5-26-2008

DDASaccident800

Humanitarian Demining Accident and Incident Database
AID

DDAS Accident Report

Accident details

Report date:	20/12/2013	**Accident number:**	800
Accident time:	16:30	**Accident Date:**	26/05/2008
Where it occurred:	Jaalbhanjyang Army Post Minefield	**Country:**	Nepal
Primary cause:	Management/control inadequacy (?)	**Secondary cause:**	Management/control inadequacy (?)
Class:	Handling accident	**Date of main report:**	02/06/2008
ID original source:	MAU/265	**Name of source:**	
Organisation:	[Name removed]		
Mine/device:	MUV fuze	**Ground condition:**	grass/grazing area rocks/stones
Date record created:		**Date last modified:**	20/12/2013
No of victims:	1	**No of documents:**	2

Map details

Alt. coord. system:	Grid Reference: 43585 86046	**Coordinates fixed by:**	

Accident Notes

inadequate communications (?)

inadequate medical provision (?)

inadequate training (?)

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

Accident report

Details of this accident were made available in 2013 in a PDF file. The content is reproduced below, edited for anonymity. Text in square brackets [ ] is editorial.

Internal accident report

Report of the investigation into the circumstances surrounding the demining incident that occurred on 26th May 2008 at Jhalbhanjyang (JBJ) minefield resulting in injury to Sapper [Name removed] of the Nepal Army demining team no.3.

3rd June 2008

To: Senior Advisor UNMIN MAU

Demining Accident Investigation Report

Reference: Terms of Reference MAU/265 dated 26th May 08

The above reference appointed [Demining group] Nepal to investigate the circumstances surrounding the demining incident that occurred on 26th May at Jhalbhanjyang (JBJ) minefield involving personnel from the Nepal Army demining team.

[Name removed] of [Demining group] Nepal was tasked to visit the site and investigate the incident, assisted by Captain [Name removed] of the Nepal Army and [Name removed] of the UNMIN MAU, in accordance with IMAS 10.60 and the MAU TOR. In accordance with the TOR, herewith follows the formal report from [Demining group] Nepal, consisting of this management summary supported by the detailed on-site investigation report with its annexes.

The Incident

During the post-demolition QA of a PMD-6 mine, [the Victim] handled a MUV fuse, complete with MD-2 detonator, which functioned resulting in the auto-amputation of his right hand. He was evacuated from the site by a Nepal Army helicopter. The fuse appears to have been left over from an incomplete demolition, which rendered it a misfire without any transit or striker retaining pin in place.

The accident was avoidable through the application of the drills and safety briefings which [the Victim] had received.

Key Matters Arising

Context

The Nepal Army team at JBJ consisted of novice deminers and unproven supervisors. The team was part way through the [Demining group] Nepal training process, having only just completed their formal training course, which was to culminate in a recommendation for accreditation assessment after a period of operational deployment. Deployment to JBJ was the operational phase of their training and was the first time the deminers had operated in a live minefield.

After deploying with the Nepal Army and establishing the non-clearance aspects of the task, the [Demining group] Nepal Technical Advisor (TA) was re-tasked to another site and supervision of the NA team was handed over to the UNMIN MAU Technical Advisor (TA). It is understood that the MAU TA approached the supervision of the NA team at JBJ as if they were being assessed for accreditation. This shift of supervisory emphasis appears to have transformed the task from being a training exercise in a live minefield, where the initial priority needed to be the tight supervision of novice deminers and supervisors, into an assessment task where the NA supervisors were operating with a level of independence that exceeded their capability and experience. For example, instead of operating initially as a training task, with just a few lanes until the novice deminers and inexperienced supervisors had gained some confidence and competence, the site was developed from the outset with full production as the primary focus.

With the de-emphasising of the training nature of the task, inexperienced decisions did not appear to be noticed nor corrected. Examples of inexperienced decision making was evident in a number of key areas:

- The supervision of the novice deminers was left as one Section Leader to two demining pairs, even where the distances and geography made this an impossible task (e.g. lanes 1 & 3).
- There was no supervision of the post demolition QA in Site A (lanes 1 & 3).

- The charges for the demolitions were ineffective by weight and placement.

QA drills

The handling of the MUV fuse on a number of occasions by three different deminers indicates a systemic failure in their understanding of the risks posed by the MUV mine fuse. The deminers acknowledged that they had been trained not to touch items, had been briefed that day not to touch items, but still did so. Seemingly, despite recognising the item, and acknowledging that the fuse had no pins in place, the deminers proceeded to touch the fuse because they thought it was safe. One deminer thought the item was safe because it had been in a demolition. As well as confirming their lack of knowledge of the risks, this also highlights that the deminers have yet to understand the inviolate nature of the mandatory instructions in SOP and the limits of their operational authority and autonomy.

