

Sudan National Mine Action Standards – SNMAS 06.02

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Battle Area Clearance (BAC)

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1. Introduction

Armed conflicts and hostilities leave behind munitions, if not managed immediately after the hostility and conflict is over or ceased; they can cause and pose severe impact on the communities and people living around or close to those battle areas. Presence of munitions can also hinder livelihood and development interventions. The common understanding is that the munitions that are used during the armed conflicts, do not all of them always work as intended, rather some of them remain unexploded.

In situations where there has been high ammunition usage rates the resulting hazards from Explosive Remnants of War (ERW) can be extensive across battle areas. In addition, in almost all post-conflict environments, there have been undesired explosive events in ammunition storage facilities because of inadequate and/or inappropriate munitions management. As a result, ERW have been dispersed and scattered over a large area around the storage facilities.

The hazard or risk from ERW will vary according to the munitions type and a number of factors associated with their release, firing or arming systems. Therefore, if the condition of an item of ERW cannot be established, the principle is to treat each ERW item as hazardous and to destroy them in situ. The purpose of dealing with ERW as part of demining operations in Sudan is to survey, identify, remove and destroy all ERW hazards from a specified area to a specified depth to ensure that the land is safe for land users. Battle Area Clearance (BAC) is the systematic and controlled clearance of ERW contaminated areas where the risk is known to be ERW.

It is paramount that the confidence of beneficiaries and stakeholders is built on the areas cleared from ERW that they can safely use the land after clearance completed. Undertaking BAC operations requires well established management system, operating procedures, well trained operators and quality assurance and monitoring processes which are appropriate, effective, efficient and safe. To achieve the confidence of beneficiaries, the planning and prioritization for BAC shall consider national and local level needs and requirements. Community liaison is effective confidence building measure in demining including BAC operations.

All the hazardous areas contaminated with mine and or ERW in Sudan shall be surveyed and recorded in IMSMA as CHA or SHA based on the direct or indirect evidence of hazards that are identified during survey activities, the requirements for survey are detailed in SNMAS 05.02. However, many CHAs and SHAs will only contain ERW including unexploded Land Surface Ammunition (LSA) and or unexploded air delivered weapons which require BAC operations. BAC is the term used to describe the systematic search, locating and clearance of all items of explosive ordnance within a given area.

2. Scope

This SNMAS provides standard guidelines and requirements for the clearance of explosive remnants of war (ERW) and BAC operations in Sudan. This SNMAS should be read together with SNMAS 06.01 for clearance requirements and SNMAS 05 series for land release operations.

3. Reference

The main reference for this SNMAS is IMAS 09.11.

4. Terms and Definition

A complete glossary of all mine action terms and definitions is given in IMAS 04.10, which should be referred to, IMAS 04.10 is inclusive and broader in principle, covering all mine action terms and definition that are used globally including Sudan. However the terms related to BAC operations are covered in this SNMAS and those used in Land Release are covered in SNMAS 05.01.

The term “Battlefield” refers to an area in which ERW including UXO and Abandoned Ordnance (AO) have been found. This may include former battle areas, defensive positions and sites where air delivered or artillery munitions have been left, fired or dropped.

The term “Battle Area Clearance (BAC)”, refers to the systematic and controlled clearance of hazardous areas where the hazards are known not to include mines.

The term “Cluster Munition” refers to a conventional munition that is designed to disperse or release explosive sub-munitions each weighing less than 20 kg and includes those explosive submunitions.

5. Battle Area Clearance (BAC) General

BAC operations involve locating, investigation and disposal of ERW, including UXO, Abandoned Explosive Ordnance (AXO) and other Explosive Ordnance, but not mines, over specific areas, which may include battlefields, defensive positions and sites where air delivered or artillery munitions have been left, fired or dropped. Prior to conduct BAC operations, the demining organizations shall be accredited for BAC operations and shall use NMAC approved BAC SOPs, equipment and well trained and qualified operators.

BAC operations involve surface and sub-surface clearance and this shall be decided based on a comprehensive Field Risk Assessment (FRA), and the requirements of beneficiaries and humanitarian and rehabilitation priorities and intended land use. However, the first option should always be the sub-surface clearance in all BAC tasks, unless technical survey dictates that there is no need for sub-surface clearance in parts of or in the whole BAC task. BAC operations do not cover the disposal of stockpiled munitions in national storage facilities.

Former battlefields shall be accepted as “cleared” when the clearance organisation has ensured the removal and or destruction of all, or specified, ERW hazards, depending on the tasking order and instructions, from the specified area to the specified depth.

6. Battle Area Clearance Requirements and Prioritization

6.1 BAC Prioritization

Priorities for BAC tasks as part of humanitarian demining should be established at the outset, and as a result of analysis on non-technical survey data and requests for clearance. The priorities for clearance shall be determined based on the impact of battlefields on the communities, the blockages they have created and based on the national mine action plan and the needs and priorities of humanitarian assistance missions. For more details about planning and prioritization, refer to SNMAS 03.01.

The priorities for BAC clearance as part of supporting development interventions may specify an exact area to be cleared with clearance depth specified for different areas depending on the assessment of hazard site and the intended land use.

