8-26-2008

# DDASaccident577

Humanitarian Demining Accident and Incident Database
*AID*

# DDAS Accident Report

## Accident details

| | | | |
|---|---|---|---|
| **Report date:** | 13/06/2008 | **Accident number:** | 577 |
| **Accident time:** | 10:48 | **Accident Date:** | 22/08/2005 |
| **Where it occurred:** | SS 19, Nimule to Juba Road, Lokichokkio | **Country:** | Sudan |
| **Primary cause:** | Management/control inadequacy (?) | **Secondary cause:** | Inadequate training (?) |
| **Class:** | Missed-mine accident | **Date of main report:** | 26/08/2005 |
| **ID original source:** | None | **Name of source:** | UNMAO Sudan |
| **Organisation:** | [Name removed] | | |
| **Mine/device:** | PMN AP blast | **Ground condition:** | grass/grazing area<br>route (verge)<br>sparse trees |
| **Date record created:** | | **Date last modified:** | 13/06/2008 |
| **No of victims:** | 1 | **No of documents:** | 1 |

## Map details

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|---|---|---|---|
| **Longitude:** | | **Latitude:** | |
| **Alt. coord. system:** | | **Coordinates fixed by:** | GPS |
| **Map east:** | E 031 57 34.3 | **Map north:** | N 03 59 25.0 |
| **Map scale:** | | **Map series:** | |
| **Map edition:** | | **Map sheet:** | |
| **Map name:** | | | |

## Accident Notes

inadequate area marking (?)

inadequate communications (?)

inadequate medical provision (?)

inadequate metal-detector (?)

inadequate survey (?)

inadequate training (?)

incomplete detonation (?)

mine/device found in "cleared" area (?)

**Accident report**

Details of this accident were made available as a collection of files in June 2008. The files show that two accidents occurred within minutes of each other, and two days after these accidents, a missed AT mine was found by road construction workers at the same task site. The two accident reports have been separated and this report deals with the first accident. See DDAS Accident 578 for the second accident. The missed-mine investigation is included in the report for DDAS Accident 578. The conversion of these files to DDAS format has led to some original formatting being lost. The original files are held on record. Text in square brackets [ ] is editorial.

**Initial report**

Initial reports state that [the Victim] was working in his lane when a he initiated an unknown item. The size of the blast would indicate a partial or fuse assembly. A few seconds later, a larger explosion was heard, where [Name removed] had moved from his lane to assist [The victim]. [The second accident occurred when the rescuer] moved using the shortest possible route, through uncleared area. [See DDAS Accident 578 for details of the rescuer.]

The incident for [the Victim] occurred in a cleared area – to be confirmed

The team were conducting BAC clearance methods in an area identified as an UXO contaminated zone. Both deminers were working in echelon, 25m apart, following the road verge 3m from road centre.

Based on information received to date, it appears that [the Victim], conducting BAC sub-surface clearance was moving within his lane when he initiated an unknown device. [A second deminer] reacted to this accident crossing uncleared ground to help his colleague.

The deminers were working parallel to the road, estimated as 3m from centre.

The area, Chainage 64 + 000 (GPS N 03 59 25.0 E 031 57 34.3) was classified as a UXO contaminated area based on survey information gathered previously. No indications of an AP threat could be obtained.

## Investigation of the mine accident [Demining group]

Investigating officer [Name removed] QA officer Rumbek

Dated 23 – 26 August 05

**Introduction**

On Monday 22 August 05 UNMAS were informed by [International demining NGO] that a mine accident had taken place in Nimule and a request was made to form a investigation in to the incident. UNMAS QA officer from Rumbek was asked to accompany [International demining NGO] to the accident site and carry out a on site investigation

**Sequence of events**

[International demining NGO] team 1 were given task SS 19 route verification and clearance from Nimule to Juba. Team 1 from [International demining NGO] deployed and had carried out a second survey of the road and designated several areas as high risk areas needing to be searched. Both surveys had been carried out using local SPLA engineers and professional witnesses to explain the local military situation. It was agreed by [International demining NGO] that team 1 would divide in to two smaller teams due to the task sizes and locations and one half would work at Moli and the second half would push forward to the mined area at Jebelain approx 2 hours up the road towards Juba. On Thursday 18 August the team deployed to their

new task and set up there admin area at Grid N 03 59 31.5 E 031 57 31.3. The area was classed as a BAC task as the local information gained said it was a accident site and contained UXO only and no mines

