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DDAS Accident Report

Accident details

Report date: 19/05/2006	Accident number: 388
Accident time: not recorded	Accident Date: 10/06/2003
Where it occurred: Al Zubyaer Distruct, Basrah Governorate	Country: Iraq
Primary cause: Inadequate training (?)	Secondary cause: Management/control inadequacy (?)
Class: Demolition accident	Date of main report: 25/06/2003
ID original source: Bol 03-001	Name of source: RMACT/UNDP
Organisation: Name removed	
Mine/device: Ordnance	Ground condition: not applicable
Date record created: 22/02/2004	Date last modified: 22/02/2004
No of victims: 0	No of documents: 1

Map details

Longitude: 47° 41' 35"	Latitude: 30° 32' 59"
Alt. coord. system:	Coordinates fixed by:
Map east:	Map north:
Map scale:	Map series:
Map edition:	Map sheet:
Map name:	

Accident Notes

non injurious accident (?)
inadequate area marking (?)
safety distances ignored (?)
inadequate training (?)

Accident report

A Board of Inquiry report was made available in January 2004. It is reproduced below, edited for anonymity. The photographs referenced were not made available.

Board of Inquiry 03-001: Ammunition incident [demining group] 10th June 2003

President: [Name excised] Mine Action Advisor UNDP Iraq

Member: [Name excised], EOD supervisor-SRSA Iraq
Governorate: Basrah, District: Al Zubyraer, Village: N/A
EOD site: Lat 30.32.59 Long.47.41.35
Signed: Basrah 25 June 2003

Content list

Annexes [Not made available.]

1. Definitions
2. Initial investigation report by RMACT
3. Conveying order for BOI with TOR
4. Statement by EOD Team 3 Leader [Name excised]
5. Statement by EOD manager [Demining group] Iraq [Name excised]
6. Statement by EOD Team 3 2I/C [Name excised]
7. Statement by EOD Team 3 Medic [Name excised]
8. Statement by EOD Team 3 Interpreter [Name excised]

Introduction

On 10 June 2003 [Demining group] reported an ammunition bunker had spontaneously detonated in the Basrah area. RRMACT initiated an investigation. The investigation concluded the spontaneously detonation was caused by [demining group] EOD Team 3. The incident occurred during an Explosive Ordnance (EO) clearance operation in a warehouse. RRMACT initiated a BOI.

This report covers the incident, immediate actions taken by [Demining group] after the incident, the management issues leading to this incident and the training preparations conducted by [demining group].

Summary

The result of this accident is alarming. Although only property damage occurred, this incident could have been prevented. Within a month of entering Iraq, [the demining group] providing humanitarian mine action, made this EO removal task into a far more hazardous and demanding task. It is now a much more technical complicated task with increased risks for people using the area.

The BOI conclude that during EOD Team 3 demolition of two Sagger missiles 105 metres from the ammunition warehouse, the resulting demolition caused a hot fragment to jump into the scattered propellant laying outside the entrance of the warehouse. This initiated a propellant fire.

[Demining group] EOD Team Leader 3 did not adhere to [demining group] SOPs and did not apply common sense for this EOD task. [Name excised], the Team Leader of EOD 3, resigned shortly after the incident and left the country before conducting this BOI.

On close inspection of [the demining group]'s SOPs, it is evident the SOPs are limited when it comes to EOD/EOC operations.

Furthermore, [demining group] did not train and prepare their EOD staff entering Iraq in accordance with their [demining group] Training SOP, which requires five days in-country training.

The BOI concludes the reasons to this incident as a combination of several causes:

Poor judgment of the Team Leader non compliance to [demining group] SOP.

[Demining group] management did not adhere to their own training SOP to prepare employees for Iraq.

[Demining group] SOPs do not cover more advanced EOD OPS (only BAC and very simple disposal through demolition).

[Demining group] has unclear QA/QC procedures when it comes to EOD OPS.

[Demining group] OPS Iraq management exercise minimal control of its EOD OPS.

Method of investigation

The BOI received the Convening Order on 14 June 2003. The investigation commenced on 15 June 2003 with gathering earlier reports and other essential information for the BOI. (see Annexes 1, 2 and 4 [not made available]). A field visit was conducted 16th June to the accident site.

On 18th June, statements were obtained from [name excised], [Demining group] EOD Manager; [name excised], 2I/C EOD Team 3; [name excised], EOD Team 3 Medic and interpreter, [name excised]. (Annexes 5—8). In addition, interviews were made with [demining group] PM, [four names excised].

The report was to be complete by 19 June 1800 hours, however due to several unforeseen factors the completion date was amended to 25 June. Further discussions with [Demining group] PM [name excised] on 22nd June concentrated on the SOPs.

