DDAS Accident Report

Accident details

Report date:	14/06/2008	**Accident number:**	579
Accident time:	11:45	**Accident Date:**	26/11/2005
Where it occurred:	Lutaya, 3.5 km West of Yei town	**Country:**	Sudan
Primary cause:	Field control inadequacy (?)	**Secondary cause:**	Inadequate training (?)
Class:	Excavation accident	**Date of main report:**	30/11/2005
ID original source:	None	**Name of source:**	UNMAO Sudan
Organisation:	[Name removed]		
Mine/device:	M14 AP blast	**Ground condition:**	dry/dusty grass/grazing area hard metal fragments metal scrap
Date record created:		**Date last modified:**	14/06/2008
No of victims:	1	**No of documents:**	2

Map details

Longitude:		**Latitude:**	
Alt. coord. system:		**Coordinates fixed by:**	
Map east:	E 30 38.728	**Map north:**	N 04 04.534
Map scale:		**Map series:**	
Map edition:		**Map sheet:**	
Map name:			

Accident Notes

handtool may have increased injury (?)

inadequate training (?)

squatting/kneeling to excavate (?)

visor not worn or worn raised (?)

Accident report

Details of this accident were made available as a collection of files in June 2008. 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.

IMSMA Accident report

The deminer was doing clearance around an accident site where an AP mine blew off the tire of a car on the 23rd November. The soil in the area is hard and there are lots of metal pieces in the ground. The mine was detonated by the deminer during excavation most likely due to incorrect procedures. The blast went through a gap between the visor and the vest and caused injuries to the deminers face. Also the thumb on his right hand received injuries. The leather gloves the deminer was wearing saved him from worse injuries.

UNMAO initial report

Introduction

On Saturday 26 August 2005 @ 1250hrs UNMAS Sub Office YEI was informed by [Demining NGO's Acting Ops Manager] that a mine accident had. taken place in LUTAYA and we were asked to participate in the initial accident investigation. UNMAS Ops Officer, [Name removed], accompanied [Demining NGO's Acting Ops Manager] to the accident site where they carried out a on site investigation together.

Summary

The deminer, [the Victim], initiated what appears to have been a M14 AP mine at 1145hrs while excavating in hard ground. The deminer suffered injuries to his right hand thumb and blast/ fragmentation injuries to his face (cuts on jaw, lips and above right eyebrow).

Casevac procedures where immediately started on site by the Section Commander, [Name removed], and the first report of the accident to [Demining NGO] Base was sent at 1150hrs.

After the medic on site had performed ABCD, administered 50mg of PETHADINE the casualty was put in the ambulance where IV fluids (1000ml) and oxygen was given during transport to the [Demining NGO] Hospital in YEI.

The casualty was admitted at the [Demining NGO] Hospital at 1207hrs (approximately 22 minutes after the accident).

Location of Incident

Lutaya village, Yei Town, N04 04.534; E30 38.728

Investigation Team

[Demining NGO officer] and UNMAS Operations Officer, investigated the accident on Saturday November 26th 1310hrs.

Execution of Investigation

We used what had been assessed by [Demining NGO] to be a safe road, it is in daily use by locals and NGOs, leading up to the site of the accident. 25-30 pictures of the area in general, site of accident, detonation site and deminers' equipment were taken from the areas assessed by [Demining NGO] to be safe and from clearance lanes. [Pictures were not made available.]

Evidence

Ground: Dry, hard packed soil.

Two sites of detonation (one from mine initiated by truck earlier in the week, one from the detonation causing the accident) approximately 30cm apart.

Vehicle(s) and Equipment: [Demining NGO] were working with the standard manual demining and PPE equipment and tools on site.

The visor (with apparent damages, and blood on the lower inside, from the blast) was left at the base of the lane where the deminer left it as he took it off after the blast.

The gloves that he was wearing were left approximately 5 metres, back and to the left from the direction of clearance, further way from the visor.

This is the place where the section Commander caught up with the injured deminer.

There is blood on the gloves, and on the ground, at this location.

The right hand gloves' thumb shows clear signs of having been damaged by the blast.

The PPE was taken off the injured deminer as he was being treated by the medic and was left in a spot between the site of the detonation and the position where the deminer was given medical treatment. The PPE has blood on the collar and around the neck.

The deminers' prod was left in his working lane and bears no signs of having been damaged by the blast. The prod can be ruled out as having been the tool that initiated the mine.