On Thursday 18 Aug the team found a TM 57 on the roadside. On Friday 19 Aug a searcher walking down the middle of the road (not in a search lane just walking to his box) discovered a large reading in the middle of the road. This information was brought to the attention of the on site supervisor who investigated further and discovered 2 x TM72 mines laid on top of each other 29 m from the previous mine. Again once the search of the east side was complete the team were tasked with the clearance of the main carriageway before proceeding to the west side of the carriage way. Once the team started to search the west side they discovered another TM57 on the road edge 19 m from the previous 2 mines in the centre of the road. The search continued of the west side when the deminer in lane 3 stood on a AP mine which partially detonated causing deminer 1 to fall forward in to the uncleared area of his search lane.

On hearing the detonation the searcher from lane 4 deminer 2 rushed to help (removing his visor as he left his lane) although this deminer did not raise the alarm but ran to the area cleared in the lane and proceeded to walk in the cleared area to assist deminer 1. As he got towards the end of the cleared lane he also stood on an AP mine which fully detonated.

At the same time the team leader nearest to the incident raised the alarm and the team moved to the accident site. When the Site Supervisor arrived at the lane he discovered deminer 1 had dragged himself from the lane and was at the roadside complaining and the deminer 2 was several meters inside the area with a foot injury. The team were apprehensive and did not really want to enter the lane so the site supervisor picked up a locater and cleared to the injured deminer 2. As he drew near he asked if he could turn around to make it easier to carry him out. This was done and the supervisor picked up the deminer and withdrew to the road.

At the roadside was the medic and the ambulance and so immediate first aid was given. Once the patient had been assessed and stabilised. The ambulance was loaded and the site supervisor followed in his land rover with the second deminer1 to the airfield at Nimule. On arrival at Nimule airfield it was discovered that there was no plane waiting so a radio call was put through to WHISKEY LIMA for a ETA of the plane. Once given the site supervisor decided to leave the airfield and move to the Merlin hospital at Nimule town and seek medical advice from their doctor. The doctor treated the deminer and was happy for the onward movement of the patient as the airplane arrived and so he was evacuated with the site Medic back to Loki and on to Nairobi hospital.

**Geography and weather**

The verges of the roadside out to 13m either side of the centre line in accordance with the road contract. The verges are overgrown with tall grass and minor trees and vegetation. The road itself is a small track running from Nimule to Juba. The team had come from the Juba side and placed the control point at the northern end of the road. The weather was hot sun and clear skies.

**Site layout and Marking**

Site layout was in accordance with the [International demining NGO] SOPs which included a rest area, ambulance point, control point and clearance lanes in accordance with the BAC SOPs. Marking inside the clearance lanes did not comply with the SOPs which state either a brightly coloured rope between two sticks are to be used as a guide for the searcher or brightly coloured traffic cones.

On site the team were using 2 or 3 red topped pickets as the guides.

**Management, supervision and discipline on site**

Management of the site was under the command of the international site supervisor and added to which he had two nominated team leaders all of which patrolled the site looking for problems and correcting them. However once the accident occurred the International supervisor took a hands on role instead of a supervisory role and so command and control was lost during this time.

The team gathered around the accident site while the clearance and recovery was taking place.

The ambulance and medic were on site only a few meters from the accident site while the clearance and recovery of the second deminer was taking place.

The equipment was not properly recovered and marked for investigation.

No map of the site or written report had been assembled before the investigation so it could not be confirmed what equipment had been recovered or from where.

**Communications and reporting**

Communications and reporting consisted of a radio check with lima base in the morning before work and no further check until the accident happened.

The radio log had recorded the following details for the day of the accident.

07:35am from Moli to lima base radio check

10:55am from Moli to lima base mine accident.

11:45 am from Moli to lima base leaving task mobile to Nimule airstrip

1:00pm From Moli to lima base arrival at Nimule airstrip

1:15pm arrival at Nimule hospital

2:05pm confirm plane arrival at Nimule.

It had been agreed between WFP [International demining NGO] and [Name removed] security that the teams on the ground would have Thuraya satellite phones on all sites, the team itself did have a sat phone but it was with the other half of the team 2 hours away.

Radio checks had not taken place at regular intervals during the working day.

There was no comms established between the two half teams so the team at Jebelain was not aware of the accident until much later when informed by the [International demining NGO] HQ in Loki.

