



NATIONAL TECHNICAL STANDARDS AND GUIDELINES SOUTH SUDAN

PART 1 DEMINING

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Additional Standards and Guidelines:

Part 2 – Information Management and Reporting
Part 3 – Mine Risk Education (MRE)
Part 4 – QA Procedures

AMENDMENTS

Amendments to this document shall be published periodically. An accurate record of amendments shall be maintained in the table below.

Any comments, suggestions or proposed amendments to this document should be addressed to NMAA/UNMAS-SS.

Amendment Number	Amendment date	Amendment to Section	Amendment Details
01	Nov 17	Chapter 12	Complete rewrite
02	Nov 17	Chapter 14	Complete rewrite
03	May 18	Chapter 5	Complete rewrite
04	Feb 19	Chapter 20	Para 20.4.1.a delete 40cm , insert 20cm

FOREWORD

Reference: International Mine Action Standards,
<http://www.mineactionstandards.org/>

The National Technical Standard & Guidelines (NTSG) for humanitarian mine action operations¹ in South Sudan are essential to enable the National Mine Action Authority to plan and assess humanitarian mine action operations being conducted by mine actions organisations² within South Sudan Mine Action Program (South SUDANMAP). The mine action organisation may be involved in one or more of the following humanitarian mine action activated in South Sudan:

- a. Mine Risk Education (MRE)
- b. Landmine Impact Survey (LIS)
- c. Non-Technical Survey Assessments (NTS)
- d. Technical Survey (TS)
- e. Manual Mine Clearance (MMC)
- f. Road/Route Survey, Verification and/or Clearance Operations
- g. Mechanical Operations
- h. Mine Detection Dog (MDD) Operations.
- i. Explosive Detection Dog (MDD) Operations
- j. Explosive Ordnance Disposal (EOD)
- k. Battle Area Clearance (BAC)
- l. Remote Explosive Scent Tracing (REST).
- m. Humanitarian Mine Action Operations involving two or more activities, I.E. NTS, MMC, BAC, MDD, Mechanical. This is referred to as 'Integrated Operations'.

These NTSG are split into four parts:

Part 1:- Deming

Part 2:- Information System (IMSMA)

Part 3:- MRE

Part 4:- QA

The aim of these Technical Standards is to provide mine action organisations with references for the conduct and management of humanitarian demining activities. They have been produced using experience gained locally and incorporating lessons and best practices learned in other worldwide theatres.

This document is not intended to replace or replicate Standard Operation Procedures (SOPs) nor does it absolve mine action organisations from the responsibility to produce their own SOPs. Conversely these NTSGs are intended to be used as an aid in developing SOPs, by detailing the

minimum standard and accepted practices/methods of conducting humanitarian mine action activities as part of the South SUDANMAP.

Variation in procedures and methods of operation are to be expected amongst the different mine action organisations. These provide an example of the accepted practices by the NMAA & UNMAS South Sudan (UNMAS-SS) and provide a basis for comparison during the desk and operational accreditation process.

Organisations which do not conform to the standards outlined in this document shall not be accredited to work within the South SUDANMAP. Additionally, accredited mine action organisation's which do not continuously comply and adhere with the terms of their accreditation i.e. continue to apply the standards and details of accredited SOPs; may have their accreditation suspended or removed.

The following terms used throughout this document indicate specific levels of obligation:

'Shall' is used to indicate a requirement, methods or specifications that are to be applied in order to conform to the standard.

'Should' is used to indicate the preferred requirement, methods or Specifications.

'May' is used to indicate a possible method or course of action.

This document is designed to be a "living" document. The procedures and practices shall be continually reviewed in order to ensure they remain relevant to the current mine/ERW situation as well as advances in technology.

In parts this documents meets and exceeds those minimum standards set out in the International Mine Action Standards (IMAS), which should be read in conjunction with this publication.

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Date 1st October 2015

¹ The term 'humanitarian mine action' is used to describe/refer to the planning, implementation and conduct of all mine action projects and associated activities within South Sudan.

² The term 'mine action organisation' is used to refer to any organisation, government, NGO, military or commercial entity, prime or sub-contractor, consultant or agent involved in any humanitarian mine action activities in South Sudan.

INTRODUCTION

In accordance to 'Security Resolution 1590; the United Nations Mine Action service South Sudan (UNMAS-SS), has been appointed by the National Mine Action Office (NMAA) South Sudan, who represent the Government of the Republic of South Sudan (GRSS), to co-ordinate and facilitate all humanitarian mine action activities in South Sudan. This includes the establishment of the National Technical Standards and Guidelines (NTSG) for humanitarian Mine Action activities, accreditation of mine action organisations and the quality assurance for tasks completed by such organisations.

The establishment of minimum standards for humanitarian mine action activities are to ensure the following:

To include the safety of people directly or indirectly involved in the work, the quality of the work (level of clearance), the medical evacuation procedures and common activities such as hazard area marking and reporting.

The identification of acceptable procedures shall provide guidelines for the conduct of mine action operations. These shall provide the basis for SOP to be developed by mine action organisations.

The evaluation and approval of SOP and training programs submitted by the mine action organisations will form the minimum standards which shall be fulfilled in order to receive accreditation to conduct mine action operations within South Sudan.

The preparation of an evaluation ground for Mine Detection Dogs (MDD) and criteria for the evaluation of the MDD.

Quality Assurance (QA) of humanitarian mine action activities,

The standards in this document have been written in conjunction with the International Mine Action Standards (IMAS). Where necessary these minimum standards have been enhanced to provide the most appropriate level of safety required for humanitarian mine action operations in South Sudan.

NATIONAL TECHNICAL STANDARDS AND GUIDELINES (NTSG)

The NTSG shall be adhered to by all mine action organisations.

This NTSG provides limited explanations for conducting specific humanitarian mine action activities in order to provide the minimum requirements for conducting recommended and proven clearance methods safely and effectively. In circumstances where an organisation intends to conduct specific procedures which are not detailed in the NTSG or IMAS, prior

authorisation shall be sort and possibly granted by the NMAA/UNMAS-SS. All mine action organisations shall be required to have their SOPs and Operational mine action activities accredited as detailed in Chapter 19.

Any amendments to the NTSG shall only be authorised by the Chairperson of NMAA / Program Manager for the UNMAS-SS.

STANDARD OPERATING PROCEDURES (SOP)

All mine action organisations shall provide NMAA/UNMAS-SS with a complete set of SOPs in English which covers all humanitarian mine activities which they wish to be accredited to conduct.

ACCREDITATION

To allow the NMAA/UNMAS-SS to effectively monitor all humanitarian mine action activities conducted in South Sudan and to achieve an accepted standard of competence and operational best practices, all organisations shall be required to conform to the necessary accreditation requirements before and during humanitarian mine action activities in South Sudan.

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GLOSSARY

This Glossary is derived from the current edition of IMAS and provides a summary of the mine action terms, definitions and abbreviations used in mine action. If additional information is required then please refer to IMAS.

All of the terms listed within this glossary may not have been used in this NTSG. They are however included should the requirement to include them in the drafting of mine action organisations SOPs or other documentation arise.

When a term listed in this glossary has been used within the NTSG it is not generally accompanied by the definition. For purposes of clarity and conformity this glossary should be referred to at these times.

All mine action organisations are requested to apply these principals during the compilation of SOPs, referring to an activity, task or other or when the need to refer to the relevant term is required.

Abandoned Explosive Ordnance (AXO)

explosive ordnance that has not been used during an armed conflict, that has been left behind or dumped by a party to an armed conflict, and which is no longer under control of the party that left it behind or dumped it. Abandoned explosive ordnance may or may not have been primed, fuzed, armed or otherwise prepared for use. (CCW protocol V)

acceptance

the formal acknowledgement by the **sponsor** or the sponsor's nominated representative that the **equipment** meets the stated requirements and is suitable for use in **mine action** programmes. An acceptance may be given with outstanding caveats.

access lane

marked passage leading through a **mined area** that has been cleared to provide **safe** movement to a required point or area.

accident

an undesired event which results in **harm**.
Modified from definition in OHSAS 18001:1999.

accreditation

the procedure by which a **mine action organisation** is formally recognised as competent and able to plan, manage and operationally conduct mine action activities safely, effectively and efficiently.

For most mine action programmes, International organisations such as the United Nations Mine Action Service or regional bodies have introduced accreditation schemes. ISO 9000 usage is that an '**Accreditation**' **body** accredits the 'Certification or Registration' bodies that award ISO 9000 certificates to organisations. The usage in IMAS is completely different to this, and is based on the main definition above, which is well understood in the mine action community.

accreditation body

an organisation, responsible for the management and implementation of the national **accreditation** system.

agreement

an alternative term for a contract. An agreement includes all the crucial elements of a contract.

Definition when used in a legal sense.

ammunition

see **munition**

anti-handling device

a device intended to protect a **mine** and which is part of, linked to, attached or placed under the mine and which activates when an attempt is made to tamper with or otherwise intentionally disturb the mine. [MBT]

Anti-Personnel Mines (AP)

a **mine** designed to be exploded by the presence, proximity or contact of a person and that shall incapacitate, injure or kill one or more persons.

Mines designed to be detonated by the presence, proximity or contact of a vehicle as opposed to a person that are equipped with anti-handling devices, are not considered AP as a result of being so equipped.

area reduction

the process through which the initial area indicated as contaminated is reduced to a smaller area.

Area reduction may involve some limited **clearance**, such as the opening of access routes and the **destruction of mines** and **ERW** which represent an immediate and unacceptable **risk**, but it shall mainly be as a consequence of collecting more reliable information on the extent of the **hazardous area**. Usually it shall be appropriate to mark the remaining hazardous area(s) with **permanent** or **temporary marking systems**.

Likewise, area reduction is sometimes done as part of the clearance operation.

audit

a timely process or system inspection to ensure that specifications conform to documented quality standards. An audit highlights discrepancies between the documented standards and the standards followed and might also show how well or how badly the documented standards support the processes currently followed.

Battle Area Clearance (BAC)

the systematic and controlled clearance of hazardous areas where the **threat** is known not to contain **mines**.

benchmark

*in the context of **humanitarian demining**, the term refers to ... a fixed point of reference used to locate a marked and recorded **hazard** or **hazardous area**. It should normally be located a short distance outside the hazardous area.*

A benchmark may not be necessary if the **reference point** is sufficiently close to the perimeter of the **hazardous area**.

bomblet

see **submunition**.

booby trap

an **explosive** or non-explosive device, or other material, deliberately placed to cause casualties when an apparently harmless object is disturbed or a normally safe act is performed. [AAP-6]

boundary lane

a **cleared lane** around the perimeter of a **hazardous area**.

box

a squared area that is developed for the purpose of being searched by **MDD**. A box normally measures 10m x 10m, but other sizes may be preferred.

briefing area

*in the context of **humanitarian demining** ...* a clearly identifiable **control point** intended to be the first point of entry to a **mine action worksite**.