Post-demolition drills were not covered in any great depth during the 4 week training course, the post-leave refresher training or the on-site training during the establishment of the task, and the potential hazards arising from incomplete demolitions do not appear to have been covered at all. This aspect of training apparently was intended to be covered on-site during the operational phase. However, the lack of training of the deminers on the post-demolition hazards may have contributed to their misplaced conclusion of the condition of the MUV fuse.

Despite being briefed by [Demining group] Nepal of an UMIN MAU modified QA drill, during the establishment of the task, it does not appear as though this was adopted on site.

Demolition drills

The demolition drills employed at the site increased the possibility that fuses would be left over as a result of incomplete demolitions. The explosive records for the site indicate that only 1/2 a stick of Nepalit explosive was being used per mine, and that the half cartridge was being placed end on to the MUV fuse/TNT charge join. The small charge weight and end-on placement had the effect of severely reducing the available explosive effect on the mine.

Nepalit is a waterproof cartridge based powdered quarrying explosive; it is not a high explosive. Powdered explosives are not designed to used in partial cartridges, due to the difficulty in handling a split cartridge case. Prior to JBJ, it is understood that the Nepal Army had been using PEK plastic high explosive which, by its characteristics, does lend itself to being used in partial cartridge quantities.

Demolition options were also curtailed by the unavailability of reliable detonating cord. The Nepal Army detonating cord previously had proved itself to be wholly unreliable. Consequently it had stopped being used and the only method of initiation available was direct initiation of the charge from a detonator.

From the evidence at the site, it appears that poor demolition practice had caused only partial demolition of a number of mines, and had resulted in the TNT from the PMD-6 mines being thrown into the minefield access lanes. It was entirely possible that a fuse could also have been thrown into an access lane.

There was no fire fighting plan or equipment in place to deal with the possibility of a post demolition fire.

There had been other instances of incomplete demolition at other demining sites, but these had not been raised as non-conformances. The unavailability of serviceable detonating cord had also not been raised as a non-conformance. Similarly, previous instances of non-FFE fuses being moved by hand by the AGMA Nepal supervisors had occurred at other sites, but these actions had not been developed into drills which could be applied in the absence of the

[Demining group] TA. There is some anecdotal evidence that at Mahadev Danda minefield, a non-FFE fuse had been moved to the metal scrap pit by the Nepal Army without the [Demining group] Nepal TA knowledge. In all previous cases, none of these non-conformances were reported.

Medical

Whilst the medical staff on site acquitted themselves well, it was only by good fortune and skilful flying that the casualty was able to be evacuated by air in a timely fashion. The Nepal Army aircraft could not land at the primary HLS due to bad weather. The existence of the secondary HLS was pure luck, as a function of the UNMIN HLS recce, and not planned.

There were a number of deficiencies with the medical plan:

- The only means of CASEVAC for life threatening injuries was by air. However, no plan was in place to confirm that an aircraft was available, to notify of aircraft unavailability nor to monitor the weather. The critical importance of the availability of air assets to the site medical plan was not publicised at all.
- The road evacuation plan for non-life threatening casualties, or in the event that air assets were not available for a life-threatening casualty, hinged on ferrying the casualty down the single access track to the Nepal Army hospital at Dumre, some 25kms away. It was planned the casualty would be moved in either the [Demining group] Nepal TA vehicle (a Prado) or the UNMIN MAU TA pickup. Neither of these could carry a stretcher-bound casualty adequately or would allow for medical staff to treat a casualty whilst on the move. It was a 1hr 20min journey to Dumre until normal conditions, without ferrying a casualty. The on-site medical team only had sufficient oxygen for about 60-90 minutes. They did have other, larger bottles of oxygen, in the ambulance.
- Despite the possibility of the potential need for a protracted period of evacuation, the standard on-site demining medics equipment had not been reviewed to determine if any additional equipment or drugs were required to make the trauma kit fit for purpose.
- There was no copy of the UNMIN Aeromedevac instruction on site. It is not clear whether the Nepal Army could have initiated an UNMIN Aeromedevac.

Whilst the Nepal Army Doctor on site (Captain Dr. [Name removed]) was generally very pleased with the standard of training and competence of the demining medics, he recommended that the demining medics are trained to intubate and that the medics had the opportunity to practise opening veins. Indeed, the demining medics would benefit from a programme which allows them to routinely practice their skills, such as rotation through an emergency room.

