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Storage, Transportation and Handling of Explosives

Mine Action Coordination Centre of Afghanistan (MACCA)
Post Box : 520 Kabul – Afghanistan
Website: www.macca.org.af

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Storage, Transportation and Handling of Explosives

1. Introduction

The need to provide a safe working environment is a fundamental principle of mine action management. The provision of a safe working environment includes the safe storage, transportation and handling of explosives and explosive materials.

The Mine Action Coordination Centre of Afghanistan (MACCA) is the authority responsible for safety in mine action in Afghanistan. This responsibility includes establishing the minimum requirements for the storage, transportation and handling explosives and ensuring compliance with these requirements.

2. Scope

This chapter covers the minimum requirements for the storage, transportation and handling of explosives as part of mine action in Afghanistan. While this chapter specifically refers to demining organisations and demining operations, the provisions of the chapter also apply to organisations carrying out other mine action operations; including Abandoned Explosive Ordnance (AXO) disposal and stockpile destruction operations.

3. General Requirements

Modern explosives are safe if they are stored, transported and handled in accordance with the manufacturers' instructions. Demining organisations in Afghanistan should not use explosives of uncertain origin or age, or when the environmental storage conditions have not met the manufacturers' requirements.

The environmental requirements regarding temperature, humidity and vibration control for ammunition and explosives vary and are dependent on their intended storage conditions, shelf life, and future transportation, handling and use. The performance of explosives will be unpredictable and their safety will be reduced if the manufacturers' environmental conditions are not met. In general, explosives shall be:

- a) Kept dry and well ventilated.
- b) Kept as cool as possible and free from excessive or frequent changes of temperature.
- c) Protected from direct sunlight.
- d) Kept free from excessive and constant vibration.

These environmental requirements shall be complied with for the storage, transportation and handling of explosives used in mine action operations in Afghanistan.

4. Categories of Explosive Storage Facilities

There are three categories of explosive storage facilities for mine action in Afghanistan:

- a) Main Explosive Depot (MED), Kabul. This is a purpose built ammunition and explosive storage depot located at the Mine Detection Centre (MDC), Kabul and managed and controlled by MACCA. This depot holds the bulk stocks of serviceable demolition explosives for Afghanistan mine action programme. Demining organisations shall draw their explosives from this depot.

Note: For the purposes of this standard the MED is a permanent Explosive Store House (ESH), with the exception that there is no explosive limit set by the MACCA for the MED.

- b) Permanent Explosive Store Houses (ESH). These are the explosive storage facilities located at demining organisation administrative areas. The maximum quantity of bulk explosives; excluding detonators, detonating cord and safety fuse, permitted to be stored by demining organisations at any time shall be 500kg.

- c) Field Explosive Stores. These are used for the storage of explosives at a worksite for a single day's operations. Storage shall be in wooden boxes or steel containers. Separate field explosive stores may also be established for safe-to-move mines or ERW recovered during normal demining operations.

Explosive stores may be 'barricaded' or 'unbarricaded', and this affects the minimum safety distances to be applied to the particular store. A barricaded store is one that is effectively screened from other buildings, roads or tracks by a natural or artificial barrier. To be classed as 'effectively screened', the barrier shall meet the following criteria:

- a) The top of the barrier shall be higher than a straight line drawn from the top of the wall of the store to the eaves-line of the other building.
- b) The top of the barrier shall be higher than a straight line drawn from the top of the wall of the store to a point 3.5m above the centreline of the road or track.
- c) If the barrier is artificial, it shall consist of a mound or wall of reverted earth, masonry, concrete or other suitable building material not less than 90cm thick.
- d) A natural barrier may be a hill that stands between the store and the other building, road or track.

5. Minimum Specifications for Permanent ESH

Permanent ESH shall be bullet resistant, fire-resistant, theft resistant, weather resistant and ventilated. Minimum specifications are:

- a) The ESH shall be structurally sound.
- b) The roof shall have a thermal shield designed to maintain interior temperatures below 40⁰ Celsius.
- c) Doors shall fit tightly. Hinges and locking-ware shall be attached so as they cannot be removed when the door is locked. Padlocks shall be of a comparable standard with that of hinges and locking ware. The doors shall be fitted so as to open outwards.

Additional requirements for ESH are:

- a) Permanent ESH shall not be heated.
- b) Unless permanent ESH are established buildings with electrical reticulation then lighting should be either natural light or the use of electrical torches.
- c) Adequate ventilation shall be provided, however ventilation systems shall be designed so that no rain or snow can enter the ESH. Ventilation openings shall have strong mesh screen covers to prevent objects being thrown into the ESH.
- d) Sites shall have adequate drainage to prevent water entering the ESH.
- e) An earthing rod/spike shall be attached to the ESH.
- f) Sea shipping containers may be used as permanent ESH provided they are in good condition and meet the minimum specifications and requirements.

6. Permanent ESH Safety Distances

The minimum safety distances to be applied in Afghanistan between permanent ESH and inhabited buildings, public roads and other magazines are specified at [Annex A](#) to this chapter of AMAS. For permanent ESH with a maximum bulk explosive limit of 500kg, the minimum safety distances shall be:

- a) From inhabited buildings: Unbarricaded - 386m; barricaded - 193m.
- b) From public roads: Unbarricaded - 150m; barricaded - 75m.