The team had no direct communications with their HQ in [International demining NGO] as the SOPs state and so it was 12:55pm before [International demining NGO] HQ were informed and they were given the information from [Name removed] security.

The original radio request only stated a mine accident and none of the information stated in SOPs during the emergency procedure was sent.

[International demining NGO] HQ in Loki was not aware of the accident until they were informed by [Name removed] security at 12:55pm some two hours after the accident.

**Medical and injuries**

Deminer 1 sustained what was described as like a sprained ankle and internal pain in his right leg.

The team had not carried out casevac training since Jul 5 before leave on July 8. SOPs state Casevac training must take place either once a month or on arrival at a new task location.

Records of the last casevac training were recorded in a personal diary not on [International demining NGO] site paperwork that was present on site.

Contents of the Trauma pack could not be checked during the investigation as the team medic had taken his bag with him to Loki and so it was not on site during the investigation.

Several people both within and from external agencies who witnessed the ambulance drive by suggested it was travelling too fast for the local road conditions. Also the used of flashing lights and sirens would be better used only in built up areas or when needed not permanently as this causes people to come to the road to see what's happening and may cause further problems

**Personnel team and statements**

The team had been split in to two teams and so only half the original team were on this particular work site. The team had been working and accredited for 7 months and had not reported any problems. UNMAS had not been on site to QA this team since the accreditation procedure. The statements were taken by UNMAS QA and [International demining NGO].

However they have not been included in my report due to the lack of command and control during the accident there were several inconsistencies which may have confused the investigation. All agreed on the general theme but all remembered different personalities doing different things at different times.

**Equipment and tools**

[International demining NGO] were working with the standard BAC equipment and tools on site.

However due to the command and control breakdown the equipment was not dealt with. Resulting in the actual equipment from the accidents was not available for inspection.

The kit had been removed from site after the accident by one of the team leaders but it had not been kept separate or accounted for in any way.

The team leader stated he had cleared in to the lanes with demining equipment in order to recover the equipment, although no signs of clearance lanes or vegetation cutting and clearance could be seen.

**Mines and UXO involved**

During the investigation a safe lane was cleared in to the two accident sites so an investigation was able to take place. Once the area around the first accident was cleared the remnants of a PMN were collected and removed. The evidence from the second mine suggested it would be the same or similar. The mine accident was 290m from the rest area.

**Dress and PPE**

The team were wearing standard [International demining NGO] PPE consisting of body armour and visor. However it was not collected and marked and so was not available for the investigation team

**Clearance procedures**

Standard BAC clearance procedures and drills were to be used on this BAC site. Once the cleared lane had been breached to the accident site it was noted that the clearance lane was not in accordance with [International demining NGO] SOPs. The cleared lane was 2.5 meters wide and had extended past the short picket (clearance marker) by several meters. It also appeared that the search was being conducted in a front to back method rather than a side to side method.

**Conclusion**

It can be concluded that this accident could have been lessened and even avoided if the [International demining NGO] SOPs had been used correctly on the ground. Had the Threat assessment been upgraded in accordance with the SOPs when the first mine was found on a BAC site then demining drills and equipments would have been able to find all the AP mines. Even without this, had the on site casevac procedures been fallowed and command and control maintained then perhaps the second accident may not have occurred. Had deminer 2 raised the alarm and waited for the supervisor to take command in accordance with the SOP. However it must be concluded that the best medical care was given to the patients and all effort was given to them during their casevac procedure even when things were going slowly.

**Recommendations**

Survey assessments need to be formalised and recorded and this information needs to be on site readily available

Surveys and threat assessments need to speak with more than one source however accurate in order to confirm the on site situation.

Threat assessments need to be formalised and recorded in accordance with SOPs and [International demining NGO] policy.

Threat assessments needs to be reviewed as and when necessary, not just written on day one of the task and ignored till the clearance is finished. If on site conditions change then the threat assessment needs to be reviewed again.

On site threat assessments needs to be communicated to [International demining NGO] HQ regularly any changes need to be communicated at the earliest opportunity

Agreements between [International demining NGO] and [Security company] due to the security situation that state a minimum equipment list on site need to be agreed and implemented and used on all sites. If this equipment Phones etc is not available then the site should be suspended till the equipment can be purchased.

Communications plans and SOPs need to be reviewed in accordance with what actually happens in country and practiced.