The briefing area contains a plan of the **hazardous area** and its current level of clearance, at a scale large enough for briefing purposes, showing the location of control points (car park, first aid point, explosive storage areas, the areas where **mine clearance** work is progressing and distances), and where safety equipment is issued to **visitors**.

cancelled area

an area previously recorded as a **hazardous area** which subsequently is considered, as a result of actions other than **clearance**, not to represent a **risk** from **mines** and **ERW**.

This change in status shall be the result of more accurate and reliable information, for example from technical survey, in accordance with national **policy**. The documentation of all **cancelled areas** shall be retained together with a detailed explanation of the reasons for the change in status.

clearance

(Explosive Ordnance Clearance (EOC))

tasks or actions to reduce or eliminate the **Explosive Ordnance (EO)** hazards from a **specified area**. [NATO Study 2187]

cleared area

cleared land

an area that has been physically and systematically processed by a **mine action organisation** to ensure the removal and/or **destruction** of all **mine** and **ERW hazards** to a **specified depth**.

IMAS 09.10 specifies the **quality system** (i.e. the organisation, procedures and responsibilities) necessary to determine that land has been cleared by the mine action organisation in accordance with its contractual obligations.

Cleared areas may include land cleared during the **technical survey** process, including **boundary lanes** and **cleared lanes**.

cleared lane

safety lane

the generic term for any lane, other than a **boundary lane**, cleared by a survey or clearance team to the international standard for **cleared land**. This may include **access lanes** outside the **hazardous area** or cross/verification lanes inside a hazardous area.

Cluster Bomb Unit (CBU)

an expendable aircraft store composed of a dispenser and **sub-munitions**. [AAP-6] a bomb containing and dispensing sub-munitions which may be **mines** (anti-personnel or anti-tank), penetration (runway cratering) bomblets, fragmentation bomblets etc.

community liaison

community mine action liaison

liaison with **mine/ERW** affected communities to exchange information on the presence and **impact** of mines and ERW, create a reporting link with the **mine action** programme and develop **risk reduction** strategies. Community mine action liaison aims to ensure community needs and priorities are central to the planning, implementation and **monitoring** of mine action operations.

Community liaison is based on an exchange of information and involves communities in the decision making process, (before, during and after **demining**), in order to establish priorities for mine action. In this way mine action programmes aim to be inclusive, community focused and ensure the maximum involvement of all sections of the community. This involvement includes joint planning, implementation, monitoring and **evaluation** of projects.

Community liaison also works with communities to develop specific interim safety strategies promoting individual and community behavioural change. This is designed to reduce the impact of mines/ERW on individuals and communities until such time as the **threat** is removed.

Confirmed Hazardous Area (CHA) refers to an area identified by a non-technical survey in which the necessity for further interventions through either tech survey or clearance has been confirmed.

contract

a formal agreement with specific terms between two or more entities in which there is a promise to do something in return for a valuable benefit known as a consideration.

contractor

any organisation (governmental, non-government or commercial entity) contracted to undertake a mine action activity. The organisation responsible for the conduct of the overall contract is referred to as the 'prime contractor'. Other organisations or parties the prime contractor engages to undertake components of the larger contract are referred to as 'sub-contractors'. Sub-contractors are responsible to the prime contractor and not to the principal.

control area or point

all points or areas used to control the movements of visitors and staff on a **demining worksite**.

cost-effectiveness

an assessment of the balance between a system's performance and its whole life costs.

critical non-conformity

the failure of a 1.0m² unit of land during **inspection** to meet the stated **clearance** requirements. IMAS identifies two types of critical non-conformities: the discovery of a mine or ERW; and other critical non conformities as defined by NTSG.

deflagration

the conversion of **explosives** into gaseous products by chemical reactions at or near the surface of the explosive (c.f. **detonation**).

Defined Hazardous Area (DHA)

refers to an area generally within a CHA that requires full clearance. A DHA is normally identified through thorough survey.

deminer

a person qualified and employed to undertake **demining** activities on a **demining worksite**.

demining**humanitarian demining**

activities which lead to the removal of **mine and ERW hazards**, including **technical survey**, mapping, **clearance**, **marking**, post-clearance documentation, **community mine action liaison** and the **handover of cleared land**. Demining may be carried out by different types of organisations, such as NGOs, commercial companies, national **mine action** teams or military units. Demining may be emergency-based or developmental.

in **IMAS** standards and guides, **mine and ERW clearance** is considered to be just one part of the demining process.

in IMAS standards and guides, demining is considered to be one component of mine action.

in IMAS standards and guides, the terms demining and humanitarian demining are interchangeable.

demining accident

an **accident** at a **demining workplace** involving a **mine** or **ERW hazard** (i. e. mine accident).

demining accident response plan

a documented plan developed for each **demining workplace** which details the procedures to be applied to move **victims** from a **demining accident** site to an appropriate treatment or surgical care facility.

demining incident

an incident at a **demining workplace** involving a **mine** or **ERW hazard** (i. e. mine incident).

mine action organisation

refers to any organisation (government, NGO, military or commercial entity) responsible for implementing demining projects or tasks. The mine action organisation may be a prime contractor, subcontractor, consultant or agent.

demining sub-unit

an element of a **mine action organisation**, however named, which is operationally accredited to conduct one or more prescribed **mine action** activities, such as **technical surveys**, manual **clearance**, **EOD** or the use of **MDD** teams.

demining worker

all employees who work at a **demining worksite**.

demining worksite

any workplace where **demining** activities are being undertaken.

Demining worksites include workplaces where survey, **clearance** and **EOD** activities are undertaken including centralised disposal sites used for the destruction of mines and ERW identified and removed during clearance operations.

Survey, in relation to a demining worksite includes non-technical survey undertaken to identify mine and ERW hazards and hazardous areas.

demolition

destruction of structures, facilities or material by use of fire, water, **explosives**, mechanical or other means.

demolition ground

an area authorised for the **destruction** of **munitions** and **explosives** by **detonation**.

destroy (destruction) in situ**blow in situ.**

the **destruction** of any item of ordnance by **explosives** without moving the item from where it was found, normally by placing an **explosive** charge alongside.

destruction

the process of final conversion of **munitions** and **explosives** into an **inert** state whereby they can no longer function as designed.

detection

*in the context of **humanitarian demining**, the term refers to* the discovery by any means of the presence of **mines** or **ERW**.

detonation

the rapid conversion of **explosives** into gaseous products by means of a shock wave passing through the explosive (c.f. deflagration). Typically, the velocity of such a shock wave is more than two orders of magnitude higher than a fast deflagration.

detonator

a device containing a sensitive **explosive** intended to produce a **detonation** wave.
[AAP-6]

disarm

the act of making a **mine** safe by removing the **fuze** or igniter. The procedure normally removes one or more links from the firing chain.

disposal site

an area authorised for the destruction of **munitions** and **explosives** by **detonation** and burning.

donor

all sources of funding, including the government of mine affected states.

drill munition

an **inert** replica of a **munition** specifically manufactured for drill, display or instructional purposes.

education

the imparting and acquiring over time of knowledge (awareness or possession of facts, ideas, truths or principles), attitude and practices through teaching and learning. [Oxford Concise English Dictionary]

environmental factors

factors relating to the environment and that influence the transportation of odour from the **mine**, the **detection** of the target odour or the ability of people and dogs to work safely and effectively. (i.e. Wind, rain, temperature, humidity, altitude, sun and vegetation). (Definition for **MDD** use only).

equipment

a physical, mechanical, electrical and/or electronic system which is used to enhance human activities, procedures and practices.

evaluation

a process that attempts to determine as systematically and objectively as possible the merit or value of an intervention.

The word 'objectively' indicates the need to achieve a balanced analysis, recognising bias and reconciling perspectives of different stakeholders (all those interested in, and affected by programmes, including beneficiaries as primary stakeholders) through use of different sources and methods.

Evaluation is considered to be a strategic exercise.

Definition when used in relation to programmes. (*UNICEF Policy and Programming Manual*)

explosive materials

components or ancillary items used by **mine action organisations** which contain some **explosives**, or behave in an explosive manner, such as **detonators** and **primers**.

Explosive Ordnance (EO)

all munitions containing **explosives**, nuclear fission or fusion materials and biological and chemical agents. This includes bombs and warheads; guided and ballistic missiles; artillery, mortar, rocket and small arms **ammunition**; all **mines**, torpedoes and depth charges; pyrotechnics; clusters and dispensers; cartridge and propellant actuated devices; electro-explosive devices; clandestine and improvised explosive devices; and all similar or related items or components explosive in nature. [AAP-6]

Explosive Ordnance Disposal (EOD)

the **detection**, identification, evaluation, **render safe**, recovery and **disposal** of EO. EOD may be undertaken:

as a routine part of **mine clearance** operations, upon discovery of the **ERW**.

to dispose of **ERW** discovered outside **mined areas**, (this may be a single **ERW**, or a larger number inside a specific area).

to dispose of **EO** which has become **hazardous** by deterioration, damage or attempted **destruction**.

Explosive Remnants of War (ERW)

Unexploded Ordnance (ERW) and Abandoned Explosive Ordnance (AXO). (CCW protocol V).

explosives

a substance or mixture of substances which, under external influences, is capable of rapidly releasing energy in the form of gases and heat. [AAP-6]

failure

an event in which any system, **equipment**, components or sub-components does not perform as previously specified.

Failures may be classified as to cause, degree, relevance, dependence and responsibility.

fragmentation hazard zone

for a given **explosive** item, explosive storage or **mine/ERW** contaminated area, the area that could be reached by fragmentation in the case of **detonation**.

Several factors should be considered when determining this zone; the amount of explosive, body construction, type of material, ground conditions etc. See also [**secondary fragmentation**].

fuze

a device which initiates an **explosive** train. [AAP-6]

Non-Technical Survey (NTS)

the continuous process by which a comprehensive inventory may be obtained of all reported and/or suspected locations of **mine** or **ERW** contamination, the quantities and types of **explosive hazards**, and information on local soil characteristics, vegetation and climate; and assessment of the scale and **impact** of the landmine problem on the individual, community and country.

GIS

Geographical (or Geospatial) Information System

an organised collection of computer hardware, software, geographic data, and personnel designed to efficiently capture, store, update, manipulate, analyse, and display all forms of geographically referenced information.