- c) From other permanent ESH: Unbarricaded - 35m; barricaded - 18m.

Barricading is only required on the sides of permanent ESH that do not meet the minimum safety distances for Unbarricaded ESH.

7. Fire Prevention

The fire prevention requirements for permanent ESH are detailed at [Annex B](#) to this chapter.

8. Prohibited Articles

Annex B to this chapter provides a list of articles that are prohibited inside permanent ESHs.

9. Warning Signs and Symbols

The following warning signs shall be posted outside permanent ESH in English, Pashtu and Dari:

- a) A general danger warning for people to keep away.
- b) 'No smoking within 30m' and 'no naked light' signs or symbols.
- c) A sign listing the explosive hazard divisions of the contents of the ESH. Details of explosive hazard divisions are included in [Annex C](#) to this chapter of AMAS.
- d) A prohibited articles board listing articles that are not permitted to be brought into the ESH.
- e) A sign giving details of points of contact.
- f) A fire symbol to alert personnel to the hazards in the building in the event of fire.

10. Security

The minimum security requirements for permanent ESH are:

- a) Fencing. Except where located in a secure compound, permanent ESH shall be surrounded by a strong fence. These fences shall:
 - 1) Be a minimum of 2m high.
 - 2) Be no closer than 5m to the ESH at any side.
 - 3) Have gates that permit vehicle access.
- b) Guards. Permanent ESH shall be guarded by an armed guard 24 hours a day.
- c) Security lighting. Security lighting shall be used to light up the surrounds of the ESH during the hours of darkness.
- d) Keys. Keys for permanent ESH shall be held by the supervisor in charge of the ESH and strict control of access to the ESH shall be maintained.

11. Inspection of Permanent ESH

Demining organisations shall notify MACCA if they intend to build or establish a new permanent ESH.

All permanent ESH shall be inspected and assessed for suitability by MACCA. This inspection will cover the construction specifications of the ESH and compliance with the following:

- a) Minimum safety distances.
- b) Requirements for fire prevention.
- c) Requirements for warning signs and symbols.
- d) Security arrangements.

- e) Compliance with the general requirements for the storage of explosives as detailed in section below.

12. Storage of Mines and ERW in Permanent ESH

In situations where it is not possible to dispose of safe-to-move mines and ERW on the day they are located, they may be stored in permanent ESH under the following conditions:

- a) Storage shall be limited to the absolute minimum time necessary; normally overnight or over a weekend.
- b) Where possible, mines and ERW shall be kept in separate ESH. Where mines and ERW and serviceable demolition explosives are stored in the same ESH they shall be separated by a permanent interior wall or a 0.3m thick barrier constructed from sandbags or earth filled boxes.
- c) Storage of mines and ERW in permanent ESH shall comply with the restrictions on the types of mines and ERW that can be stored together as indicated by the ammunition Compatibility Groups (CG) explained in section below.
- d) The total explosive limit of 500kg, including the weight of demolition explosives and the explosive component of the mines and ERW, for permanent ESH shall not be exceeded.

13. Field Explosive Storage

Field explosive stores are used for the temporary storage of explosives on demining worksites and for the storage of safe-to-move mines and ERW recovered during demining operations. The general requirements for the storage of explosives and recovered AXO and munitions for stockpile destruction operations is described in Annex C to this AMAS.

14. ERW Ammunitions Compatibility Groups (CGs)

Under international standards, all explosives and munitions have been allocated to one of twelve CGs indicated by the letters A to H, J, K, L, and S, in order to ensure correct segregation during storage and transportation. Group I is omitted to avoid possible confusion between the letter I and the Roman numeral 1. Group S is given a distinctive letter since it corresponds to a unique possibility for mixing in storage and transport.

Storage and transportation of all explosives and munitions shall be carried out in accordance with ammunition CGs. [Annex D](#) to this AMAS includes details of ammunition CGs.

15. Transportation of Explosives

The minimum requirements for the transportation of explosives can be found in Annex E to this AMAS and includes the actions to be taken for transporting safe-to-move mines and traffic accident breakdown procedures.

16. Transport of Explosives for Daily Use

Containers used for the carriage of detonators for daily use shall be made of steel or wood. Detonators inside the containers shall be in the original packing or in some other packaging that prevents movement of the detonators. Detonators shall never be transported loose inside detonator containers.

Wooden boxes with secure lids shall be used for the transport of small quantities of explosives for daily use. These boxes shall be marked with the word 'explosives' on the outside in English, Pashtu and Dari.

17. ERW Handling of Explosives

The following shall be the minimum requirements for the handling of explosives in Afghanistan:

- a) Safety distances/fire prevention. Smoking is not permitted when handling explosives or within 30m of explosives.
- b) Security. Explosives shall be guarded at all times. The only exception to this is after explosive charges have been laid, however in that case the danger area shall be secure.
- c) Personnel/qualifications:
 - 1) Only suitably qualified personnel shall handle or use explosives for demolition tasks.
 - 2) Unqualified personnel shall only handle explosives for administrative tasks and under the supervision of a person trained in either, the handling and storage of explosives, or a person trained in the handling and transport of explosives.
 - 3) Unqualified personnel required to handle explosives shall be briefed on the safe handling of explosives and the safety precautions to be observed in and around explosives, explosive stores and explosive vehicles.
- d) Handling. Explosives shall only be handled in accordance with the manufacturers' instructions and specifications.
- e) Clothing. Clothing worn by personnel handling explosives shall not be of a type that may cause sparks. This includes synthetic clothing and boots with steel hobnails or toecaps.

