

## CHAPTER XVI

### CLEARANCE AND TECHNICAL SURVEY OF THE AREA CONTAMINATED WITH UNEXPLODED CLUSTER MUNITION

#### INTRODUCTION

1. Clearance and technical survey of areas with unexploded cluster munitions is performed by trained, organized, disciplined and equipped operational staff based on standard operating procedures that ensure the required level of quality, maximum safety of personnel and equipment, efficiency and adaptability to terrains in BiH.

#### GOAL

2. Establishing standards for clearance and technical survey of areas contaminated with unexploded cluster munitions, which implies searching, locating and destroying of unexploded cluster munitions, in a safe manner for operational personnel, with the required quality and user confidence.

3. Remove all unexploded cluster munitions from the defined area to the depth defined in the project.

4. Marking of the cluster munition suspected area reduces the risk for potential users of that area.

5. Reduce or completely eliminate the remaining suspected or hazardous area once the exact position of the zones of action is defined through clearance and technical survey, based on the criteria for excluding the suspected area.

#### RANGE

6. Unexploded cluster munitions are scattered on mined and mine-safe areas. Finding and removing unexploded cluster munitions from mined areas is done after mine clearance (in progress or after completing the task).

7. All safety rules and procedures that must be followed in humanitarian demining also apply to the removal of unexploded cluster munitions.

8. Procedures for clearance and technical survey of areas with unexploded cluster munitions must ensure the safe operation of operational staff and the required quality that ensures the safe use of cleared and technically surveyed areas.

9. The organization and procedures of work on the site where clearance and technical survey of areas with unexploded cluster munitions is performed must be described in the SOP of the accredited organization.

## SITE ORGANIZATION AND SEQUENCE OF OPERATIONS

10. All intended areas in the administrative part of the site for clearance and technical survey of areas with unexploded cluster munitions are defined as on humanitarian demining tasks.
11. Unexploded cluster munitions fired from the rifle is accidentally scattered on mine suspected areas (between confrontation lines). On the tasks of clearance or technical survey of mine suspected areas, unexploded cluster munitions fired from rifles will be searched with metal detectors / locators after clearance and technical survey of the sampling unit, before sampling.
12. When a mine suspected area is contaminated with unexploded cluster munitions spread from an airplane or artillery, the detection and removal of unexploded cluster munitions is performed after the removal of the mine hazard, as a standard procedure for removing unexploded cluster munitions.
13. The risk area of the task is defined by coordinates and must contain the coordinate "evidence point-indicator". "Evidence point – indicator" is the place (determined by the coordinates in the survey sketch) where unexploded cluster munitions was noticed, the place of the accident / incident, the crater caused by the explosion, but visible on a hard surface such as concrete, asphalt, house facades or a place where parts of exploded cluster munitions were found, confirmed by surveyors or senior quality control officer (VRKK) during sub-ammunition removal operations, or by several interviewees of a confirmed place where unexploded cluster munitions were located (and removed).
14. Zone / zones of action recognized by the survey report are defined (type of cluster munitions, MK, KB, BLU, ..) on the basis of all available collected information and their position **may** change. The final shape and boundaries of the action zone (s) are determined on the basis of contamination indicators found during clearance/technical survey.
15. Operations begin with the opening of working paths by manual methods of technical survey from the safe area through the shortest distance (optimally) to the area around the "evidence point-indicator".
16. In the task, the area around each "evidence point-indicator" of the square shape and size of a 50x50 m is cleared and a square of 150x150m is technically surveyed around the specified square. All squares 150x150m within one zone of action are connected and the boundaries of the task are defined, which are affected by the geography of the terrain and all other information from the general survey.
17. Identified "evidence points-indicators" during clearance and technical survey are vectorized by the team leader and the inspection body of BHMACH, based on which the direction and area of action to be cleared is determined.
18. Technical survey must be carried out at least 50m from the cleared area, unless the cleared area borders with the another cleared area or area without identified risk (PBUR) defined through the general survey.

19. If parts of exploded cluster munitions are found in the technically surveyed area at the site, regardless of the fact that it is not possible to define the exact location of the explosion, the area for clearance that is part of the cluster munitions action zone must be defined. Use the locations of the found parts of the exploded cluster munitions to define (zones of action) the clearance area.