The handle of the trowel was found by [Demining NGO's Acting Ops Manager] on site after the on site investigation was concluded and as he was closing the area off.

According to [Demining NGO's Acting Ops Manager] the trowel has clearly been damaged by the detonation. This, and the accounts of the deminer and others involved, identifies the trowel as the tool that initiated the mine. I have not seen the damaged trowel myself.

The detector and other tools were not on site when I conducted the on site investigation. Even though all the equipment belonging to the injured deminer should have been left on site I do not think that the removal of said equipment has in any way had any negative effects on the investigation.

Mine / UXO: The team were conducting Technical Survey on the site of the accident as a result of a truck having initiated what appears to have been an M14 AP mine a couple of days earlier. Judging from the dimensions of the two detonation sites (the mine initiated by the truck and the mine initiated by the deminer) and the injuries sustained by the deminer it appears to have been a case of M14 AP mines.

No remnants from the mines were recovered during the technical survey and investigation.

The mine accident occurred approximately 50m from the resting area.

Casualty(s) (position, clothing, injuries): Injured deminer, [the Victim], was squatting with his left knee on the ground, body facing forward towards the area to be cleared.

He was wearing his visor, PPE and gloves.

While excavating a signal, using a flat nosed trowel with his right hand, the deminer initiated the mine.

The deminer suffered injuries to his right thumb and the blast managed to get on the inside of his visor (between the PPE and bottom of the visor) causing cuts to the lower jaw, lips and right eyebrow.

Incident Details

[Demining NGO] were informed by locals of an incident involving a truck and a AP mine at LUTAYA (SW of YEI) and sent a small demining team to conduct a Technical Survey of the area two days later. UNMAS Ops Officer was informed of this by [Demining NGO's Acting Ops Manager].

Last year [Demining NGO] cleared almost 30000m^2 in the area (Task ID SS001). The site of the accident is approx 100 m west of where that clearance stopped.

However, the accident happened inside the DA called Lutaya 2

The accident site is a flat grass field that has been slashed by the workers at JRS.

Approximately three meters from the site of the detonation of the mine initiated by the truck on November 23rd is a mango tree where the local people usually rest in the shade.

According to the survey report from 2004, an AT mine was removed close to the mango tree in 1998.

The team leader had marked an area 25x25 m around the incident (truck and AP mine Nov. 23rd) site as DA.

The DA was limited by high vegetation towards east and south, the construction site to the west and the road between St. Joseph church and the JRS compound to the north.

One deminer was deployed on the south side and one towards the road.

The deminers used a path leading through the DA as base lane.

The ground in the area is hard and contains lot of metal fragments, cartridges and other scrap metal.

The grass in the area had been removed by labourers from JRS the previous week.

The medic and ambulance were located in the resting area, 100m west of the DA.

The team leader, [Name removed], acted as ambulance driver.

On the 25th the team cleared 46m^2 without any finds except metal nails and cartridges.

The four deminers worked in pairs of two, working one hour shifts.

The drills used were as per SOP: Investigation and removal of all metal signals.

After pinpointing the object with the metal detector, the deminer should start 15 cm behind the centre of the signal and investigate 15 cm to either side with the prodder until he reaches the object. If he finds nothing with the prodder, he can assume it is only a piece of metal and dig it out. If he hits something he suspect to be a mine, he will have to establish an excavation trench from where he started prodding and 20 cm towards himself. The trench is to be 30cm in width, 20 cm in length and 10 cm deep. The trench allows the deminer to excavate from the side without risk of hitting the pressure plate of the mine from the top. For every 2.5 cm he shaves off the side of his trench, he will prod the wall and base. If the soil is hard, the deminer will have to use water to soften it.

Sequence of events:

09:45– Work start at on site

11:20 – Deminer starts his shift

11:45 – Time of accident

11:50 – Accident reported to [Demining NGO] Base

12:00 – Message to all demining teams to stop work and return to camp

12:07 – Casualty arrived at [Demining NGO] Hospital in YEI

12:19 – Accident scene closed off, cordon set

12:20 – [Demining NGO] Ops officer arrive accident site with medical coordinator

13:00 – UNMAS Ops officer alerted

13:10 – UNMAS+[Demining NGO] Investigation team arrive accident site

13:45 – UNMAS+[Demining NGO] Investigation at site completed

14:45 – Area marked and closed off

15:30 – [Demining NGO] Debrief with all deminers in field camp in Ronyi

16:00 – [Demining NGO] Debrief with everybody involved in accident

17.00 – UNMAS Ops officer starts interviews

The deminer involved in the accident was working his first shift of the day. He had been working for 25 minutes when the accident occurred.