SOP

During the investigation, examination of the Nepal Army SOP revealed a number of deficiencies. Non-exhaustive examples include:

- Version control is hampered as the SOP are not dated nor signed.
- SOP are not available in Nepalese.
- The demolition procedures in SOP 5 are silent as to charge weight.
- The charge placement diagrams are not specific to Nepal.
- Post demolition QA is not mentioned in the QA SOP.
- There are references to non-existent Chapters (for example SOP 7, Para 7g, speaks of referring to ‘Chapter 15’).
- There are inconsistent references to authorities. For example,

- No mechanism exists for the formal promulgation of amendments to SOP (for example, a technical bulletin system).
- The technical detail of mines in Nepal has no information on the fuses used.
- The RSP for mines does not limit this activity to those who have had any special training.

Communications

During the investigation it became clear poor communications between the various project stakeholders is having an effect on the success of the project. This situation is exacerbated by uncertainty on responsibilities, frequent policy changes and a lack of clarity on project aims. Previous initiatives to improve communication and suggestions to foster greater technical understanding have withered. From discussions it is clear that there is a need for the project stakeholders to commit much greater effort into fostering collective ownership of the project.

Corrective & Remedial Action Required

In conjunction with attached report, the following corrective and remedial actions are recommended:

1. Formal and refresher training, per the SOP, is to include detailed instruction on mines to include functions, operation, dangers, dos and don'ts. Accurate and up to date records of training carried out, when, where and by whom, are to be maintained as stated in SOP.

2. International Technical Advisors, the Site Manager, the Site Supervisors and Section Leaders are to provide the correct level of supervision, guidance and advice to deminers as stated in SOP. Particular care must be shown towards inexperienced deminers who are undergoing training.

3. International Supervisors and Site Managers must provide individual lane supervision to deminers whilst carrying out clearance and QA procedures until the Section Leaders are confident in the deminer's ability and experience.

4. No demining is to be carried out at remote minefields that are vulnerable to extreme weather changes which could prevent an injured deminer being CASEVAC by helicopter, especially where the alternative CASEVAC by road is not a viable option.

5. Additional medical equipment (e.g. bandages, medication & oxygen) is provided at each demining site according to the evacuation need (e.g. duration).

There should be grab bags of bandages available on site (minimum of 50 large trauma dressings) and each of the Nepal Army staff should carry their own first field dressing.

6. Consideration is given to the procurement and deployment of Quikclot as part of the medical kit.

Quikclot is a brand of haemostatic agent. It is a traumatic wound treatment that stops moderate to severe bleeding by promoting rapid coagulation. Haemostasis is achieved through rapid absorption in and around the wound - the reduced volume of liquid concentrates clotting factors

See http://en.wikipedia.org/wiki/QuikClot for further information

Further to the discussions with Captain Dr. [Name removed], it is recommended that:

- The demining medics are rotated through an emergency room in order to maintain and improve their skills.

- An expert review of the medical aspects of the demining programme is organised by the Army Medical Directorate, so they can provide specialist input on all medical matters and especially on policy issues relating to military personnel. This would, for example, provide a policy decision on the desirability of training the demining medics to intubate.

8. Some training arms are purchased to allow the demining medics to practice their skills at opening veins.

9. In the event of an accident, only the Site Manager is to contact his superior officer to inform him/her that there has been an accident and to wait out for further information. The Site Manager should then be allowed to concentrate on the casualty and related issues. Only when the situation is under control and the Doctor on site has confirmed the course of action to be taken with the casualty (road or helicopter CASEVAC) should the Site Manager update his superiors. In the absence of the Site Manager then this responsibility will fall to the Site Supervisor.

10. Where CASEVAC by air is the primary, or only, means of evacuation, a system is established to ensure that the importance of aircraft availability is publicised and procedures are in place to verify the availability of an aircraft.

11. Where CASEVAC by air is the primary, or only, means of evacuation, a secondary HLS is established to facilitate an alternative possibility of evacuation in the event of localised bad weather.

12. Where evacuation by road is required, a suitable vehicle is available to facilitate the evacuation of a casualty.

13. All personnel are to adhere to the relevant SOP at all times. Under no circumstances are procedures to be modified on site. Any modification, such as procedural change, must be authorised through the correct channel and the amendment, if approved, formally promulgated prior to the 'modified procedure' being carried out. In addition, all personnel are to receive formal and/or refresher training on any procedural change prior to carrying out demining activities and this training is to be recorded.

14. The SOP published on 30 April 08 should be subject to a review to ensure their fitness for purpose. The document should be subject to the accepted norms for document control and accountability. A procedure should be developed and promulgated for the amendment process for SOP.