GIS allows a user to graphically view multiple layers of data based on their geographic distribution and association. GIS incorporates powerful tools to analyse the relationships between various layers of information.

ground preparation

preparing of ground in a **minefield** or **hazardous area** by mechanical means by removing or reducing obstacles to clearance e.g. tripwires, vegetation, hard soil and metal contamination to make subsequent **clearance** operations quicker and safer.

ground processing

the practice of applying a mechanical tool or system to a **minefield** or **hazardous area** with the aim of clearing all of the **mines** or **ERW** within the mechanical tool or system's capabilities.

guide

an IMAS guide provides general rules, principles, advice and information.

handover

the process by which the beneficiary (for example, the **NMAA** on behalf of the local community or land user) accepts responsibility for the **cleared area**. The term '**alienation**' is sometimes used to describe a change of ownership of the land which accompanies the handover of a cleared area.

handover certificate

documentation used to record the **handover of cleared land**.

hazard

potential source of **harm**. [ISO Guide 51:1999(E)]

**hazard (ous) area
contaminated area**

a generic term for an area not in productive use due to the perceived or actual presence of **mines**, **ERW** or other **explosive** devices.

hazard marker

object(s), other than **hazard signs**, used to identify the limits of a **mine** and **ERW hazard area**. Hazard markers shall conform to the specification established by the **NMAA/UNMAS**.

hazard marking system

a combination of measures (signs and barriers) designed to provide the public with warning and protection from **mine** and **ERW hazards**. The system may include the use of signs or markers, or the erection of physical barriers.

hazard sign

a permanent, manufactured sign which, when placed as part of a marking system, is designed to provide warning to the public of the presence of **mines**.

health

in relation to work, indicates not merely the absence of disease or infirmity, it also includes the physical and mental elements affecting health, which are directly related to safety and hygiene at work. [ILO C155]

humanitarian demining

see **demining**. (In IMAS standards and guides, the terms demining and humanitarian demining are interchangeable.)

impact

the level of social and economic suffering experienced by the community resulting from the **harm** or **risk** of harm caused by **mine** and **ERW hazards** and **hazardous areas**.

Impact is a product of:

the presence of mine/ERW hazards in the community;

intolerable risk associated with the use of infrastructure such as roads, markets etc;

intolerable risk associated with livelihood activities such as use of agricultural land, water sources etc; and

number of victims of **mine** and **ERW incidents** within the last two years.

impact free

a term applied to countries that may still have **mines** but where the **mined areas** are not having a negative socio – economic **impact** on communities, e.g. the mines may be in remote, marked and unpopulated areas.

impact survey

see **Landmine Impact Survey (LIS)**

IMSMA

the Information Management System for Mine Action (IMSMA)

This is the United Nation's preferred information system for the management of critical data in UN-supported field programmes. The Field Module (FM) provides for data collection, information analysis and project management. It is used by the staffs of **MACs** at national and regional level, and by the implementers of **mine action** projects - such as **mine action organisations**.

incident

an event that gives rise to an **accident** or has the potential to lead to an accident.

inert

a munition that contains no **explosive**, pyrotechnic, **lachrymatory**, radioactive, chemical, biological or other toxic components or substances.

An **inert munition** differs from a **drill** munitions in that it has not necessarily been specifically manufactured for instructional purposes. The inert state of the munition may have resulted from a **render safe procedure** or other process to remove all **hazardous** components and substances. It also refers to the state of the munition during manufacture prior to the filling or fitting of explosive or hazardous components and substances.

inspection

the observation, measurement, examination, testing, **evaluation** or gauging of one or more components of a product or service and comparing these with specified requirements to determine conformity.

inspection body

an organisation which conducts post-clearance **QC** on behalf of the **NMAA/UNMAS** by applying random **sampling** procedures, or other appropriate and agreed methods of **inspection**.

insurance

an arrangement for compensation in the event of damage to or loss of (property, life of a person).

Insurance should include appropriate medical, death and disability coverage for all personnel as well as third party liability coverage.

Such insurance need not necessarily have to be arranged through an insurance broker or company, unless otherwise required by contractual arrangements. Self-insurance (under-writing) schemes, provided they are formally constituted on accepted actuarial principles and provide adequate cover, may be an acceptable alternative.

intended use (land)

use of land following **demining** operations.

Intended use: use of a product, process or service in accordance with information provided by the supplier. [ISO Guide 51:1999(E)]

Intended land use should be included in the **clearance** task specification and clearance task **handover** documentation.

interchangeability

*in the context of **mine action equipment procurement**, the term refers to a condition which exists when two or more items of **equipment** possess such functional and physical characteristics as to be equivalent in performance and durability, and are capable of being exchanged for one another without alteration of the items themselves,*

or of adjoining items, except for adjustment, and without selection for fit and performance.

intermediate point

survey markers used between **turning points** that are more than 50m apart.

International Mine Action Standards (IMAS)

documents developed by the UN on behalf of the international community, which aim to improve safety and efficiency in **mine action** by providing guidance, by establishing principles and, in some cases, by defining international requirements and specifications.

They provide a frame of reference which encourages, and in some cases requires, the sponsors and managers of mine action programmes and projects to achieve and demonstrate agreed levels of effectiveness and **safety**.

They provide a common language, and recommend the formats and rules for handling data which enable the free exchange of important information; this information exchange benefits other programmes and projects, and assists the mobilisation, prioritisation and management of resources.

International Organisation for Standardization (ISO)

A worldwide federation of national bodies from over 130 countries. Its work results in international agreements which are published as ISO **standards** and **guides**. ISO is a NGO and the standards it develops are voluntary, although some (mainly those concerned with **health, safety** and environmental aspects) have been adopted by many countries as part of their regulatory framework. ISO deals with the full spectrum of human activities and many of the tasks and processes which contribute to **mine action** have a relevant standard. A list of ISO standards and guides is given in the ISO Catalogue [www.iso.ch/infoe/catinfo/html].

The revised mine action standards have been developed to be compatible with ISO standards and guides. Adopting the ISO format and language provides some significant advantages including consistency of layout, use of internationally recognised terminology, and a greater acceptance by international, national and regional organisations who are accustomed to the ISO series of standards and guides.

key informants

individuals who have relatively good knowledge on the **hazardous areas** in and around their community.

Key informants may include, but are not limited to, community leaders, mine-affected individuals, schoolteachers, religious leaders etc.

lachrymatory ammunition

lachrymatory **ammunition** contains chemical compounds that are designed to incapacitate by causing short-term tears or inflammation of the eyes.

Landmine Impact Survey (LIS)

impact survey

an assessment of the socio-economic **impact** caused by the actual or perceived presence of **mines** and **ERW**, in order to assist the planning and prioritisation of **mine action** programmes and projects.

Land Release is the process of applying all reasonable effort to identify or better define Confirmed Hazardous Areas (CHA) and remove all suspicion of mines/ERW through non-technical survey, technical survey and clearance using an evidence based and

document approach. The criteria for “all reasonable effort” shall be defined by the National Mine Action Authority (NMAA).

letter of agreement

a simpler form of **contract** that states the essentials of the agreement without including all the detail. It may be used as a precursor to a formal contract or, in some cases, may be used in place of a more formal contract.

licence

*in the context of **mine action**, the term refers to* a certificate issued by a **NMAA/UNMAS** in relation to the capacity or capability of a facility, for example a demolition site may be licensed for certain explosive limits and explosive storage areas may be licensed for certain types and quantities of munitions. **Mine action organisations** receive organisational or operational **accreditation** from an accreditation body authorised by a NMAA/UNMAS.

logistic disposal

*in the context of **mine action**, the term refers to* the removal of **munitions** and **explosives** from a **stockpile** utilising a variety of methods, (that may not necessarily involve **destruction**). Logistic disposal may or may not require the use of **RSP**.

lot size

*in the context of **humanitarian demining**, the term refers to* an area (comprising a number of 1.0m² units of **cleared land**) offered for **inspection**.

magazine

*in the context of **mine action**, the term refers to* any building, structure or container approved for the storage of **explosive** materials.

maintainability

the ability of an **equipment**, component or sub-component under stated conditions of use, to be retained or restored to a specific condition, when maintenance is performed by personnel having specific skill levels, under stated conditions and using prescribed procedures and resources.

marking

emplacement of a measure or combination of measures to identify the position of a **hazard** or the boundary of a **hazardous area**. This may include the use of signs, paint marks etc, or the erection of physical barriers.

marking system

an agreed convention for the **marking** of **hazards** or **hazardous areas**.

mechanical application

the generic term to describe the use of machines in the conduct of **mine clearance** operations.

medical support staff

employees of **mine action organisations** designated, trained and equipped to provide first aid and further medical treatment of **demining** employees injured as a result of an **accident**.

Memorandum of Understanding (MOU)

a document used to facilitate a situation or operation when it is not the intention to create formal rights and obligations in international law but to express commitments of importance in a non-binding form.

mine

munition designed to be placed under, on or near the ground or other surface area and to be exploded by the presence, proximity or contact of a person or a vehicle.
[MBT]

mine accident

an accident away from the **demining workplace** involving a **mine** or **ERW** hazard (i. e. **demining accident**).

mine action

activities which aim to reduce the social, economic and environmental **impact** of **mines** and **ERW**.

Mine action is not just about demining; it is also about people and societies, and how they are affected by landmine contamination. The objective of mine action is to reduce the risk from landmines to a level where people can live safely; in which economic, social and health development can occur free from the constraints imposed by landmine contamination, and in which the victims' needs can be addressed. Mine action comprises five complementary groups of activities:

MRE;

humanitarian demining, i.e. mine and ERW survey, mapping, marking and clearance; victim assistance, including rehabilitation and reintegration;

stockpile destruction; and

advocacy against the use of APM.

A number of other enabling activities are required to support these five components of mine action, including: assessment and planning, the mobilisation and prioritisation of resources, information management, human skills development and management training, **QM** and the application of effective, appropriate and safe equipment.

Mine Action Authority (MAA)

an organisation that carries out **MRE** training, conducts reconnaissance of **mined areas**, collection and centralisation of mine data and coordinates local (**mine action**) plans with the activities of external agencies, of (mine action) NGOs and of local **deminers**. [UN Terminology Bulletin No. 349] For national mine action programmes, the National Mine Action Authority (NMAA) /United Nations Mine Action Service South Sudan (UNMAS-SS) acts as the operational office of the **NMAA**.

Mine action organisation

refers to any organisation (government, NGO, military or commercial entity) responsible for implementing mine action projects or tasks. The mine action organisation may be a prime **contractor**, subcontractor, consultant or agent.

Mine awareness

see **Mine Risk Education (MRE)**.

Mine clearance

the clearance of **mines** and **ERW** from a **specified area** to a predefined standard.

Mine Detection Dog(s) (MDD)

a dog trained and employed to detect **mines**, **ERW** and other **explosive** devices.

mine free

a term applied to an area that has been certified as clear of mines to a specified depth. Also applied to a country or an area that has not had a mine contamination problem.

mine incident

an incident away from the demining workplace involving a **mine** or **ERW** hazard (i.e. **demining incident**).

mine risk

the probability and severity of physical injury to people, property or the environment caused by the unintentional **detonation** of a mine or ERW. [Adapted from ISO Guide 51:1999(E)]

Mine Risk Education (MRE)

activities which seek to reduce the risk of injury from mines/ERW by raising awareness and promoting behavioural change including **public information dissemination**, **education** and training, and **community mine action liaison**.

mine risk reduction

those actions which lessen the probability and/or severity of physical injury to people, property or the environment. [Adapted from ISO Guide 51:1999(E)] Mine risk reduction can be achieved by physical measures such as **clearance**, fencing or marking, or through behavioural changes brought about by **MRE**.

mine sign

a sign which, when placed as part of a **marking system**, is designed to provide warning to the public of the presence of **mines**.

mine threat**mine and ERW threat**

an indication of the potential **harm** from the number, nature, disposition and detectability of **mines** and **ERW** in a given area.

mined area

an area which is dangerous due to the presence or suspected presence of **mines**.

minefield

an area of ground containing **mines** laid with or without a pattern. [AAP-6]

monitoring

*in the context of **mine action**, the term refers to* the authorised observation, inspection or assessment by qualified personnel of worksites, facilities, equipment, activities, processes, procedures and documentation without taking responsibility for what is being monitored. Monitoring is usually carried out to check conformity with undertakings, procedures or standard practice and often includes recording and reporting elements.