During the course of work, the deminer received several warnings from the section commander to be particularly cautious as he approached the crater from the last detonation as AP mines often are laid in clusters of four. The section commander also stopped him twice for him to correct his PPE. Two minutes after the last correction, the mine went off. This information has been confirmed by the second deminer at the site.

After the detonation the deminer stood up and started running away from the site. The section commander managed to stop him, sat him down and started calming him down (position were the deminers damaged and bloody gloves were left).

The section commander then called the medic on the radio and informed him there had been an accident. The team leader, medic and survey assistant rushed to the site with stretcher and trauma kit.

The casualty was taken out of the DA by the section commander and the medic started his treatment. The deminer had a deep cut in his right thumb and a smaller cut on top of his hand. In the face he had a deep cut over his right eye and on his chin in addition to several minor cuts. Soil and dirt had entered into his eyes but did not cause any permanent damage.

The injuries were bandaged and intravenous fluids and painkillers were administered.

After making his assessment of the situation the team leader then collected the ambulance, posted sentries and alerted [Demining NGO] base in Logobero.

10 minutes after the accident, the casualty was in the ambulance on his way to hospital. The casualty arrived in the hospital at 12:07. At 14:30 surgery started.

[Demining NGO]'s acting ops manager and medical coordinator were attending the Weekly Mine action Coordination meeting at the [Name removed] compound at the time of the accident. They received the information about the accident at 12:20. 5 min later, they arrived at the accident site. After a short brief at the site from the manual demining TA,[Name removed], who had arrived 10 min earlier, they continued to the hospital.

The medical coordinator went to follow up on the casualty while the acting ops manager went to inform the UNMAS ops officer to get the investigation started.

The deminer's explanation:

This is the information received from the deminer, [the Victim], at the [Demining NGO] Hospital in Yei on the 27th November. Present during the interview were [Name removed], UNMAS, and [Demining NGO's Acting Ops Manager], [Demining NGO] MA. The interview lasted from 14:10 to 14:25.

Before he entered the field, he received instructions from his section commander to wear his PPE correctly, be careful and remove all metal pieces. The section commander made it clear that he would be working close to the site where a truck hit a mine on the 23rd.

The ground was very hard and contained lots of metal pieces.

He had been working for 20-25 minutes and found three metal nails so far when he had a new reading on his detector. He tried to prod, but the ground was too hard and he did not have water to soak the ground. He then took his trowel and established an excavation trench 15 cm behind the signal before he started excavating the soil off from the side. He then found a small nail. When he checked the spot again, there still was a signal from the same area. He continued excavating. On the third scrape, the mine went off.

He then stood up and started running towards his section commander.

Additional information:

The deminer has been working with [Demining NGO] since April 2004. He completed his demining training in May the same year. Since then he has been employed as a deminer in Manual team 1. Throughout the time he has been employed he and his fellow deminers have received refreshment training several times. The last time was end of October 2005.

Medical assistance and evacuation

After the detonation and having sat the deminer on the ground the section commander called the medic on the radio and informed him there had been an accident. The team leader, medic and survey assistant rushed to the site with stretcher and trauma kit. The casualty was taken out of the DA by the section commander and the medic started his treatment.

The deminer had a deep cut in his right hand thumb and a smaller cut on top of his hand.

He had a deep cut over his right eye and on his chin in addition to several minor cuts.

Soil and dirt had entered into his eyes but did not cause any permanent damage.

The injuries were bandaged and intravenous fluids and painkillers were administered in a safe area in the proximity of the site of the accident.

After making his assessment of the situation the team leader then collected the ambulance, posted sentries and alerted [Demining NGO] base in Logobero.

10 minutes after the accident, the casualty was in the ambulance on his way to hospital. The casualty arrived in the hospital at 12:07. At 14:30 surgery started.

I (RF) have not asked when the team last carried out casevac training.I have not asked if a casevac exercise was conducted on site before they started work on site on the 25th of November. I have not asked for records of casevac training and do not know if there were records of casevac training in the site log. I have not checked the contents of the trauma pack or the ambulance as I do not have access to [Demining NGO]'s accredited SOPs or National Technical Guidelines and Standards.

