

# DDAS Accident Report

## Accident details

<b>Report date:</b> 17/02/2004	<b>Accident number:</b> 222
<b>Accident time:</b> 13:35	<b>Accident Date:</b> 13/10/1997
<b>Where it occurred:</b> Lime factory, Sevarlije, Doboj	<b>Country:</b> Bosnia Herzegovina
<b>Primary cause:</b> Unavoidable (?)	<b>Secondary cause:</b> Inadequate equipment (?)
<b>Class:</b> Missed-mine accident	<b>Date of main report:</b> 27/10/1997
<b>ID original source:</b> WL/MG/EB/LD	<b>Name of source:</b> BiH MAC
<b>Organisation:</b> Name removed	
<b>Mine/device:</b> AP blast (unrecorded)	<b>Ground condition:</b> soft, wet
<b>Date record created:</b> 17/02/2004	<b>Date last modified:</b> 17/02/2004
<b>No of victims:</b> 1	<b>No of documents:</b> 2

## Map details

<b>Longitude:</b>	<b>Latitude:</b>
<b>Alt. coord. system:</b> GR: 6752	<b>Coordinates fixed by:</b>
<b>Map east:</b>	<b>Map north:</b>
<b>Map scale:</b> Doboj	<b>Map series:</b> M709
<b>Map edition:</b> WGS 84	<b>Map sheet:</b> 2784-III
<b>Map name:</b>	

## Accident Notes

inadequate metal-detector (?)  
pressure to work quickly (?)  
protective equipment not worn (?)  
mine/device found in "cleared" area (?)  
inadequate area marking (?)  
inadequate communications (?)

## Accident report

A Board of Inquiry report was ordered by the country MAC and carried out by representatives of the funder, the MAC and the QA along with an observer from the demining company. The report was made available and the following summarises its content. The full report is reproduced (edited for anonymity) in *Related papers* under the "Other documents" tab.

The accident site was described as "open pastureland" near a river with areas used for agriculture in the vicinity. The vegetation was described as "waist high" grass and small bushes and trees. There had been rain the day before and the ground was described as "soft, wet and viscous". The demining team was based about a kilometre away from the site. The Control Point was 200 metres away from the "task site". Immediately adjacent to the "task site" was an area previously cleared by another team from the same demining company. The victim's group marked a safe route through the previously cleared area for site access (as required by SOPs).

A QA monitor was on the site at all times.

Minefield records of the area were incomplete and it was rumoured that local people were offering the details "for sale". However, the area was a "line of confrontation" with mines laid by both sides and only partial records kept. The presence of the device involved in this accident was not known to the local people. The group's relationship with local people was described as good, enhanced by the employment of several locals.

The contract for the work was considered significant, with payment by square metres cleared leading to possible pressure for speed [see Bosnia Herzegovina incidents on 19<sup>th</sup> July 1997 and 9<sup>th</sup> October 1997].

The team comprised a Team Leader (Gurkha), six deminers, a medic and a translator. Work started at 11:00 (following a morning of refresher training) and the accident occurred at 13:35. They were using Ebinger 420 PB detectors - during tests they could detect a PMA-2 fuse on the site to an "average" depth of 8cm.

The victim was directing the return to work after lunch when at 13:35 he walked along the end of the cleared area to the start of the centre lane and stepped onto the mine. The investigator's report states that the victim "lost his foot and most of his lower limb". He was taken to Dobo hospital and arrived at 13:48 and was moved to a hospital in the UK on 13<sup>th</sup> October 1997.

Statements of witnesses say that they checked around the victim with a detector and gave medical help. There was a yellow painted metal re-bar post close to the mine. The deminers said they had removed the post and checked around it, then replaced it. The investigators thought that it might have been used to mark the location of the mine. One deminer commented in his statement that the victim was walking in an area "we all used".

The accident was the third experienced by the demining group within three weeks. The demining group had acted on most recommendations from previous accident inquiries and their personnel now wore helmets and visors in suspected fragmentation mine areas. The company had also ordered a change to one of the MAC approved detectors. The need for the company to press for the supply of minefield data from the MAC was thought to require further attention.