18. Management and Control of Explosives - Explosives Supply System

The bulk supply of explosives for demining Organizations is managed by each organization individually as required to suit their usage rates and storage capabilities. The demand should be processed through MACCA/DMC to the Ministry of Interior. Said ministry will introduce mine action organizations to the explosives supplier in Afghanistan. The organizations are responsible and accountable for the use of explosive.

18.1 Stock Holdings

Demining organisations shall not exceed the explosive stock holding capabilities of their ESH.

18.2 Stock Checks

All managers of explosive storage facilities shall conduct stock checks of explosives in their control once a month. Any discrepancies in stock holdings shall be reported in accordance with section 20 below. Records of stock checks shall be maintained by ESH managers and shall be made available for inspection by the MACCA as required.

18.3 Explosive Accounting

Demining organisations shall maintain accurate records of explosives issued, explosives expended and current stocks. All explosives used shall have signed certifications from the demolition supervisors of the items expended by item and unit of measure. The record shall include the name and signature of the supervisor certifying that the explosives have been expended. These certifications shall be reconciled against stock figures at the end of each month and checked against explosives remaining in stock. Any discrepancies shall be investigated. All explosive records shall be made available for inspection by the MACCA/DMC or AMAC as required.

Demining organisations using explosives shall report details of explosive issued, held and used in accordance with the requirements of AMAS 08.02 reporting.

19. Loss of Explosives

As soon as an organization suspects that explosives have been lost, it shall initiate a complete stock check of all explosives held against its records. If the loss is confirmed the matter shall be immediately reported to the MACCA through the AMAC with full details of the extent of the loss. The loss shall be reported to the Afghanistan Police. The MACCA will determine what follow-up action shall be taken.

20. Theft of Explosives

When the theft of explosives occurs, the area where the theft occurred shall be immediately secured without disturbing the site. The details shall then be reported to the MACCA, through the AMAC, and the Afghanistan Police. The extent of the theft may not be able to be determined until an investigation is started. The AMAC shall determine what follow-up action needs to be taken.

21. Explosive Defect Reporting

Demining organisations shall notify the MACCA through the AMAC, in writing, of any defects identified with explosives supplied to the programme. If the defect affects safety then the report shall be made immediately by radio or telephone so that other demining organisations using the same explosives can be warned. When this occurs, a written follow-up report in writing shall be submitted by the demining organisation.

22. Inert, Drill, Instructional or Replica Mines and Ammunition

Procedures for the management and control of inert, drill, instructional or replica mines and ammunition are detailed in [Annex F](#) to this chapter.

23. Mines and ERW for MDD Training and Testing

The procedures for the management and control of mines or ERW containing explosives used for the training and testing of MDD teams is described in Annex G to this chapter.

Annex A

Table of Distances for the Storage of Explosive Materials

| Quantity of Explosive Kg | | Distance m | | | | | | | |
|-----------------------------|-----------|---------------------|--------------|-----------------------------|--------------|------------------------|--------------|-------------------------|--------------|
| | | Inhabited buildings | | Public Roads Traffic Volume | | | | Separation of magazines | |
| | | | | Less than 3000 veh/day | | More than 3000 veh/day | | | |
| Over | Less than | Barricaded | Unbarricaded | Barricaded | Unbarricaded | Barricaded | Unbarricaded | Barricaded | Unbarricaded |
| 0 | 2 | 32 | 64 | 14 | 27 | 23 | 46 | 3 | 5 |
| 2 | 5 | 41 | 82 | 16 | 32 | 29 | 58 | 4 | 7 |
| 5 | 9 | 50 | 100 | 20 | 41 | 37 | 74 | 5 | 9 |
| 9 | 14 | 57 | 114 | 23 | 45 | 42 | 84 | 5 | 10 |
| 14 | 18 | 64 | 127 | 25 | 50 | 47 | 94 | 5 | 11 |
| 18 | 23 | 68 | 136 | 27 | 54 | 50 | 100 | 6 | 13 |
| 23 | 34 | 77 | 154 | 32 | 64 | 58 | 115 | 7 | 14 |
| 34 | 45 | 86 | 173 | 34 | 68 | 63 | 126 | 7 | 15 |
| 45 | 57 | 91 | 182 | 36 | 73 | 68 | 136 | 8 | 16 |
| 57 | 68 | 98 | 195 | 39 | 77 | 72 | 144 | 9 | 17 |
| 68 | 91 | 107 | 213 | 43 | 86 | 79 | 159 | 10 | 19 |
| 91 | 114 | 116 | 232 | 48 | 95 | 86 | 172 | 10 | 21 |
| 114 | 136 | 123 | 245 | 50 | 100 | 91 | 183 | 11 | 22 |
| 136 | 182 | 134 | 268 | 54 | 109 | 100 | 201 | 12 | 25 |
| 182 | 227 | 145 | 291 | 59 | 118 | 108 | 216 | 13 | 26 |