The drive from the site of the accident to the [Demining NGO] Hospital appears to have been fast for the local road conditions, but this should not have done anything to worsen the injuries or status of the patient. The doctor at the [Demining NGO] Hospital in YEI has not been interviewed.

Geography and Weather

The team leader had marked an area 25x25 m around the incident (truck and AP mine Nov. 23rd) site as DA. The DA was limited by high vegetation towards east and south, the construction site to the west and the road between St. Joseph church and the JRS compound to the north. The deminers used a path leading through the DA as base lane.

The ground in the area is hard and contains lot of metal fragments, cartridges and other scrap metal. The grass in the area had been removed by labourers from JRS the previous week.

The medic and ambulance were located in the resting area, approximately 100m west of the DA.

On the 25th the team cleared 46m2 without any finds except metal nails and cartridges. The four deminers worked in pairs of two, working one hour shifts.

The weather was hot sun and clear skies.

Demining Procedure: Manual demining procedures.

Demining Equipment / Tools / PPE / Explosives

Visor (appears to have been in good shape before the detonation)

PPE (appears to be in good shape)

Trowel - HAVE NOT SEEN THE TROWEL SO I CANNOT SAY WHAT SHAPE IT MIGHT HAVE BEEN IN BEFORE OR AFTER THE ACCIDENT. [Demining NGO's Acting Ops Manager] says that it was a wedge shaped, flat nosed trowel.

Communications

From [Demining NGO]s report:

"The procedures at the radio room in Logobero could have been better. The accident happened during change over of radio operator and there were a great deal of confusion with the radio log in the beginning. Personnel in the field reacted quickly and other activities were stopped shortly after the accident."

I, [Name removed], have not checked their Radio Log but according to all information obtained during the course of the investigation the accident was reported to [Demining NGO] base at 1150hrs. It is unclear if radio checks have been carried out at the start of operations and on a regular basis, but this is due to the fact that I have not asked and have not checked the radio logs. For the same reason it is also unclear exactly what information that was sent from the site of the accident to [Demining NGO] Base.

[Demining NGO's Acting Ops Manager] came to the OCHA office in YEI at 1250 hrs and at that time he verbally informed UNMAS Operation Officer on the details of the accident.

UNMAS Operations Officer tried calling Regional TA, [Name removed], Regional Planning Officer/ Acting Chief of Operations, [Name removed], and Operations Officer JUBA, [Name removed] immediately after completing initial investigation on the site of the accident (approx. 1340hrs) without getting hold of either of them.

At approximately 1345 UNMAS Operations Officer managed to get hold of Operation Officer KHARTOUM, [Name removed].

[Name removed] was informed of the accident and the initial findings of the investigation. [Name removed] was informed that RF would go to the [Demining NGO] Hospital in YEI to see what kind of damages the deminer had sustained and what the status was of the deminer. [I] said that [I] would call [Name removed] up after the visit to the hospital.

At approximately 1445hrs [I] called [Name removed] and informed him of the injuries sustained by the deminer and his current status. It was agreed that [Demining NGO]s and [my] initial investigation reports were to be sent to the Regional TA, [Name removed], and CC [Name removed] Monday before lunch (within 48 hours of the accident).

Site Layout and Marking

It is unclear whether the site layout was in accordance with the SOPs as I do not have access to accredited copies of [Demining NGO]'s SOPs, but it appears that the general layout of the site was in accordance with international standards.

The only question mark is in regards to the distances between the two clearance lanes. The lanes were approximately 10-15 metres apart. The deminer in the second lane sustained no injuries from the detonation of the mine.

[Demining NGO's Acting Ops Manager], upon being asked the question, said that in the accredited SOPs the supervisor on site does not have the authority to minimize the distance between lanes based on what kind of threat (type of mines) is to be expected on a specific site, but that amendments to that effect have been sent for accreditation.

Command and Control

There were one international supervisor, [Name removed] TA Survey, and one local Section Commander.

It appear that even though the Section Commander has been reminding the deminers to wear their PPE properly and told the deminer involved in the accident to exercise extra caution on approaching the location of the first detonation (truck, AP mine, Nov. 23rd) he has not corrected the deminer when he was using excavation methods that did not comply with accredited SOPs and allowing the deminers to excavate in hard soil without watering the ground. This is probably because they did not have jerry cans with water on site (based on the information from the injured deminer).