6.2 Quality of Clearance

The requirements for BAC depend on the extent and type of hazards, and the site specific conditions. The two categories of clearance are surface and sub-surface clearance, the clearance organization shall make an appropriate and evidence based decision on the extent of surface and sub-surface clearance to be undertaken in a BAC tasks. A comprehensive technical survey as per the requirements of SNMAS 05.03 and Field Risk Assessment shall be conducted in each BAC task in order to support decision making process for surface and or sub-surface clearance.

Surface clearance usually relies on visual search; however, there may be situations that need instrumental search to supplement and facilitate BAC search of areas with vegetation, earth mounds and other areas that limit the visual search. Recording of searches, munitions types and locations of items found is crucial in BAC operations that can assist in determining the requirements for sub-surface search and clearance.

At minimum the sub-surface search of 20x20 meter boxes shall be conducted on all direction from the location where an ERW item or several munitions have been identified during the surface search, the boxes shall be expanded based on the types of hazards and the worksite requirements.

Unless specific requirements dictate, all ERW items found during BAC operations should be destroyed in-situ. If in situ destruction is not possible, all safe to move ERW and Small Arms Ammunition (SAA) and hazardous parts thereof, shall be removed and disposed of, in a designated demolition site; in accordance with requirements of SNMAS 06.03 Explosive Ordnance Disposal.

All ERW contaminated areas are subject to sub-surface clearance, unless technical survey identifies certain parts within a hazard require only surface clearance. Decision on surface clearance shall be based on the findings of technical survey and field risk assessment. All technical survey reports shall be submitted to NMAC through its sub offices by clearance organization for approval, prior to conduct further clearance operations.

The removal and destruction of all or specified ERW hazards, in the specified area to the specified depth shall be achieved by:

- 1) Tasking BAC accredited organisation with operationally accredited capabilities including competent staff with appropriate levels of EOD qualification, using effective management system, and applying safe and effective operational procedures (SOPs) approved by NMAC;
- 2) Internal and external Quality Assurance monitoring of the BAC operations and Quality Control of the cleared areas and outputs;
- 3) Regular review of the QA and QC findings and taking required improvement actions;
- 4) Ensuring proper community liaison and involvement of people including men, women and children;
- 5) Conducting post-clearance impact assessment of the cleared land.

6.3 Depth of Clearance

The depth of clearance in BAC operations shall be determined by the clearance organization in consultation with NMAC sub office, based on the findings of non-technical and technical surveys and other reliable information including technical survey and clearance of the neighbouring battle areas cleared which can establish the depth of ERW hazards expected in the area, comprehensive FRA and an assessment of the future intended land use. If required inputs to establish clearance depth are not available or cannot be obtained, then the minimum clearance depth should be adjusted based on the types of anticipated ERW hazards, the metal contents and the calibre of ERW items. Below mentioned requirements shall be considered by clearance organizations when establishing clearance depth in BAC tasks:

- a) ERW may be on the surface of the ground. In this case, the specification may call for the removal and or destruction only of surface ERW hazards;
- b) Clearance in urban areas may require the removal of many meters of rubble as part of the clearance process;
- c) In situations where large bombs and missiles or heavy calibre projectiles have been used, the depth of clearance may be several meters;
- d) Shifting sands in desert areas or coastal areas may require clearance to a depth of

several meters to locate and destroy ERW which were originally on or close to the surface;

The following should be considered when ERW hazards are located in a piece of ground that requires sub-surface clearance:

- e) 30 cm from the original ground surface for ERW with calibre 82mm and smaller, ;
- f) 100 cm from the original ground surface for ERW items with calibre between 82 and 120 mm; and
- g) More than 100 cm to several meters for heavy ERW including air dropped bombs and artillery munitions.

The required clearance depth can be adjusted as clearance work progresses. Any change shall be agreed between NMAC and the clearance organisation, and shall be formally recorded in task dossier. The clearance operations may be repeated if there is a subsequent change to the land use which requires a greater depth of clearance; this should be decided by NMAC and communicated to clearance organization.

7. Cluster Munitions (CMs)

Cluster munitions are delivered by a wide variety of launch or delivery systems, such as missiles, rockets, projectiles, mortars or aircraft dispensers. The CMs are normally dispensed in one of three ways; base ejection, nose ejection or case rupture. Since sub munitions disperse after ejection, the density of the impact footprint is dependent on the speed and altitude at which the dispenser, projectile or rocket opens.

The failure to detonate rate of CMs cannot be accurately determined, unless such necessary strike data is available.

The requirements given in this standard provides the foundation and framework from which each mine action organization shall develop their SOPs.

- 1) Once a cluster munitions strike area has been identified, it shall be surveyed and recorded in IMSMA.
- 2) All CMs sites shall be prioritized based on the threat to human life and livelihood and shall be cleared as per the requirements of this standard.
- 3) The clearance of cluster munitions strike areas should employ a two-phase approach, including visual search (phase one) as a means of rapidly removing the immediate and obvious cluster munitions threat and risk to human lives.
- 4) During the visual search the site supervisor shall ensure that a strict control is maintained, and the area is thoroughly investigated.
- 5) The CMs that require to be destroyed in situ shall be clearly marked and the local population warned of the threat, before demolition. If required, protective work to be employed to minimize damages.
- 6) Close liaison with the local community, local authority and any other organizations working in the immediate vicinity shall be maintained when conducting demolitions particularly in built up areas.

