

DDAS Accident Report

Accident details

Report date: 15/05/2006	Accident number: 206
Accident time: 11:30	Accident Date: 08/06/1999
Where it occurred: Grebnica, Domaljevac, Posavski (Canton 2)	Country: Bosnia Herzegovina
Primary cause: Management/control inadequacy (?)	Secondary cause: Inadequate training (?)
Class: Demolition accident	Date of main report: 17/06/1999
ID original source: PC/NH/RB/MM	Name of source: BiH MAC
Organisation: Name removed	
Mine/device: PROM-1 AP Bfrag	Ground condition: grass/grazing area metal scrap residential/urban
Date record created: 15/02/2004	Date last modified: 17/03/2004
No of victims: 1	No of documents: 2

Map details

Longitude:	Latitude:
Alt. coord. system: BQ 0535 9041	Coordinates fixed by:
Map east:	Map north:
Map scale:	Map series: 1002
Map edition:	Map sheet: St 376-3
Map name:	

Accident Notes

inadequate communications (?)
inadequate equipment (?)
inadequate training (?)
safety distances ignored (?)
visor not worn or worn raised (?)
inadequate area marking (?)

Accident report

Clearance at the site appears to have been conducted by one-man teams using a one-man drill. The demining group was not accredited, but the deminers and the victim were qualified and registered in the country MAC's national deminer database.

An independent accident report was prepared for the country MAC. That report was made available and the following summarises its content.

The accident occurred on the flood plain of a river at a village through which a "highway" ran. The mined area was described as flat, partly overgrown with grass, and with a lot of garbage randomly dumped on the site. It had formerly been the play area of an elementary school. The ground was considered suitable to work with a prodder. It was dry and sunny at the time of the accident. The area was contaminated with metal, "which slows the work of the metal detector" but did not have electromagnetic soil. The group had found "a PMA-3, two Italian SGV-20s, 1 TMRP-6 with a tilt rod, a PROM-1P and a DK-10" prior to the accident.

"A mine clearance operation seemed to have been undertaken in 1996 by a German commercial company but the work apparently stopped after an earlier accident occurred." [The earlier accident is not recorded in the National Database.] The country MAC was not informed about the clearance being undertaken at the time of the accident - which was said to be being done as a favour by a demining company with no contract.

The site was incorrectly marked and markings were sparse and hard to understand. There was no CASEVAC safe lane, no marked base line or datum point, no marked access lanes and no metal detector test area. Working lanes were up to 51 metres long. Separation between concurrent working lanes varied from 4m to 20m. Deminers decided when to take their breaks. No QA or QC was conducted. No site Log of comms was kept. Communications were by hand held radio and a telephone in a nearby house.

The detector used was a "Koncar" DM1. When the detector signalled the deminers used a prodder to locate the find and the trowel to excavate it. The prodder was also used for finding tripwires.

The victim was a Team Leader. A second Team Leader supervised the site.

The victim "was preparing a mine for demolition in the middle of the second working lane" when then the accident occurred at 11:30. He had a trowel and shears with him at the time of the accident. The handle of the trowel "was separated horizontally and was burned." A prodder was found to the right of the crater. He "received many injuries to the head, to both legs and arms". He showed no sign of life when reached by other deminers. He was taken to Orasje hospital. It took 20 minutes to get the victim to the medic who waited on the asphalt road. It took a further 10 minutes to get him to hospital. The ambulance used was borrowed from the local hospital.

The investigators found that the crater showed evidence of digging on the side facing the working lane. "The imprint of the mine's body, star and fuse could be clearly seen in the soil that remained", implying that the mine had been moved prior to detonation. It appeared that the mine had detonated at an angle straight towards the victim.

The investigators examined the protective equipment being used. The victim was wearing "an old US military helmet, flak-jacket and military boots". The equipment did not meet the MAC's standard. The helmet had a heavy steel outer and plastic liner. It had no visor. There were three holes on the outside of the helmet where fragments had penetrated. The chin strap was not fastened. 53 fragment holes were counted on the external skin of the frag-jacket. "Eleven fragmentation holes crossed to the level of the chest on the left side". There was no blood on the jacket. Several fragments remained inside it. There were safety "pins" for the PROM attached to the jacket shoulder. [The make of jacket was not identified.]

The victim's boots were torn in the toe area with possible frag holes on the upper. "No trace of blood" was found.

Insurance was for 100815,10 DM in the event of death - payment delivered to the demining company.



[The pictures show the victim's PPE. The helmet was "holed" and the toe of one boot shredded. The frag jacket took a lot of impacts low down.]



Conclusion

The investigators concluded that the victim was preparing a PROM-1 for demolition in-situ, and that the accident occurred "probably when trying to dig the ground around the mine for placing the explosive charge". The work was performed in "contravention" of National Technical and Safety Standards Guidelines. It was not correctly laid out or marked, safety distances were not observed, the victim did not wear safety equipment, and that other deminers were working while a preparation for demolition was in progress.