It does appear that the Section Commander has acted properly once the accident occurred, by stopping the injured deminer from moving into potentially dangerous areas, informing the medic of the accident over the radio and leaving as much as possible of the injured deminers' equipment on site.

It does appear as if there might have been not enough supervision of the excavation procedures (and the lack of watering the ground) from the international supervisor.

The international supervisor made a good decision when not calling for the Super Puma immediately upon the accident, but instead waited for the assessment of the medic before deciding on how to proceed with the casevac. This was probably also because of the international supervisors own assessment of the injuries sustained by the deminer.

Quality Assurance and Control

It was the second day on site for the team. QA/ QC logs have not been asked for and have not been checked.

Details of Non Compliance to Agency SOP / NTSG / IMAS

- Not using water to soften up hard soil to make it possible to prod the ground in accordance with SOPs
- Not using an excavation trench when excavating.
- Not excavating from the side, but from the top down.
- Not stopping BAC when evidence of mines found.

Unknowns:

- Casevac exercise prior to starting work on site? In accordance with SOPs and NTSG?
- Radio procedure as per SOPs?
- QA procedures as per SOPs?
- Contents of Trauma bag as per SOPs and NTSG?

CONCLUSIONS

It is my conclusion based on the injuries sustained by the deminer, interviews and from the on site investigation that the following has occurred:

-Deminer has not watered the ground to soften the soil up so he could use his prod properly.

-He has not used excavation trenches when excavating unknown objects that would enable him to approach the unknown object from the side.

-The Section Commander has not stopped the deminer from breaching the SOPs when it comes to watering, prodding and excavation.

-The deminer has not been wearing his PPE properly at all times, but had to be told on a number of occasions by his Section Commander to correct his PPE.

-It appears that the deminer has been excavating signal from on top of the signal and straight down towards the unknown object rather than excavating from the side.

-It appears that the deminer has been using his trowel pointing down towards the ground, with his right hand thumb pointing down towards the project (therefore damages to his thumb and the top of his hand, but not to the other fingers).

-It appears that the gloves the deminer was wearing at the time of the accident might have saved his thumb.

-It appears that the deminer, even though he had just corrected his PPE, has worked in a position that opened up an area between the lower part of the visor and the PPE that enabled the blast to be channeled up under the visor causing cuts to the lower face and right eyebrow.

-It appears that the deminer after the blast has moved in the opposite direction and to the left, from the direction of clearance, moving towards potentially dangerous areas and that the Section Commander has managed to stop the deminer in time.

-It appears that the Section Commander has correctly informed personnel in the resting area of the accident and has called medic and stretcher carriers and site supervisor forward to a safe area closer to the casualty, and that he then has taken the casualty to them.

-It appears that the medic on site has done a correct and good job with the initial treatment of the casualty

-It appears that the site supervisor made the right assessment when not calling for the Super Puma, but waited for the assessment of the medic before deciding on how to proceed with the casevac

-It appears as if [Demining NGO] has followed correct procedure upon the accident by informing their base and suspending work on all manual demining sites

-It appears that [Demining NGO] informed the UNMAS Operations Officer as soon as they had the possibility to (within an hour of the accident)

-[Demining NGO] has been most accommodating during the course of the investigation

-It does however appear as if the injured deminer is not telling the truth when he claims that he used excavation trenches when excavating signals and that he was excavating from the side towards the object when the detonation occurred.

The accident has to be classified as “avoidable” if [Demining NGO] SOPs and procedures had been implemented correctly on site.

Further Actions, Recommendations and Lessons Learned

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

-Threat assessments need to be formalised and recorded.

-On site casevac exercises before starting task on new site. Casevac training needs to be carried out in accordance with SOPs and recorded onsite in the site paperwork.

-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

-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.

-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.

The following recommendations were made by [Demining NGO] and I agree with them:

“Before resuming demining operations, a minimum of two days must be spent retraining the deminers, section commanders and team leaders, emphasizing on correct use of tools and PPE. The section commanders must be given closer follow up so that they are capable to interfere when they see breaches to the SOP. The SOP must be scrutinized to find out if there are any unclear points with regards to use of water when the ground is hard. The TA for manual demining will work out a training program that covers the mentioned subjects.

No manual demining activities will take place until retraining is completed and ops manager and manual demining TA together with UNMAS have evaluated the status of the teams.”

Full [Demining NGO] Sudan Accident report

Accident report mine accident Lutaya 26/11-2005

At 1145, 26th November, [Demining NGO] had a demining accident in Lutaya, 3.5 km West of Yei town. The deminer sustained injuries to his face as well as his right hand. He is now in the [Demining NGO] hospital in Yei Town.