The investigators found a clearly marked base-line in evidence at the site but found that it had been marked after the accident. At the time of the accident the team was relying on the previously cut vegetation to show the edge of the previously cleared area as a base-line.

The accident occurred "on the borderline between the cleared and uncleared area". The borderline was not marked. The area had been walked over by local people offering advice to the deminers, but the ground had been hard at the time. The detonation occurred between the base of "a firm stone" and agricultural soil. An examination of the crater revealed that the mine "had been buried deeper than might be expected" - between 15 and 18cm.

## Conclusion

The investigators concluded that the demining group had insufficient "lead-time" to properly plan the task, that the base-line was not marked and marking of cleared areas was inadequate and that the mine was below the depth that prodding and excavation would normally find it.

## Recommendations

The investigators recommended that SOPs be "adhered to", with clear and unambiguous marking. Also that Team Leaders should wear the same protection as the deminers, that dogs should be used in areas where deep buried mines are suspected, that MAC approved detectors be used, that the MAC mine database be used to provide known information before starting work at any site, that the demining company should consider disciplinary proceedings, that the victim should be fully compensated, and that a sat-phone or HF link between the company and the funder's Technical Advisor should be established.

## Victim Report

<b>Victim number:</b> 287	<b>Name:</b> Name removed
<b>Age:</b>	<b>Gender:</b> Male
<b>Status:</b> supervisory	<b>Fit for work:</b> not known
<b>Compensation:</b> not made available	<b>Time to hospital:</b> 13 minutes
<b>Protection issued:</b> Various	<b>Protection used:</b> none

## Summary of injuries:

### INJURIES

minor Hands

minor Leg

### AMPUTATION/LOSS

Leg Below knee

### COMMENT

See medical report.

## Medical report

No formal medical report was made available.

A field medic's statement reported that the victim had "lost his right foot and had wound in the left leg inside area of knee". He used six bandages then "put RINGER Lactus a' 1000 ml i.v." then "gave injection of TRODON/1 ampulla 2ml. The injured man was conscious and communicated.

On arrival at hospital "they treated a wound in the left leg and some smaller wounds in the hands " before taking him to surgery.

## Analysis

Despite the failure to mark the edge of cleared areas adequately, this accident is classed as "Unavoidable" because the investigators decided that the mine was buried to a depth of 15-18cm. If this is true, the mine could not have been reliably located by the detector or by prodding. The secondary cause is listed as "Inadequate equipment".

The failure to use a method that would have been capable of finding the mine is a possible "Management/control inadequacy".

## Related papers

Other documents in the file include a detailed map of the area, the MAC detector test report [cursory] showing a significant decline in performance after three hours battery use by three of the four detectors tested, a sketch of the site, photographs of the site and the crater, and statements from the personnel involved. These documents were not made available for copying.

## Original Bol report

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

Dated: 27 October 1997

### REPORT ON 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 13 October 1997 at a demining task site, at Grid Reference 6752, near the Lime Factory at Sevarlije, Doboj. This accident involved members of [[Demining group 1]]/[Demining group 2]; the company reported the accident to UN MAC on the afternoon of 13 October 1997. [Clearance was being done by a collaborative commercial venture involving an international and a national commercial company.]
2. On the day of the accident the UN MAC issued the Terms of Reference for a Board of Inquiry to conduct an accident investigation report. The Terms of Reference for the Board of Inquiry appointed [name excised] as chairman of the board with members consisting of [name excised], Republika Srpska PIU and [name excised], the World Bank Technical Advisor for the Republika Srpska. The Operations Director of [Demining group 1], Col [name excised] attended as an observer on behalf of [[Demining group 1]]/[Demining group 2]. In addition the UN MAC provided an ATO to conduct crater analysis and on-site mine detector performance.
3. The UN MAC Terms of Reference for the Board of Inquiry are shown at Annex A to this report.
4. This is [[Demining group 1]]/[Demining group 2]'s fifth accident since starting the PIU contract for Republika Srpska on 26 June 1997 and the third in the Doboj – Treslic area in the last three weeks.