15. The following changes to drills are recommended:

- No-one is to directly handle any fuse assembly which is not FFE.
- All items which are not FFE are to be destroyed by demolition.
- Any fuse assembly which has a detonator attached is not to be touched at all and is to be destroyed in-situ. This also applies to detonators on their own.
- Any fuse/igniter which is not FFE, and which does not have a detonator attached (for example an unfired MUV igniter which still has a viable percussion cap), may be moved (one at a time) using the deminer trowel with handguard, provided that the person is wearing PPE and the igniter is pointing away from the person. The sole reason for moving an item in this circumstance is to move it to a more convenient place for demolition (because it is not FFE).
- Only items which are FFE are to be placed in scrap pits.

16. PMD-6 mine charges should be laid parallel to the mine and not end on to the mine. Staff are to be reminded that the purpose of demolition is to ensure the complete destruction of the mine using serviceable explosives.

The charge weight of serviceable Nepalit is to be a minimum of one complete 170g cartridge per mine for PMD-6. In the event that this increase in charge weight is still resulting in incomplete demolitions, the charge weight should be increased to two cartridges, then to three etc.

The practice of splitting Nepalit cartridges into two should cease.

Wherever possible, demolitions should use a mouldable, plastic explosive (such as PEK).

The Nepal Army should provide serviceable detonating cord to facilitate effective demolitions.

Consideration should be given to the release of the surplus explosives and demolition accessories from the UNMIN MAU EOD programme in the event that the Nepal Army has explosive supply limitations.

A fire-fighting plan, with suitable equipment, should be implemented at each site.

17. All staff should be reminded that any one entering a minefield, without exception and for whatever reason, irrespective of whether operations are under way or not, MUST wear full PPE.

18. The Project Stakeholders have a meeting to identify communication issues that are affecting project success and to decide on a strategy to improve collective ownership.

Signed: Programme Manager, [Demining Group] Nepal

Accident Report for Demining Accident 26 May 2008 dated 2nd June 2008

References:

(a) Terms of Reference (TOR) for Demining Accident Investigation dated 26 May 2008.
(b) Work Site Accident Response Plan for Work Site Task ID No: Jaalbhanjyang Army Post (Grid Reference: 43585 86046) dated 18 May 2008.
(c) Map, Dumre-Bandipur, Sheet No 2784 02B, Scale 1:25,000.
(d) IMAS 10.60, Safety & Occupational Health Ð Reporting and Investigation of Demining Incidents, First Edition, incorporating Amendment Numbers 1, 2 & 3, dated 1 October 2008.
(e) Nepal Army Standing Operating Procedures (SOP) issued 30th April 2008.

Introduction

1. This report highlights the findings resulting from the formal investigation conducted over the period 27th - 29th May 2008 relating to the demining accident that occurred on 26th May 2008 at Jaalbhanjyang Army Post Minefield. This report format is as listed Reference A.

Terms, definitions and abbreviations

2. A list of terms, definitions and abbreviations used in this report is given in Annex A. A complete glossary of all terms, definitions and abbreviations used in the IMAS series of standards is given in IMAS 04.10.

Documentation

3. Terms of Reference (TOR) for Demining Accident Investigation and minefield location are at Annex B to this report.

Part One – Background

4. Demining organisation name: Nepal Army

5. Organisation sub unit, site office/project number, team name/number: Demining Team No 3.

6. Name of Worksite Supervisor: Capt [Name removed]

7. Location of incident (province, district, village, task no): Jaalbhanjyang Army Post (Grid reference 4358586046)

8. Date and time of incident: 26th May 2008 at approximately 1630hrs

9. Type of incident. (See clause 4.1.1): Unplanned detonation of a MUV fuze complete with MD-2 detonator

Part Two – Details of Incident

10. Details of the task being carried out at the time of the incident: QA post-demolitions in Lane No's 1, 3, 4, 5 & 6

11. When and where the incident occurred: At approximately 1630hrs on 26th May 2008 in Lane No 3, Site A

12. How the incident occurred including brief description of the events that led up to the incident, personnel, equipment and procedures involved: Pte [the Victim] was carrying out QA post-demolition on one of the two blast holes in Lane No 3 when his MD8 detector picked up a signal in the blast hole. Pte [the Victim] had difficulty in pinpointing the signal so he asked Pte [Name removed] to assist him (Pte [Name removed] was passing Lane No 3 to go to Lane No 1 to carry out QA post-demolitions). Pte [Name removed] used his MD8 detector in the blast hole and pinpointed where the item was. Pte [Name removed] then picked up the item using his finger and thumb and told Pte [the Victim] that it was a fuze, which he inspected and placed on the ground approximately 2m down from the blast hole. Pte [Name removed] then left Lane No 3 to go to Lane No 1.