- 7) Site supervisor shall determine as accurately as possible and record the coordinates of the centre of the cluster strike. This recorded information shall be used during the phase two of clearance which is sub-surface search using detection tools and equipment.
- 8) The information gathered during the Phase I visual search should be used to assist with the Phase II planning of technical survey and clearance including targeted investigation to the cluster strikes and systematic investigation in rest of the CMs task.
- 9) Phase II search shall be conducted immediately after phase I and may be conducted as a combination with Phase I.
- 10) A site-specific clearance depth shall be agreed between the clearance organization and the NMAC operations department and sub office and shall be formally recorded in the clearance plan for each CMs site.
- 11) If any mines, tripwires or suspicion of mines are discovered during the sub-surface search, the task shall immediately be stopped, the appropriate safety requirements considered, and the facts reported to NMAC sub office and operations department.
- 12) The clearance organization shall undertake a comprehensive field risk assessment (see Annex A to SNMAS 05.03), revise the operational plan obtain NMAC approval of the changes in operations.

8. Detection Equipment

For sub-surface BAC various detecting equipment may be appropriate, that include:

- 1) Shallow search metal detectors, the same as used during mine clearance operations, however, operational efficiency needs to be considered when using them in BAC operations.
- 2) Shallow search metal detectors which are designed or calibrated against a specified ERW targets.
- 3) Wide area and large loop metal detectors
- 4) Deep search locators.
- 5) Magnetometers.
- 6) Detector arrays, manually carried or mounted on vehicles,
- 7) Possible use of mine detection dogs (MDD), however, the use of MDD will be severely limited in highly contaminated ERW hazards due to dispersed explosive contamination of the land.
- 8) Any new detection technology that comes to exist.

9. Safety

The minimum safety distances for BAC operations are dependent on the expected hazard and the type of operation being conducted. The following requirements shall be considered by clearance team:

- 1) For surface clearance investigation of ERW, where there is a risk of movement or disturbance of ERW items, a minimum of 50 meters of safety distance is considered and the principle of the minimum number of people in a specified danger area applied.
- 2) For sub-surface clearance involving excavation, a suitable safety distance related to the expected munitions is assessed and applied. The safety distance should be based on the

conduct of FRA, and minimum of 25 meters is applied, the safety distance can be increased based on the type of anticipated ERW item; to a minimum of 50 meters.

10. Recording and Reporting

Management and maintenance of comprehensive records relating to what has been found in BAC operations, by which organization, where and in which depth will assist Sudan Mine Action Programme (SMAP) short and longer term planning.

To respond to urgent humanitarian needs; rapid surface BAC will reduce risk to communities, IDPs and returnees, and enable access across the land. In the longer term, additional sub-surface clearance may be or become necessary. There are significant benefits of maintaining records indicating what type of munitions may be found in different areas, based on surface clearance data. It is therefore crucial that all BAC completion reports shall have records of the type of ERW identified during clearance operations. Every BAC task, regardless whether it is surface or sub-surface, shall be accurately documented including the type of ERW, and recorded in IMSMA.

IMSMA and GIS shall enable accurate information management to help plan immediate and long term BAC and EOD requirements. To properly manage the residual risk of ERW contamination in Sudan, a robust and comprehensive recording system within IMSMA shall be managed and maintained.

11. Responsibilities

11.1 National Mine Action Centre Sudan (NMAC)

The Sudan National Mine Action Centre with technical support of UNMAS shall:

- 1) Specify, plan and prioritize the ERW contaminated areas to be cleared and the depth of clearance in tasking order.
- 2) Specify the standards and guidelines for monitoring and QC to be applied to clearance contracts and agreements.
- 3) Accredite demining organizations and their clearance assets to undertake BAC operations in Sudan.
- 4) Conduct monitoring and QC of land release operations and outputs.
- 5) Undertake post demining impact assessment (PDIA) of the areas released through NTS, TS and clearance.
- 6) Manage and maintain Information Management System through IMSMA to record all survey and clearance data.
- 7) Manage and maintain a quality management system to ensure consistent delivery of quality clearance and land release services.

11.2 Mine Action Organizations

All mine action organizations working in Sudan shall:

- 1) Obtain accreditation from NMAC to operate as a clearance organization.
- 2) Apply the requirements of SNMAS throughout the clearance and land release operations.
- 3) Develop SOPs for BAC operations.
- 4) Maintain and make available documentation of clearance to NMAC and properly report their outputs in standard IMSMA forms as specified in SNMAS 10.01.

- 5) Ensure effective application of community liaison with the affected community and they are fully consulted and are cognizant of all demining activities including BAC operations.
- 6) Ensure that the priorities of men, women and children are considered throughout the clearance and land release operations.
- 7) Undertake internal monitoring and QC of their clearance activities and outputs, and regularly report to NMAC on the quality of their demining including BAC operation.