*in the context of **MRE**, the term refers to ...*the process of measuring or tracking what is happening. This includes:

measuring progress in relation to an implementation plan for an intervention – programmes/projects/activities, strategies, policies and specific objectives.

measuring change in a condition or set of conditions or lack thereof (e.g., changes in the situation of children and women or changes in the broader country context).

definition from UNICEF Policy and Programming Manual.

monitoring body

an organisation, normally an element of the **NMAA/UNMAS**, responsible for management and implementation of the national monitoring system.

MRE organisation

any organisation, including governmental, non-governmental, civil society organisations (e.g. women's union, youth union, red cross and red crescent societies), commercial entities and military personnel (including peace-keeping forces), which is responsible for implementing MRE projects or tasks. The MRE organisation may be a prime contractor, subcontractor, consultant or agent. The term 'MRE sub-unit' refers to an element of an organisation, however named, that is accredited to conduct one or more prescribed MRE activities such as a public information project, a schools based education project or a community mine action liaison project evaluation.

MRE partner

an institution or agent within the mine-affected community who is able to work with an MRE organisation to facilitate, establish and implement an MRE project.

munition

a complete device charged with **explosives**, propellants, pyrotechnics, initiating composition, or nuclear, biological or chemical material for use in military operations, including **demolitions**. [AAP-6]

In common usage, 'munitions' (plural) can be military weapons, ammunition and equipment.

national authority

*in the context of **stockpile destruction** the term refers to* the government department(s), organisation(s) or institution(s) in each country charged with the regulation, management and coordination of stockpile destruction.

Neutralise

The act of replacing safety devices such as pins or rods into an **explosive** item to prevent the **fuze** or igniter from functioning.

It does not make an item completely safe as removal of the safety devices shall immediately make the item active again (i. e. **disarm**).

A **mine** is said to be neutralised when it has been rendered, by external means, incapable of firing on passage of a target, although it may remain dangerous to handle. [AAP-6]

non-sparking material

material that shall not produce a spark when struck with tools, rocks, or when the material itself strikes hard surfaces.

Non-Technical Survey describes an important survey activity which involves collecting and analysing new and/or existing information about a hazardous area. Its purpose is to confirm whether there is evidence of a hazard or not, to identify the type and extent of hazards within any hazardous area to define, as far as is possible, the perimeter of the actual hazardous areas without physical intervention. A non-technical survey does not normally involve the use of clearance or verification assets. Exceptions occur when assets are used for the sole purpose of providing access for non-technical survey

teams. The results from a non-technical survey can replace any previous data relating to the surveyed area.

particle board

a composition board made of small pieces of wood, bonded together.

permanent marking system

a **marking system** having an indefinite period of use, usually requiring maintenance (i. e. **temporary marking system**).

Personal Protective Equipment (PPE)

all equipment and clothing designed to provide protection, which is intended to be worn or held by an employee at work and which protects him/her against one or more **risks** to his/her **safety** or **health**.

pilot test

a process ahead of the commencement of wide range data collection to ensure that all survey project elements, such as team deployment, data collection, reporting and administration, are functioning as planned.

policy

defines the purpose and goals of an organisation, and it articulates the rules, standards and principles of action which govern the way in which the organisation aims to achieve these goals.

Policy evolves in response to strategic direction and field experience. In turn, it influences the way in which plans are developed, and how resources are mobilised and applied. Policy is prescriptive and compliance is assumed, or at least is encouraged.

post clearance survey

*in the context of **humanitarian demining**, the term refers to ...the process of measuring, examining, testing or otherwise comparing a sample of **cleared land** against the **clearance** requirements.*

pre-test

a process at the start of a survey to validate clarity and appropriateness of the selected survey instrument.

primer

a self-contained **munition** which is fitted into a cartridge case or firing mechanism and provides the means of igniting the propellant charge.

principal

the entity that contracts another entity to undertake the required **mine action** activity. The principal may be a donor, a **NMAA**, organisation acting on behalf of the NMAA, a commercial organisation or any entity that desires mine action to be conducted and engages a mine action organisation to do so.

procurement

the process of research, development and production or purchase which leads to an **equipment** being accepted as suitable for use, and continues with the provision of spares and **Post Design Services** (PDS) throughout the life of the equipment.

prodding

a procedure employed in the process of **demining** whereby ground is probed to detect the presence of sub-surface **mines** and/or **ERW** (i. e. **sapping**).

programme

a group of projects or activities which are managed in a co-ordinated way, to deliver benefits that would not be possible were the projects and/or contracts managed independently.

project

an endeavour in which human, material and financial resources are organised to undertake a unique scope of work, of given specification, within constraints of cost and time, so as to achieve beneficial change defined by quantitative and qualitative objectives.

project management

the process by which a project is brought to a successful conclusion.

proposal

an offer for consideration or acceptance by another entity.

protective measure

means used to reduce **risk**. [ISO Guide 51:1999(E)]

public education

the process aimed at raising general awareness of the **mine** and **ERW** threat; through public information, formal and non-formal education systems. Public education is a mass mobilisation approach that delivers information on the mine/ERW threat. It may take the form of formal or non-formal education and may use mass media techniques.

In an emergency situation, due to time constraints and the lack of available data, it is the most practical means of communicating safety information. In other situations it can support **community liaison**.

public information dissemination

information concerning the **mine** and **ERW** situation, used to inform or update populations. Such information may focus on particular issues, such as complying with mine ban legislation, or may be used to raise public support for the mine action programme. Such projects usually include risk reduction messages, but may also be used to reflect national mine action policy.

quality

degree to which a set of inherent characteristics fulfils requirements. [ISO 9000:2000]

Quality Assurance (QA)

part of **QM** focused on providing confidence that quality requirements shall be fulfilled. [ISO 9000:2000]

The purpose of QA in **humanitarian mine action** is to confirm that management practices and operational procedures for mine action activities are appropriate, are being applied, and shall achieve the stated requirement in a safe, effective and efficient manner. Internal QA shall be conducted by **mine action organisations** themselves, but external inspections by an external **monitoring body** shall also be conducted.

Quality Control (QC)

part of QM focused on fulfilling quality requirements. [ISO 9000:2000]
QC relates to the *inspection* of a finished product. In the case of **humanitarian demining**, the 'product' is **safe cleared land**.

Quality Management (QM)

coordinated activities to direct and control an organisation with regard to **quality**. [ISO 9000:2000]

random sampling

selection of **samples** by a process involving equal chances of selection of each item. Used as an objective or impartial means of selecting areas for **test** purposes.

recognition piece

A metal piece, which is placed under test items to make them recognisable with a metal detector.

reduced area

see **area reduction**

the area of **hazardous** land remaining after the process of area reduction. It is still referred to as a **hazardous area**.

reference point

landmark

a fixed point of reference some distance outside the **hazard(ous) area**. It should be an easily recognised feature (such as a cross-roads or a bridge) which can be used to assist in navigating to one or more **benchmarks**.

Internationally these are often also referred to as Geodetic Points when they refer to a pre-surveyed location such as a trig point.

reliability

the ability of an **equipment**, component or sub-component to perform a required function under stated conditions for a stated period of time.

reliable (mine action) information

information deemed acceptable and reliable by the **NMAA/UNMAS** for the conduct of **mine action** operations.

Render Safe Procedure (RSP)

the application of special **EOD** methods and tools to provide for the interruption of functions or separation of essential components to prevent an unacceptable **detonation**.

research

the systematic inquiry, examination and experimentation to establish facts and principles.

residual risk

*in the context of **humanitarian demining**, the term refers to* the risk remaining following the application of all reasonable efforts to remove and/or destroy all **mine** or **ERW hazards** from a **specified area** to a **specified depth**. [Modified from ISO Guide 51:1999]

risk

combination of the probability of occurrence of **harm** and the severity of that **harm**. [ISO Guide 51:1999(E)]

risk analysis

systematic use of available information to identify **hazards** and to estimate the **risk**. [ISO Guide 51:1999(E)]

risk assessment

overall process comprising a **risk analysis** and a **risk evaluation**. [ISO Guide 51:1999(E)]

risk evaluation

process based on **risk analysis** to determine whether the **tolerable risk** has been achieved. [ISO Guide 51:1999(E)]

risk reduction

actions taken to lessen the probability, negative consequences or both, associated with a particular **risk**.

safe

the absence of risk. Normally the term **tolerable risk** is more appropriate and accurate.

safety

the reduction of risk to a tolerable level. [ISO Guide 51:1999(E)]

sample

*in the context of **humanitarian demining**, the term refers to one or more 1.0m² units of land drawn at random from a lot.*

sample size

*in the context of **humanitarian demining**, the term refers to the number of 1.0m² units of land in the **sample**.*

sampling

*in the context of **humanitarian demining**, the term refers to a defined procedure whereby part or parts of an area of **cleared land** are taken, for testing, as a representation of the whole area.*

sampling plan

*in the context of **humanitarian demining**, the term refers to a specific plan that indicates the number of 1.0m² units of land from each lot which are to inspected (**sample** size or series of sample sizes) and the associated criteria for determining the acceptability of the lot (acceptance and rejection numbers).*

sapping

*in the context of **humanitarian demining**, the term refers to a procedure employed in the process of demining whereby, in conjunction with other procedures, ground is cleared by digging forward to a **specified depth** from a **safe** start point.*

scent

a distinctive odour.

secondary fragmentation

in an **explosive** event, fragmentation which was not originally part of the **mine/ERW**.

South Sudan National Mine Action Authority (NMAA)

The government department(s), **organisation(s)** or institution(s) charged with the regulation, management and coordination of mine action in South Sudan.

In certain situations and at certain times it may be necessary and appropriate for the UNMAS, or some other recognised international body, to assume some or all of the responsibilities, and fulfil some or all the functions, of a NMAA.

specified area

*in the context of **humanitarian demining**, the term refers to that area for which **mine clearance** activity has been contracted or agreed, as determined by the **NMAA/UNMAS** or an **organisation** acting on its behalf.*

specified depth

*in the context of **humanitarian demining**, the term refers to the depth to which a **specified area** is contracted or agreed to be cleared of **mine** and **ERW hazards**, as determined by the **NMAA/UNMAS** or an **organisation** acting on its behalf.*

standard

a standard is a documented agreement containing technical specifications or other precise criteria to be used consistently as rules, guidelines, or definitions of characteristics to ensure that materials, products, processes and services are fit for their purpose.

Mine action standards aim to improve safety and efficiency in mine action by promoting the preferred procedures and practices at both headquarters and field level. To be effective, the standards should be definable, measurable, achievable and verifiable.