On 23rd June, RRMACT received complementary documentation to [Demining group] SOPs. The document received was the British Army's Ammunition and Explosives Regulations.

Incident facts

On 10th June 2003, [demining group] EOD Team Echo 3 were conducting a clearance operation on a building used by the Iraqi Forces to store ammunition of mixed natures.

This building was looted and as a result propellant from the ammunition was scattered in the immediate area and the confines of the building. This building was located at GPS Lat 30.32.59 Long. 47.41.35.

At approximately 10:35hrs, a fierce fire was detected outside the building immediately after the demolition by detonation of 2 Sagger missiles. The fire spread rapidly to inside the building and several loud explosions were seen and heard to take place.

Picture 1 Overview of warehouse after incident

There were no casualties but the building was totally destroyed, the roof collapsed onto several hundred items of ammunition.

[Demining group] did not seal the site and no initial investigation was conducted by [demining group] in accordance with [demining group] SOP 26 and IMAS 10.60 Reporting Investigation.

An investigation team was dispatched from the RMACT on the 11th June to determine the cause of the incident which had initially been reported as a 'cook off'. The RMACT was shown the site of the incident by [the demining group PM]. Also present was the [demining group] EOD Team Leader and his Deputy.

Explosive Ordnance involved

The ammunition involved was a mix of several types laying in a thick layer of loose propellant (cordite). For more details see Annex 4, [name excised]'s statement. [Annex not made available.]

Priority of task

This task was identified as a priority task for the local population. Looting in the area created a second dangerous hazard area by breaking down the munitions and spreading propellant over the adjacent areas.

At the site, the Team Leader correctly identified propellant as being very dangerous in its unpacked and exposed condition but only removed it in order to gain access to the relatively safe and stable stocks of ammunition.

Picture 2 Collapsed building on top of Ammunition

Picture 3 Ammunition at the warehouse

Quality assurance and Quality control

No documented QA or QC has been presented.

The Team Leader was present during all demining activities. According to [EOD Team 3 2I/C] and the national interpreter, no [demining group] in-country management visited EOD Team 3 at any work site since start of EOD Team 3 EOD OPS in Iraq. [Demining group PM] stated during a discussion with him 22 June, that three attempts by [demining group] in-country management were made prior to the incident, however due to various reasons it never occurred.

[Demining group] on site Work Documentation

No existing work documentation such as site diagrams or sketches were evident.

Tasking procedures

The tasking procedure can be outlined as follows:

RMACT provides the Dangerous Area Reports to [demining group].

[Demining group] (Programme Manager) issues the task (Dangerous Area Report) to the team leaders.

The tasked Team Leader conducts the clearance operation (EOD).

This process occurred for this task.

Geography and weather

The area is an ammunition storage area located on flat and arid terrain. The weather on 10 June 2003 was sunny, temperature between 40 to 48 degrees Celsius with light wind.

Training

Individual skills

According to the involved key staff CVs, they have both technical and supervisor experience within demining (EOD) OPS.

[Demining group] preparation for clearance OPS in Iraq

It is important to note that the [Demining group] international supervisors assembled for this mission have been assembled from a diverse background. The 2IC had previous experience in Iraq. The 2I/C came to Zimbabwe the day before [Demining group] team departed for Iraq. The training before entering Iraq seemed to concentrate on [Demining group] SOPs.

Based on the answers during the BOI interviews with the PM, OPS Manager, [Team medic] and [Team 3/2IC], the following training over two days was conducted in country:

In country Health, medical, hygiene, nutrition and heat deceases.

Mine detector/bomb locator training.

According to [Demining group] training SOP 34:

“Proper training is the first essential step in the overall process and must be carried out using professional training staff, in an environment conducive to training. Rigidity of training standards and discipline is fundamental in mine clearance operations.”

SOP 34, 5:

“Where the company enters a new theatre of operations the entire contingent will undergo a 5 day in-country retraining and orientation. This will include lectures from in-country specialists.”

[Demining group] used only two days of in-country retraining and orientation out of the recommended 5 days according to [Demining group] SOP 34 para 5.

Site layout and marking

No formal site layout was established or marked. [Demining group] does not have any SOPs to cover this type of EOC/EOD operations.

Management, supervision and discipline on site

The on site supervision consisted of two international site supervisors with international EOD operators and one medic. There were no field visits by [Demining group] management to any EOD Team 3 sites since start of operations in Iraq.

The site discipline was unclear and according to EOD Team 3 2I/C's statement, the Team Leader conducted burning of propellant without warning to all personnel at the site. This indicates normal site discipline was not adhered to.

