing to complete a 5m check and leaving metal in a reportedly cleared lane.

All Ebinger 535 detectors are to be withdrawn from the field pending subsequent more strenuous testing (possibly by the manufacturers).

Full re-clearance of the ground covered by the victim on the day of and the day before the accident will take place, and a thorough evaluation will be made of clearance already completed.

All demining team supervisors will be spoken to by their respective programme managers with regards quality control ( particularly 5m checks) in the minefield.

Signed: Programme Manager

Nampula / Niassa

[The demining NGO were operating in one-man-teams, with the enhanced levels of supervision that this entails. They routinely squat or kneel to excavate. The group always wears a full-face visor and a short frontal apron when in mined areas.]

**Victim Report**

<b>Victim number:</b> 394	<b>Name:</b> Name removed
<b>Age:</b>	<b>Gender:</b> Male
<b>Status:</b> deminer	<b>Fit for work:</b> yes
<b>Compensation:</b> not made available	<b>Time to hospital:</b> not applicable
<b>Protection issued:</b> Long visor Short frontal vest	<b>Protection used:</b> Long visor; Short frontal vest

**Summary of injuries:**

INJURIES

minor Foot

#### COMMENT

No medical report was made available.

### **Analysis**

The primary cause of this accident is listed as a "*Field control inadequacy*" because the victim was working in breach of SOPs and his error was not corrected. The level of supervision when using a one-man-drill is usually high but in this case it was inadequate. The victim was obliged by management to work with an inadequate detector and inadequate supervision, yet he was punished by being dismissed. The selection, training and monitoring of the Field Supervisors was inadequate. Given that these are responsibilities of those higher in the management chain, (along with the provision of adequate detectors) the secondary cause is listed as a "Management/control inadequacy".

The deminer was dismissed for breaching SOPs but it was not the breach of SOPs that led to him missing a mine. The deminer was working with a detector that was withdrawn following the investigation because it was incapable of reliably detecting the mine involved. The demining group should have had adequate daily detector checks to ensure that the tool was capable of working appropriately. The failure to do so was a "*Management/control inadequacy*" that was only noticed when the accident occurred.

The PMN detonator is very small indeed and inside an HE booster. It seems likely that the PMN booster and detonator were initiated without detonating the main TNT fill.