Pte [2nd name removed] was called forward from the Control Point to take over from Pte [the Victim] in Lane No 3. The handover between the two deminers took place in Lane No 3 and both deminers handled the fuze assembly. Pte [2nd name removed] then proceeded to carry out QA post-demolitions on the 2nd blast hole whilst Pte [the Victim] picked up the fuze assembly to take it to the metal collection point; at this point the fuze assembly exploded in his right hand.

The modified QA procedure for clearing through the blast hole(s) was not followed by either deminer.

13. The cause, nature and extent of injuries caused to personnel or damage to equipment, property of infrastructure as a result of the incident: An MUV fuze assembly without any pins, c/w MD-2 detonator attached functioned as designed in Pte [the Victim]'s right hand causing an auto-amputation of his right hand and slight explosive burn marks to his lower left arm. No other personnel were injured and no damage was caused to equipment or property.

14. Why the incident occurred and whether the incident could have been avoided: The incident occurred due to the deminer not following procedures as taught and stated at Reference E to this report. In addition, the Section Leader failed to provide the necessary supervision to the deminer as stated at Reference E to this report. This incident was avoidable.

15. Any remedial action necessary to prevent incidents of this nature occurring:

- More detailed instruction on mine components;
- Formal and refresher training carried out documented;
- Authorised procedural changes to be included as an amendment in Reference E to this report, and
- One to one supervision for inexperienced/newly trained deminers.

16. Any other matters considered relevant to the incident:

- Site Manager is to ensure deminers have the correct level of supervision when carrying out their tasks in the minefield. A Section Leader cannot supervise a deminer from 100m away as was the case in this instance.
- At the time of the incident the Site Manager contacted his superior officer to inform him of the accident. This resulted in the Site Manager being distracted with constant phone calls preventing him from focusing on the difficult task at hand.

17. Level of training and experience of the personnel involved in the incident, including where applicable, supervisory and managerial staff: The Site Manager, Site Supervisors and Section Leaders have all completed a four week demining course conducted in accordance with International Mine Action Standards (IMAS), and all have carried out live minefield clearance in other minefields. Demining Pairs have attended a four week demining course over the period 9th March to 4th April 2008 in accordance with IMAS regulations. The Demining Pairs have not carried out any live clearance in a minefield prior to Jaalbhanjyang Army Post Minefield. Prior to minefield operations, all personnel as listed in the Team Orbat at Annex F to this report had carried out formal and refresher training at the NA EOD Holding Unit & Jaalbhanjyang Army Post. Training was carried out as stated at Reference E to this report. All personnel carried out CASEVAC training on 22nd May 2008 with the assistance of one doctor and two qualified medics. The Worksite Accident Response Plan was rehearsed and all forms of communications were tested (radio, mobile and satellite phone).

18. The work routines being followed prior to and at the time of the incident:

0630hrs - Morning Site Briefing
0730 - 1000hrs - Demining operations
1000 - 1100hrs - Lunch break
1100 - 1430hrs - Demining operations
1450 - 1545hrs - Demolitions
1545 - 1630hrs - QA post-demolitions

Deminers work 40min on, 40min rest. During demining operations handovers were occurring in the safe lane between the demining pairs; however during QA post-demolitions handovers between demining pairs were either taking place in Lane No 3 or not at all. Handover briefings covered ground & soil conditions, equipment issues and work carried out.

19. The dates of the last leave period or day off of personnel involved in the incident: Last day off for all personnel was Friday 23rd May 2008.

20. The dates and results of recent monitoring (internal and external) of the team involved in the incident: External monitoring was carried out on Saturday 24th May 2008 and internal monitoring carried out every 30min, daily, by Section Leaders and periodically through out each day by Site Manager and Site Supervisors. There are no records or results for external or internal monitoring carried out.

21. The procedures being followed by the personnel involved in the incident for the activities being carried out at the time of the incident: Deminers in Lane No 3 were not following

procedures prior to and at the time of the incident. Section Leader responsible for Lane No 1 & 3 was also not following procedures as stated at Reference E to this report.

22. The safety equipment or protective clothing required to be used, or worn by the personnel involved in the incident, and whether the equipment or clothing was worn or used, and if so, whether it was done so correctly: All personnel were wearing body armour and helmet/visor correctly. The body armour prevented further injury to the deminer as the outer cover had been pierced but the Kevlar inner had not. There was no damage to the helmet/visor.