### 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.
  - 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 modified.
  - d. Vehicle and radio allocation to work sites has been improved.
  - 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 modified.
  - h. The company has ordered MINELAB F1A4 metal detectors for future use.
6. The following recommendation was made after [[Demining group 1]]'s accident on 19 July 1997. It is the opinion of the Board of Inquiry that more action could be taken to fully implement this recommendation.
- a. If parameters of a mine-clearance task are unclear, clarification and advice should be sought from the client.

#### CONDUCT OF THE INVESTIGATION

- 7. All members of the Board including the observer for [Demining group 1], attended a Board briefing at the UN MAC at 0830 on the 14 October 1997. All members departed after the briefing to the [[Demining group 1]]/[Demining group 2] Regional HQ (The Lime Factory) from Sarajevo arriving at the Lime Factory at around 1230hrs. The team, as on previous visits were cordially welcomed and 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 and the PIU site monitor had written statements shortly after the accident and these were translated into English prior to the Board's arrival. 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 visited the scene of the accident at about 1400 hrs. The accident site was inspected and an assessment made of the layout and conduct of [[Demining group 1]] operations.
- 10. A second visit was undertaken with the PIU (World Bank) monitor and the leader of another [[Demining group 1]] team, who had cleared an adjacent mined area. The investigation lasted until late on Tuesday afternoon, this included interviews, writing of statements, visits to the site of the accident, inspection of documents & maps and the equipment used by the injured deminer.
- 11. The injured deminer could not be interviewed due to being MEDEVACed to the UK on Monday 13 October 1997.

#### GENERAL

- 12. Dobož Municipality's request for demining tasking in this area were provided to UN MAC Banja Luka on 26 May 1997 and the tasks form part of the RS PIU priority tasking schedule UN MAC holds minefield records and information for this site and surrounding areas.
- 13. [[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.
- 14. This was a new task, personnel from [[Demining group 1]]/[Demining group 2] demining Team (Callsign C1) were tasked; the team consisted of an international (Nepalese) team leader, six deminers, a medic and a translator. [[Demining group 1]]/[Demining group 2] started the clearance at around 1100hrs on Monday 13 October and two-and-a-half hours later the accident occurred.

15. This team was operating in accordance with [[Demining group 1]] Standing Operational Procedures.
16. The mine was an Anti Personnel blast 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. Average depth of the crater was 160mm.
17. The detector, an Ebinger 420 PB, used by the clearance teams at this site could detect to an average depth of 80mm. Annex B shows details of the performance of four of the company's Ebinger 420 PB detectors tested on the accident site during the period of the investigation.
18. There are a number of similarities to each of [[Demining group 1]]'s recent accidents. This will be considered in a later report.

#### GEOGRAPHY

19. The area that [[Demining group 1]]/[Demining group 2] is operating is within the Zone of Separation, approximately 5 kilometres south of Dobo.
20. The task site area is in open pastureland, near the River Bosna, with several areas close to the site used for agriculture. This area was mined by the VRS as part of the local defensive plan to protect the riverbank and associated areas during the war. It is known that the forward echelons from opposing forces advanced into this area. The clearance task is related to the clearance of the Lime Factory and quarry areas and the electrical power line associated with this site. The area has vegetation that is around waist height with several small bushes and trees in the immediate area. The nearest local residents to this site live approximately two hundred metres away. The RS PIU set the priority for the task, after consultation with the local municipality.
21. [[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 BQ683498. All local employees live at the Lime Factory during the working week. 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, states that he 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 strict disciplinary lines. Local staff are allowed out only on weekends and there is a strict no-alcohol rule.
22. The distance from the [[Demining group 1]]/[Demining group 2] location at the Lime Factory to the task site is approximately one kilometre, travelling time is approximately four minutes by vehicle.

#### PIU CONTRACTS WITH [[Demining group 1]]/[Demining group 2]

23. The PIU 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 a daily average of 800 square metres on each of their four clearance sites.
24. World Bank Senior Technical Adviser states that Current [[Demining group 1]] monthly clearance rate 57,648 square metres.
25. This subject was referred to in the Board of Inquiry report after [[Demining group 1]]'s first mine accident, in July 1997. The PIU contract with [[Demining group 1]] is to achieve 500,000 square metres of clearance by the end of the six month contract.