Standard Operating Procedures (SOPs)

Standing Operating Procedures (SOPs)

instructions which define the preferred or currently established method of conducting an operational task or activity.

Their purpose is to promote recognisable and measurable degrees of discipline, uniformity, consistency and commonality within an organisation, with the aim of improving operational effectiveness and safety. SOPs should reflect local requirements and circumstances.

standards

requirements, specifications or other precise criteria, to be used consistently to ensure that materials, products, processes and services are fit for their purpose.

Mine action standards aim to improve safety and efficiency in mine action by promoting the preferred procedures and practices at both headquarters and field level.

Standing Operating Procedures (SOPs)

see Standard Operating Procedures (SOPs).

steel

general purpose (hot or cold rolled) low-carbon such as ASTM A366b or equivalent.

stockpile

*in the context of **mine action**, the term refers to a large accumulated stock of **EO**.*

stockpile destruction

the physical destructive procedure towards a continual reduction of the national **stockpile**.

submunition

any **munition** that, to perform its task, separates from a parent munition. [AAP-6]
mines or munitions that form part of a **CBU**, artillery shell or missile payload.

survey marker

a durable and long lasting marker used to assist in the management of marked and **cleared land** during **demining** operations.

survivor (landmine/ERW)

persons either individually or collectively who have suffered physical, emotional and psychological injury, economic loss or substantial impairment of their fundamental rights through acts or omissions related to the use of mines and ERW. Mine survivors or victims include directly impacted individuals, their families, and communities affected by landmines and ERW.

survivor assistance

see victim assistance

Suspected Hazardous Area (SHA) refers to an area suspected of having a mine/ERW hazard. An SHA can be identified by an impact survey, other form of National survey, or a claim of presence of explosive hazards.

task identification number (ID)

a unique number used to designate a **hazardous area**. Task identification numbers shall be allocated by the **NMAA/UNMAS**.

technical survey

previously referred to as a Level 2 survey

the detailed topographical and technical investigation of known or suspected **mined areas** identified during the planning phase. Such areas would have been identified during any information gathering activities or surveys which form part of the **NTS process** or have been otherwise reported.

temporary marking system

a marking system having a stated finite period of use (i. e. **permanent marking system**).

test

determination of one or more characteristics according to a procedure. [ISO 9000:2000]

Test and Evaluation (T&E)

activities associated with the testing of hardware and software.

Activities include the formation and use of procedures and standards, the reduction and processing of data and the assessment and evaluation of **test** results and processed data against criteria such as defined **standards** and specifications.

test site

the site at which a series of test boxes or lanes are prepared for the purpose of operational accreditation testing of MDD.

theft resistant

construction designed to deter and/or delay illegal entry into facilities used for the storage of explosives.

threat

see **mine threat**

TNT (2, 4, 6 Trinitrotoluene)

one of the most widely used military high **explosives**. TNT is very stable, non-hygroscopic and relatively insensitive to impact, friction, shock and electrostatic energy. TNT is the most widespread type of explosive used in **mines** and **munitions**.

tolerable risk

risk which is accepted in a given context based on current values of society. [ISO Guide 51:1999(E)]

trial

a series of **tests** organised in a systematic manner, the individual results of which lead to an overall evaluation of a component, **equipment** or system.

turning point

a fixed point on the ground which indicates a change in direction of the perimeter of the **hazardous area**. It shall be clearly marked and recorded. Buried metal objects should be used to mark all turning points for permanent future reference.

Unexploded Ordnance (ERW)

EO that has been primed, fuzed, armed or otherwise prepared for use or used. It may have been fired, dropped, launched or projected yet remains unexploded either through malfunction or design or for any other reason.

unit rate

the rates agreed and accepted for specific priced activity items and quantities stated in a contract.

United Nations Mine Action Service (UNMAS)

the focal point within the UN system for all mine-related activities.

UNMAS is the office within the UN Secretariat responsible to the international community for the development and maintenance of **IMAS**.

UNICEF is the focal point for **MRE**, within the guidelines of UNMAS overall coordination.

user

the individual or organisation that shall operate the equipment.

For the purpose of **mine action**, the user could also be defined as 'a composite body of informed and authoritative opinions on the needs of national commercial and NGO users, today and in the future'.

validation

the act of ratification that takes place after a process of verification.

verification

confirmation, through the provision of objective evidence that specified requirements have been fulfilled. [ISO 9000:2000]

victim

an individual who has suffered harm as a result of a **mine** or **ERW accident**.

In the context of **victim assistance**, the term victim may include dependants of a mine casualty, hence having a broader meaning than survivor.

victim assistance

survivor assistance

refers to all aid, relief, comfort and support provided to victims (including survivors) with the purpose of reducing the immediate and long-term medical and psychological implications of their trauma.

village demining

self-supporting **mine** and/or **ERW clearance** and **hazardous area** marking, normally undertaken by local inhabitants, on their own behalf or the behalf of their immediate community. Often described as a *self-help initiative or spontaneous demining*, village demining usually sits outside or in parallel with formal mine action structures, such as *demining* undertaken by militaries or *humanitarian demining* such as is supported by the UN, international and national non-governmental organisations, private enterprise and governments, among others.

visitor

for the purposes of IMAS, a person who is neither a member of the **mine action organisation**, nor a **demining worker** accredited by the **NMAA/UNMAS**.

White Phosphorous (WP)

a chemical smoke screening agent which burns in contact with air, (with serious anti-personnel affect if the phosphorous comes in direct contact with people).

workplace

all places where employees need to be or to go by reason of their work and which are under the direct or indirect control of the employer. [ILO R164]



South Sudan

National Technical Standards Guidelines

Date: 1st October 2015

Chapter 01

1 Survey

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1.1. Non-Technical Survey

- a. Non-technical survey (NTS) is an essential component of humanitarian mine action on the South Sudan Mine Action Programme (South SUDANMAP). The term Non-technical Survey describes an important survey activity which involves collecting and analysing new and/or existing information about a hazardous area (HA). Its purpose is to confirm whether there is evidence of a hazard or not, to identify the type and extent of hazards within any HA and to define, as far as is possible, the perimeter of the actual HA without physical intervention.
- b. This chapter provides guidance on the conduct of NTS and details procedures, responsibilities and obligations of the mine action organisations involved.

1.1.1. Purpose of NTS

- a. Due to the high number of hazardous areas (HA) reports recorded in South Sudan NTS is necessary to confirm the status of this data by conducting thorough investigations of the reported HA/SHA and conducting reviews of any existing data available.
- b. NTS serves the following purposes:
 - to assess whether areas are contaminated by mine/ERW, or to re-define the boundaries of previously reported HA's
 - to cancel incorrect reports of mines/ERW
 - to identify socio-economic and threat factors that may influence future priority setting;
 - to collect information about accidents, soil properties, vegetation, access routes, local infrastructure, the security situation and other factors that may influence priority setting and method of following up with additional mine action support.
 - NTS may further serve as a planning tool for future mine action tasks (i.e. technical survey and/or clearance).

1.1.2. NTS Outputs

- a. Upon completion of an NTS, the suspected area should be reclassified into one or more Confirmed Hazardous Areas (CHA). It should also be noted that it is possible, if the information from the NTS is strong enough, to move straight from a NTS directly to clearance. NTS therefore, has the following three outputs:

- Identifying a CHA.
 - Providing more exact estimations of the actual HA/SHA and the removal of suspicion about parts or all of an original CHA.
 - Cancellation of all parts of a SHA.
- b. CHAs should only be created after a NTS has been undertaken and evidence of hazards has been found which shall require further action. A NTS may not be able to define clear boundaries of the area and, if this is the case, approximate boundaries should be assessed. A lack of survey detail should not inflate these boundaries.

1.1.3. NTS General

- a. NTS is reliant on the quality of information provided by the informants therefore, the NTS team shall ensure that all relevant information sources are identified and that information from these sources is appropriately collected and recorded.
- b. The survey should be structured in such a way that male and female informants who have specific knowledge about several potentially mined areas are interviewed as part of the process.
- c. Separate meetings should be arranged with female informants and children respectively, as these groups might be prevented from participating fully in mixed group meetings.
- d. It may also prove difficult to repeatedly return to the same informants many times for information about new areas. A plan for the systematic collection of information should address this issue.

1.1.4. Classification of Sources

- a. The quality of information received during NTS is dependent upon the informant's knowledge and the evidence found by the team when conducting NTS of the SHA. Therefore, to assist in determining the quality of information received, the following broad classification should be considered:
 - **First-hand sources of information;** people and institutions with first-hand knowledge of when and where mines were laid. This information may be considered more accurate than second and third hand information. First hand sources of information may include men, women and children in the affected communities, military, police, mine victims and others who observed mine laying or accidents etc.

- **Second-hand sources of information;** people and institutions that did not form part of or observe the mine laying or accidents but have been told about the mine/ERW hazard. Second-hand sources of information may also include men, women and children in the local communities, pedestrians, local authorities, farmers, hunters, hospitals etc.
- **Physical evidence of mines/ERW;** physical observable information that indicate various degrees of evidence of mines. Physical evidence may include craters, military positions, trench lanes, local mine marking, packaging etc.

1.1.5. Land Use

- a. During NTS a team may find that the recorded HA, is being used by the local community, for cultivation or grazing purposes. When this has occurred, the use of land by the community may serve as one of the factors in the confirmation of whether or not a HA contains landmines or ERW.
- b. Depending on the degree of use by the local community, a wrongly recorded HA may be cancelled in part or completely.
- c. Usage of land varies significantly, from intensive cultivation to infrequent use by hunters. The level of usage determines how reliable the information is. For example, if land has been used extensively for cultivation over a number of seasons with no evidence of mines/ERW has occurred, this should be deemed sufficient information to clarify the true situation of the HA.
- d. If land has been used only marginally, a longer period may be required before the same confidence can be assured.
- e. The fact that land is in use it may not, in isolation, be sufficient to release land. Past, current and future use should be combined with additional information to allow land release. A standard system should be in place to classify confidence in the information provided by assessing the use of the land therefore, when assessing past and current use of land, the following broad requirements should apply:
 - A systematic assessment of how land has been used, how long it has been used, and how many people have used it should be made. Attention should be given to the precise limits of areas used, together with any areas which have not been used.

- A systematic assessment should be made of whether mines or ERW have been found during the use of the land, the circumstances under which these hazards were found, and how long ago they were found.

1.1.6. Road Use

- a. NTS may find that extensive use of a suspected road may provide sufficient evidence to conclude that the road, or parts of it, is no longer suspected of being hazardous due to mines and ERW, even though it may not have been physically cleared.
- b. It is rare that roads are mined along their entire length, so they should be divided into smaller sections that may form part of a longer CHA. Some sections may be released by assessing the use of the road while other sections may not be released and may require further investigation. This may apply to linear road sections as well as to the areas on the side of the road, particularly as requirements develop for certainty about safety at greater distances from the centre line of the road.
- c. When assessing past and current use of roads, the requirements in para 1.1.5, Land use, should be adapted and applied.