23. The medical and emergency support available to the team/personnel involved in the incident and whether this support was adequate or not in the circumstances of the incident: The medical and emergency support available was adequate and all medical personnel involved in the incident are to be commended on their actions.

It is to be noted that at this particular site CASEVAC by road is not a viable option for serious injuries due to the road conditions.

24. Whether the incident was contributed by or caused by any of the following:
Any weakness in command and control:

(a) The Section Leader responsible for Lane No 1 & 3 failed to command or control all personnel carrying out their duties in Lane No 3.

(b) Neglect, carelessness, or misconduct by any of the personnel involved: The three deminers and the Section Leader involved in the incident neglected to carryout their duties as stated in Reference E to this report. In addition, the Section Leader was careless in positioning himself in Lane No 1 and failing to observe the actions being carried out by the deminers in Lane No 3.

(c) Personnel being given inappropriate or dangerous orders by supervisory or managerial staff: N/A

(d) Non-compliance with orders, instructions or procedures: The three deminers involved in the incident did not comply with orders and instructions given to them during the morning site briefing. The deminers and Section Leader did not comply with procedures as stated in Reference E to this report.

(e) The use of alcohol, drugs or prescribed medicine: N/A

(f) Deficiencies in SOP: Amend Reference E to this report to include:

- Mines found in Nepal and charge weight and placement required for demolition procedures;
- Partial or low order demolition of mines and mine components that may remain after such an event;
- Actions on mine components and dangers associated with these items;
- The modified procedure when carrying out QA after demolitions on blast holes utilising the basestick in not included in SOP.
- Any modification such as procedural change must be authorised through the correct channel and the amendment, if approved, included into the relevant document prior to the ‘modified procedure’ being carried out. In addition, all personnel are to receive formal and/or refresher training on any procedural change prior to carrying out demining activities.

(g) Incorrect use of equipment: N/A

(h) Any shortfall in training of personnel involved in the incident: Deminers involved in the incident did not receive training on the modified procedure when carrying out QA after demolitions.

(i) Injury sickness to any personnel involved in the incident: Only Pte [the Victim] was injured.

(j) Malfunction of equipment or materials, including explosives: N/A
(k) The prevailing weather conditions: Fine, cool, breezy and clear.
(l) Any deficiencies in basic support to personnel on site: N/A

Part Three – Summary, Conclusions and Recommendations

25. **Summary.** The three deminers involved in the incident recognised the item recovered from the 1st blast hole in Lane No 3, Site A, during QA post demolition procedures as an MUV fuze assembly which contained no safety pins. However due to lack of experience/training they did not recognise that the MUV fuze assembly contained an MD-2 detonator.

After the item was handled on five separate occasions it functioned as designed in Pte [the Victim]'s hand causing auto-amputation of his right hand.

The Section Leader responsible for supervising Lane No 1 & 3 failed to carry out his duties as listed in Reference E to this report.

Initial medical treatment was provided in the safe lane directly by Lane No 3 and further treatment was administered at the First Aid Point located by the Control Point. The treatment provided by the doctor and medics is to be commended.

26. **Conclusion.** The accident that occurred at Jaalbhanjyang Army Post Minefield on 26th May 2008 was preventable.

27. **Recommendations.** On conclusion of the investigation conducted over the period 27th – 28th May 2008 the following recommendations are made:

(a) Formal and refresher training (as stated in Reference E to this report) is to include detailed instruction on mines to include functions, operation, dangers, do's and don'ts. Accurate and up to date records of training carried out, when, where and by who are to be maintained as stated in Reference E to this report.
(b) International Supervisors, Site Manager, Site Supervisors, Section Leaders are to provide the correct level of supervision, guidance and advice to deminers as stated in Reference E to this report. Particular care must be shown towards inexperienced deminers.
(c) International Supervisors and Site Managers must provide individual lane supervision to deminers whilst carrying out clearance and QA procedures until the Section Leaders are confident in the deminer's ability and experience.
(d) No demining is to be carried out at remote minefields that are vulnerable to extreme weather changes which could prevent an injured deminer being CASEVAC by helicopter, especially where the alternative CASEVAC by road is not a viable option.
(e) Additional medical equipment (bandages, medication & O2) is provided at each demining site.
(f) All personnel are to adhere to the relevant SOP at all times. Under no circumstances are procedures to be modified on site. Any modification such as procedural change must be authorised through the correct channel and the amendment, if approved, included into the relevant document prior to the 'modified procedure' being carried out. In addition, all personnel are to receive formal and/or refresher training on any procedural change prior to carrying out demining activities.