Background

On the 23rd of November a truck working at the construction site outside the JRS teacher’s training Center in Lutaya hit a mine and blew off a tire. [Demining NGO] was informed of the accident and responded by sending an investigation team two days later. Last year [Demining NGO] cleared almost 30000m^2 in the area (Task ID SS001). The site of the accident is approx 100 m west of where the clearance stopped. However, the accident happened inside the DA called Lutaya 2. The accident site is a flat grass field that has been slashed by the workers at JRS. Three meters from the old crater is a mango tree where the local people usually rest in the shade. According to the survey report from 2004, an AT mine was removed close to the mango tree in 1998.

Personnel present at time of accident

[All names removed] Team leader; Section commander; Deminer; Deminer; Deminer; Deminer; Medic; Survey assistant.

All deminers in the team have worked as deminers since May 2004, the section commander since June 2005.

Location

The team leader had marked an area 25x25 m around the accident site as DA. The DA was limited by high vegetation towards east and south, the construction site to the west and the road between St. Joseph church and the JRS compound to the north. One deminer was deployed on the south side and one towards the road. The deminers used a path leading through the DA as base lane. The ground in the area is hard and contains lot of metal fragments, cartridges and other scrap metal. The grass in the area had been removed by laborers from JRS the previous week. The medic and ambulance were located in the resting area, 100m west of the DA. The team leader acted as ambulance driver. On the 25th the team cleared 46m^2 without any finds except metal nails and cartridges.

Procedures used

The deminers worked in pairs with one hour rotation shifts. The drills used were as per SOP: Investigation and removal of all metal signals. After pinpointing the object with the metal detector, the deminer should start 15 cm behind the center of the signal and investigate 15 cm to either side with the prodder until he reaches the object. If he finds nothing with the prodder, he can assume it is only a piece of metal and dig it out. If he hit something he suspect to be a mine, he will have to establish an excavation trench from where he started prodding and 20 cm towards himself. The trench is to be 30cm in width, 20 cm in length and 10 cm deep. The trench allows the deminer to excavate from the side without risk of hitting the pressure plate of the mine from the top. For every 2.5 cm he shaves off the side of his trench, he will prod the wall and base. If the soil is hard, the deminer will have to use water to soften it.

Chain of events

09:45– work start at JRS

11:20 – deminer started his shift

11:45 – Time of accident

11:50 – Accident reported to [Demining NGO] Base

12:00 – Message to all demining teams to stop work and return to camp

12:07 – Casualty arrived hospital

12:19 – Accident scene closed off, cordon set

12:20 – Ops officer arrive accident site with medical coordinator

13:00 – UNMAS Ops officer alerted

13:10 – Investigation team arrive accident site

13:45 – Investigation at site completed

14:45 – Area marked and closed off

15:30 – Debrief with all deminers in field camp in Ronyi

16:00 – Debrief with everybody involved in accident

17.00 – UNMAS Ops officer starts interviews

The deminer who had the accident was working his first shift of the day. He had been working for 25 minutes when the accident occurred. During the course of work, the deminer received several warnings from the section commander to be particularly cautious as he approached the crater from the last detonation as AP mines often are laid in clusters of four. The section commander also stopped him twice for him to correct his PPE. Two minutes after the last correction, the mine went off. This information has been confirmed by the second deminer at the site. After the detonation the deminer stood up and started running away from the site. The section commander managed to stop him, sat him down and started calming him down.

The section commander then called the medic on the radio and informed him there had been an accident. The team leader, medic and survey assistant rushed to the site with stretcher and trauma kit. The casualty was taken out of the DA by the section commander and the

medic started his treatment. The deminer had a deep cut in his right thumb and a smaller cut on top of his hand. In the face he had a deep cut over his right eye and on his chin in addition to several minor cuts. Soil and dirt had entered into his eyes but did not cause any permanent damage. The injuries were bandaged and intravenous fluids and painkillers were administered. After making his assessment of the situation the team leader then collected the ambulance, posted sentries and alerted [Demining NGO] base in Logobero. 10 minutes after the accident, the casualty was in the ambulance on his way to hospital. The casualty arrived in the hospital at 12:07. At 14:30 surgery started.