1.1.7. NTS Requirements

- a. **Reports** Standards have been set for the recording of information, so that there are common formats for collation and dissemination. Records shall be kept in written, graphic, and digital formats so that both digital and paper based reports may be transferred to the teams in the field and the operational planners on the programme. On the South SUDANMAP the IMSMA Survey and Hazard Report Form shall be the primary form used for recording of all NTS information photographs/sketches are to be supplied with the report. When applying the Land Release Policy; during NTS of a SHA, i.e. no evidence of mines/ERW, found, as mentioned in paragraph 1.1.5 “Land Use,” then a Cancellation Report shall be used to cancel the area.
- b. **Maps:** Maps are a key element in providing geographical data on HA/SHA/CHA/DHA. If available, the most detailed and accurate maps should be used for recording of these areas however, if no suitable maps are available accurate sketch maps may be used. The map series, date of production and scale shall be clearly identified. It is important to remember that a different map series may have been used and referred to in earlier

surveys/mapping reports; there should be no confusion in cross-referencing. The use of digital maps are widely used on the South SUDANMAP therefore, it is the organisations responsibility to liaise with the UNMAS-SS IMSMA Office on the most compatible mapping software recommended to be used.

- c. **Measurement** All measurements used on the South SUDANMAP shall be metric measurements. A variety of measurement equipment may be used to accurately record HA/SHA/CHA/DHA data. These may include;
 - Metric measuring tape, compasses, protractors, Global Positioning System (GPS), Differential Global Positioning System (DGPS), range finders etc.
 - In each case the equipment selected shall provide the greatest degree of accuracy and reliability to the field operator who shall ensure accuracy during the application.
 - Personnel tasked to conduct NTS shall have a good working knowledge of map reading and be able to operate and calibrate their own equipment.
- d. **Differential Global Positioning System** DGPS provides the greatest degree of accuracy when recording positional data. Whenever possible and/or practicable, a DGPS should be employed by mine action organisations to accurately record positional data during humanitarian mine action activities. When organisations are contractually obligated to utilise DGPS during the recording of positional data, they shall be required to do so.
- e. **Marking of HA** Marking of all hazardous areas is a vital component of humanitarian mine action operations and shall be implemented at the earliest possible opportunity in order to provide a visual warning of the presence of mine/ERW. Whenever possible the standard mine sign and minefield marking systems, as per chapter 3, shall be the chosen method however, it is accepted that initially this may not always be possible or practicable. However, marking shall be installed at the earliest opportunity.
- f. Hazardous area marking has been categorised into four levels; Temporary Marking, Semi-Permanent Marking, Permanent marking. For further information on marking systems and procedures see NTSG Chapter 3.

1.1.8.NTS Team Requirements

- a. Organisations / Teams conducting NTS on the South SUDANMAP shall meet the following requirements.
- b. **Training** All organisations conducting NTS shall be required to submit a training programme to NMAA/UNMAS-SS for approval prior to commencing training (See Chapter 13). Correct training of NTS staff shall have a major impact on the accuracy of the NTS being conducted. During the training the following tasks shall be conducted.
 - Thorough internal assessments of team members shall be conducted and their results recorded.
 - On completion of training, a signed Training Declaration and the internal assessment results shall be submitted to NMAA/UNMAS-SS.
 - An operational accreditation assessment shall be conducted by NMAA/UNMAS-SS.
- c. **Team Composition** The size and composition of an NTS team may vary depending on the local situation and the complexity of the task. As a minimum, the team shall be composed of;
 - 1 x Team Supervisor
 - 2 x Operators (Trained in Community Liaison)
 - 1 x Accredited medic
 - 1 x Designated ambulance driver
- d. Non-Technical Survey teams should include both female and male staff to ensure that surveys may be carried out in a gender sensitive manner. At least one member of the team should be trained and accredited as a Community Liaison Officer (CLO).
- e. **Communication Requirement** There is a requirement for the team to be capable to communicate in the event of an emergency. Each team must have as a minimum a primary and secondary means of communication which both of which are capable of contacting the designated support locations as per organisation SOPs/NTSG.
- f. **CASEVAC/MEDVAC Plan** When conducting NTS tasks, a CASEVAC/MEDEVAC Plan shall be required as per organisations SOPs/NTSG.
- g. Minimum Vehicle Requirements
 - 1 x Support vehicle
 - 1 x Ambulance/Safety Vehicle

- h. **Safety** NTS teams shall not take unnecessary risks;
 - By walking or driving on land/roads where there is a risk of mines.
 - When team members work on foot, credible local advice shall be sought prior to walking on land, paths or roads.
 - Local guides should only be trusted after a careful assessment has determined that the guide has sufficient knowledge of hazards in the area to safely guide the survey team on mine-free land.
 - NTS teams should not enter the SHA.
- i. **Liaison** Teams conducting NTS should employ their Community Liaison Officer (CLO) to help coordinate with the appropriate local authorities to ensure that it is safe to conduct NTS work in an area and to avoid disruptions in the work of the authority, the police or the military. He/she may also acquire information from other informants that the team may not have had access to.

1.2. Technical Survey

- a. The detail of this Chapter provides the minimum requirements to mine action organisations charged with conducting Technical Survey (TS) tasks on the South SUDANMAP. Organisation SOPs and Implementation Plans shall reflect these minimum requirements. Any deviation from these guidelines shall require approval by the NMAA/UNMAS-SS Chief of Operations.

1.2.1. Purpose of TS

- a. To ensure that all activities during TS are carried out with the minimum exposure to risk. To ensure that the technical levels are of a standard that shall enhance the safety, effectiveness, efficiency and quality of all clearance operations

1.2.2. Responsibility

- a. It is the responsibility of the mine action organisation, with delegated authority through supervisors, team leaders and section leaders, to ensure that all specific TS procedures and associated practices are implemented in accordance with this Chapter.
 - Ensure that all activities during NTS are carried out with minimum exposure to risk

- Ensure that the technical levels are of a standard that shall enhance the safety, effectiveness, efficiency and quality of all technical survey operations.

1.2.3. General Safety

- a. Prior to conducting TS utilising any accredited assets it is the responsibility of the mine action organisation to compile and assimilate all of the available information concerning their task in order to draft their implementation plan. This may include but not be restricted to information from NMAA/UNMAS-SS, information from other mine action organisations concerning previous relevant activities, information from the NTS team, MRE team and possibly the Landmine Impact Survey.
 - When conducting TS, the drills for all procedures associated with TS activities Mechanical, Manual, and MDD etc. shall be fully adhered to as outlined in the relevant chapters in this NTSG.

1.2.4. Information Gathering

- a. The primary aim of TS shall be to collect sufficient information to enable any future clearance requirements to be more accurately defined. This includes:
 - Priority of future clearance operations.
 - Hindrance factors – vegetation, logistics, communications etc.
 - Area(s) to be cleared in future clearance operations.
 - Required depth of clearance.
 - Local soil conditions – type, density, firmness etc.
 - Mine patterns and types of mines to include fusing, positions etc.
 - Fragmentation and general metallic contamination levels.
 - Suitable means of clearance for the task.
 - Areas suitable for different means of clearance i.e. manual, MDD and/or mechanical assets.
 - Estimated time required for completion of future clearance operations.

1.2.5. Overall Sequence of Work

- a. In general the following procedures shall be covered during the TS:
 - Tasking.
 - Gathering of documentation to include but not restricted to accident and incident reports, NTS reports, minefield record(s), and MRE reports.
 - Site visit to the hazardous area. The site visit team should comprise of all interested and/or involved parties including but not restricted to, mine

- action organisation rep(s) i.e. team leaders, site supervisors, NMAA/UNMAS-SS rep, MRE rep, local community rep, mechanical/MDD organisation reps and reps from the organisation that conducted the NTS.
- Task preparations including meetings with male and female representatives of the community and MRE for the local population (MRE should be done before, during and after the TS).
 - Site preparations and setting up of site.
 - Clearance of the boundary lane. If area reduction is to be carried out at the site this may be done as concurrent activity during the clearance of the boundary lane.
 - Preparations of exploratory lanes.
 - Marking and/or fencing of the task.
 - Internal QA of work.
 - NMAA/UNMAS-SS Ext QA visits.
 - Completion report to be submitted to the NMAA/UNMAS-SS.

1.2.6. Specific Technical Requirements

- a. TS involves probing SHA (using manual, mechanical and/or MDD assets) to establish if there is a mine/ERW threat and if so the extent of the hazardous area.
- b. The TS may involve the deployment of individual assets or a combination of all three. A TS team shall undertake thorough training in all TS requirements to ensure that all team members/assets are competent in performing their individual responsibilities.
- c. TS tasking may require the mine action organisation to erect hazardous area fencing/markings to reduce the risk of unintentional entry into the hazardous area. This may be tasked later, after receiving the priority of the minefield but generally if clearance does not immediately follow a TS then the area shall be marked by semi-permanent or permanent fencing depending on the estimated duration before clearance commences. The level of marking shall be determined in the tasking order. Information on this shall be passed on to representatives of all members of the community through the MRE team or Community Liaison Officer.
- d. Sometimes it may be appropriate to conduct TS when there is no immediate need to clear all the land. The objective in such circumstances shall be to

accurately identify record, mark and fence the extent of the hazardous area in order to reduce the risk of mine accidents or incidents occurring.

- e. The process through which the initial area indicated as contaminated (during the NTS) is reduced to a smaller area is known as 'area reduction'. Area reduction may involve some limited clearance, such as the opening of access routes and the destruction of mines and ERW, which represent an immediate and unacceptable risk but it shall mainly be as a consequence of collecting more reliable information on the extent of the hazardous area.
- f. When TS establishes new boundaries of a CHA they should be marked/fenced with permanent or semi-permanent marking systems until cleared by a demining team. However full boundary marking may not be possible
- g. TS and Area reduction using MDD may be done using accredited search methods.
- h. If mines are being found when conducting area reduction MDD shall be withdrawn and should work no closer than 10 meters to the area that is suspected to be mined.
- i. Where a mine is found on the boundary lane during the process the perimeter shall be extended outwards a further 10 metre. This shall ensure all mines have been captured inside the minefield.
- j. The soil in the area should be analysed to determine mineral and scrap metal contamination, which shall affect the choice of detectors for the clearance operation (if several are available).
- k. Tests of the soil's composition and mechanics shall be made, to establish the potential use of mechanical equipment. Access of routes leading to the clearance site should also be examined especially where the use of heavy mechanical equipment is considered.
- l. Likely depths of mines and ERW shall require an understanding of the mine laying tactics and weapon systems used, and an assessment of whether there has been any soil slippage, flooding, erosion or vertical movement of the mines within the soil, why an analysis of the area must be done. It may also involve the clearance of one or more sample areas/exploratory lanes.
- m. The TS team shall be equipped with sufficient field equipment so that it may operate fully autonomous from other operations.

