10-9-1997

DDASaccident223

Humanitarian Demining Accident and Incident Database
AID

DDAS Accident Report

Accident details

Report date:	15/05/2006	**Accident number:**	223
Accident time:	13:55	**Accident Date:**	09/10/1997
Where it occurred:	Lime Factory, Sevarlije, Doboj	**Country:**	Bosnia Herzegovina
Primary cause:	Management/control inadequacy (?)	**Secondary cause:**	Management/control inadequacy (?)
Class:	Missed-mine accident	**Date of main report:**	27/10/1997
ID original source:	MG/WL	**Name of source:**	BiH MAC
Organisation:	Name removed		
Mine/device:	PMA-2 AP blast	**Ground condition:**	bushes/scrub metal scrap rocks/stones route (verge) trees
Date record created:	17/02/2004	**Date last modified:**	17/02/2004
No of victims:	1	**No of documents:**	2

Map details

Longitude:		**Latitude:**	
Alt. coord. system:	BQ679509	**Coordinates fixed by:**	
Map east:		**Map north:**	
Map scale:	Doboj	**Map series:**	M709
Map edition:	WGS 84	**Map sheet:**	2784 III
Map name:			

Accident Notes

pressure to work quickly (?)

inadequate communications (?)

Accident report

A Board of Inquiry report was ordered by the country MAC and carried out by representatives of the PIU, an ex-pat Technical Advisor and a representative from the demining company. The report was made available and the following summarises its

content. The full BoI report is reproduced (edited for anonymity) in *Related papers* at the “Other documents” tab.

Work started at 06:45. The team completed one clearance task at 11:00 hours and moved after a lunch break to another site close by. The new site was in an area where the group had been working for "some weeks". The team comprised a Team Leader (ex-pat), six deminers, a medic and a translator.

Teams were spaced at 50 metres because the Team Leader did not know what the threat would be. [The MAC held mine data which was not supplied to the demining group.] Teams started work using metal detectors and prodders in two man teams. At 13:00 the deminers had a rest break. At 13:45 they returned to work where the victim's team cleared 45 square metres in the next hour. Ten minutes later the victim stepped on a mine.

The accident occurred on the verge of a road beside a river. The 4000m area was "densely" vegetated and sloped steeply down to the riverbank. [A photograph showed the area heavily overgrown with mature trees and bushes.] Clearance lanes started directly off the asphalt roadside. The road was in use and could not be closed for the duration of the task. Metal contamination at the site meant that Quality Assurance was to be provided by using dogs over the area after manual clearance (rather than 100% metal removal). The accident occurred in an area contaminated both subsurface and surface with garbage and fallen telephone cables.

The victim "lost his left foot". He was given "an infusion of fluid" and casevaced "successfully". He was later taken to Belgrade for further treatment.

A QA Monitor was on site, but did not make a statement. The QA team was criticised for not accepting information from a local who held it.

The victim said that he was wearing his protective equipment at the time and did not break any SOPs as he worked.

The investigators decided that the mine was probably a PMA-2 by the crater size. No fragments were found.

The company was funded by the World Bank to clear a set number of metres each month (83,200). This was thought to have led to an "inappropriate pressure…to reach commercial targets". The company could not "carry forward any excess clearance in one month to reduce pressure for the next". The investigators were intensely critical of the contract, but recognised that the World Bank disagreed with some of their views. The investigators were of the opinion that pressure to work quickly "seems to be implicit and is also due to the deminers' knowledge of the terms of the clearance contract".

The detector in use (not identified) was found capable of detecting "a PMA-2 fuse" at 15cm on the site. The crater was 17cm deep, so the investigators believed that the mine was buried deeper than usual.

The investigators observed that most recommendations from previous incidents had been acted on. At the time of the incident, the demining group provided every deminer with protective clothing and a visor (not a helmet). In areas where fragmentation mines were expected, they provided a helmet and visor.

Conclusion

The investigators found no fault with the company's SOPs but said that "insufficient planning and lead-time was allowed for the clearance team to be prepared…". They thought that the "contractual pressure created an atmosphere of unnecessary urgency", that communications between the demining company and the [QA] were inadequate and that the parties involved were all interpreting the contract differently.