#### SITE LAYOUT

26. The task was to clear an area of approximately 4000 square metres. The proposed task plan is shown at Annex C.

27. The area of the task site, including the Control Point was marked and taped-off. The Control Point is in a cleared, flat area of ground, near occupied buildings, some two hundred metres from the forward edge of the task area.
28. [[Demining group 1]] team callsign C4 had previously cleared the area next to the proposed clearance task. Callsign C1 had created an access lane through the cleared area, using small pickets. This access lane led to the start of the task.
29. The task started on the edge of the previously cleared area. Vegetation on the previously cleared area had been cut down. The cleared area was marked by four two-metre wooden posts, spaced at approximately 30 metre intervals.
30. On arrival of the Board at the accident site, a clearly marked Base Line was evident. The team stated that this had been put in place after the accident. The Team Leader, relying on the cleared vegetation line and the four minefield markers, had not created a Base Line prior to the accident. The start of three clearance lanes could be clearly seen as indicated on the site map at Annex C.
31. The crater left after the detonation of the mine was near to the centre of the three clearance lanes. This was on the borderline, between the cleared and the uncleared area. The borderline was not marked by tape or string and was not easy to identify accurately.
32. Close to the edge of the crater, approximately 450mm inside the previously cleared area, a yellow-painted metal rod, approximately one-metre in length was inserted into the ground. Approximately 800mm of this rod were protruding above the surface of the ground.
33. The area for approximately two metres around the yellow rod had been investigated by the previous Callsign (C 4), as a possible mined area. Team leader C4 states that the metal rod had been removed and the area underneath checked. Both prodder and metal detectors were used and no indications of possible mines were registered. The rod was replaced to its original position after this search.
34. Although callsign C4 had investigated this area, part of this area was outside the marking that showed the limit of their clearance. The marking of their area was inadequate, wooden posts were used. No tape or string was used.
35. During an earlier inspection of the site, the area around the yellow rod had been walked over by a number of people, including local people who had come to offer advice about where the minefield was laid and [[Demining group 1]] personnel. When the area was walked over at this time, the weather was dry and the ground was hard.
36. On the day before the accident and on the day of the accident it had been raining in the area. On the day after the accident, during a visit to the scene of the accident by the Board of Inquiry, it was noted that the ground was soft, wet and viscous.

#### SUPERVISION AND QUALITY ASSURANCE

37. 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 Nepalese national with experience in humanitarian demining in Kuwait and Africa. The next line of supervision is provided by frequent daily visits by the teams' supervisor, [name excised], with regular visits during the week 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. Col [name excised] was at [[Demining group 1]] HQ in Pale, approximately 150 Km away.
38. An RS PIU monitor, Mr [name excised] is on the site at all times. World Bank Senior Monitor and Technical Adviser, Mr [name excised], last visited the Lime factory sites on Friday 10 October, as an observer to a previous Board of Inquiry.

39. 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.

#### COMMUNICATIONS

40. 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.
41. There is no electricity and no telephone at [[Demining group 1]]/[Demining group 2] local HQ, in the Lime Factory.
42. [[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.
43. 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.
44. There is no telephone or radio communication from the RS PIU to either [[Demining group 1]] or to the UN MAC, this is due to in-country communication problems.

#### MEDICAL

45. A comprehensive medical kit was on site at the time of the accident. The medic was stationed at the Control Point, approximately 200 metres from the scene of the accident. The Ambulance was on the site. The Casevac operation was successful and the injured person was stabilised and despatched to the hospital without further problems.
46. The nearest hospital to the accident site is at Doboj, approximately 10 Kilometres; travelling time is approximately 15 minutes.
47. The injured deminer lost his foot and most of the lower limb during the explosion. He has now been evacuated, to the United Kingdom for further medical treatment.
48. All [[Demining group 1]]/[Demining group 2] personnel at this site are now fully familiar with CASEVAC procedures and the route to the local Doboj hospital and these are practised and recorded regularly.