20. Determination of the clearance area if the zone of action cannot be defined on the basis of the found unexploded cluster munitions.

a. If parts of the bomb are found and unexploded cluster munitions or parts of exploded cluster munitions **are not** found, the clearance area is **not** defined.

b. If a bomb or warhead with unexploded cluster munitions is found, a clearance area with minimum dimensions of 50 x 50 m is defined around it. If a part of unexploded cluster munitions was in the bomb or warhead at the time of the fall, and the rest was not found in the task, it is necessary to initiate a survey immediately in order to define the risk area where the cluster munitions are scattered.

21. Areas that are technically surveyed and cleared depend on the found unexploded cluster munitions and very often the boundaries of the defined risk area and zone of action in the task will not be equal to the boundaries of technically surveyed and cleared area at the end of operations. Part of the area of a task that is not treated by conducting the above operations will be declared as PBUR after a targeted technical survey has been conducted .

22. Targeted technical survey is probing 3% of the re-surveyed area of completed task with square-shaped samples measuring 10x10 m in the direction or around the zone of action outside the boundaries of the treated areas. If unexploded cluster munitions are found by targeted technical survey, clearance and technical survey are performed as described, and after the completion of the above actions, targeted technical survey is being performed again.

## MARKING

23. Marking pegs are driven into the ground on the cleared area and are used in the same way as in demining sites.

24. In addition to the pegs connected by a ribbon, red flags can be used to mark the working path when a rope is used. The maximum distance between pegs or flags is 5 m.

25. The red plastic cohen is used during the visual inspection to mark the working path at a maximum distance of 2m, and to mark the progress made in the working path .

26. A triangular plastic marker is used to mark the signal location of the metal detector / locator.

## MANUAL METHOD OF WORK AND LIMITATIONS

27. According to the characteristics of the suspected area, we define two ways:
  - a. Visual inspection - inspection of hard surfaces that do not allow the penetration of cluster munitions
  - b. Deep clearance
28. The standard for the area cleared from cluster munitions is to remove all metal larger than 200 grams to a depth of 30 cm. The test piece has cylindrical shape weighing 200 grams (inert cluster munitions) buried to a depth of 30cm on a marked area of 1x1m, on which there is no locator signal. If it is not possible to excavate to the stated depth (due to the rocky soil) then the excavation is done to a smaller depth where the stone forms a compact rock.
29. The required quality for the surface from which unexploded cluster munitions are removed is the elimination of the danger of explosion and individual metal heavier than 200 grams to a depth of 30 cm (or all metal larger than the minimum mass of cluster munition we expect on the task).
30. The width of the working path is 1.3 m, and the overhang is 10 cm.
31. Before starting work (removal of vegetation), a visual inspection of vegetation in front of the operator from top to bottom is performed in the working path, as well as moving of vegetation by hands to inspect the soil up to 50 cm in front of the operator in a suspected area.
32. Vegetation in the risk area, in front of the operator, is being removed respecting the safety procedures as in the working path when clearing mines.
33. Vegetation is removed from the working path which prevents inspection by a metal detector / locator along the entire width of the working path and which is an obstacle to the progress of the operator.
34. When a rope and flags (in 50x50m box clearance) are used to mark the working path, the first working path is cleaned without the rope, which is being moved for the width of the working path parallel to the first working path. If the vegetation in the part of the box that is being cleared does not allow the operator to pass with the locator, then the working path is not being cleaned (skipped) but the next working path is cleaned, and the vegetation is removed from the cleared paths and the complete skipped working path is being surveyed.
35. Excavation is done with a hand shovel as in demining. Excavation can be done with bigger tools if at least 10 cm before the metal detector / locator signal (on the surface without signal) is dug up to 30 cm with a larger tool and from that hole the excavation starts according to the metal detector / locator signal with a shovel on the side.

36. The operating mode (sensitivity level) of the detector / locator determined by the test does not change during operation. The detector / locator is tested on the specified test piece after each shutdown and records of testing and results are kept.

37. If working with the locator encounters mineralized soil where the degree of sensitivity of the locator does not correspond to the situation in the field, a new test site is defined and a new mode of operation of the locator is determined, which detects the test piece.