Recommendations

The investigators recommended that where deeply buried mines were expected, detectors must be "maintained, operated and tested" appropriately, and listed the detectors approved

by the MAC. They thought that the parties involved in the contract should meet regularly, that a telephone or radio link to the QA office was desirable, and that the team involved should undergo "retraining" for at least a day.

Victim Report

Victim number:	288	**Name:**	**Name removed**
Age:		**Gender:**	Male
Status:	deminer	**Fit for work:**	yes
Compensation:	300,000 DM	**Time to hospital:**	57 minutes
Protection issued:	Frag jacket Long visor Trousers/leggings	**Protection used:**	Frag jacket, Long visor, Leggings

Summary of injuries:

INJURIES

severe Leg

AMPUTATION/LOSS

Leg Below knee

COMMENT

See medical report.

Medical report

No formal medical report was made available.

Another deminer stated that the victim was talking all the time as he was approached for MEDEVAC.

The medic stated that the victim was born in 1938. He observed that the victim's left leg was amputated below the knee and that his right leg had smaller injuries "under joint". He applied bandages and stopped the bleeding on his left leg, then attended his right. He then administered: Th:Ringer Lactate 1000 ml i.v. Intravenous cannulae, noting that the victim was talking and cooperating at all times. His respiration was normal and his pulse "70 in one minute".

He stated that the victim arrived at hospital at 14:52 where they did "RTG of both legs" and he was admitted.

The victim was interviewed on 22nd June 1999 in Zenica, Bosnia Herzegovina. He started by saying that he was glad to have lost his leg below the knee because he knew he was better off than others who had kept their foot but were crippled and without compensation. He said that the detector he was using was an Ebinger but gave the model only as "EBEX". He thought that it took only 20 minutes to get to hospital but could remember nothing after the accident so assumed he was unconscious. He was wearing leggings at the time of the accident. His left foot was traumatically amputated and his right leg was injured between the legging and the boot. He showed a long scar laterally across the leg just above the ankle on the inside. He believed that the legging reduced the severity of that injury. He had no injuries at all above his knees. He said that he was taken to Doboj hospital where he stayed for three

days, then moved to Belgrade Hospital on 12th October. He had no treatment in Belgrade and asked to be moved.

On 11th November he was moved to a military hospital and on 13th November they surgically amputated his leg removing "some small bone" probably three centimetres. Because much of his calf muscle was still intact, they could wrap his stump without grafting.

He allowed his stump to be photographed as shown above.

On 17th December 1997 he was allowed home. On 12th February 1998 he was given his first lower-leg prosthetic. On October 9th 1998 he was issued a second, his stump having "settled down".

The victim received a salary from the demining company until August 1998. In September 1998 he received 300,000 DM as compensation. He said that nothing could compensate for the loss of his leg but that he felt he had been treated fairly - although he was glad that he no longer had young children to support.

Analysis

The primary cause of this accident is listed as a "Management/control inadequacy" because the investigators clearly felt there was a pressure for speed but did not blame the demining company for applying this. The investigators blamed the funder who had built inappropriate pressures into the contract. When funders detail the area to be cleared each day, they are acting as managers, and in this case must bear some responsibility if the accident occurred because of the pressure they imposed. Further investigation of their role by an independent person may be desirable.

Related papers

The file included a detailed map. a sketch map, details from the minefield register showing that a row of PMR2-A mines and a row of PROM-1s had been laid in the area, photographs of the crater (showing very hard stony ground), a crater drawing estimating depth, photographs of the accident site, and pictures of the victim's armour. These documents were not made available for copying.

Original BoI report

The following is the original BoI report, edited for anonymity.

27 October 1997

REPORT ON 9 OCTOBER 97 MINE ACCIDENT NEAR LIME FACTORY, DOBOJ

Reference A: Map, Series M709, Sheet 2784-III, Doboj. (WGS 84)
B: UN Mine Action Centre Technical Guidelines. Dated 12 July 1997.
C: [Demining group 1] Standing Operating Procedures for Demining. Dated May 1997.

INTRODUCTION

1. A mine accident occurred on 9 October 1997 at a demining task site, at Grid Reference BQ679509, near the Lime Factory at Sevarlije, Doboj. This accident involved members of [Demining group 1]/[Demining group 2]; the company reported the accidents to UN MAC on 9 October 1997. [The "company" was a collaborative commercial venture between an international and a national company.]