| Quantity of Explosive Kg | | Distance m | | | | | | | |
|-----------------------------|-----------|--------------------------------------|--------------|-----------------------------|--------------|------------------------|--------------|-------------------------|--------------|
| | | Inhabited buildings Distance in m | | Public Roads Traffic Volume | | | | Separation of magazines | |
| | | | | Less than 3000 veh/day | | More than 3000 veh/day | | | |
| Over | Less than | Barricaded | Unbarricaded | Barricaded | Unbarricaded | Barricaded | Unbarricaded | Barricaded | Unbarricaded |
| 227 | 272 | 109 | 318 | 61 | 123 | 115 | 230 | 14 | 28 |
| 272 | 318 | 161 | 322 | 66 | 132 | 103 | 235 | 15 | 29 |
| 318 | 363 | 170 | 341 | 68 | 136 | 126 | 252 | 15 | 30 |
| 363 | 409 | 177 | 354 | 70 | 141 | 131 | 262 | 16 | 32 |
| 409 | 454 | 182 | 363 | 73 | 145 | 136 | 272 | 16 | 33 |
| 454 | 545 | 193 | 386 | 75 | 150 | 144 | 289 | 18 | 35 |
| 545 | 636 | 204 | 409 | 77 | 154 | 153 | 305 | 19 | 37 |
| 636 | 726 | 213 | 427 | 79 | 159 | 159 | 319 | 20 | 39 |
| 726 | 817 | 222 | 445 | 82 | 163 | 166 | 332 | 20 | 40 |
| 817 | 908 | 229 | 459 | 84 | 168 | 172 | 343 | 20 | 41 |
| 908 | 1135 | 247 | 495 | 86 | 173 | 185 | 370 | 22 | 44 |
| 1135 | 1362 | 263 | 527 | 89 | 177 | 196 | 392 | 24 | 47 |
| 1362 | 1816 | 288 | 577 | 95 | 191 | 215 | 430 | 26 | 53 |
| 1816 | 2270 | 311 | 622 | 102 | 204 | 233 | 466 | 28 | 55 |
| 2270 | 2724 | 331 | 663 | 107 | 213 | 248 | 496 | 30 | 59 |

Note: Storage quantities in excess of 2724 kg should be limited to the Main Explosive Depot (MED) Kabul, which is regulated by MACCA

Annex B

Fire Prevention Requirements – Permanent ESH

No smoking shall be permitted within 30m of an ESH. 'No smoking within 30m' and 'no naked lights' signs or symbol shall be prominently displayed on the ESH.

Grass and undergrowth shall be cut down and kept short in the area around the ESH to a distance of 20m.

Flame or spark producing equipment shall not be used within 30m of an ESH. When such equipment is required to carry out repairs to the ESH, all explosives shall be removed.

Paints, oils, petrol or any other flammable materials shall not be stored with explosives. Authorised cleaning materials may be used in the ESH for maintenance but shall be removed when not in use.

Empty containers of any type shall not be stored with explosives.

A minimum of two serviceable 5kg CO² fire extinguishers shall be in a prominent position outside each explosive store. If there is a risk of grass fires in the vicinity of an ESH, then additional fire fighting equipment such as shovels, buckets of sand and fire beaters shall be provided.

All fire fighting equipment shall be maintained in a fully serviceable condition.

An earthing rod/spike shall be attached to the ESH as lightning protection.

A 'prohibited articles' board, listing articles that are not permitted into the ESH, shall be prominently displayed at the entrance to the ESH. The prohibited articles to be shown on the board are:

- a) Lanterns, oil lamps and stoves and all flame or fire producing appliances.
- b) Matches, cigarette lighters or other portable means of producing a spark or flame.
- c) Tobacco in any form and any article used for the purpose of smoking.
- d) Inflammable liquids and solvents other than those authorised for maintenance work.
- e) Food and drink.
- f) Radio equipment of all types including mobile phones.
- g) Firearms, with the exception of those carried by guards.
- h) Drugs and medicines other than those forming part of an authorised first aid kit.
- i) Ammunition not authorised to be stored.
- j) Any unprotected power source.

External signs on ESHs shall give details of points of contact to obtain access to the ESH and shall list the explosive hazard divisions of the contents of the ESH.

Some method of sounding an alarm in the event of fire shall be in place.

A fire symbol shall be displayed outside each building containing explosives to alert personnel to the hazards in the building in the event of fire.