Concerning safety distances or protection of staff during this demolition, this has not been investigated due to the shortage of time and transport assets. After reading the statements it seems that the safety distance and protection can be questioned. This need to be addressed in future SOP improvement.

Adherence to the SOP and IMAS

Team Leader of EOD Team 3 did not follow [Demining group] SOP concerning high order demolition of UXO safety distances. Concerning burning of propellant, [Demining group] SOPs do not cover this subject. This is an essential element given the presence of this material found throughout this region of Iraq.

[Demining group] did not adhere to their SOPs concerning the 5 day in-country retraining and orientation. Furthermore, [Demining group] investigating procedures were not followed.

Communications and reporting

Communications to [Demining group] base Iraq is by UHF radio and constant contact is maintained.

Medical, including injuries sustained

Medic on site, no injuries sustained.

Equipment and tools

No key equipment or tools have been involved in the incident.

Possible causes of the incident

This BOI concludes that a hot fragment from the high order demolition of the Sagger missiles landed in the propellant at the ammunition store. This hot fragment initiated the propellant causing some of the ammunition to cock off.

It is clear to this BOI that the Team Leader did not adhere to [Demining group] SOP safety distances concerning high order demolitions. The Team Leader showed poor judgment during the conduct of this kind of EOD operation.

When it comes to burning of propellant, [Demining group] SOPs do not cover this subject. The [Demining group] SOPs mainly address mine field clearance OPS and are weak concerning EOD OPS. [Demining group] SOPs are mainly for EOD with in BAC or minefield clearance. One possible reason could be the lack of a proper EOD SOPs with a clear EOD OPS concept.

According to [Demining group] OPS Manager at a meeting on 12 June (two operational days after the incident) [Demining group] country management concluded:

“All propellant gathered for a controlled burn must not be closer than 100m from any other cordite propellant or unexploded ordnances, and that the depth of propellant to be burnt is not to exceed a height of 200mm”

The UK Ammunition and Explosive Regulations states:

“The danger area to be observed for a particular propellant burn is to be determined by the SATO and is dependent upon the nature, type and quantity of propellant to be burnt. As a guide, the recommended radius of the danger area is 50 m for every 500 kg to be burnt, maintaining a minimum safety distance of 100 m. Common sense and experience must be used when applying this guide to large burns.”

In light of the above statements, the BOI recommends no propellant burning within 500m from other flammable or hazardous items/installations or facilities.

Conclusions

The Board of Inquiry has concluded the following:

1. [Demining group] is directly responsible for this incident, which could have been prevented with adequate training and supervision.
2. Team Leader of EOD 3 has resigned as an immediate action taken by [Demining group].
3. [Demining group] does not have SOPs or proper concept of EOD/EOC operations covering this type of activity.
4. [Demining group] management lacks adequate internal QC procedures for EOD tasks.
5. [Demining group] management did not follow their training SOP with the prescribed 5 day in-country retraining and orientation in country.
6. [Demining group] did not adhere to their SOP 26 or IMAS 10.60 Reporting Investigation, paragraph 5.2.

Recommendations

The following recommendations are made:

1. [Demining group] should review and amend their SOPs in order to reflect the EOD operations.
2. [Demining group] should review and amend their concept of EOD operations in order to ensure controlled, sound, efficient and safe EOD operations.
3. [Demining group] review operational procedures and safety distances for propellant burns and demolition at sites containing other flammable or hazardous items/installations or facilities

4. [Demining group] should conduct in country training to meet conditions outlined in paragraphs (1) and (2) above.
5. [Demining group] should strengthen their internal QA and QC procedures for EOD ops.
6. [Demining group] should strengthen their EOD management capability in order to control and improve operations.
7. [Demining group] shall adhere to [Demining group] SOP 26 and IMAS 10.60 paragraph 5.2 if an incident occurs in the future.
8. [Demining group] should establish and present a plan how to achieve the above recommendations. The plan should be presented and approved by the MA authority or RMACT.
9. RMACT should report findings of this investigation to all demining organisations operating in the country.

Analysis

The primary cause of this accident is listed as “inadequate training” because the investigators determined that the personnel involved were not appropriately trained for the work. The secondary cause is listed as a “Management control inadequacy” because the investigators determined that appropriate SOPs and training were not made available to the staff involved. However, the CVs of the senior field staff may have led the senior managers to believe that they were suitably experienced and trained to develop appropriate SOPs and field-training without their involvement.

The fact that the national authority investigated this non-injurious accident is unusual but very appropriate. Their findings may help to prevent similar accidents occurring in future.