1.2.7. Technical Survey Reporting

- a. A Survey and Hazard report shall be completed by the mine action organisation and submitted to NMAA/UNMAS-SS Sub-office once the TS has been completed. This shall include a sketch map, which shall be clearly illustrated, the scale shall be large as is practical and it shall have the following information recorded on it:
- Landmark details including description, photograph and grid reference.
 - Benchmark details including details, photograph and the grid reference.
 - Start point position.
 - Turning point positions plotted using a DGPS or compass bearing and distance. All turning points shall be given a number that shall be recorded on the polygon sketch showing distance and bearings. Turning points shall be on the inside of the boundary lane.
 - Each Leg (A straight run of the HA boundary lane between intermediate or turning points) the distance shall be recorded in metres and the bearing shall be recorded in degrees (360degrees azimuth).
 - North indicator.
 - Scale.
 - Date – the sketch was completed.
 - Description and location of the admin area used.
 - Name – the name of the person who made the sketch shall be indicated.
 - Mined area – areas found to be mined, during the survey shall be indicated on the sketch and this shall include patterns.
 - All mines/ERW locations.
 - Mines and ERW destroyed or removed.
 - Exploratory lane details of locations, lengths etc. shall be recorded
 - Areas cleared using MDD shall be recorded which should include all indications given by the MDD
 - Areas cleared using mechanical means of clearance/ground preparation including detonations are also to be recorded on the sketch.
 - Details of possible areas suitable for future mechanical clearance/ground preparation.
 - Details of areas suitable for future MDD ops – suitable without ground prep, with ground prep.

- Areas suitable for manual clearance and areas that shall require a full excavation.
- Any steep areas.
- Areas with dense vegetation.
- Marking/Fencing that has been done in the minefield
- Areas with high fragmentation or non-cooperative soil
- Access routes for mechanical means of clearance ground/preparation
- Areas where flooding and/or erosion have occurred.
- Location of accidents in the area.
- Other information such as but not restricted to visual remains, craters, evidence of removed mines, mine patterns.
- Any other relevant information.
- Signature from the verifying supervisor.
- Type of equipment used.

1.2.8. Marking and Fencing

- a. Mine action organisations shall carry out the marking of the hazardous area in conformance with their tasking order. The fencing shall conform to Chapter 3.

1.3. Land Impact Survey

- a. Land Impact Survey (LIS) is an integral part of the South SUDANMAP. It is a specialised activity that is planned and coordinated by NMAA/UNMAS-SS and implemented by organisations that are appropriately trained and experienced in ensuring the requirements and standards are met and achieved at all times.
- b. This chapter does not go into finite detail or cover all facets of the LIS that shall be carried out and/or implemented during its conduct on the South SUDANMAP but aims to provide the essential information necessary for all readers to have an insight into the conduct and requirements of the activity and to highlight pertinent requirements when conducting the activity.

1.3.1. General

- a. A completed LIS shall provide data for improved planning and prioritisation of the South SUDANMAP. The data shall also provide a baseline against which to measure progress and inform policy-makers on the most effective allocation of resources to combat the problem.

- Through this process, the impact of the mine/ERW problem may be categorised and mapped, permitting policy-makers to focus efforts in the most affected areas and enabling the targeting of interventions for mine risk education, marking, technical surveys, clearance and victim assistance.
- LIS protocols have been developed and shall be implemented to assure stakeholders that the LIS is conducted in accordance with the LIS methodology developed by the Survey Working Group (SWG).

1.3.2. The LIS Process

- a. Outlined below are the phases of the survey process. These phases and their component activities are presented in a general chronological order, which corresponds to the task/sub-task matrix of the certification guidelines. A number of tasks/sub-tasks shall occur within each phase, although in some cases a given task may continue throughout two or more phases.
- b. PHASE 1: Planning, Preparation and Office Establishment:
 - UN Assessment Mission The assessment mission shall determine the requirement and utility of a survey and will explicitly call for such a survey when it is needed. An assessment mission report calling for the conduct of a survey is the first step in the process. UNMAS shall use these reports to determine in which countries a survey is appropriate and possible, and to assist in priority setting.
 - Advance Survey Mission An Advance Survey Mission shall develop the contacts and information required to plan for the actual survey. Critical planning information shall be gathered and capacity assessment made of organisations and resources, which may be capable of supporting a survey.
 - Survey Proposal & Outline Plan An initial survey proposal shall be prepared containing an outline plan based on operational data collected during the Advance Mission. The outline plan shall provide a basis to begin the survey project. Further development of this plan shall be an ongoing task conducted during the implementation of the survey and shall include refinements based on the results of both pre- and pilot-tests.
 - Operational Set-up & Establishment of Country Presence An operational base(s) shall be prepared complete with temporary offices and a communications system to support the survey team.

- Recruit Local & International Staff An open and transparent recruitment and selection process shall be undertaken designed to attract and retain competent local & international staff. The survey team shall include members with a wide range of skills including social-science methodology, information management and technical mine expertise. The survey team shall include both men and women to ensure they may conduct CL activities in a gender sensitive manner. Final selection of staff is the responsibility of the implementing survey team with due consideration of the National host.
 - Preliminary Opinion Collection The survey team should begin the systematic collection of informed opinion of national “experts” familiar with the mine contamination problem in close coordination with the South SUDANMAP. This is an on-going activity and shall be repeated as needed throughout the survey, especially as the actual survey team’s move into new States
- c. PHASE 2: Project Expansion and Survey Instrument Refinement:
- Selection and Training Based on the selection process and the level of academic and professional skills of the survey staff recruited, a training programme shall be developed. The aim of the training programme shall be to teach survey-related skills and knowledge to reinforce the survey process and upgrade any skill or knowledge shortfalls. The importance of gender mainstreaming in mine action should also be included in the training.
 - Conduct Pre- and Pilot Tests Following the survey training stage, a pre-test of the survey instrument itself shall be conducted to determine its utility and cultural acceptability. Likewise a pilot test shall be conducted of the entire survey process to analyze management, logistics and administrative systems and planning assumptions.
 - Review A complete review and analysis of the pilot test results and adjustment of the survey process shall be completed before launching the Impact Survey.
 - Develop Survey sampling methodology The refined survey process shall be used to develop methodologies for conducting both a sample survey as well as a sampling to check for false negative. These shall be used to

build a predictive model of the survey results as well as to build a measure of confidence regarding survey findings.

- Revise Operational Plan Prior to actually conducting the survey, information gained during the testing exercises shall be used to revise and update the final operations plan. This shall be done in country and shall involve input from the South SUDANMAP and other stakeholders as necessary.

d. PHASE 3: Data Collection, Processing and Verification

- Collect systematic Preliminary Opinion in each Area This is the focused qualitative interviewing of key informants starts at the beginning of survey process. As boys, girls, men and women have different gender roles in their communities, they will have different areas of regular movement and different knowledge of threats in these areas. For this reason, boys, girls, men and women should be interviewed during the LIS. Documented and coded interview forms are recorded, collated and analysed.
- Administer and Manage Impact Mine /ERW Survey Data The conduct of the Impact Survey shall take place under contractual agreements and in close collaboration with the South SUDANMAP. The survey shall be conducted in accordance with UN policy. There shall be a results-based management system established to track team assignments and outputs, rigorous field supervision and extensive internal quality controls on data editing and entry.

e. PHASE 4: Data Analysis. Presentation and Hand-Over

- Data Analysis The objective analysis of data collected during the survey is vital to ensure acceptance of the survey results. The analysis of facts collected in quantitative study and impact weighting that is applied shall be transparent, logical and understandable. The analysis of data shall meet the informational needs of the National Authorities.
- Handover As part of completing the survey, the Survey Team shall present its preliminary findings, maps and data to the South SUDANMAP and other stakeholders in the country. This shall be done not only to share the knowledge gained, but to illicit comments and input prior to publishing the final report and releasing data on the world-wide web.

- f. Prior to departing the country, the survey team shall provide all information to the South SUDANMAP. This information shall include all relevant data, maps and a draft written report.

1.3.3. Reports

- a. The Survey Team shall produce a Final Report as a product for the National Authorities in order to allow them to continue the mine action process. This report shall focus on an objective presentation and analysis of the data gathered in the survey. The survey team leader shall also produce a more subjective report providing commentary and recommendations for how future mine action programs should be conducted. Sex and age disaggregated data on informants interviewed during the LIS should also be included in the report.

1.3.4. Quality Assurance guidelines

- a. General Areas of evaluation are as follows:
 - **Survey Utility**: To ensure that a survey shall serve the practical information needs of the National Authorities and International community.
 - **Survey Feasibility**: To ensure that the survey shall be realistic in its operational goal and timelines. The survey shall be practical in application and the results shall meet expectations of stakeholders.
 - **Survey Ownership**: To ensure that the survey shall be conducted legally, ethically and with due regard for those involved with the survey and those who will be affected by the results and ensuring that the National Authority is part of the process.
 - **Survey Accuracy**: To ensure that the survey shall reveal and convey technically correct information concerning the Mine/ERW problem and associated factors. Accuracy involves ensuring veracity of data, objectivity of analysis and fair assessment of the survey process.
 - **Survey Information Transfer and Reporting**: To ensure that information is conveyed and transferred in an accurate, complete manner to the South SUDANMAP. Using IMSMA, information transferred shall be in a form useable to those who receive it

1.3.5. LIS Operational Protocols

- a. These were developed by the Survey Working Group (SWG) and are, in effect, the de-facto standards for the conduct of LIS. They are developed

according to best practice in mine action, social science and statistical analysis and provide the detail of how an LIS should be conducted. The main nine LIS operational protocols are currently as follows:

- Advance Survey Mission
- Preliminary Opinion Collection
- Minimum Data Requirements
- Field Organisation
- Guidelines for Interviewers in the Community Visit
- Visual Inspection
- False Negative Sampling
- Impact Scoring and Community Classification
- Data Analysis

b. The protocols shall be the prime references for the implementing organisation and shall provide the only basis on which the evaluation of the LIS may take place.

1.3.6. Evaluation Criteria

a. The evaluation shall be based on criteria of organisational preparedness and operational conduct. The following can apply:

b. Organisational Preparedness The surveying organisation shall be assessed as to whether they are sufficiently prepared to implement LIS in accordance with the SWG operational protocols. They shall be assessed according to specific criteria relating to the following issues and activities:

- The Advance Survey Mission
- The feasibility of the initial operational plan
- Staff recruitment
- Staff training
- Development of the survey instrument

c. Operational Conduct The surveying organisation shall be assessed on its ability to implement survey operations in accordance with the LIS operational protocols and the initial operational plan. They shall be assessed according to specific criteria relating to the following issues and activities:

- Impact scoring and community classification
- Minimum data requirements
- Field organisation

- Preliminary opinion collection (national and local)
- Community interviews (including boys, girls, men and women)
- Visual inspection
- False negative sampling
- Strategic planning activities

1.4. Responsibilities

1.4.1. NMAA/UNMAS-SS

- a. Shall where applicable establish and/or maintain:
 - Develop national standards for the conduct of survey operations.
 - Accredite organisations to undertake survey operations as defined in this chapter.
 - Utilise the information collected through the survey process to better understand the nature, extent and distribution of contamination and to prepare tasking orders and annual works programmes.
 - Define liability issues relating to survey operators, individuals undertaking surveys in accordance with the national legislation.
 - Monitor the quality of the land release outputs through survey operations.
- b. Mine action organisations
 - Mine action organisations shall:
 - Gain accreditation from NMAA/UNMAS-SS needed to conduct survey operations.
 - Apply the national standards for survey in accordance with the provisions of the organisations SOP.
 - Collect the necessary information from the survey operations.
 - Accurately report the findings of all survey operations.
 - Where applicable, conduct formal handovers of assessed sites to organisations conducting follow-on activities.
 - Consult closely with the local communities as required with regard to all information garnered from surveys.



