

5. SAFETY - CLEARANCE OPERATIONS

1. General

These standards address the minimum requirements for humanitarian UXO and mine clearance. It should be recognized, that there are no comprehensive safety regulations and equipment for UXO and mine removal that can adequately cover all situations. In these cases, the minimum requirements may not be adequate and therefore more stringent safety instructions should be applied.

2. Management and supervision

The management and supervision of personnel, involved in all aspects of the clearance activities, must be undertaken using relevant SOPs and guidelines. Any changes to SOPs to be implemented only after written approval has been given by ANAMA.

All personnel, involved in clearance activities, must receive the proper training, be qualified and medically fit.

3. Minimum size of Demining or EOD team

The minimum size of a mine clearance or EOD team is to be two qualified specialists, one of whom is to be the team leader/supervisor. The minimum support for communication and medical are contained in a separate chapter of these standards.

4. Working periods

Mine/UXO clearance should be undertaken in daylight and dry conditions. The working period will depend on the working conditions and the ability to maintain concentration. The maximum working hours in minefields is 7.5 hours per day and 37 hours per week. Adequate rest periods are to be taken and all details of the working conditions are contained in a separate chapter of these standards.

5. Personal Protective Equipment (PPE)

All personnel, involved in minefield/UXO survey or clearance operations, are to wear protective equipment, when appropriate. The minimum equipment requirement is eye protection and a protective jacket. The following requirements are standards for this equipment:

- *Eye Protection.* Eye and face protection is to be provided by the use of a fragmentation visor. The eye protection must meet the minimum standard of personal protection, which is to be capable of withstanding a v50 rating (dry) of 450m/s for a 1.102 fragment (refer STANAG 2920) and be tested in accordance with US NIJ 0101.03 standards. Visor should be long enough to cover the protective jacket collar.
- *Protective Jackets.* Protective jackets should be worn. The jacket should be designed to protect and deflect blast and fragmentation from the operator. Sleeves are not mandatory, but the jacket must have groin and frontal protection. The jacket must be capable of withstanding a v50 rating (dry) of 450m/s for a 1.102 fragment (refer STANAG 2920) and be tested in accordance with US NIJ 0101.03 standards.

- *Coverall or special clothing.* Special protective clothing should be used in case of the removal and destruction of certain items, containing toxic elements. Clothing material must be non-melting and fire resistant. The SOPs should stipulate the special protective clothing required.
- *Footwear.* Footwear should be comfortable and offer protection from the normal environmental elements, such as abrasive stones, sharp grass stalks, twigs etc. Footwear of soft material is recommended, since this will reduce the foot injury in case of a mine strike.

6. Minimum mine clearance safety distances and procedures

Minimum safety distances must be maintained by personnel, undertaking mine clearance activities. Distances are to be modified based on the known danger areas of individual mines and munitions, where the terrain dictates or when the presence of tripwires or booby traps is suspected. The SOPs should stipulate required minimum safety distances.

Table 1

| MINIMUM DISTANCES FOR A DEMINING WORK SITE | | | | |
|---|--|--|----------------|-----------|
| <i>Distances should be increased when circumstances require</i> | | | | |
| Ser | Feature | Minimum distance apart (meters) | | |
| | | AP Blast | AP Frag | AT |
| 1. | Working Lanes | 25 | 50 | 50 |
| 2. | Access Lanes | 25 | 50 | 50 |
| 3. | Intermediate lanes from base line(s) | 50 | 50 | 50 |
| 4. | On-site explosive storage area, max 20 kg | 100 | 100 | 100 |
| 5. | Control post, Medical post, Vehicle park, Rest area, Latrine etc | 100 | 100 | 100 |
| 6. | On-site bulk storage, Occupied building, Helicopter landing site | 200 | 200 | 400 |
| 7. | Demolition area | 1000 | 1000 | 1000 |
| SAFETY DISTANCES ARE PRESENTED IN TABLE 2 IN THIS CHAPTER. | | | | |

7. Clearing safety procedures

Minimum safety equipment to be worn is body armour vest and visor.

All sites must have a paramedic with an ambulance (or equivalent) and maintain radio contact with Base camp. Operations must cease immediately, if the paramedic is not available or radio communications are lost.

