

DDAS Accident Report

Accident details

Report date: 19/05/2006	Accident number: 314
Accident time: 13:00	Accident Date: 07/06/2000
Where it occurred: Power lines North of Rio Ligonha, Nampula Province	Country: Mozambique
Primary cause: Unavoidable (?)	Secondary cause: Inadequate equipment (?)
Class: Excavation accident	Date of main report: 09/06/2000
ID original source: GZ/AVS2001:MZ03	Name of source: HT (field): IND 132
Organisation: Name removed	
Mine/device: M969 AP blast	Ground condition: hard metal fragments pylons and surrounds
Date record created: 20/02/2004	Date last modified: 29/02/2004
No of victims: 1	No of documents: 1

Map details

Longitude: 38° 30' 18" E	Latitude: 15° 30' 50" S
Alt. coord. system:	Coordinates fixed by:
Map east:	Map north:
Map scale:	Map series:
Map edition:	Map sheet:
Map name:	

Accident Notes

inadequate medical provision (?)

inadequate equipment (?)

squatting/kneeling to excavate (?)

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 electricity power lines north of the Rio Ligonha in Nampula Province were a regular target for RENAMO sabotage during the Civil War. As a result, 34 of the high tension towers on the section from Mucarre to Murrupula were protected from further attack through the laying of a small protective anti personnel minefield around the base of each pylon. These mines remain today, and are preventing EDM from carrying out essential repair and rehabilitation works.

1.2 The Niassa Survey/UXO team deployed to begin a third phase of clearance around the base of these towers on 17th April 2000. For task site location, see map copy at Annex A [not made available]. At 13:00 on 7th June 2000 the victim accidentally detonated an explosive device.

1.3 The internal accident investigation was conducted over 7/8th June and involved the following personnel: Mozambique Country Manager, Mozambique Chief Administrator, Mozambique Survey Officer.

1.4 As well as a detailed scrutiny of the accident site, interviews were conducted with the following personnel: Niassa Survey/UXO Team Supervisor, Trainee Supervisor, Niassa Survey/UXO Team Medic, Niassa Survey/UXO Team Deminer - victim)

1.5 Also present on the 8th June was a representative of IND who attended all interviews as well as the accident site.

2. Events leading to the accident

2.1 The Survey/UXO team began a third phase of clearance of the task on 17th April 2000. Each tower is suspected to be protected by up to 45 mines. These were laid in clusters of 8 to 10 around the base of each of the four legs. For this particular task, where there is the possibility of causing further damage, all mines found are moved to a demolition pit located away from the towers. By 7th June 2000, 531 M969 Portuguese anti-personnel blast mines had been destroyed. 18 of the 34 towers had been cleared with work on-going at another five.

2.2 Tower 231 is situated 1400m west of the Rio Lalaua. The soil has a high laterite content, and so the clearance was being conducted using a combination of detector and excavation using an enxada. This is a standard method used by our group in Mozambique. By the 7th June 2000, 21 mines had been found around the tower, with work still to be completed on the remaining South West leg.

2.3 On 7th June 2000 the victim completed 5m of clearance which were checked by the Team Supervisor. The victim then went on to clear a further 1.3m before indicating that he had located a mine. The mine was lying on its side 30cm from the leg of the tower. The Team Supervisor examined the mine before tasking the Trainee Supervisor to move the mine to the demolition pit, during the 12:50-13:00 break period. At 13:00 the final 50 minute work period began. The Team Supervisor observed the victim restarting excavation then began walking away from the tower. When the Team Supervisor was 17m away, an unplanned explosion occurred.

3. Treatment of the victim and subsequent evacuation

3.1 On hearing the unplanned explosion, the Team Supervisor (who was only 17m away), immediately called by VHF radio for the ambulance and medic to move to tower 230. The team supervisor then moved to assist the victim who was on his feet and staggering in the cleared area under the tower. The victim was heard asking "where is my enxada, where is my

visor? “. The Team Supervisor guided him from the area of the tower to the access road some 13m away. The Team Supervisor noted during a later interview that the victim was conscious and remained quite calm throughout.

3.2 On hearing the unplanned explosion and subsequent VHF radio message the medic and Trainee Supervisor moved towards tower 230 from their positions at the medical point and demolition pit respectively. On arrival the medic performed the following actions.
Confirmed the victim's level of consciousness and breathing (he was able to talk calmly).
Cleaned and dressed wounds to both hands.
Inserted a cannula, set up an IV giving set and began to administer 500ml of Ringers solution.
Administered 10mg of Nubain (pain relief drug) via the cannula.
Administered 10ml of Crystapen (liquid antibiotic) via the cannula.

3.3 At 13:03, the Country Manager and the Chief Administer arrived at the task Control Point on a scheduled visit. They were told that an unplanned explosion had taken place by the team driver, who subsequently drove 1000m to recover the victim. By 13:10, some 9 minutes after the blast, the victim was loaded on a stretcher to the rear of a Land Rover 130 covered pick up and left for Nampula Hospital. At 13:10, the Team Supervisor reported the accident in full to headquarters in Nampula .