#### PERSONALITIES

49. Personnel directly involved are as follows.
- a. Team leader [victim]
  - b. Deminer
  - c. Deminer
  - d. Deminer
  - e. Deminer
  - e. Interpreter
  - d. Team Medic.
  - e. RS PIU monitor.

#### DOGS

50. No Explosive Detection Dogs have deployed to this site.

#### EQUIPMENT

51. The Board carried out an informal test on five metal detectors similar to those used during the clearance task. A PMA-2 Anti Personnel mine fuze was used as a field-test piece, in accordance with normal [[Demining group 1]] practice. Recordings were taken using new batteries in each metal detector, with a second set of tests taken after leaving the metal detectors switched on for approximately three hours. The average detector performance



was detection of the field-test piece at an average depth of 80mm. The test results are shown at Annex B.

52. The other tools and equipment are standard items as detailed in [[Demining group 1]] SOPs, such as mine-clearance prodders, gardening shears etc.
53. Full protective clothing and headgear is available for all personnel in [[Demining group 1]]/[Demining group 2] demining operations. Industrial working boots are issued to all demining personnel.
54. 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.
55. Every deminer is issued with a visor. Deminers working in areas where fragmentation mines are anticipated are issued with helmets and visors. The injured Team Leader, [name excised] was not wearing body armour, visor or helmet.
56. 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.

#### BLAST ANALYSIS

57. The blast crater is in an area of ground that has been used previously as agricultural land, with a small track running through the site towards the river. This track was apparently created using local stones and forms one side of the crater area. The track has not been maintained for many years and the vegetation has overgrown the surface. The mine was positioned between a firm stone base and agricultural soil.
58. The blast from the mine formed an irregular shaped hole some 800mm long, ranging from 400 to 700mm wide. Depth at the centre of the blast area was approximately 180mm. Although it had been raining for several hours, the base of the hole was firm and the explosive burn marks could be clearly seen, after removing the soil migration caused by the rain. The sides and base of the hole contained stones from the immediate area of a small track. The hole was surrounded by grass and vegetation. The hole contained no metal or man-made fibres to indicate the type of mine it originally contained.
59. The explosion would have excavated some earth below the mine. The initial crater analysis indicates that the mine was buried at a depth of between 150 and 180mm. The surface of the ground is sloping, (see detailed sketch at Annex B). This mine was buried deeper than would normally have been expected.

#### DETAILED ACCOUNT OF ACTIVITIES ON 13 OCTOBER 1997.

60. This account is taken from formal and informal interviews and statements from all personnel involved. Most interviews took place through interpreters.
61. The team had only recently arrived at Dobo and had spent the first part of the day on refresher training, prior to deployment on a new task, number B-001-BL-11/7. Training started at 0800hrs. During this time, the PIU Monitor, [name excised], [[Demining group 1]] Operations manager, [name excised] and the Team Leader, [the victim] received a verbal briefing about the site from [name excised].
62. [Name excised] is the Leader of [[Demining group 1]] Team S4; he had met local informers from Dobo who were familiar with the mines laid in this area by VRS during the war.
63. A mid-morning break was taken at around 1100hrs and the team started to set up the site after this break. The Monitor and Team Leader discussed the methods of work and the work parameters and decided that work would start from the edge of the previously cleared area. One team started on Lane One but this work was stopped after they had moved just a few yards. The teams working in lanes two and three continued to work. All work was stopped at 1300hrs for lunch and resumed at around 1330hrs.

64. The teams working in lanes two and three moved to the edge of their respective work areas and were putting on their protective equipment. [The victim] gave further instructions to the team in lane two and then moved towards the direction of lane three.
65. While moving along the unmarked edge of the mined area he walked over and activated a mine.