(g) In the event of an accident, only the Site Manager is to contact his superior officer to inform him/her that there has been an accident and to wait out for further information. The Site Manager should then turn his phone off and concentrate on the casualty and related issues. Only when the situation is under control and the doctor on site has confirmed the course of action to be taken with the casualty (road or helicopter CASEVAC) will the Site Manager contact his superiors. In the absence of the Site Manager then this responsibility will fall to the Site Supervisor.

Signed: Investigating Officer [Demining group] Nepal. 3rd June 2008

[The accident site]

[A photograph of the Victim's body armour showed a non-penetrative fragment strike on the chest. Maps and support documentation are held on file.]

[The Site manager reported that "The deminer cried out that a fuze had gone off in his hand. The deminer lost part of his right hand in the explosion".]

[The deminer who located the fuze reported that "It looked like he had lost some fingers on his right hand".]

Victim Report

Victim number:	996	**Name:**	[Name removed]
Age:	25	**Gender:**	Male
Status:	deminer	**Fit for work:**	not known
Compensation:	Not recorded	**Time to hospital:**	Not recorded
Protection issued:	Frontal apron, Long visor	**Protection used:**	Frontal apron, Long visor

Summary of injuries: minor Arm,; Amp Hand

COMMENT: See Medical report

Medical report

A brief medical report from Shree Birenda Hopital (on form B-61) recorded:

"Auto-amputation following mine blast"

“Under General Anaesthetic:

Cleaning, debridement was done
Irrigation
Fish [unintelligible] incision was given and soft tissue incised at the same level
Disarticulation of the wrist joint done
Loose approximation of soft tissue done by viczyl
Loose approximation of skin done by Ethelone
Dressing done and pressure bandage applied.”

An IMSMA report gave the Victim’s age as 25 and recorded “burns/discolouration” to his lower left arm.

[The Medic reported that “Majority of the deminers right hand was damaged. The medic’s statement reads:]

On 26th May ‘08 in the morning 7:15am demining work was started. In that day total 12 PMD 6 were found. During day time at 2:30pm our team started to dispose all the found mines and after disposing mines, they started to carry out their Quality assurance. During QA, we medic and doctor were sitting in the control point, suddenly we heard explosion with Medic! Medic! Voice so, we ran there, with our trauma Kit, where WO2 [Name removed] were holding casualty injured hand. First of all I wrap up with pressure bandage in casualty hand, then after Doctor came up and we gave the casualty Inj. Metoclopramide 10mg. and inymorphin first 5mg or 3ml in safe land and we put the casualty in stretcher & bring him up to CP. After that we open his vein and gave him N/S saline first and Haemaccel then after. Patient was still shouting in pain, so after 10 minutes we gave him Morphine 1ml IV. Due to uncontrolled bleeding, again we put pressure bandages and we gave him oxygen to make easy for his respiration because patient was given Inj. Morphine. The condition of patient was Life threatening .Thus as quick as possible patient has to carried by Helicopter, so it’s not possible to take patient in ambulance because it can take more time and the road is also not accessible, so we waited for helicopter and later on Helicopter came up, weather was not clear over here, so it cause some delay .With some difficulties, finally we carried patient up to helicopter. Doctor and medic with patient they all went to Kathmandu.

If there’ve been 2-3 casualties, we wouldn’t have adequate medicine. We were lacking of pressure bandages. There could have lack of medic because there was number of working lane. There was only one oxygen cylinder with two stretchers. If there’ve been more casualties in same time we would have only one trauma kit. In upcoming days thinking up on the following weakness, I think there should be adequate equipments.

Cpl. [Name removed] (Medic)

Related papers

Reference: [Demining group]/06/02/01 2nd June 2008

[Name removed] Project Manager [Demining group] Nepal

INTERNAL ISSUES FOR [Demining group] NEPAL, UNMIN (MAU) & NEPAL ARMY DEMINING TEAM

1. Internal issues for [Demining group] Nepal, UNMIN (MAU) & Nepal Army Demining Team resulting from the incident investigation carried out over the period 27th – 28th May 2008 into the minefield incident at Jaalbhanjyang Army Post Minefield which occurred on 26th May 2008 at approximately 1630hrs.

2. [Name removed], [Name removed], Capt [Name removed] (Site Manager), Capt [Name removed] (Site Doctor) and WOII [Name removed] (Site Supervisor) travelled to Jaalbhanjyang Army Post Minefield on Saturday 17th May 2008 to carryout preliminary tasks prior to the arrival of Nepal Army Demining Team No 3 ([Name removed] left for KTM at 1400hrs 18th May 2008). Sequence of events as follows:

- Obtain relevant information to allow the formulation of the Emergency Response Plan (ERP);
- Confirm Minefield Working Plan;
- Minefield Site Layout, and
- Refresher training location.

