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Mine Detection Dog Operations

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The Use of Mine Detection Dogs

1. Introduction

Mine Detection Dogs (MDD) are a valuable asset in the mine and ERW (Explosive Remnants of War) clearance process. The MDDs can be used in different roles; however they are best at working in areas where there is low concentration of mines and ERW and for areas where the presence of metal fragmentation, mineralised soils limits the use of other clearance assets.

Experience has shown that a minimum period of 2 weeks may be required to allow the MDD to become acclimatised to the local weather conditions, vegetation, soil condition and surrounding environment. All MDDs deployed into Afghanistan shall undergo this acclimatisation period before being deployed operationally.

MDD should be regarded as a method of confirming the presence of mine contamination rather than identifying the location of every individual mine.

All MDDs deployed to Afghanistan shall be subject to evaluation and accreditation before commencing operational tasks.

2. Scope

This chapter covers the minimum requirements to conduct MDD operations in Afghanistan.

3. Limitations

MDDs are not suitable for working in areas where there is a heavy background contamination from mines, ERW or scattered explosives, checks shall be made to ensure that this contamination does not overshadow the target signal.

MDDs shall not work in areas where tripwires are expected, unless they are specifically trained to detect tripwires.

MDD should not be used in areas where vegetation prevents searching, or if vegetation restricts the ability of the MDD handler to view and control the search. Vegetation may be removed by cutting or burning.

MDD shall not be used on areas where the slope is of such a nature that the MDD may dislodge stones rocks or boulders or where such MDD needs to concentrate more on maintaining its balance than on conducting the search.

MDD shall not be used if the wind speed is greater than 4 m/s at ground level where the soil surface is very dry and dust is being raised. All MDD teams shall have a wind and temperature measuring device on site during operations.

MDD shall not be used to search when the prevailing wind is coming from behind the MDD. As the target substance may not be recognised until the MDD has passed the actual location of the object. MDDs should ideally be used to search with a side wind but can also be used when there is a head wind. Strong wind speeds may reduce the indication accuracy of a MDD. A general principle is that increased wind speed requires an increased area to be investigated manually after a MDD has indicated.

Hot and wet soil provides optimal vapour detection conditions. If the temperature in the soil is near freezing point the scent will diminish and impede detection. MDDs shall therefore not be used for vapour detection when the soil temperature is below or near freezing point.

MDD shall not be used for vapour detection when the air temperature is colder than 8⁰ Celsius or higher than 35⁰ degree Celsius unless they have been specifically trained and accredited.

Rain acts to wash target substances from the surface to deeper portions of the soil. Light rain has minimum impact on the presence of the target odours in the soil and subsequent evaporation may give a short-term release of odours that will improve the detect-ability of target items. Heavy rain, over extended time, will remove most of the target substances from the soil surface. Therefore MDD shall not be used for vapour detection when it is raining or until the soil has dried after a heavy rain. MDD operations may commence after 2 days of dry weather.

MDD should not be used when the ground surface is covered with snow.

The previous detonation of mines/ERW in an area where the MDD will be working can disturb the MDD if there is a presence of scattered explosives and pieces of destroyed mines/ERW. MDDs shall not be used in areas with visible contamination from explosives or the remains of detonated mines and ERW.

MDD shall not be utilized in high-density minefields except for QC operations following the clearance of the mined area. MDD may be used for the following operations:

- a) A minimum of two MDDs shall be used over the medium and low threat area and thereafter internal QC of 10% may be conducted by only one MDD on the area searched. MDD shall not perform QC on its own work.
- b) One MDD may be used where it undertakes secondary search or quality control in areas cleared by mine clearance machines.

4. Planning

- a) If the MDD is only accredited to undertake regular search for mines and ERW it shall not be used behind Mechanical assets or if the presence of tripwires is suspected.
- b) Prior to using MDDs an assessment of the type of mines believed to be present in the area shall be carried out. MDD shall not be used if the perceived or identified mines contain different explosives or substances to those the MDDs are trained to detect, unless they are trained and tested to detect the new types of explosives.
- c) MDD shall not work in areas flooded by water. Before starting work in a former flooded area the MDD should be tested in the same area, if possible. No work should occur in the area within 14 days of the water having dried up.
- d) Safe lanes are prepared so as to provide access for the MDDs and handlers to a box or working area. They also provide safe start lines for the MDDs and handlers. Safe lanes should normally be two meters wide however they may be a minimum width of 1 meter. The safe lanes may be cleared manually or by MDDs.
- e) The whole search area shall be visible to the MDD handler. If the vegetation is such that the handler is not able to observe the MDD at all times during the search then the box shall be divided into several smaller boxes or lanes.
- f) All areas searched by a minimum of two different accredited MDD belonging to the same team should be considered cleared.