The acting ops manager and medical coordinator were at a meeting at the SLIRI compound at the time of the accident. They received the information about the accident at 12:20. 5 min later, they arrived at the accident site. After a short brief at the site from the manual demining TA, who had arrived 10 min earlier, they moved on to the hospital. The medical coordinator went to follow up on the casualty while the acting ops manager went to inform the UNMAS ops officer to get the investigation started.

The deminer's explanation

This is the information received from the deminer, [the Victim], at the [Demining NGO] Hospital in Yei on the 27th November. Present during the interview were [Name removed], UNMAS, and [Demining NGO's Acting Ops Manager], [Demining NGO] MA. The interview lasted from 14:10 to 14:25.

Before he entered the field, he received instructions from his section commander to wear his PPE correctly, be careful and remove all metal pieces. The section commander made it clear that he would be working close to the site where a truck hit a mine on the 23rd. The ground was very hard and contained lots of metal pieces. He had been working for 20-25 minutes and found three metal nails so far when he had a new reading on his detector. He tried to prod, but the ground was too hard and he did not have water to soak the ground. He then took his excavation shovel and established an excavation trench 15 cm behind the signal before he started scraping the soil off from the side. He then found a small nail. When he checked the spot again, there still was a signal from the same area. He then started scraping again. On the third scrape, the mine went off. He then stood up and started running towards his section commander.

Additional information: The deminer has been working with [Demining NGO] since April 2004. He completed his demining training in May the same year. Since then he has been employed as a deminer in Manual team 1. Throughout the time he has been employed he and his fellow deminers have received refreshment training several times. The last time was end of October 2005.

Actions taken after the accident

All demining operations in Ronyi and at UNHCR were stopped as soon as the accident was reported and the deminers were taken back to their respective camps. As soon as the situation was under control all deminers were gathered in the demining camp in Ronyi. The manual demining TA and the team leader at the accident site gave a briefing about what had happened and gave them an update on the deminer's situation. All personnel involved in the accident then were transported to Logobero for an internal debrief. Each team member gave their description of what happened and wrote a short statement on what they had seen and experienced. The statements are attached to this report. [Handwritten statements held on

record.] As a part of the investigation [Name removed] from UNMAS then came to interview the team leader, the section commander and the medic. All deminers were then given time off until Monday morning.

Accident investigation

[Name removed] from UNMAS was informed 1hour and 15min after the time of the accident. He was taken to the accident site where he did his inquiries. The crater from the explosion is 30-40 cm away from the old crater. It is a small crater, 15 cm in diameter. The deminer's base stick was 20 cm behind the edge of the crater, one meter from the base lane. The handle of the deminers shovel was found 15m away from where he was working, the blade blown off. This confirms the deminer's story that he was excavating at the time of the accident. The size of the crater indicates a small AP blast mine. The blast has gone between the visor and the vest of the deminer.

Crater from detonation

The explanations from the casualty and the section commander are diverging. The deminer claims that he established an excavation trench and worked from the side towards the object. This is not supported by the section commander. There are also no signs at the site that this was done. On the contrary, the holes from the other objects that have been removed show that the objects have been taken straight out of the ground. Both deminer and section commander admitted that water had not been used.

As for the facial injuries, a test done at the accident site show that it is possible to get a gap between the visor and the vest even if the PPE appears to be worn correctly.

Gap between visor and vest [See analysis]

Conclusion

The accident happened because of breaches to the SOP. First of all, water was not used to soften the ground. This made both prodding and excavation difficult. Without being able to prod down to sufficient depth, the deminer could not know whether the object was a mine or something else. To be able to dig in hard soil one has to use force. If this force is applied from the top it is more than enough to set off an AP mine. This is the second breach to the SOP and most likely the cause for the accident. A contributing factor to the accident might be that the detonation 30 cm away three days earlier plus the fact that the mine might has been in the ground for years might have made the mine more unstable.

The SOP is a bit vague on what happens when the soil is hard. It states that water may be used to soften the ground, but it makes no reference to what actions the deminer should take if water is not available.

When the accident first happened, the medical procedures at the site worked very well. The casualty was quickly stabilized and moved to hospital. The procedures at the radio room in Logobero could have been better. The accident happened during change over of radio operator and there were a great deal of confusion with the radio log in the beginning. Personnel in the field reacted quickly and other activities were stopped shortly after the accident.