38. The cleared area in the working paths in technical survey must not be less than 25% of the total defined area for technical survey. Inspector for quality control (IKK) must control 3% of the area from the defined zone of action (boundary of the cleaned area) on the cleaned area, and 3% of the area of the total technically surveyed area will be treated through the untreated area. Of the total area of the task, the internal control will control another 2% of the area at the request of the inspection body in cooperation with the OK officer in the part of the task where it assesses the need to define the area of operation.

39. In the technical survey the working paths are run in parallel at a maximum distance of 5 m. The technically surveyed area consists of boxes with a maximum length of 25 m and a maximum width of 5 m. With the consent of the inspection body, the site manager/team leader can clean the working paths in another configuration (meet the requirement for the size of the cleared area in TS) when the terrain configuration or found unexploded cluster munitions enable more effective technical survey.

40. The external control will control the cleaned area in the working paths and the untreated area that borders with the working path.

41. Unexploded cluster munitions shall be destroyed on the spot or, in exceptional cases, with the consent of the inspection body, moved to the place of destruction while respecting all safety measures.

42. When unexploded cluster munitions are found in the working path, the detector / locator searches the area around the unexploded cluster munitions to mark the location with four pegs and the operator can continue working in the working path or mark the location where unexploded cluster munition was found with a triangular sign on a peg and close the working path.

43. It is not recommended to use a machine that disturbs the ground, because the removal of vegetation can dispose unexploded cluster munitions that can fall either on the machine (cumulative medium penetrates the machine's armor) or on untreated area in technical survey. An armored excavator with a bucket can be used to move construction debris to a safe surface when unexploded cluster munitions are in the rubble of buildings. In these cases, it is difficult to use a locator, so the use of MDDs is recommended.

44. Sampling of the cleared area of the task is done in one unit, while sampling of technically surveyed areas of the task, at the request of the organization can be done in several units. The size of the samples is determined according to the re-surveyed area, for cleared area

by the method from IMAS 09\_20, and 5% for the technically surveyed area. The size of the individual sample is from 1 to 50m<sup>2</sup>.

45. Layout of the total sample area is done half-targeted and half randomly according to the MAC's step generator. The targeted samples are distributed on a technically surveyed area which the inspection body estimates to represent the direction of distribution of cluster munitions. The entire surface of the samples for the cleaned area is randomly distributed according to the random sample generator. After completion of sampling on the cleaned area, the rest of the random samples will be used on the technically surveyed area.

46. Officer for quality assurance (OOK) and the inspection body will identify the number of box(es) and the size of the controlled area in their quality control reports.

**BOSNIA AND HERZEGOVINA MINE ACTION CENTER**

Number .....

Date ..... 20\_

Pursuant to Article 36 of the Law on Demining in Bosnia and Herzegovina (Official Gazette of BiH, No. 5/02) and item 6 of Chapter XVI of the BiH Standard, the Mine Action Center in Bosnia and Herzegovina issues

**CERTIFICATE**

**ON THE QUALITY CONTROL CONDUCTED ON CLEARANCE AND TECHNICAL SURVEY OF THE TASK CONTAMINATED WITH UNEXPLODED CLUSTER MUNITION**

The certificate refers to the following location and attached documentation:

<i>Location name</i>		<i>MAC ID no. task</i>
<i>Municipality</i>		<i>Coordinates of the basic point</i> Y X
<i>Task area</i> (m <sup>2</sup> )		<i>Accredited</i> <i>Organization – contractor of works</i>

The Mine Action Center in Bosnia and Herzegovina confirms that the quality control in order to ensure the quality of the demining task was performed according to the following content:

**Content of activities and quality control**

1. The formation and issuance of the terms of reference was performed by BHMIC after the general survey procedure is conducted.
2. During its work, the accredited organization complied with the requirements of the BiH Standards and performed the work according to the approved Standing Operational Procedures (SOPs).
3. Internal quality control measures in the accredited organization are implemented according to the procedures in the approved SOP.
4. During the performance of the task, expert supervision was performed by the inspection bodies for quality assurance of BHMIC. Errors found during the works were corrected at the request of the inspection.
5. During the expert supervision, quality control by sampling was performed according to ISO 2859-0, using the method of random and targeted sampling. During the sampling, unexploded cluster munitions, UXO and critical errors up to a certain removal depth of 30 cm were not found, which was recorded in the final report on the expert supervision of the performed task.
6. A Minutes on the takeover of the cleared and technically surveyed area have been compiled with a statement on the implemented activities, official declarations and attachments that indicate the quality completion of the works by the accredited organization.