5. Depth of Clearance

Depth of clearance should be determined by demining organization and approved by the tasking authority based on the projected land use for the area.

The depth of clearance shall be referenced to the original undisturbed surface of the ground, but only in cases where the surface level has risen. Where the surface level has dropped, the specified depth of clearance below the existing surface level shall be achieved.

MDD personnel shall not carry handheld radios or mobile telephones while in training and clearance areas.

6. Personal Protective Equipment (PPE)

MDD handlers are permitted to use reduced face protection to avoid voice distortion. Reduced face protection may be half-face visors or the use of eye protection in the form of sun glasses which has been tested and guaranteed.

7. Medical Support to MDDs

Demining organisations shall provide health care to their MDDs with the same consideration as they provide to humans. When MDDs are operational:

- a) There should be one person on site with the required knowledge and skill for providing emergency medical treatment for MDDs.
- b) Suitable medical equipment shall be available on site for the treatment of MDDs.
- c) A dog emergency evacuation plan should be in place, which includes procedures for retrieving the dog safely from the minefield and transporting it via the quickest and safest route to suitable veterinary support.

When the MDDs are not operational, during non-working hours or on weekends:

- a) There should be one person available on call with the required knowledge and skill to provide medical treatment for dogs.
- b) A plan should be in place for the transferring of sick or injured dogs to a suitable veterinary facility.

Demining accident response plans for MDD operations shall include procedures for removing MDD casualties from hazardous areas and the provision of veterinary support.

A medical logbook should be maintained for each MDD. Information about vaccination, other prophylactics, de-worming, illness, injuries and any medical treatment should be included in the logbook. Some of the most important health care aspects to address in the logbook are listed in Annex B.

8. Medical Clearance for Work

All MDDs shall be examined by veterinarians and cleared as medically fit for work before they are permitted to carry out MDD operations. They shall be re-checked and cleared by a veterinarian on a six-monthly basis.

MDDs shall be subjected to daily health checks by dog handlers. This health check should be done before and after working hours of MDDs and the result should be recorded in the logbook. Serious medical problems or instances where a dog fails to respond to treatment should be reported to a veterinarian for further assessment. Required daily health check points are included in Annex A.

If a MDD has a slight health problem or minor injury and is assessed by the handler as able to work, the MDD group leader/supervisor shall reconfirm this assessment before the MDD is authorised to commence work. In such cases, the MDD's performance shall be closely monitored throughout the entire day.

If the health check reveals that a MDD suffers from illness which might affect its detection capability and reliability, then the MDD shall not be used for clearance before it has fully recovered. MDD with minor injuries to paws or noses shall not be used.

Daily Test (Warm Up) MDDs are not effective without proper management and verification on a continual basis. This shall include daily evaluation (daily warm up) of MDD. Continuous training shall be conducted when MDDs are identified as below standard. MDDs should be subjected to weekly training and quarterly evaluation. Handlers should be supervised by task site supervisors/Set Leader on a continuous basis while performing their work.

MDD daily test (warm up) areas should be established on all demining worksites employing MDD teams. The aim of this warm-up is to make sure the MDD is capable of detecting the target odour, and is sufficiently lively, motivated and focused to work. All MDDs should be tested on a daily basis prior to being deployed into a hazardous area.

The area which has been selected should be the same as minefield. This will require an initial established warm up box/panel in a known safe area free from contamination on the start of demining operations. Once search areas have been established the warm up box/panel should be erected within the cleared/searched area. These boxes/panels may be moved every second day as work progresses and should be erected 20 meters before the work line.

Pieces of explosive from different types of mines shall be used to simulate how they are found in the minefield. The explosive pieces shall be placed at various positions within the box/panel and recorded. The explosive pieces may be a maximum of 1 inch/25mm in size and should be kept in a separate container free from contamination. The explosive pieces should be recovered when the box/panel is moved forward, every alternate day. No person shall enter the warm up area at any time prior to the warm up so as to avoid contamination of the area.

9. Training

The target mine or explosives in training minefields shall be laid at different periods of time and the MDDs shall be evaluated on them after 3 weeks at minimum.

The mines or explosives used for evaluation or training exercises shall be buried, at different depths and quantities.

In order to maintain maximum performance and safety during operations, all MDDs shall be subject to weekly training. All MDDs and their handlers shall receive refresher training and be evaluated on a regular basis. When MDDs are deployed in the field, internal QA tests should be conducted on a regular basis. All organisations should also perform internal Quarterly Evaluation on their MDDs and this may be observed by the MACCA.

The size of each training box may differ depending on the operational search system used by the demining organisations, however, the following rules shall apply when preparing training boxes in a training site:

- a) The test field shall have one or more clearly recognisable benchmarks. Distance and bearing shall be taken from at least one corner marker for each box to the benchmark.
- b) The exact location of each box shall be recorded on a map with reference points.