Annex C

Field Explosive Storage

Field explosive stores shall comply with the following requirements:

- a) The quantity of explosives that are stored at demining worksite for daily mines/UXO demolitions shall be based on the actual need (based on number of maximum mines/UXO that are normally located/destroyed at demining field). The team leader shall decide on the quantity of explosives accessories that are transported to the demining worksite on a daily basis (should not be exceeded from 10 kg explosives and 20 detonators for minefield clearance and 25 kg explosives and 50 detonators for EOD operations). Unnecessary carriage of excessive explosives to the demining worksites shall be avoided. The maximum quantities of serviceable demolition explosives permitted in a field explosive store are 25 kg of bulk explosive and 50 detonators.
- b) Field explosive storage shall comply with the environmental requirements for the storage of explosives as laid down in section 3 above.
- c) Minimum safety distances, as adapted from [Annex A](#), between field explosive stores, other explosive stores, working personnel or demining worksite control areas shall be 100m for a barricaded store and 200m for an unbarricaded store.
- d) Field explosive stores shall be sited outside the fragmentation danger area for any demolition ground.
- e) The minimum fire fighting equipment required for a field explosive store shall be a serviceable 2kg CO² fire extinguisher.
- f) Field explosive stores shall be clearly marked and signposted, unless the security situation dictates this not be done. 'No smoking within 30m' signs in English, Pashtu and Dari shall be posted.
- g) Safe-to-move mines or ERW shall not be stored in the same field explosive store as serviceable demolition explosives.
- h) Storage of explosives, mines and ERW in field explosive stores shall not be permitted overnight. Unless circumstances dictate otherwise, safe-to-move mines and ERW shall be disposed of on the day they are located. Section 12 above details the procedures for the storage of mines and ERW unable to be disposed of on the day they are located.
- i) Storage of mines and ERW in field explosive stores shall comply with the restrictions on the types of mines and ERW that can be stored together, as indicated by the ammunition CGs explained.
- j) Grass and undergrowth shall be cut down and kept short in the area around the field explosive store out to a distance of 20m.
- k) Field explosive stores shall be guarded when they have explosives or mines and ERW in them. Guarding may be done by a member of a demining team's administrative staff.
- l) Fuels, oils, and lubricants and any other flammable materials shall not be stored in field explosive stores.

Note: Field storage of safe-to-move mines and ERW applies to mines and ERW recovered during normal demining operations. It is not applicable to mines or ERW stored as part of Abandoned Explosive Ordnance (AXO) disposal operations or Open Burning/Open Demolition (OBOD) stockpile destruction operations. Large stocks of AXO discovered during demining operations shall be reported to the MACCA. These will be dealt with as part of AXO disposal operations.

General Requirements for the Storage of Explosives

The following general requirements for the storage of explosives shall be adhered to for the storage of explosives in Afghanistan:

- a) No explosives shall be stored in a residence or an office building.
- b) Detonators shall be kept well away from other explosives in a separate store or alternatively, they shall be separated from the main explosives by a blast proof partition such as a sandbag wall.
- c) Electric detonators shall be stored and transported in their original containers or in suitable containers that protect them from Radio Frequency (RF) hazard.
- d) Explosives and general stores shall not be stored together. This excludes tools for opening the explosive boxes.
- e) Explosive stores shall only be used for the storage of explosives. They shall not be used for any other work, as shelters or as rest facilities.
- f) If explosive stores have to be repaired, explosives shall be removed from the store to a safe place beforehand.
- g) Surplus packaging material from explosives shall not be kept in an explosive store.
- h) Explosives shall not be removed from their boxes or packages until they are ready to be used. The number of open packages shall be kept to a minimum.
- i) Explosives shall be stored in a manner such that the oldest explosives get used first. Packaging shall be 'date-marked' to assist with this.
- j) Explosives shall be kept above floor or ground level on pallets, boards or on shelves. Explosives stored in the field shall be stored off the ground.
- k) Explosive boxes shall be stacked in such a way that the stack is stable.
- l) Cardboard boxes that may be subject to crushing shall not be stacked.
- m) Sufficient space shall be left above and around boxes to ensure that air can circulate around the stack.
- n) Personnel in charge of explosive stores shall be trained in the handling and storage of explosives.
- o) Only authorised personnel are permitted to enter an explosives store.
- p) Radios shall not be operated within 50m of an explosive store containing electrically-initiated munitions.

Storage of Recovered AXO and Munitions for Stockpile Destruction Operations

AXO recovered during demining operations and munitions for stockpile destruction operations may be stored in buildings or field stores, however the general requirements for the storage of explosives still apply. These are:

- a) Environmental requirements for the storage of explosives.
- b) Safety distances. There are no limits on the quantities of munitions able to be stored provided that minimum safety distances are applied.
- c) The requirements for fire prevention.
- d) Signage requirements.
- e) Security.
- f) Other applicable general requirements for the storage of explosives.

Storage of AXO and munitions for stockpile destruction operations shall be carried out in accordance with the ammunition Compatibility Groups (CGs) for the munitions being stored; as explained in Annex D.

ANNEX D

Compatibility Groups Which May be Stored Together

| Compatibility group | A | B ^{1,3} | C | D | E | F ² | G | H | J | K | L | S |
|---------------------|-----|------------------|-----|-----|-----|----------------|-----|-----|-----|-----|-----|-----|
| A | yes | no | no | no | no | no | no | no | no | no | no | no |
| B | no | yes | no | no | no | no | no | no | no | no | no | yes |
| C | no | no | yes | yes | yes | no | yes | no | no | no | no | yes |
| D | no | no | yes | yes | yes | no | yes | no | no | no | no | yes |
| E | no | no | yes | yes | yes | no | yes | no | no | no | no | yes |
| F | no | no | no | no | no | yes | no | no | no | no | no | yes |
| G | no | no | yes | yes | yes | no | yes | no | no | no | no | yes |
| H | no | no | no | no | no | no | no | yes | no | no | no | yes |
| J | no | no | no | no | no | no | no | no | yes | no | no | yes |
| K | no | no | no | no | no | no | no | no | no | yes | no | no |
| L | no | no | no | no | no | no | no | no | no | no | yes | no |
| S | no | yes | yes | yes | yes | yes | yes | yes | yes | no | no | yes |

Note: Detonators may be stored or transported with other materials, provided they are adequately segregated.