Radio checks form a important part of site safety and should be carried out on a regular basis and recorded on the radio log in accordance with SOPs

When using lima base as a communications centre then the casevac procedure needs to be practiced and agreed with them on a regular basis.

The casevac plan needs to be written to take in to account the fact that [Security company] planes may need to be diverted and may not be immediately available on site. This may mean alternative medical facilities need to be located or extra medical equipment issued to take this in to account.

Casevac training needs to be carried out in accordance with SOPs and recorded onsite in the site paperwork.

Medical teams should only move forward to a designated safe area and not adjacent to the continued clearance.

Casevac training needs to encompass all the accident procedure including what happens after the ambulance has left site.

During a casevac the vehicle speed should be acceptable but not excessive depending on the local situation and agreed in company policy

Due to the extended nature of a lot of sites and the extended times to the nearest airfield a review of the current medical training to ensure that the best care is given to any patient. Allowing for all the medical equipment and drugs to be used effectively.

Command and control needs to be maintained at all times to ensure safety.

SOPs need to be checked and written in accordance with what the teams should actually do on the ground.

Retraining needs to be undertaken every time a switch from BAC to Demining or demining to BAC takes place to ensure the procedures and skills are fresh.

Clearance should only proceed when the proper equipment is on site so the SOPs for marking and clearance can be followed and easily understood.

Internal and external QA assessments need to be carried out on a regular basis to confirm team drills and skills.

## Victim Report

| | | | |
|---|---|---|---|
| **Victim number:** | 753 | **Name:** | [Name removed] |
| **Age:** | | **Gender:** | Male |
| **Status:** | deminer | **Fit for work:** | presumed |
| **Compensation:** | Not recorded | **Time to hospital:** | 130 minutes |
| **Protection issued:** | Frontal apron<br>Long visor | **Protection used:** | Long visor, frontal apron |

**Summary of injuries:**

severe Foot

COMMENT: See brief Medical report.

### Medical report

Casualty [the Victim], Fractured right foot, no other injuries. Treatment given: Bandaging of foot. No administrated drugs on site. Pain Killers (orally – administered in Marlin Hospital).

[The Victim] was seen by the Merlin doctor and as he was mobilising independently, he required no further treatment and did not continue to Loki.

### Analysis

The primary cause of this accident is listed as “Management control inadequacy” because the investigator found that there were many on site errors and the site was controlled by an “international supervisor”. The investigator states that after the accident “the International supervisor took a hands on role instead of a supervisory role and so command and control was lost”. That the international supervisor did not know how to react to an accident or how to maintain command and control indicates an extreme failing in terms of his selection, training and management, so the secondary cause is listed as “Inadequate training”. That the Operations Manager had to ask the Programme manager to supply satellite telephones for each separate working party illustrates one of the failings of employing programme managers who do not know basic field requirements. The team should not have been split until after an adequate communication system was in place and proven, but instead the team was deployed with no means of rapid communication. For both security and in case of accident, this decision was irresponsible.

An inadequate survey had been conducted and even after the survey had been shown to be inadequate because mines had been found, the type of clearance was not revised. This is the direct cause of the accidents that occurred. It meant that BAC using ferrous stick detectors was used in an area with known AT mines when minimum metal AT and AP mines should have been anticipated. The stick detector is not suitable for minimum-metal mine search. Even with the PMN AP mine, which has a large metal signature, most of the signature derives from an aluminium alloy band around the top of the mine. Ferrous-metal stick detector cannot detect aluminium alloys. The international site supervisor should have withdrawn BAC and halted work until it was possible to conduct properly organised and marked lane-drills with minimum-metal detectors.

There was inadequate marking on site, and the site was entirely disturbed before the investigation, both of which are serious breaches of SOP. The senior staff “cleared” the suspect lane (on which at least two devices had been missed using a stick detector) using a “locator” (stick detector), so risked stepping on another mine himself.

The investigator reports that parts of a PMN were found at the site of the first detonation. Given the minor injuries sustained from a large AP blast mine, it seems likely that the mine did not detonate completely, or that he was not stepping directly on it at the time.

Two days after the accident the road building company following the deminers found a plastic cased Anti-Tank mine on the road. Fortunately it did not detonate.

The experience and professionalism of the management of the international demining NGO involved appears to have been unacceptably poor and it surprising that the UNMAS authority in Sudan did not withdraw their accreditation. The group is no longer working in Sudan (2008).