#### TASKING

66. The RS PIU provides taskings for potential clearance targets to contractors. It is understood that the contract requires that notice should be given for impending tasks. This is in order that the contractor has time to reconnoitre and plan clearance tasks. In this case the tasking was provided to [[Demining group 1]],[Demining group 2] by the PIU on the day before the area was to be cleared and on the morning of the accident the task was discussed in detail.
67. The PIU decide whether a target is to be Mine Clearance or Survey without consultation with [[Demining group 1]],[Demining group 2].
68. It is normal for PIUs 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 PIU from UN MAC, to be passed on to the contractor. In this particular case information is held by UN MAC about mined areas in the immediate task area. It is believed that only a few people, involved in the military activity during the war in this area, have a comprehensive knowledge of the actual mined areas. There is some evidence to suggest that would-be informers in the area are offering information about mined areas for sale. Records of the area are incomplete and the informer was apparently not aware of the mine that caused the accident.

#### SUMMARY

69. This Demining team was demining in an area of open terrain. Most minefields laid by the VRS in this area are known but this information is not complete. This area is on a former line of confrontation and it is reported that both sides had the opportunity to lay mines in the area.
70. Implementation and mounting of the task was carried out in a hurry. The team did not create a Base Line to start their work from; this was in breach of [[Demining group 1]] Standing Operational Procedures. The boundaries of the area pronounced cleared by the previous team were accepted as such. The edge of the cleared vegetation was the edge of the cleared area. This boundary was not marked properly. The area containing the yellow rod had been "cleared" by the previous team.
71. The mine was buried deeper than would normally be expected.

#### CONCLUSIONS

72. Insufficient planning and lead-time was allowed prior to the start of this task.
73. No Base Line or Safe Lane was set-out to define the limits of cleared and uncleared areas.
74. Marking of the previously cleared area was inadequate.
75. The site of the accident was on the edge of an area already cleared by a [Demining group1]],[Demining group 2] team.
76. The yellow rod may have originally been used as a marker for the mine involved in this accident.
77. The mine was below the depth that the prodder and metal detector could have normally been expected to find it.

#### RECOMMENDATIONS

78. Standing Operational Procedures must always be adhered to. In particular:
- a. Marking of cleared and uncleared areas should be complete and unambiguous. Where more than one post is used to mark any area, it should be linked to the next post by tape or string in all cases.
  - b. Team Leaders should wear the same body and face protection as the rest of their teams.
  - c. No movement should be allowed outside marked, cleared areas.
  - d. A Base Line and Safe Lane must always be established for every task. Access lanes to the Safe Lane must always be clearly marked.
79. Where deep-buried mines are anticipated or suspected, dogs are the most effective way of attempting to find them. If dogs are available, they should always be used.
80. UN MAC recommends the following metal detectors.
- Foerster MINEX 4  
 Guartel MD8  
 Minelab F1A4  
 Vallon ML1620B
81. Information from the UN MAC database should always be sought before every task.
82. [[Demining group 1]] should consider if any disciplinary proceedings are appropriate and should implement them in accordance with their Standing Operational Procedures.
83. It is recommended that the injured Team Leader should be paid the full amount of any compensation award that is applicable under the terms of the contractor's insurance.
84. A satellite telephone or HF radio link from PIU to [[Demining group 1]] and UN MAC is recommended.
85. A satellite telephone or HF radio link from World Bank Senior Technical Adviser to UN MAC and [[Demining group 1]] is recommended.

Signed:

World Bank, RS PIU, UN Mine Action Centre

**Annexes**

- |         |   |                                   |
|---------|---|-----------------------------------|
| Annex A | - | Terms of Reference.               |
| Annex B | - | Metal detector test.              |
| Annex C | - | Sketch of area.                   |
| Annex D | - | Photographs of area               |
| Annex E | - | Sketch and photographs of crater. |
| Annex F | - | Statements by personnel involved. |

**Distribution**

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

Annex B to  
Accident Report

Dated 16 Oct 97

DEPTHS OF ON-SITE LOCATION OF PMA-2 FUZE USING EBINGER 420PB

<b>Ser</b>	<b>Detector Serial No.</b>	<b>Depth 0hr</b>	<b>Depth + 3hrs</b>	<b>Remarks</b>
<i>(a)</i>	<i>(b)</i>	<i>(c)</i>	<i>(d)</i>	<i>(e)</i>
1.	2482	800mm	700mm	
2.	2478	800mm	800mm	
3.	2512	1300mm	100mm	
4.	2477	900mm	700mm	