**DIRECTOR**



12. Size of technically surveyed area	
13. Number of cleaned houses (buildings)	
14. Area size of cleaned houses (buildings)	
15. Cleared area of targeted TS	m2                      number of samples

16. Zone of action

17. Is it outside the scope of the task PBUR (area without identified risk)

18. Internal quality control was performed by and the size of the performed internal sampling in m<sup>2</sup>

19. Monitoring performed and by whom

<input type="checkbox"/>	Yes .....	<input type="checkbox"/>	No.
<input type="checkbox"/>		<input type="checkbox"/>	
<input type="checkbox"/>		<input type="checkbox"/>	

20. Types and quantities of unexploded submunitions and exploded parts removed

**II- OFFICIAL DECLARATIONS ON TAKING OVER THE CLEARED AND TECHNICALLY SURVEYED AREA**

HANDOVER BY ACCREDITED ORGANIZATION	TAKING OVER BY BIH MINE ACTION CENTRE
<p>I declare that the clearance and technical survey of the area (building) described in this document (final report) were performed in accordance with Standard for mine and UXO removal up to the stated depth.</p> <p>I estimate that the area (building) is well cleaned and technically surveyed from unexploded sub-ammunition for safe use and as such I hand it over to BHMAC.</p>	<p>I ....., QC inspector at BH MAC based on its own knowledge and through expert supervision of the task by QQ officer ..... from regional office.....of BHMAC, am taking over this cleared and technically surveyed area (building) on behalf of BHMAC since the expert monitoring and sampling showed that clearance and technical survey of the area (building) was performed in accordance with the requirements of the Standard for mine and UXO removal in BiH.</p>

	..... ( inspector's signature )
21. Name and position of the responsible person at demining organization	22. Name of the head of BHM MAC office
23. Signature and stamp	24. Signature and stamp
25. Statement number ..... Date of handover.....	26. Number of minutes: .....  Date of taking over: ..... ..

### III-ANNEXES:

#### A) Contributions of the accredited organization:

- a) -List of persons of the department (team, section...) or more of them who performed the task with functions.
- b) - Review of working days and hours of work with achieved effects by engaged departments - sections, teams and groups (data from daily reports for deminers and MDDs and a special attachment for mechanical preparation if performed).
- c) -Daily reports (demining teams, MDDs, mechanical preparation and monitoring if performed).
- d) - Overview of the equipment used in the applied methods (name, type - type and quantity).
- e) -Graphic presentation of the task - sketch in scale on geodetic bases or the largest scale of the topographic map from the coordinates of small points and places where cluster munitions was found.
- f) Sampling sketch.
- f) - Photocopies of internal reports on QC (persons for QA organizations).
- g) -Description of the course of the task (problems in the implementation of the plan, errors identified by internal quality control, monitoring if it was engaged and BHM MAC inspections and how they were solved, comparison of found unexploded cluster munitions and parts and places of explosion of exploded cluster munitions with information from the general survey Report and the definition of zone of action, a description of activities that indicate the reliability of the standard quality of clearance and technical survey, etc., and important photos that prove it).

h) - Minutes on informing the authorities / end user on the boundaries of the marked cleaned and technically surveyed area.

**B) – Attachment of inspection bodies:**

a) - Minutes on expert supervision (from daily expert supervision).

b) - Final report on expert supervision (positive in terms of quality for the purpose of taking over and issuing certificates of QC).

c) - Decision on the prohibition of further works and repetitions (if adopted) and other evidence indicating the expertise and quality of the performed task of clearance and technical survey of cluster munitions .

d) -Sketch of the progress of the task.

APPROVED BY

Commission for Demining in BiH

Act number: 14-3 6-24-350-1 / 13 dated  
21.02.2013.

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