- c) All corners shall be marked with a recognition pole, which is driven into the soil. At least one corner marker shall be accurately recorded on the training box map.
- d) All training items shall be equipped with a recognition piece, placed centrally under the training mine. Additional recognition pieces should be buried at other locations inside the training box to ensure that a MDD is not indicating on the metal.
- e) The accurate location of all training items and recognition pieces shall be recorded on the map.
- f) The recognition piece should be made of cut reinforcement rods or similar material and should not exceed 15gr.
- g) One copy of the box record shall be prepared and handed to AMAC.

10. Search Patterns

The two most common search patterns currently in use for MDD operations are:

- a) The search lane system. The MDD searches in a series of straight parallel lanes between 0.3m and 0.5m wide within a search box or panel. These lanes are typically up to 10m in length. The lanes may originate from any side of the search box or panel (depending on wind direction). The MDD may search with or without a leash, and the MDD may search on its way out from the handler only, or both on its way out and back.
- b) The short-leash system. The MDD searches in a series of straight parallel lanes between 0.3m and 0.5m wide within a search box or panel. The lanes may originate from any side of the search area (depending on wind direction). The MDD handler may walk beside or behind the dog in the lane which has been previously cleared by other MDD. All the area should be searched by two MDD before the handler walks on the ground. This generally means that the area has been searched by an MDD on a long-leash before the short-leash system is used.

There are advantages and disadvantages in both the search patterns above, and some programmes prefer to search an area once with the long leash system, and once with the short leash. The relative advantages are:

- a) Long leash are faster, especially when the handler has clear oversight of the search lane
- b) Short leash makes it easier for the handler to monitor the performance of the dog, to ensure complete search to the end of the lane, and to work in difficult terrain with limited visibility.

The following procedures shall apply when searching with MDD:

- a) All the searches shall be followed in accordance to the search pattern described in the demining organisation's SOPs.
- b) The MDD shall search the whole box or panel with no parts remaining un-checked.
- c) The MDD should search with its nose close to the ground at all times during the search.

11. MDD Operations in Previously Burnt Areas

MDD shall not be used to search in areas where the vegetation has recently been burned (after less than four days at a minimum).

12. Marking of Search Boxes

Search boxes shall be marked in a manner whereby the handler is able to see each of the corners of the box. If necessary, flags or other elevated marking such as pegs and tape may be used to achieve this.

Marking of search boxes and cross over lanes during the establishment of MDD worksites shall conform to the general marking requirements covered in AMAS 05.03.

Where painted rocks are used to mark the boundaries of MDD working areas, they should be painted a minimum of three days prior to commencing search by MDD's, the rocks may be painted in the last safe known MDD rest area.

13. Work routine

Demining organisations using MDDs shall establish work routines for MDDs and lay down the criteria for rotation. However, the length of each search period for each MDD shall be decided by the MDD handler based on the performance of the MDD. It is recommended that MDD's should work for 20 - 30 minutes with 10 minutes of rest. The Maximum time for the MDD to conduct MDD Operations is 4.5 hours per day.

If two MDDs are used as a pair, they shall be rotated systematically between the roles of primary and secondary search. This rotation shall occur several times per day.

14. Indication Requirements

MDDs shall be trained to indicate target scents by sitting or lying down next to the indication. When indicating, they shall not be in physical contact with the point of the indication. If a MDD sits or lies down on the top of an indication or scratches at the ground during operations, training or testing, it shall be withdrawn from operational services and re-trained until the behaviour is corrected.

The handler shall after his MDD has indicated, call the MDD out the area from the shortest distance and over an area that has been already searched by the MDD.

The location of an indication by a MDD shall be clearly and accurately marked to within of the actual indication. During marking, the MDD handler shall not physically enter to the unclear area before it has been checked twice using separate MDD.

A MDD that indicates a target correctly may be rewarded. During rewarding, the MDD shall not be permitted to enter in the hazardous or un-searched area. If a MDD is difficult to control during rewarding; whether during operations, training or tests; it shall be withdrawn from operational service and re-trained until the behaviour is corrected.

15. Clearance Drill

Searching methods may vary depending on how the dog is trained according to the SOP of each organisation. In general terms the following procedure should be followed:

- a) There shall be an overlap of at least 25 cm on each side of every lane searched.

- b) When a dog has indicated the presence of a suspected mine, then an area of at least one metre around the indication point (4 sqm) should be cleared manually before the dog can be allowed to continue when no mines are found.
- c) All MDDs cleared area information shall be included in the MDD Daily Work Report;

16. Road Clearance

Demining organisations using MDD to clear roads shall develop specific procedures for this type of clearance operation. The general procedures described in this chapter shall apply.