2. On the day of the accident UN MAC appointed Mr [name excised] as a member of a Board of Inquiry to conduct an investigation and report about the accident. Mr [name excised], Republika Srpska PIU was appointed as a member of the Board. [Demining group 1] and the World Bank were both invited to appoint one member each. Col [name excised] attended on behalf of [Demining group 1]/[Demining group 2]. The World Bank did not provide any assistance to the Board of Inquiry.

3. UN MAC issued Terms of Reference for the Board of Inquiry. These are shown at Annex A to this report.

4. This is [Demining group 1]/[Demining group 2]'s fourth accident since starting the World Bank funded contract for Republika Srpska, in June 1997.

ACTIONS TAKEN AS RESULT OF PREVIOUS ACCIDENTS

5. Recommendations from previous accident reports have been actioned by the company, in particular;

   a. Personnel operating in areas where fragmentation mines are suspected now wear helmets with visors. This subject continues to be under review by [Demining group 1] management and it may require further investigation, through UN MAC and the Technical Working Group.
   b. Personal equipment and hand tools have been the subject of several changes and the issue, use and management of these items is now resolved.
   c. Drills and procedures in mined areas have been improved.
   d. Vehicle and radio allocation to work sites has been increased.
   e. Casualty evacuation and communications procedures have been reviewed and improved.
   f. Supervision of teams in the field is now subject to a continuous regime of supervision by managers and supervisors who are more senior than the team leader.
   g. Reporting procedures and documentation have been improved.
   h. The company has ordered MINELAB F1A4 metal detectors for future use.

6. The following recommendations were made after [Demining group 1] accident on 19 July 1997. Action remains outstanding to fully implement these recommendations.
   a. If parameters of a mine-clearance task are unclear, advice should be sought from the client.
   – [Demining group 1] Operations Director states that this advice is requested from PIU.
   b. Safety and Quality Assurance should take a greater priority than clearance-rate targets.
   - [Demining group 1] management state that they do not pressure their teams into moving faster than conditions or safety allows. This claim is supported by answers to questions put to team members. However, Pressure now seems to be implicit and is also due to the deminers' knowledge of the terms of the clearance contract.

CONDUCT OF THE INVESTIGATION

7. [Name excised] deployed to [Demining group 1]/[Demining group 2] regional HQ (The Lime Factory), from Sarajevo on the day after the accident and arrived at the Lime

Factory at 0830hrs. The Operations Director of [Demining group 1]/[Demining group 2], Colonel [name excised] welcomed the team and stated that he had instructed his employees to assist the Board of Inquiry in every way. Throughout the investigation [Demining group 1]/[Demining group 2] employees assisted the Board considerably by their open and helpful attitude.

8. Shortly after arrival of the Board at the Lime Factory, written statements were requested from all members of the team involved. The team members had written statements shortly after the accident and these were translated into English prior to the Board's arrival. Statements are shown at Annexes B and C to this report. No statement was provided to the Board by the World Bank/PIU Monitor at the site. A sketch map, paperwork and reports relating to the day of the accident were prepared for the Board's inspection.

9. Members of the Board arrived at the scene of the accident at 1030hrs on Fri10 Oct. At this time the area of the accident was inspected and an assessment was made of the site layout and conduct of [Demining group 1]/[Demining group 2] operations.

10. Investigation lasted one day; this included interviews, writing of statements, visits to the site of the accident, inspection of documents & maps, and of clothing and equipment used by the injured deminer.

11. The injured deminer was interviewed in Doboj hospital on 10 Oct.

GENERAL

12. [Demining group 1]/[Demining group 2] relations with local people are generally good. This relationship is enhanced by the fact that several [Demining group 1]/[Demining group 2] employees are from the local area.

13. Personnel from [Demining group 1]/[Demining group 2] started this task approximately two-and-a-half hours before the accident occurred. This task was part of a larger group of tasks and this team had been working in this area since 5 July. Doboj Municipality request for demining tasking in this area were provided to UN MAC Banja Luka on 26 May 1997 and passed to [Demining group 1]/[Demining group 2] through RS PIU. This task is number two on the list of Priority One tasks. UN MAC holds minefield records and information for the site and surrounding areas.