Exception: Detonators that are not mass detonating may be stored with safety fuze, electric squibs, igniters, or igniter cord and as specified in IMAS 10.50.

Note: Compatibility Group F CAN be stored in the same magazine as C, D and E, but it shall be well segregated and the entire quantity shall be considered as Compatibility Group F.

Note: Fuses in B with D or E of which fuses are components. The load is treated as Compatibility Group F.

Note: Compatibility Group G shall be stored in its standard service packaging for it to be allowed to be stored with C, D or E. Otherwise it M

The magazine specifications provided in this AMAS are specifications that apply to the storage of explosives normally used in the destruction of mines and ERW, including unexploded sub-munitions hazards. Organisations should not assume that these specifications are safe for the storage of munitions awaiting EOD procedures for destruction in a CDS or other requirements.

Annex E

Transportation of Explosives

The following are the minimum requirements for the transportation of explosives in Afghanistan:

- a) Safety distances. Vehicles carrying explosives travelling in convoy shall travel with a minimum spacing of 200m between vehicles.
- b) Fire prevention. All vehicles carrying explosives shall conform to the following fire prevention precautions:
 - 1) A serviceable CO² fire extinguisher shall be carried in the cab.
 - 2) Smoking is not permitted in the vehicle or within 30m of the vehicle.
 - 3) Fuel shall not be carried anywhere other than in the fuel tank.
 - 4) No fire-making materials, matches, lighters or similar shall be carried in explosive vehicles.
 - 5) Vehicles transporting explosives shall be fitted with a grounding strap to permit the release of any build-up of static electricity.
- c) Warning signs and symbols. Due to the varying security situation, warning signs shall not be displayed on vehicles carrying explosives unless directed by the MACCA. When required, signs shall display the internationally recognised 'explosives' symbol and explosive hazard division for the categories of explosives on the vehicle. Details of explosive hazard divisions are included at [Annex C](#) to this chapter of AMAS. The signs shall be fitted to the front and rear of the vehicle.
- d) Security. Explosives being transported shall never be left unattended. If the driver has to leave the vehicle, the co-driver shall remain with the vehicle.
- e) Vehicle requirements:
 - 1) Vehicles carrying explosives shall be serviceable, have a spare wheel and a wheel changing kit.
 - 2) Vehicles used for the transportation of explosives shall be suitable for the load to be carried and the road conditions on which the vehicle is to travel.
 - 3) Vehicles carrying bulk explosives to and from the MED shall have the following equipment:
 - I. Two sealed beam hand torches with a constant light capable of being seen at 150m distance.
 - II. Two red warning triangles for marking stationary vehicles on the road.
 - III. Two red warning flags.
 - IV. A shovel and pickaxe.
 - 4) Vehicle and trailer combinations may be used for the transportation of explosives. Any trailer used shall be fitted with a braking system that ensures the trailer will stop automatically if the trailer disconnects from the towing vehicle.
- f) Driver requirements:
 - 1) Vehicles transporting explosives shall have a co-driver.
 - 2) Drivers and co-drivers of vehicles carrying explosives shall be trained in the handling and transport of explosives.
 - 3) Drivers and co-drivers shall be in good health before starting out on a journey with explosives.

- 4) Both the driver and co-driver shall be a minimum of 22 years of age and have an Afghanistan driver license for the class of vehicle they will be driving.
 - 5) Both the driver and the co-driver shall be briefed about the type of explosives to be carried and the hazards associated with the particular type. They shall also be briefed on the current security situation in the area they are to travel and the actions to be taken if a security problem is encountered.
- g) Passengers. Passengers shall not be carried in vehicles transporting bulk explosives to and from the MED in Kabul.
- h) Packaging requirements:
- 1) Explosives shall always to be transported in boxes. Loose explosives shall never be transported. Explosives shall be packed inside boxes in such a manner that movement inside the box is not possible.
 - 2) When practical, explosives shall be transported in original boxes. Where they are not transported in their original boxes, the boxes shall be clearly marked as follows:
 - I. The word 'explosives' shall be shown.
 - II. The contents of the boxes shall be indicated
 - III. The hazard classification code of the contents shall be shown. See Annex C to this chapter of AMAS.
 - IV. The weight or quantity of items in the box shall be shown.
 - 3) Each box containing explosives shall contain a printed instruction sheet giving details of storage, handling and disposal requirements for the explosives contained therein.
- i) Loading requirements:
- 1) When practical, explosives shall be transported in a dedicated vehicle. If explosives and general cargo are carried on the same vehicle, the explosives and general cargo shall be securely stowed such that there is no danger from cargo movement.
 - 2) Explosives shall be evenly spread over the deck and shall not be stacked above the height of the sideboards of a vehicle.
 - 3) Explosives loaded for transportation shall be adequately secured to prevent movement of the load during the journey.
 - 4) Explosives transported on open decks of vehicles shall be covered by a waterproof tarpaulin or similar cover sufficient to keep them dry.
 - 5) Detonators shall be carried in a metal or wooden container. They may be carried in the cab of an explosives vehicle separated from other explosives, but when possible, shall be carried in a separate vehicle which is not carrying explosives.
 - 6) Loading and unloading of serviceable demolition explosives shall only be carried out at recognised explosive storage facilities and, unless extraordinary circumstances dictate, shall only be done during daylight.
- j) Safe driving requirements:
- 1) The speed of explosive vehicles shall not exceed 80% of the posted speed limit.
 - 2) Drivers of vehicles carrying explosives shall avoid rapid acceleration or sudden braking.
- k) General safety. Generally, explosives should not be transported at night. If vehicles carrying explosives have to stop for the night, and the explosives remain on the vehicle, then the vehicle shall be placed under continuous guard.