Recommendations

The investigators recommended that every demining organisation in the country should conform to the MAC technical and safety standards and that all work at a site must stop while a mine was being investigated. They added that while a company was awaiting accreditation, it should not be able to undertake work and no local authority should offer work to unaccredited companies. It was stressed that the situation where demining companies could be authorised to operate by other government ministries must be changed immediately.

Further recommendations were that work at the site must stop, authorisation for the demining company to operate must be rescinded and its request for authorisation rejected "forthwith". Also that no demining company should be able to continue a demining operation without a visit of MAC inspectors during the first five days. They also recommended that the country MAC should issue a "technical bulletin...on demolition procedures for the PROM-1" and that all protective clothing and equipment for demining must be in accordance with STANAG 2902.

A senior advisor in the country reported that the demining Commission "have recommended changes to the legislation...[so that] all organisation ... be required to obtain accreditation **before** undertaking clearance operations".

Victim Report

Victim number: 264	Name: Name removed
Age:	Gender: Male
Status: supervisory	Fit for work: DECEASED
Compensation: 100,815 DM (insured)	Time to hospital: 30 minutes
Protection issued: Helmet Frag jacket	Protection used: Helmet, Frag jacket

Summary of injuries:

INJURIES

severe Arms

severe Head

severe Legs

FATAL

COMMENT

No medical report was made available.

Analysis

The primary cause of this accident is listed as a "*Management/control inadequacy*" because the group's management failed to make basic provisions for safety that are standard in the industry. It is possible that the victim was working properly in making an excavation to place a demolition charge when the device detonated, but it seems likely that the victim was not adequately trained in the task he was undertaking. The secondary cause is listed as "*Inadequate training*".

There were many failures of management at the site as identified by the investigators. However, their identification of the protection as inadequate was only well targeted as far as it applied to the failure to provide a visor. As the results of other close-quarter PROM-1 detonations show, a STANAG V50 of 450m/s is unable to provide protection against this threat. The victim would almost certainly still have died if he had been wearing the required protection.

Related papers

The following "Lesson Learned" document released by the MAC was accessed from another source.

BOSNIA AND HERZEGOVINA MINE ACTION CENTRE

Tuesday, July 06, 1999

ACCIDENT LESSONS LEARNED: JUNE 8th 1999 Team Leader Mine Demolition

1. A non-accredited company agreed to demine a schoolyard when requested by a local authority in contravention of National Technical and Safety Standards Guidelines.
2. This company used qualified deminers and a team leader registered in the BHMAC National Database.
3. The site markings were not clear in contravention of National Technical and Safety Standards Guidelines.
4. The safety distance between working clearance lanes, and personnel in uncleared areas, were not respected in contravention of National Technical and Safety Standards Guidelines.
5. Prodders were used as tripwire feelers by deminers in contravention of National Technical and Safety Standards Guidelines.
6. The deminers set their own working discipline for breaks in contravention of National Technical and Safety Standards Guidelines.
7. The deceased team leader used a standard military helmet without visor in contravention of National Technical and Safety Standards Guidelines.
8. The metal detectors were not in conformity with those found most suitable for use in BiH.
9. No demining drills/procedures/markings of this platoon were in conformity with Technical and Safety Standards Guidelines.
10. The MAC RO did not have any information about this task site in contravention of National Technical and Safety Standards Guidelines.

CONCLUSIONS

11. The demining operation in this area was performed in contravention of National Technical and Safety Standards Guidelines.
12. On the day of the accident, the demining site was not laid out in accordance with National Technical and Safety Standards Guidelines and the organisation for work was in contravention of all the rules for humanitarian demining.
13. On the day of the accident, the Team Leader, despite his knowledge of mines, did not wear adequate equipment for personal safety, and the supervisor should have stopped the operations.
14. On the day of the accident, all the deminers operated inside correct safety distances and their work should have been stopped immediately by the supervisor.
15. When the accident occurred in the working lane, the deminers were still working in the other working lanes in contravention of National Technical and Safety Standards Guidelines.

16. The Team Leader was killed when preparing a PROM-1 for demolition 'in situ' and most probably when trying to dig the ground around the mine for placing the explosive charge.

RECOMMENDATIONS

17. While a new company request for accreditation is in review, it should not request or accept any demining work.

a. A letter to this effect should be signed by the director of the Company when requesting BHMACH accreditation; this letter should be drafted and added to BiH National Technical and Safety Standards No 16 (Accreditation);

b. Until a company's request for accreditation is approved, no local authorities should offer work to unaccredited companies.

18. In BiH, any organisation can request an authorisation through the appropriate Government ministry to operate as a commercial demining enterprise and this authorisation does not involve BHMACH. Without any state or entity law, some companies can continue to operate in contravention of National Technical and Safety Standard Guidelines. It is necessary to change this situation as soon as practicable.

19. No commercial companies, NGO or the EAFs should continue to operate demining operations at a new task site without any visit of MAC inspectors in the first five days.

20. As soon as any mine is found and is being investigated by the Team Leader, all task site is stopped immediately.

21. A technical bulletin should be issued by BHMACH on demolition procedures for the PROM 1.

22. The Protective Clothing and Equipment is to be in conformity to International Standards and the former military equipment cannot be agreed as safety for humanitarian demining operations.