14. A [Demining group 1]/[Demining group 2] demining Team was working the task; this consisted of an international (Zimbabwean) team leader, six deminers, a medic and a translator. This team was structured in accordance with [Demining group 1]/[Demining group 2] regional structure.

15. Mine involved in this accident was an Anti Personnel mine. No conclusive evidence is available to state unequivocally what type of mine it was. No fragments were found during the Board of Inquiry's investigation. From initial crater analysis and local knowledge it is considered most likely that the mine involved was a PMA-2. Average depth of the crater was 170mm. A detector used at this site was used by the Board of Inquiry to locate a PMA-2 fuze at a depth of 150 millimetres on this site. A sketch and photographs of the crater dimensions are shown at Annex F to this report.

GEOGRAPHY

16. The area that [Demining group 1]/[Demining group 2] is operating in is inside the Zone of Separation, approximately 5 kilometres south of Doboj.

17. The task site area is on a road verge, next to the River Bosna. This area was mined by the VRS as part of the local defensive plan to protect the riverbank and the Lime Factory during the war. The task is related to the clearance of the Lime Factory and quarry and the water pumping station associated with this site. The area is heavily vegetated and the verge slopes steeply from the road down to the riverside. The nearest local residents to this site live approximately one kilometre away, in the village of Potocani. Priority for the

task was set by the RS PIU, after consultation with the local municipality and the Lime factory.

18. [Demining group 1]/[Demining group 2] personnel live in and deploy from [Demining group 1]/[Demining group 2] local Headquarters at the Lime Factory, Grid Reference BQ680509. All local employees live at the Lime Factory. The two team leaders run the operation from the factory. Mr [name excised], [Demining group 1]/[Demining group 2] Field Operations Manager for Northern RS, visits the factory and associated work-sites twice or three times each week. The organisation of [Demining group 1]/[Demining group 2] employees at the factory is run on military disciplinary lines. Local staff are allowed out only on weekends and there is a strict no-alcohol rule.

19. Task site from [Demining group 1]/[Demining group 2] location at the Lime Factory is approximately 400 metres, travelling time is approximately three minutes walk.

WORLD BANK/PIU CONTRACTS WITH [Demining group 1]/[Demining group 2]

20. The World Bank funded contract operated by [Demining group 1]/[Demining group 2] is for a clearance rate of 83,200 square metres per month. In order to achieve this target, [Demining group 1]/[Demining group 2] is required to clear 800 square metres daily on each of their four clearance sites.

21. Deminers and team leaders are aware of this commercial aspect to the contract and it is apparent that an inappropriate pressure is felt by management and field workers to reach commercial targets.

22. This subject was mentioned in the Board of Inquiry report after [Demining group 1]'s first mine accident, in July 1997. The PIU (World Bank) contract with [Demining group 1] is to achieve 500,000 square metres of clearance by the end of the contract, (Budget for the contract is for six months.) This is achievable, but a number of aspects of the terms of the contract produce what may be unnecessary pressures for deminers in the field.

23. The contractor claims that;

    a. No allowance is made for the contractor to carry forward into subsequent months any square metres that have been cleared above the current month's target. Conversely, the contractor cannot recover any losses. That is, if the contractor fails to meet the monthly target in one month, this cannot be made up for in subsequent months.

       Comment: As a consequence of this aspect to the contract, deminers seem to feel themselves to be on a treadmill and that they must always fulfil daily and monthly targets, regardless of difficulty of the task.

    b. The contractor is bound to work at least 26 days every month. Even if the deminers fulfil the 83,200 square metres cleared target in less time, they are still obliged to work every day to complete a minimum 800 square metres daily. This means that no time can be allowed for difficult ground or for planning and preparation of impending tasks.

       Comment: [Demining group 1]/[Demining group 2] employees are currently working to a regime where the priority to keep the clearance running at a constant minimum of 800 square metres every day is given an exceptional significance.

24. There is some disagreement from World Bank and PIU with the above statements.

SITE LAYOUT

25. The area of the task site, including the Control Point is marked and taped-off. Marking in the clearance lanes is adequate. Control Point is in a cleared, flat area of ground, which is on the opposite side of the road from the clearance lanes.