Recommendation

Before resuming demining operations, a minimum of two days must be spent retraining the deminers, section commanders and team leaders, emphasizing on correct use of tools and PPE. The section commanders must be given closer follow up so that they are capable to interfere when they see breaches to the SOP. The SOP must be scrutinized to find out if there are any unclear points with regards to use of water when the ground is hard. The TA for manual demining will work out a training program that covers the mentioned subjects.

No manual demining activities will take place until retraining is completed and ops manager and manual demining TA together with UNMAS have evaluated the status of the teams.

Victim Report

Victim number:	755	**Name:**	[Name removed]
Age:		**Gender:**	Male
Status:	deminer	**Fit for work:**	not known
Compensation:	Not made available	**Time to hospital:**	25 minutes
Protection issued:	Frontal apron Long visor	**Protection used:**	Frontal apron, Visor worn raised

Summary of injuries:

minor Eyes

severe Face

severe Hand

COMMENT: See Medical report.

Medical report

No formal medical report was made available. The investigation includes the following:

The deminer had a deep cut in his right hand thumb and a smaller cut on top of his hand.

He had a deep cut over his right eye and on his chin in addition to several minor cuts.

Soil and dirt had entered into his eyes but did not cause any permanent damage.

[It is presumed that surgical intervention was required because the Victim was retained in hospital.]

Statements

Attachments: Statements from team members

[Most statements are handwritten so not reproduced. They are held on file.]

Accident Report from Lutaya Teacher Training Centre

I am employed as Technical Advisor Survey in [Demining NGO] Mine Action.

[Demining NGO] MA has previously conducted deming operation in the Lutaya area. Jesuitt Refugee Service has started building of a new compound in Lutaya TTC area. On Nov. 23rd a truck hit an anti personnel mine when unloading building materials near the foundation of the new compound. The truck sustained minor damage and the driver was not injured. Based on this JRS requested [Demining NGO] MA to conduct demining on the site.

The operation started Nov.25th and proceeded without any problem. Due to the large quantity of metal in the soil, the work was time consuming and a total of 45, 8 m2 was cleared yesterday.

The operation started today at 0945 hours without any problems. I was working on a sketch in the rest area and at 1145 hours I heard an explosion. Accompanied by team-medic [Name removed] and surveyor [Name removed], I rushed to the accident site with a stretcher and the trauma bag. Section Commander [Name removed] was sitting next to deminer [the Victim] who had been injured during demining. It seemed that the deminer had detonated an AP mine during excavation and the blast had gone on the inside of his visor since he had facial injuries. He also had injuries on his left hand and his left thumb was damaged. We managed to get the casualty to safe ground, which in this case was a well defined and used foot path before the team medic started First Aid. I went back to the rest area to fetch the vehicle and to report the accident to [Demining NGO] MA in Logobero. The injured deminer was then transferred to the vehicle and we left the accident site at 1155. [Name removed] and deminer [Name removed] stayed with two guards from JRS on the site to seal off the area and protect equipment. During the transport I reported the situation to [Demining NGO] MA and requested the radio operator to notify Yei hospital about the accident, type of injuries and expected arrival time. We arrived the hospital at 1207 hours and the patient was received by Dr. [Name removed].

At 1430 surgery started on the injured deminer.

Logobero, Nov.26th 2005

Signed: TA Survey

Analysis

The primary cause of this accident is listed as “Field control inadequacy” because the supervision ratio was very high and yet the Victim was permitted to work with his visor raised and while excavating in a dangerous manner with a short hand tool that separated in a balst so that hand injury was almost guaranteed. The secondary cause is listed as “Inadequate training” because the investigators (internal and external) agreed that refresher training was required.

The supposed “proof” that environmental fragmentation could enter between the visor and the vest at an angle that allowed eyebrow injury while wearing the visor correctly illustrates the internal investigator’s lack of understanding about blast events. When an AP blast mine detonation occurs while a deminer is kneeling and excavating, the environmental fragmentation (earth and mine casing) strikes the visor face marginally before the blast wave. The blast wave may raise the visor, but it follow the fragments. The fragmentation is tumbling in the air but has forward momentum. If it has enough momentum to cause injury, that momentum imposes a direction that prevents any fragment turning sharply and heading in an entirely different direction.

This picture was included in the report to show how fragments could get between the visor and the vest. In fact it illustrates how it could not.

In order to strike the wearer’s face to the eyebrow, the deminer was wearing the visor raised in something more like this position. He was looking out from under it as he worked, and if he did not sustain eye injury that is because the M14 mine is very small (29g Tetryl) and he was lucky.