- l) Communications. Vehicles carrying explosives shall have communications systems that permit communication with their parent HQ at any point along the route to be travelled. Special care will be taken not to use radios of vehicles carrying electric detonators.

Transporting Safe-to-Move Mines and ERW

Mines and ERW shall only be transported in a vehicle when they have been certified as safe-to-move by an EOD technician qualified to dispose of the item in accordance with AMAS 06.03 Explosive Ordnance Disposal.

Except when mines or ERW are properly packed in their original packaging, the movement of safe-to-move mines and ERW shall conform to the following requirements:

- a) Decks of vehicles used to carry safe-to-move mines and ERW shall be sandbagged to prevent the mines or ERW rolling around.
- b) Safe-to-move mines and ERW shall be laid, stacked and transported in a manner that prevents any knocking or banging together of the mines or UXO.
- c) Safe-to-move mines and ERW shall be laid and secured in such a manner that fuzes cannot strike the sides, front or rear of a vehicle cargo deck.
- d) Where practicable, safe-to-move mines or ERW shall not be transported inside the cab of a vehicle.
- e) Transport of safe-to-move mines and ERW shall comply with the restrictions on the types of mines and ERW that can be stored together as indicated by the ammunition CGs.
- f) Transport of safe-to-move mines and ERW shall comply with any special requirements for the type of mines or ERW being transported. Examples are:
 - 1) The requirement for large filled water containers when transporting White Phosphorus (WP). This container shall be large enough to fully immerse the complete package containing the item and/or the largest WP item carried.
 - 2) The requirement for special precautions to be taken for the transport of electrically initiated rockets and other electrically initiated UXO. This includes having the vehicle radio switched off, no VHF radios operating within 15m and the vehicle not being permitted to pass within 100m of high tension power lines.
- g) Where applicable, the requirements for transportation of explosives also apply to the transportation of the safe-to-move mines or UXO.

Traffic Accident/Vehicle Breakdown Procedures

If a vehicle carrying explosives is involved in a road traffic accident and the vehicle is unable to proceed, the following action shall be taken:

- a) If required, put out any fires on the vehicle.
- b) Attempt to disconnect the vehicle battery to prevent any sparking from occurring.
- c) Secure the scene to prevent any danger to other traffic. Red warning triangles and warning flags shall be used.
- d) Check the condition and security of the explosives on the vehicle. Take whatever action is necessary to ensure that any further damage is minimised and explosives remain secure.
- e) Notify the nearest police and or military, advise them of the contents of the vehicle and request their assistance.
- f) Report the accident to the MACCA, nearest AMAC or demining organisation HQ as appropriate and advise of the situation and any assistance required.
- g) Control the movement of bystanders around the casualty vehicle.

h) Await the arrival of assistance.

If an uncontrollable fire breaks out, the area within a 500m radius of the vehicle shall be closed off and evacuated. Assistance from local people may be needed for this.

If a vehicle carrying explosives breaks down, the following action shall be taken:

- a) Move the vehicle off the carriageway of the road and place warnings out to prevent any danger to other traffic.
- b) Report the break down to the MACCA, nearest AMAC or demining organisation HQ as appropriate and advise of the situation and any assistance required.
- c) Control the movement of bystanders around the casualty vehicle.
- d) Await the arrival of assistance.

If a broken down vehicle has to be repaired, the explosives shall be removed beforehand. This should be either to another vehicle or into a recognised explosives store.

Vehicles carrying explosives that have broken down may be towed, but this is only to be as far as the nearest repair facility. Vehicles towing explosive vehicles shall not exceed 40kph.

ANNEX F

Inert, Drill, Instructional or Replica Mines and Ammunition

General

The purpose of this Annex is to ensure that inert, drill, instructional or replicas of mines and ammunition are handled, stored and accounted for accurately, in order to:

- a) Avoid accidents.
- b) Avoid incidents of mistaken identification leading to unnecessary clearance operations or Render Safe Procedures (RSPs).
- c) Ensure the security of drill and inert mines and ammunition.