26. The clearance of lanes into the mined area started directly from the side of a 4-metre wide asphalt-surfaced road. Because this is a regularly used public road, it is not possible

to close the road for the full duration of the clearance task. An SFOR unit is stationed approximately two kilometres from the site, therefore it should be possible to close the road for planned detonations etc.

27. The task was to clear an area of approximately 4000 square metres of roadside verge and sloping riverbank.

28. The cleared area of the lane in which the accident occurred consists of a lane approximately one metre wide. This lane is approximately five metres from the side of the road. This is the third of three one-metre, adjoining clearance lanes in this area. The two other clearance lanes were each initiated from the same safe lane. These lanes were all cleared by working towards the road.

SUPERVISION AND QUALITY ASSURANCE

29. Supervision of clearance and survey teams in this [Demining group 1]/[Demining group 2] region is provided, in the first instance, by team leaders, in this case the team leader was a Zimbabwean national with experience in humanitarian demining in Africa. The next line of supervision is provided by irregular visits to the sites by one of two Field Operations Officers. These visits are supported by occasional visits from the [Demining group 1]/[Demining group 2] Operations Director, Col [name excised], approximately once each week. At the time of the accident [name excised] was in Tuzla. Col [name excised] was at [Demining group 1] HQ in Pale, approximately 150 Km away.

30. An RS PIU monitor, Mr [name excised] is on the site at all times. World Bank Senior Monitor, Mr [name excised], last visited the Lime factory sites on 20 September. [Demining group 1]/[Demining group 2] employees state that clearance operations in the area at that time were normal and no safety points were raised. No written reports were seen by the Board to confirm or deny this.

    Note: World Bank Senior Technical Adviser is currently using a saloon car. This vehicle is not capable of driving over ground necessary to access most [Demining group 1]/[Demining group 2] work sites.

31. All visitors to the site are recorded in a site diary. Supervision and Quality Assurance visits from [Demining group 1]/[Demining group 2] managers and supervisors have been increased since earlier accidents occurred.

32. Due to high metal contamination at this site, it is not possible to clear it to 100% metal free. Therefore it was planned to use dogs to confirm Quality Assurance after manual clearance of the area is completed.

COMMUNICATIONS

33. The accident occurred in Republika Srpska. The nearest large town is Doboj. The local Danish SFOR base has a military V-Sat telephone. This link is not continuous or reliable.

34. There is no electricity and no telephone at [Demining group 1]/[Demining group 2] local HQ, in the Lime Factory.

35. [Demining group 1]/[Demining group 2] communications to anywhere outside the region is generally by HF radio. This set-up allows HF communications to [Demining group 1] HQ in Pale and elsewhere. Communications have been improved since [Demining group 1]'s first accident.

36. There is no operations room at [Demining group 1]/[Demining group 2] regional HQ at the Lime Factory. Operations are commanded and controlled from a field level. Co-ordination is from HQ Pale and through the Field Operations Manager.

37. There is no telephone or radio communication from RS PIU to either [Demining group 1] or to the UN MAC.

38. There is no telephone or radio communication from World Bank Senior Technical Adviser to either [Demining group 1] or to the UN MAC.

MEDICAL

39. A comprehensive medical kit was on site at the time of the accident. Medic was stationed at the Control Point, approximately 100 metres from the scene of the accident. Ambulance was on the site. The Casevac operation was successful and the injured person was stabilised and despatched to the hospital without further problems, after receiving an infusion of fluid.

40. The nearest hospital to the accident site is at Doboj, approximately 10 Kilometres, travelling time is approximately 15 minutes.

41. The injured deminer, [name excised], lost his left foot during the explosion. He has now been evacuated, through [Demining group 1]/[Demining group 2]'s insurance plan, to Belgrade for further medical treatment.

42. All [Demining group 1]/[Demining group 2] personnel at this site are now fully familiar with CASEVAC procedures and the route to the Doboj hospital and these are practised and recorded regularly.

PERSONALITIES

43. Personnel directly involved are as follows.
    a. Team leader
    b. Deminer no. 1 – Injured in blast from mine.
    c. Deminer no. 2
    d. Team Medic.
    e. PIU Monitor at the site.