17. Clearance Behind Mechanical Assets

One MDD may be used as a part of a clearance system where the MDD undertakes secondary search or quality control in areas already cleared by mine clearance machines. Such machines can be flails, tillers, sifters, rollers, soil millers etc. Whilst there are no differences of principle between using MDDs for regular area clearance and using them for verification behind machines, the following rules shall apply when MDDs are used behind machines:

- a) If the machine has disturbed the soil, the MDD Teams shall not be used to clear behind the machine until at least two days after the mechanical mine clearance has taken place, provided that it has rained at least one time during these days. In periods with no rain, the soak time shall be increased to a minimum of five days or longer. Rainfall will wash away most of the undesired contamination of the surroundings caused by the machinery. This will make the search with the MDDs more accurate and reliable.
- b) If the machine has been used to clear an area with a relatively high density of mines, MDDs should not be used since lumps of explosives and bits of mines casing are likely to be spread around the area. This may confuse the MDDs and make the search less reliable.

18. MDD Clearance of Ground Processing

Organizations who wish to conduct clearance of ground processing by MDDs may develop specific procedures.

19. Recording Information

The demining organisation shall ensure that a logbook is prepared for each MDD. The aim of the logbook is to provide the demining organisation and monitoring teams with continuous written evaluation of the MDD health condition and search ability. Each handler will be in possession of a copy of his letter of License issued by the MACCA.

It is important for the dog handlers, the trainers, the veterinary and the management of an organisation to be able to follow the development of a MDD on a daily basis. The daily assessment of each MDD shall be written into the logbook prior to starting work every morning. An assessment of the MDD work shall also be written into the logbook after the search has been completed. It should also contain detailed documentation on the MDD daily work, including sketches of the area cleared.

The dog handler or the team leader in consultation with the dog handler shall write the logbook. If the dog handler has not written in the logbook himself, then he shall sign the log after each entry to confirm its accuracy. The logbook shall be stored for a minimum period of 24 months after the completion of demining tasks carried out by the MDDs. The logbook shall be kept by assigned MDD officer and presented to QA teams upon request. A copy of the daily work sheet shall be attached in the completion report.

20. Internal Quality Control (QC)

Demining organisations shall conduct 10% QC using one MDD on the areas cleared by MDD assets. The 10% shall comprise at least four separate areas spread over the total area cleared. All areas checked shall be marked on the ground and recorded in the map.

21. Miscellaneous Provisions

Records of clearance using MDDs shall include accurate detail of which search boxes were cleared by specific MDD teams.

Annex A

(Informative)

Daily and monthly health-check points

Table of recommended daily and monthly health check points

Daily health check	Monthly health check
The dog's general condition and willingness to play and respond to positive stimuli.	The dog's general condition and willingness to play and respond to positive stimuli.
Examine the skin and coat and let the hand run over the body to feel for wounds, ticks, thorns and areas of matted hair, or lumps and bumps.	Check the appetite and faeces by asking the dog handler.
Examination of breast, legs and paws. Look particularly for hot spots, swollen joints, dry pads, long or damaged claws, and fungus diseases on the feet. Carry out de-worming	Check the skin and coat for wounds, ticks, thorns and areas of matted hair, or lumps and bumps. Check for parasites, and carry out de-worming
Examine the tail, anal region and anal sacs. Look for swelling and irritation.	Examine the nose, mucous membranes, mouth, throat, tongue, and teeth.
Examine the vagina/penis and testes.	Examine the eyes and ears.
Examine the nose, eyes, and ears.	Check visually the lung functions and the hydration status.
Examine the mouth and throat. Look for swelling, changes in colour, inflamed gums, bad breath, foreign bodies/objects loose or broken teeth and accumulated tartar.	Inspect lymph nodes for swelling or sore points.
Check the temperature if there is any doubt about the dog's health.	Check the pulse and temperature.
Check date of next vaccination	Check vaccination status

Annex B
(Informative)
Logbook health care check points

Daily logging	Monthly logging
Appetite	Appetite
Thirst	Thirst
Skin condition	Skin condition
Occurrence of ectoparasites	Occurrence of ectoparasites
Condition of the legs	Condition of the legs
Condition of paws and claws	Tail condition
Tail condition	Condition of the anal region
Vagina/penis and testes condition	Vagina/penis and testes condition
Nose condition	Nose condition
Eye condition	Eye condition
Ear condition	Ear condition
Mouth condition	Mouth condition
Throat condition	Throat condition
Teeth condition	Teeth condition
Temperature	Temperature
Other prophylactics	Other prophylactics
De-worming	De-worming
Treatment	Treatment
Use of medicines	Use of medicines
Vaccinations	Vaccinations
General physical/mental health	Pulse condition
Willingness to work and play	Respiration and lung function
	Urine test
	Blood test