All authorized breakdown or modification of live mines and ammunition into inert, drill, instructional or replica items will only be carried out by an appropriately qualified and authorized EOD technician. Authority levels for EOD technicians are included in AMAS 06.03, Explosive Ordnance Disposal.

Storage

Inert, drill, instructional and other replicas of mines and ammunition shall not be stored in the same containers as live ammunition. They shall be stored in a separate location outside the explosive storage area.

Mines and ammunition that have been subjected to RSP, and have been certified as FFE, shall be stored in the same manner as drill and inert ammunition.

Containers used for the storage of inert, drill, instructional and other replicas of mines and ammunition shall be clearly marked 'INERT' or 'DRILL' in English, Pashtu and Dari. All other markings shall be removed from the container to ensure that there is no possibility that it could mistakenly be identified as containing live ammunition.

Movement

Inert, drill, instructional and other replicas of mines and ammunition shall not be moved on the same vehicle as live ammunition.

Inert, drill, instructional and inert replicas of mines and ammunition shall not be moved in the same containers as live ammunition. They shall be moved in a separate container, which shall be clearly marked 'INERT' or 'DRILL' in English, Pashtu and Dari. All other markings shall be removed from the container to ensure that there is no possibility that it could be mistakenly identified as containing live ammunition.

Breakdown of Mines and Ammunition

Organizations shall not breakdown, modify or tamper with mines and ammunition, unless it is done in the course of inspection, modification, disposal or research and development, in accordance with the appropriate technical procedures.

Marking of Inert or Drill Mines and Ammunition All inert, drill, instructional or other replicas of mines and ammunition shall be clearly marked on all sides as either 'INERT' or 'DRILL,' as appropriate, in English, Pashtu and Dari. This ensures that they can be clearly identified from all angles, and therefore do not inadvertently or accidentally become the focus of a clearance operations or RSP.

All inert, drill, instructional or other replicas of mines and ammunition produced by demining organisations shall be given a serial number. The serial number shall include the abbreviated name of the demining organisation that produced the item.

Free From Explosive (FFE) Certification

All inert, drill, instructional or replica mines and ammunition produced by demining organisations shall be given a FFE certification by the appropriately qualified EOD technician who produced the item. The certificate shall contain the following information:

- a) The serial number.
- b) Name of the EOD technician who produced the item.
- c) Brief description of item.
- d) An FFE certification statement similar to the following:

I. I certify that the item referred to on this FFE certificate contains no explosive, pyrotechnic, lachrymatory, radioactive, chemical, biological or other toxic components or substances. I also certify that the item has been marked as either DRILL or INERT. I am satisfied that it is safe to use for drill, display or instructional purposes.

- e) Name and signature of the EOD Technician.

Registration and Accounting for Inert or Drill Mines and Ammunition

Demining organisations shall maintain a master register of all inert, drill, instructional or other replica mines and ammunition for which it is responsible. This register shall include the FFE certification certificate.

The demining organisation shall operate an appropriate accounting system to ensure accountability and traceability for all inert, drill, instructional or replica mines and ammunition in its possession. All transfers of inert, drill, instructional or replica mines and ammunition from the controlling authority to another individual or organisation shall be properly recorded so that the responsibility for the item(s) can be clearly established at any time.

Displays of Mines and Ammunition

Only mines or ammunition that are produced and certified as FFE in accordance with this Annex shall be permitted to be placed on public display. Live mines, ERW and ammunition shall not be included in any public display, except that visitors to a field site may be displayed live mines and ERW that have been rendered safe-to-move. Such a display shall be under the control of an authorized EOD Technician or demining worksite supervisor.

All FFE mines or ammunition on public display shall be secured in a glass or Plexiglas cabinet, fixed to a wall or secured in some other way to prevent the removal by unauthorised personnel.

Annex G

Mines and ERW for MDD Training and Testing

The following procedures apply to the management and control of mines or ERW containing explosives used for the training and testing of MDD teams:

- a) Mines and ERW containing explosives used for MDD team training shall be stored, transported and handled in accordance with the requirements of this chapter.
- b) Explosive-filled mines shall not be stored with inert 'Free From Explosives' (FFE) training mines.
- c) No live detonators for mines shall be held at the Mine Detection Centre (MDC), Kabul or at any other location where the training or testing of MDD teams is carried out.
- d) No live detonators or blasting caps shall be fitted into mines at any time during use or storage.
- e) Igniters or fuzes may be fitted to mines provided:
 - 1) Fuzes or igniters with integral detonators or boosters fitted have been rendered FFE and are marked 'INERT'.
 - 2) Igniters with separate detonators shall have an FFE detonator permanently attached. The casing containing the main explosive charge of the detonator shall be removed, leaving only the screw threaded portion which itself shall be rendered FFE. Igniter assemblies shall be marked 'INERT' using a permanent marking media such as engraving.
- f) Checks shall be made when mines, fuzes and igniters are issued or returned to ensure that only inert FFE fuzes or igniters are issued/returned. This shall be done by the supervisor in charge of the store.
- g) If live ERW are required for training, only unfuzed UXO, or ERW fitted with transit plugs, shall be used. No white or red phosphorus-filled ERW shall be used.
- h) Personnel responsible for the storage of live training mines for MDD training and testing shall be trained in the recognition of mines and their component parts and their means of initiation.