3. The following, as noted, summarises the shortfalls prior to demining activities starting:

- 'Actions on' – mine components remaining after demolition ([Demining group]);
- Recording and signatories for the refresher training carried out ([Demining group] & Site Manager);
- Site supervisory responsibilities for Site Manager, Site Supervisors & Section Leaders ([Demining group] & Site Manager);
- Road CASEVAC dry run ([Demining group] & Doctor);
- Modified procedure for QA post-demolitions was not taught (Site Manager);
- Nepal Army SOPs not amended, dated or translated into Nepalese (UNMIN);
- No records of formal training carried out the EOD Holding Unit, KTM prior to deployment (Planning Officer), and
- Mines encountered in Nepal are not included in SOP 5; the destruction of (UNMIN).

4. The following, as noted, summarises the shortfalls during demining activities:

- Limited External monitoring (UNMIN);
- Inadequate Internal monitoring prior to QA post-demolitions on 26th May 2008 (Section Leader);
- Lack of supervision of deminers during QA post-demolitions, especially in Lane No 3, Site A (UNMIN, Site Manager, Site Supervisors - indirectly; Section Leader - directly);
- Poor Command & Control during QA post-demolitions (Lane No 3) (Section Leader);
- Modified procedure for QA post-demolitions not carried out (UNMIN & Section Leader - directly; Site Manager & Site Supervisors - indirectly);
- Failure to adhere to procedures as laid out in SOPs (deminers in Lane No 3, UNMIN, Site Manager, Site Supervisor and Section Leaders);
- Incorrect demolition procedures carried out to destroy mines (charge placement and weight) (UNMIN, Site Manager & Site Supervisors);
- CASEVAC by road was not a viable option at the demining site ([Demining group], UNMIN & Doctor);
- Lack of Command & Control post-incident due to continuous phone calls regarding accident from Army Superiors (Site Manager), and
- Lack of trust, poor communication and inconsistent advice on site (UNMIN & Site Manager).
- Confusion in roles (Accreditation or Supervisor) (UNMIN).

5. The following, as noted, relates to the incident investigation process conducted within the minefield:

- Failure to wear PPE whilst carrying out the incident investigation at Lane No 3, Site A ([Demining group] & UNMIN).

6. In this particular instance it appeared that there was little or no cohesion between UNMIN (MAU), [Demining group] Nepal and Nepal Army prior to demining activities beginning and between UNMIN (MAU) & Nepal Army once demining operations had started. Jaalbhanjyang Army Post Minefield was a 'training minefield' and all demining pairs had no 'live' demining experience prior to this minefield.

7. Sufficient Supervisors & Section Leaders (seven) were available to have one Supervisor per working lane whilst carrying out QA post-demolitions. In addition, whilst demining pairs are gaining experience and confidence, the number of working lanes should have been reduced from six to three. This allows for rest periods for Supervisors and deminers whilst one to one supervision is provided.

Signed: Investigating Officer, [Demining group] Nepal 2nd June 2008

Analysis

The primary and secondary cause of this accident is listed as a Management Control Inadequacy because it seems that the on-site supervisors at the time were assessing the group for accreditation rather than completing their training. As a result, obvious errors were not corrected. It appears likely that those conducting the "accreditation" did not notice that errors were being made because if they had noticed that safety was being compromised they should have intervened immediately.

The phrase "Auto-amputation" of the Victim's hand may be misleading because the 6cm long MD-2 detonator, while large, would not usually inflict such a severe injury. The witness report that he had lost some fingers seems more likely. The Victim's hand may have been closed around the detonator leading to finger loss and severe damage to the palm of the hand, which led to later surgical amputation (during which "disarticulation" of the wrist was performed as reported in the Medical report). The failure to record how long it took for the Victim to reach a surgical facility leaves some doubt over whether delay played a part in his complete hand loss.

In a detailed investigation, the independent investigator identified critical failings in communication between those supervising at the site and those who had been conducting training previously. (It is worth noting that he achieved this critical independence despite being an employee of the demining group involved, which shows a remarkable degree of professionalism.) He also identified many safety failings, from an inadequate Casevac provision through confused and inappropriate SOPs to unsafe demolition practices. The failure of those in control (conducting the "accreditation" assessment) to identify these failings and either correct them or stop work appears to have been the ultimate cause of this accident.