DOGS

44. No mine or explosive detection dogs were involved at this site at any time. Dogs will be used to confirm the Quality Assurance process later.

EQUIPMENT

45. The Board carried out an informal test on a metal detector used at the site. It was found that the detector could locate a PMA-2 fuze at a depth of 150 millimetres on this site. Average depth of the crater was 170mm. The blast from the mine would have excavated some of the earth underneath the mine. This mine was buried deeper than would normally expected.

46. This area was covered with vegetation prior to the clearance task. After this was cleared, a stubble remained on the surface.

47. The area of ground where the accident occurred is contaminated on the surface and underground with metal accumulated from dumping of garbage on the area and with overhead electric or telephone cables which have collapsed from their poles, onto the ground. This problem limits the use of a metal detector here.

48. Hand tools used by the demining team were standard prodders, trowels and garden pruning shears. These were used in the normal manner, approved by the UN MAC Technical and Safety Guidelines.

DRESS

49. Full protective clothing and headgear is available for all vulnerable personnel in [Demining group 1]/[Demining group 2] demining operations. Industrial working boots are issued to all demining personnel.

50. All protective clothing provided by [Demining group 1]/[Demining group 2] to demining teams is designed to provide a minimum protection to the wearer against 1.1g fragments travelling at a velocity of 450 metres per second.

51. Every deminer in every team is issued with a visor. Deminers working in areas where fragmentation mines are anticipated are issued with helmets and visors. The injured

deminer, [name excised] states that at the time of his accident he was wearing his visor and body armour.

DETAILED ACCOUNT OF ACTIVITIES ON 9 OCTOBER 1997.

52. This account is taken from formal and informal interviews and statements from all personnel involved. Most interviews took place through interpreters.

53. **Daily Routine**.[Demining group 1]/[Demining group 2] personnel work to the following daily routine.

a.	Start work	0730hrs	
b.	Breakfast	0900hrs	
c.	Break		1300hrs (Cold drinks and sometimes fruit)
d.	Cease works		1500hrs
e.	Lunch		1600hrs
f.	Dinner		1900hrs

54. Demining team departed [Demining group 1]/[Demining group 2] local headquarters at Lime Factory as normal at around 0645hrs. They started work on a demining site they had been working on prior to moving to the site where the accident occurred, at around 0700hrs, as normal. A daily briefing from the team commander is normally given to the team. Although part of [Demining group 1] SOPs, this daily briefing is an informal, unstructured briefing. It covers points relating to safety and the day's anticipated activities.

55. Lunch was taken for approximately half-an-hour, by all the team together, in the Control Point, at around 1100hrs, as normal.

56. [Demining group 1]/[Demining group 2] daily reports show that on the day before the accident (Wednesday), the team had cleared 1270 square metres of ground. On the Tuesday they had cleared 1300 square metres. On the Monday, 1120 square metres.

57. The team completed their task at this minefield and departed the task site at approximately 1100hrs. This minefield was now completely clear of mines and the team's next task would be elsewhere.

58. No break was taken and no time-off for the team was given to mark this completed clearance. The team knew that they continued to be under pressure to maintain the daily clearance of 800 square metres of ground on this day, the same as every day. It was therefore not appropriate to celebrate the completed clearance of a minefield or to pause in any way between tasks.

59. The team moved only a few hundred metres, closer to the Lime Factory, to a new mined area, next to the main road through the area.

60. The area that was to be used for the Control Point had been used on a regular basis for some time, by local people, for parking and turning vehicles. This intelligence coupled with the (incorrect) knowledge that no minefield records existed for this piece of ground, pointed to the likelihood of no mines being on this area. The team cleared this area. As the hard-topped road was to be used as the Base Line, no Safe Lane needed to be cleared.

61. Deminers were appointed to Clearance Lanes, a minimum of 50 metres apart and work in the lanes commenced at around 1200hrs.

    Note. It is normal for lanes to be a minimum of 25 metres apart. On this site the Team Leader decided to increase this distance because he did not have any information about the area of ground he was to deal with.