Medical evacuation procedures are to be in place and rehearsed once a month.

A supervisor or team leader can stop an individual or mine clearance operations anytime he feels safety is an issue. He is to immediately report such incident by radio to the next highest authority and make a record in the task log. Further actions are to be taken in cooperation with the nearest highest authority.

Incidents and accidents will be investigated and reports submitted to ANAMA as per SOP. Operation at the scene of accident will stop for 24 hours, if a mine accident occurs. The team, involved in the accident, will receive one-day refresher training before operations restart.

All areas to be used as parts of a mine-clearance work-site are to be verified prior to occupation and when required, due to security reasons. This is to include all access lanes, safe lanes and areas used for storage, resting, vehicle parking and demolition areas.

From a known safe area an access lane will be established to the mined area. This lane will be checked every day at the commencement and end of the working day.

The deminer will clear only a 1-meter wide lane and clearance will cover minimum 10cm on either side of the search lane.

Under no circumstances should anyone step into a marked dangerous area.

Activity is to cease in a working lane, if anyone approaches the deminer closer than distances, stipulated in table 1 of this chapter.

All mine clearance operations will stop within the safety distance (table 2 of this chapter), when tripwires are encountered. Tripwires procedures should be followed, and a one-meter lanes must be cleared till the both ends of the tripwire.

All mines will be blown in situ, unless conditions prohibit it due to potential damage or a safety concern. When a mine is found, it will be marked and the clearance party will start a new lane. Mines will be destroyed at the end of each day, unless a safety hazard is created.

No mines or ordnance of any kind are to be moved anywhere, unless authorized by the team leader/site supervisor. If mines or ordnance are to be moved, they will always be pulled remotely first and then be disarmed by the supervisor of the mine clearance team.

Transportation and storage of explosives is to be in accordance with these standards.

A metal detector is a precise instrument, which must be checked, given proper care and maintenance in accordance with the manufacture manual.

When using a demining prodder to investigate the source of a signal from a metal detector, always begin prodding the ground at least a hand span (minimum 15cm) back from the edge of the signal area on the width of 30cm and without exceeding an angle of 30 degrees.

If burning is used to clear vegetation, a rest period of five (5) days from the day of burning will be allowed prior to commencing work on the further clearance of mines in the area.

8. Prodding procedures

The maximum prodding angle is 30 degrees. The spacing between probes is to be maximum 5cm, unless smaller objects are present, in such case the spacing is to be reduced accordingly. The angle and spacing of the probing is to be detailed in the SOPs.

9. Equipment safety procedures

The operation methods of metal detectors and EOD iron detectors, as well as actions with malfunction and failure of instruments are to be contained in the SOPs. Any failed equipment is not to be used and to be returned to storage with an attached failure tag and corresponding report. Visors and body armour vests that have been involved in a mine accident or suffered any internal or external impact for any reason, must be returned to the storage in accordance with the procedure above. All operations must be equipped and have safety procedures in place to allow rapid response in case of emergency.

10. Storage and transportation of explosives

The Azerbaijan National Mine Action Standards for storage and transportation of explosives should be used as a minimum. They are contained in a separate chapter of these standards.

11. Mine and demolition safety distances

A demolition task consists of items, ranging from a few grams of explosives to several tones. Safety distances will vary according to the actual or perceived threat factors. Distances can be reduced depending on the terrain and the use of protective works. The following are the minimum safety distances for demolition:

Table 2

| Type of munitions | Minimum safety distance (Meters in open air) | Remark |
|--|---|--------|
| AP Mine Blast | 100 | |
| AP Mine Fragmentation/Bounding | 300 | |
| AP Mine Directional Fragmentation | 500 | |
| AT Mine Blast (Low metal content) | 500 | |
| AT Mine Blast (Plastic/High metal content) | 500 | |
| AT Mine Shaped Charge | 1000 | |
| Off Route Mine | 1000 | |
| Mortar up to 82mm | 500 | |
| Shell up to 80mm | 500 | |
| Shell up to 160mm | 800 | |
| Rocket up to 88mm | 500 | |
| Hand and Rifle Grenade | 300 | |

Note 1: Buried boosted charges estimated at 10kg have a safety distance of 500 meter. For each additional 10kg charge, 100 meter should be added.