3.4 At 13:18 headquarters informed Nampula Hospital, by phone, the details of the accident and informed them to expect the casualty. A Hospital Trauma kit was taken to the hospital by our Survey Officer who awaited the arrival of the victim. At 15:25, some 2 hours and 24 minutes after the accident, the victim was handed over to the waiting medical staff at Nampula Hospital. He was immediately examined by the duty medic. At 16:00, he was examined by a doctor. At 17:00, he was released from hospital.

4. The accident investigation

4.1 The internal accident investigation took place over Wednesday and Thursday 7/8th June 2000. This involved a detailed study of the site, almost immediately after the casualty left for the hospital, and on-site interviews and further site visit the following day. The visit on day two was also accompanied by a representative from the IND.

4.2 The study of the accident site revealed that:

- The nature of the victim's injuries, the damage to his visor, the physical evidence gathered around the seat of the blast and the history of the task all indicate that he had inadvertently detonated an M969 anti personnel blast mine whilst excavating ground with an enxada (hoe) at the front of his lane at pylon 231.
- Due to the close proximity of the steel leg of the pylon the victim had been unable to use his detector to give any pre-indication as to the presence of any suspect objects. Therefore he had been excavating using an enxada. The ground was very hard and would have required the deminer to apply greater than normal pressure in order to make any headway. The damaged head of the enxada was encountered in uncleared ground some 6m from the site of the blast. For details, see photos at annex C page C-1 [not made available].
- The previous mine found was lying on its side at the base of a large spoil heap piled at the western edge of the pylon. The seat of the explosion was 30/40cm from the position of the previous mine (unusually close even for this particular task).
- The victim had been wearing his protective equipment (vest and visor) correctly. This is backed up by the evidence of damage to the *outside* of both vest and visor and to the minor injuries sustained by the deminer.

5. Conclusions in relation to the accident

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

- The M969 was struck on the pressure plate causing it to detonate. The mine was lying on its side (in a similar manner to the previous mine found) probably because it had been washed down the spoil heap by rain water. No blame can be attached to the deminer or team. Our SOPs were at all times adhered to.
- The deminer's injuries were considerably minimised due to the correct manner in which he was wearing his protective vest and visor.
- Having made an assessment of the casualty the team medics applied the correct treatment before quickly moving the casualty to the hospital. The hospital were correctly notified of a casualty and one of our "hospital bags" was made available.
- A clear accident report was made to Nampula headquarters at 13:10. However, this was a full 8 minutes after the explosion had taken place. The driver should have made a short initial situation report alerting HQ and all other radio traffic that use of the radio should be minimised.

6. Summary actions

6.1 The underlying causes leading to the accident can be considered to be:

a) The close proximity of the metal leg of the pylon to the mine discounting the use of a metal detector to give any advanced warnings.

b) The high spoil heap lying adjacent to the pylon which has over time had rain water run off which has caused some mines laid on or around it to be displaced.

6.2 These circumstances draw into question the use of excavation around any towers surrounded with unusually high or steep slopes. An alternative method must be found. Since the immediate objective is to clear areas around the base of the towers in order to allow EDM crews access to make emergency repairs, it is suggested that the spoil heap at tower 231 is moved away from the base of the tower using our mechanical mine-clearance capability. The spoil can then be marked and cleared at a later date.

6.3 Since [the demining NGO's] well proven SOP' were not by themselves the cause of the accident normal demining should continue, though all senior operational staff should be notified of the causes.

Signed: Country Manager Mozambique

Annexes referenced in the report were not made available.

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.

An IND report was made available, but could not be copied. The accident code was 000985/Code 101. The map reference was recorded as: Lat: 15 deg 30' 50"S Long: 38deg 30'18"E

The victim was born on 1st January 1964.

The report included little detail, referring the reader to the internal accident report above. The only additional information was that equipment worth US\$50 was damaged.

Victim Report

Victim number: 396	Name: Name removed
Age: 36	Gender: Male
Status: deminer	Fit for work: yes
Compensation: not made available	Time to hospital: 3 hours
Protection issued: Long visor Short frontal vest	Protection used: Long visor; Short frontal vest

Summary of injuries:

INJURIES

minor Hands

COMMENT

No medical report was made available.

Analysis

The primary cause of this accident is listed as “*Unavoidable*” because it seems that the victim was working in accordance with his SOPs at the time of the accident. The secondary cause is listed as a “*Inadequate equipment*” because the methods used and equipment available were not appropriate, and the provision of appropriate equipment from detector to ambulance is a management responsibility.

The deminer was obliged to use a full excavation method in hard ground using an enxada.

The use of some kind of pick-axe or hoe is not unusual when conducting area-excavation. The tool is swung in at a low angle and used to shave the face of the excavation in a slow advance. This is the second of three accidents involving this demining NGO and an enxada in Mozambique. See the accidents on 14th April 1998 and on 7th July 2000.



A photograph of an enxada is shown above.

The failure of the group’s management to provide an on-site ambulance is surprising. The victim was evacuated in a Land Rover and driven over bad roads for two hours and a half hours. A full three hours elapsed before he was seen by a doctor. His injuries were very light, but had they been heavy the means of evacuation could have been life-threatening.

The internal investigating team did not acknowledge that the group’s failure to provide a dedicated on-site ambulance was a failing. It was “unusual” to the point of being almost unique amongst professional groups in Humanitarian Demining.