

19. MECHANICAL SUPPORT

1. General

ANAMA considers mechanical equipment as an essential tool for clearance/survey operations. It must be a part of a combined approach to humanitarian demining, assisting in increase of the productivity of manual, MDD, clearance, technical survey and QA tools. Presently, mechanical clearance is not a stand-alone system and requires a closely monitored follow-up of technical survey teams, supported by MDD teams, manual clearance and quality assurance. Mechanical clearance, as a minimum, should address the clearance of tripwires, vegetation and preparation of the terrain to accelerate manual clearance. ANAMA supports the evaluation of mechanical clearance systems with the aim of integrating this equipment into current operations.

Classification of mechanical tools:

- Pressure tools: rollers and flails;
- Disruption tools: ploughs, rotating tillers and rakes;
- Excavation tools: armored excavators, backhoes (backactors) and front-loaders.

2. Concept of operations

Mechanical equipment will significantly reduce economic costs and increase productivity, when this equipment is incorporated as a part of the overall demining process. Specifically, mechanical equipment can be utilized as a tool for:

- rapidly determining the extent of a minefield when conducting Level 2 Survey;
- checking the ground after manual demining as part of the quality assurance process;
- primary means of clearance.

The application of the mechanical options during the process must be controlled and its performance is to be measured to ensure that data is recorded to determine the capabilities of each mechanical option.

The mechanical tools can redistribute broken or damaged mines, parts of mines and explosives and, in some cases, undamaged and fully functional mines. In most cases, the damage caused to the mine, if it is not detonated i.e. by pressure tools, will render the mine incapable of operation; however, in some cases the explosive train may not have been separated or the train is unstable. The application of disruption tools still requires the removal and destruction of the mines at the completion of the task. Another problem area for mechanical clearance is an hilly ground, where constant depth of clearance may not be maintained, and loss of contact with the ground may occur. As a primary means of clearance, mechanical tools do not meet humanitarian standards and must be augmented by other means to ensure the cleared area is free of all mines.

3. Guiding principles

Parameters for each system will vary. In general, each system must:

- a) Be safe for operators and serve to the specific mine threat and ground conditions;

- b) Have the internal organizational structure to integrate with other demining agencies as required;
- c) Be designed and structured in such a way that it speeds up mine clearance operations in a cost effective and productive manner.

Development and employment of mechanical systems must consider the following factors:

- a) The mine threat;
- b) Simplicity of design and operation;
- c) Maintainability and sustainability in area of operations;
- d) Host organization support, including information about roads and bridges, availability of fuel and mechanical clearance priorities;
- e) Adaptability to terrain conditions in different districts of Azerbaijan;
- f) Requirement for written Standing Operational Procedures;
- g) Training of operators and purchasing of equipment, if planned.

4. Mechanical system evaluation

To categorize mechanical clearance systems capabilities in varying soil and local conditions with the aim of integrating this equipment into operations in Azerbaijan the following in-theatre evaluation is recommended:

- a) Initial trial report conducted in training area;
- b) Evaluation period - six months;
- c) Standing Operational Procedures, detailing mechanical clearance procedures, safety precautions for mechanical clearance and the appropriate integrated manual clearance drills;
- d) A closely monitored/documented follow-up manual clearance team. This team will provide both data for the evaluation and quality control of the demining site;
- e) Written evaluation report, specifying the following operational statistical data:
 - Clearance capacity (square meter / hour), which must be faster than other teams on the same task;
 - Mobility in various soil types and slopes;
 - Types, if known, of destroyed mines or UXOs, where they were laid – on surface or buried;
 - Types of partially destroyed mines or UXOs, where they were laid – on surface or buried;
 - Types of undamaged, undestroyed and thrown away mines or UXOs;
 - Depth of clearance in flat ground, including skip zones;
 - Depth of clearance in hilly ground, including skip zones;
 - Conclusions and recommendations.

This provisional statistical data, collected over the trial period, should include data on deep buried mines, surface irregularities produced by rocks or ditches and maneuverability in different soil types. This data should give a high degree of reliability to the conclusions of the report and recommended future use of the equipment.

5. Safety

A demining site that incorporates both mechanical device and manual demining procedures will require strict control and greater safety distances than those, used for manual demining.

When using pressure tools, all located mines or parts of mines are to be destroyed in situ. Under no circumstances mines or parts of mines are to be moved or neutralized and recovered, because of the possible unstable nature of the mine, firing train or firing train components.

When using disruption tools, mines may be remotely pulled to remove the danger of blast/fragmentation, when attempting to destroy mines. Once pulled, the mines are to be destroyed by demolition either in situ or in a separate disposal area.

When using excavation tools, all spoil must be checked manually and/or with MDD.

A minimum distance of 25-50 meters is to be observed by the personnel, operating remote controlled mechanical devices, from a protected vehicle or enclosure, and a minimum safety distance of 200-250 meters from other personnel.