Note 2: A qualified EOD specialist must stipulate safety distances for all munitions other than those stated above. Details should be contained in SOPs.

Note 3: Protective works should be used, when possible, to allow reduction of safety distances.

12. Safety procedures during demolition tasks

a) General

- Smoking is prohibited on the demolition sites;

- Standards for Storage and Transportation of explosives are contained in a separate chapter of these standards;
- All demolition sites must have fire-fighting equipment in place;
- Guards are to be posted at relevant locations. Local authorities are to be informed;
- Cordons are to be posted as above, where necessary;
- For the safety of all personnel, minimum safety distances are to be applied. Details are covered in a separate chapter of these standards;

b) Demolition site commander

- Only a qualified and authorized person is to be assigned as the demolition site commander;

c) Safety Fuse

- All safety fuses must be tested before being used;
- The first 30cm of safety fuse are to be cut off and discarded. The second 30cm are to be tested to ensure its performance to the acceptable burning rate (27-33 seconds). The last 30cm of all reels must be discarded;
- The length of safety fuse must be sufficient to allow the personnel to walk from the demolition site to a firing point before detonation occurs;

d) Electrical safety procedures

- All electric firing cables are to be well maintained;
- Both cable and detonators are to be checked for continuity/discontinuity before to being used;
- Electric cable must not be laid over other strands of cable;
- Twist ends of wires together on electric detonators and cables, when not in use;
- Electric firing systems must not be used, if there is a known Radio Frequency hazard exist in or around the site or if weather conditions could create lightening;
- The keys/firing device and/or the exploder/blasting machines are to be at all times carried by the demolition site commander, until the equipment is actually used;

e) Safety distances for open wires on electric detonators

| Hazards | Distance | Remark |
|--|---------------------------------------|---|
| Radio stations All frequency Less than 5 W | 0,5 m | All radio stations |
| Radio stations Frequency over 26 MHz 5-100W 100-500W over 500W | 50 m 50 m 80 m | This type of radio station can be either mobile or static, civilian or military. |
| Radio stations Frequency under 26 MHz 5-500 W 500-2,5 kW 2,5-10 kW | 150 300 600 | These types of radio station are normally static civilian stationary transmitters, or transmitters on board ships, airplanes or in elevators. |
| Power lines < 400 V 400 V – 6 kV 6 – 10 kV 10 – 50 kV over 50 kV | 5 m 20 m 50 m 100 m 200 m | All cables within a radius of 50 m from a power line must be completely isolated because of the risk of voltage leakage through the ground. |
| Radar stations | 1000 m | |

f) Detonators safety procedures

- Detonators are to be kept separate from all other types of explosive materials in special containers and must be under control;
- Detonators should never be buried;

g) Control of demolition tasks

- A minimum number of personnel (two men, one of which will supervise the work of another) should be employed to place the charges and connect the detonators;
- Sentry posts are to be positioned around the demolition area;
- Only qualified personnel is to control the explosives and accessories and to supervise the placement of charges;
- A minimum of two people must count the number of explosions during firing of multiple shots;
- On completion of a demolition task, the site commander is to check all charge locations in 50m radius to confirm that all charges have fired correctly. If any misfires or partially fired munitions/charges are found, appropriate disposal action is to be undertaken before the site is declared “all clear”;

h) Misfires action

Should a misfire occur during disposal tasks, the following soak periods should be observed before the area, equipment or target are inspected:

- 10 minutes for an electrically fired system
- 30 minutes for a non-electric system

13. Marking requirement

All mine/UXO clearance sites must be clearly marked. For details see relevant chapters of these standards.

14. Visitors

Personnel, who are not part of the regular work force and visit the site, are classified as visitors and must receive formal briefing immediately upon arrival. The briefing should as a minimum contain:

- Explanation of the site layout;
- Safety briefing;
- Actions to be taken in the event of an incident or accident;

Visitors should normally not enter hazardous areas. If visitors must enter hazardous areas, the following minimum rules apply:

- The visitor should not interfere with the demining or UXO operation;
- As soon as the visitor is on the base line/start line, all operations should cease;
- Groups of visitors should not exceed four in number and each group is to have an escort;
- Visitors should wear the same protective equipment as the deminers/UXO operators.