62. Deminers [name excised] and [the victim] were allocated an area next to the road, which they began to clear manually, with a metal detector and prodder. They continued this clearance until break-time, around 1300hrs. At this time a rest was taken and the deminers took cold drinks and coffee.

63. After resting for approximately 45 minutes, the deminers returned to work. [The victim] continued in the same area and by 1430hrs he had assisted in the clearance of three adjacent lanes totalling approximately 45 square metres. [The victim] was using a prodder and a detector.

64. At about 1440hrs [the victim] stepped on a mine, which detonated, he was standing upright when the accident occurred and he states that he did not make any errors in SOPs. The mine was just inside the area where [the victim] had cleared.

65. Casualty evacuation plan was implemented successfully.

TASKING

66. The PIU decide whether a target is to be Mine Clearance or Survey without consultation with [Demining group 1]/[Demining group 2]. No consultation is required by the contract. When taskings for potential clearance targets are provided to contractors. It is understood that the contract requires that notice should be given for impending tasks. This is so that the contractor has time to reconnoitre and plan clearance tasks.

67. It is normal for employers to request UN MAC to provide information from the national database about potential clearance or survey targets. A target folder of information and coloured maps is normally provided to the employer from UN MAC, to be passed on to the contractor. In this case no record exists of any information being formally requested from UN MAC. PIU states that this information was requested verbally from UN MAC Banja Luka in June 1997.

68. UN MAC holds information about this task site and related areas. A task folder was prepared and issued from UN MAC Information department on 3 July 1997. [Demining group 1] Operations Director states that he has not seen this information and that it has not been made available to the company at any time. UN MAC information about this task site is shown at Annex E to this report.

69. Because the area was overgrown with vegetation, the team leader deduced that local people must be wary of using it. Several piles of garbage and building rubble had been dumped on some parts of the suspect area. Photographs of the site are shown at Annex G to this report.

SUMMARY

70. This Demining team was demining in an area of difficult terrain. Insufficient minefield records, data and Intelligence was made available for them to use. Mounting and preparation for the task was carried out in a hurry. Deminers were not sufficiently prepared for the start of a new task so late in the day. Deminers and management were under an inappropriate level of commercial pressure to clear at least a minimum-sized area daily. The mine involved was probably buried deeper than would normally have been expected.

CONCLUSIONS

71. No fault was found with [Demining group 1] Standing Operational Procedures or drills.
72. Insufficient planning and lead-time was allowed for the clearance team to be prepared for this task.
73. Contractual pressures created an atmosphere of unnecessary urgency to the task.
74. Communication between the contractor and PIU are insufficient.
75. PIU, World Bank Technical Adviser and [Demining group 1] Operations Director have interpreted the contract differently.

RECOMMENDATIONS

76. Where it is suspected that mines may be buried deeper than would normally be anticipated, metal detectors are to be maintained, tested and operated to a standard that will promote their capability to detect deep-buried mines to the optimum.

77. UN MAC recommends the following metal detectors for use in this theatre of operations.
    a. Foerster Minex 4.

b. Guartel MD8.
c. Minelab F1A4.
d. Vallon ML-1620B.

78. The terms of the contract should be interpreted in the same way by the World Bank, PIU and the contractor. All three parties should meet together on a regular basis to ensure that the contract is running appropriately.

79. The contractor should make a deliberate, overt, sustained effort to reduce the commercial pressure felt by field workers to fulfil daily, weekly or monthly quotas of square metres to be cleared.

80. A telephone or radio link from PIU to [Demining group 1] and UN MAC is recommended.

81. A telephone or radio link from World Bank Senior Technical Adviser to UN MAC and [Demining group 1] is recommended.

82. The demining team involved in this accident should undergo a minimum of one day's retraining.

Annexes:

Annex A	Terms of Reference for Board of Inquiry.
Annex B	Deminers statements in English.
Annex C	Deminers statements in Serbo-Croat.
Annex D	Map provided to [Demining group 1] from PIU.
Annex E	Information from UN MAC database and Archive.
Annex F	Sketch of crater dimensions.
Annex G	Photographs of the Task site.

Signed: RS PIU, UN Mine Action Centre

Distribution
Programme Manager UN MAC
World Bank
PIU Republika Srpska
[Demining group 1]/[Demining group 2]