South Sudan

National Technical Standards Guidelines

Date: 1st October 2015

Chapter 02

2 Site Preparation and Setting Out

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2.1. Site Layout Requirements

- a. The nature of the ground shall determine the layout of any work site, however a consistent arrangement with correct marking shall increase the safety of those involved in humanitarian demining. The standardisation of site layout and all marking systems is a requirement and shall as a minimum conform to the details within this chapter.

2.1.1. Control Point

- a. The control point acts as an administration and briefing area and is the point where all visitors shall arrive. Ideally it should be on level, well-drained land and have vehicle access and preferably some shade. **The entire area of the control point and administrative areas shall be cleared regardless of whether the control point is located in a suspected hazardous area (SHA) or not.** The location of the control point shall be a minimum of one hundred metres from the baseline of the hazardous area. This distance shall be increased dependant on the perceived threat that may result from fragmentation should a high order detonation occur.

2.1.2. Access Lane

- a. An access lane shall be a minimum of two metres wide. White or unpainted posts or stones shall be used to mark this (to be marked as hazardous if one side adjacent to any hazard).

2.1.3. Vehicle Park

- a. This should be close to the Control Point and large enough to accommodate the mine action organisation's vehicles and visitor's vehicles. All vehicles should be positioned in the park so they do not have to manoeuvre to depart in the event of an emergency.

2.1.4. Stores & Equipment Area

- a. An area used for the secure storage of equipment. Usually part of or adjacent to, the Control Point.

2.1.5. Medical Area

- a. Shall be sited and equipped in accordance with Chapter 10.

2.1.6. Explosives Area

- a. Shall be sited and stored in accordance with Chapter 12.

2.1.7. Rest Area

- a. Rest areas shall be sited for use by deminers during their breaks and should provide sufficient shade, space for resting and for preparing and/or storing necessary equipment. The positioning and location of rest areas shall need to consider the requirements to comply with the wearing of PPE.

2.1.8. Metal Collection Pit

- a. This shall be marked and shall be located in a safe area and at a convenient distance from working deminers. All scrap metal removed from the mined area shall be placed within the metal collection pit. Prior to completion or suspension of the task, the contents of the metal contamination pit shall be buried and marked and recorded or removed to another area for disposal. In order to facilitate quality control, metal collection pits should not be located in areas cleared that day.

2.1.9. Latrine

- a. Latrines should be located in the vicinity of the control point and should be adequate for the number of personnel on the site. The location of the latrine shall be a minimum distance of 50m from the CP. If cultural norms require, separate toilets shall be constructed for male and female team members.

2.1.10. Demolition Area

- a. A location cleared for the disposal, by explosive demolition, of mines and unexploded ordnance. The demolition area shall be at a safe distance from the worksite in order to avoid any fragmentation falling into cleared areas where quality control or sampling is planned.

2.1.11. Sentry Points

- a. Sited at access points to hazardous areas when required; particularly on route, road and verge clearance tasks. It shall have radio communications with the senior person on site.

2.2. Site Reference Points Requirements

2.2.1. Reference Points

- a. The reference point description, location and the safe route from it to the Start point (SP) of the HA shall be included in the Survey and Hazard Report Form. There may be a requirement to identify intermediate points when the reference point is located at a vast distance from the SP, the terrain is featureless, there are a number of obstacles or there are multiple changes in direction along the route.

2.2.2. Benchmark

- a. This is to be erected on completion of clearance and can be of a natural or man-made permanent object (no trees) and shall:
- Be constructed of materials that shall endure the environment and shall extend deep enough into the ground with a solid foundation to support the weight.
 - Be clearly visible in normal daylight at a safe distance from the direction of approach.
 - Protrude a minimum of one metre above the ground.
 - A metal picket or similar shall be driven flush with the ground at the base of the benchmark.
 - All information is to be engraved as well as painted on the Bench Mark
 - Conform to the following figures:

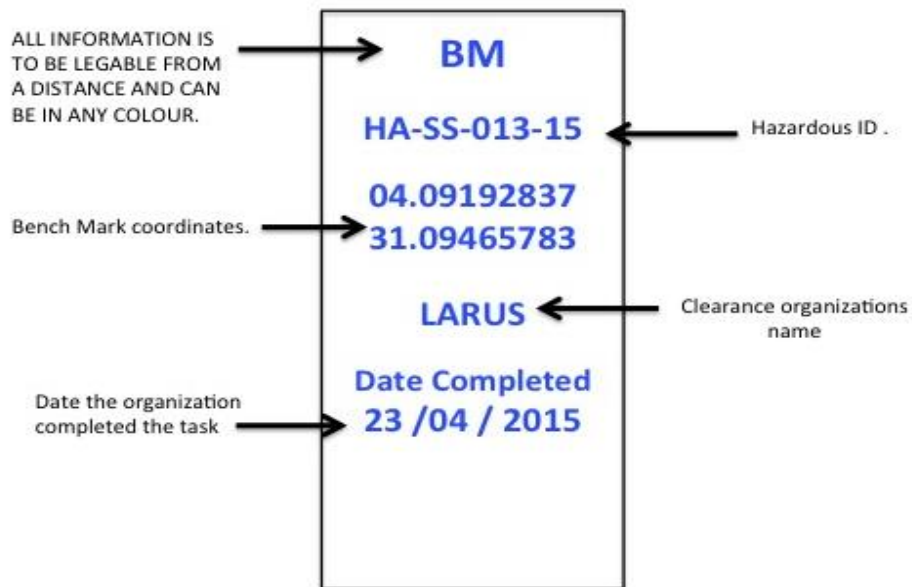


Figure 2-1 Benchmark Marking

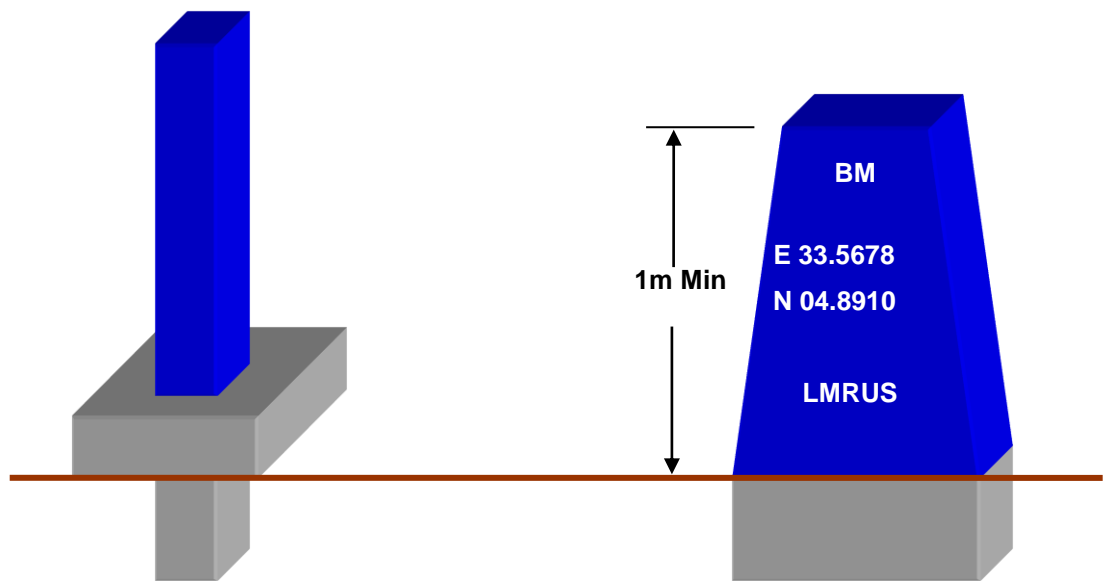


Figure 2-2 Benchmark Designs

2.2.3. Start Point

- a. This is a clearly identifiable fixed marker and the point where clearance begins. All minefield measurements are taken from this point and depending on the location of cleared mines / ERW; it may be decided to position additional start points for ease of mapping during or on completion of clearance. The initial start point should be clearly visible from the benchmark otherwise Intermediate Points shall be located for ease of navigation.

2.2.4. Boundary Line

- a. It is a fixed line located from the start point which forms the perimeter of the known hazardous area or cleared boundary lane, providing a definite location of the safe area. As clearance progresses, the minimum necessary markings (e.g., turning points, intermediary points) shall remain in place to identify the boundary line for navigation and post clearance marking purposes. The start line, which may be initially located on the boundary line, should be moved forward after a substantial amount of the area is cleared and subsequently, mark the divide between the cleared and hazardous area.

2.2.5. Boundary Lane

- a. This is a cleared and marked lane a minimum of two metres wide along the boundary of the hazardous area which is utilised when there is no confirmed safe boundary from which to start clearance. Where possible, a boundary

lane shall be cleared around the entire perimeter of the hazardous area. If there is no requirement to clear a boundary lane then it may be decided to mark a control lane outside and parallel to the Boundary Line. Depending on the requirement to restrict movement of demining personnel, equipment and vehicles in the immediate area around the boundary, it may be decided that a control lane is not necessary.

2.2.6. Start Line

- a. This is the line from where mine/ERW clearance begins and marks the divide between the safe and hazardous area. This may be located on the boundary line and should be moved forward after a substantial amount of area is cleared. In circumstances where limited clearance has been conducted (e.g., clearance lanes for technical survey) the start line should remain in position.

2.2.7. Setting out the Boundary Line & Lane

- a. When determining the position of the boundary line, the use of existing linear features such as roads, paths, cultivated land etc. should be considered. When there is a requirement to clear a boundary lane, the boundary line shall mark the rear edge of the cleared lane. The boundary lane shall be a minimum of two metres in width.

2.3. During Clearance

2.3.1. Clearance Lane

- a. This is the lane where deminers are working. The clearance lane shall be a maximum of fifty metres in length. **On reaching a maximum distance of 5 metres the lane shall be widened to a minimum of two metres**, to assist in CASEVAC. Clearance lanes shall also be required to be widened to a minimum of two metres on encountering obstacles i.e. trees, rocks, in order to safely navigate/clear past said obstacles.

2.3.2. Cleared Lane

- a. A lane that has been cleared of all mines and ERW to the required standard.

2.3.3. Intermediate Lane

- a. A cleared lane forward and parallel to the start line or boundary line which connects clearance lanes for safety and command / control purposes. The distance from the start line / boundary line to the intermediate lane and

between any consecutive intermediate lanes shall be a maximum of fifty metres.

2.3.4. Location of Mine/ERW

- a. When a mine/ERW is not dealt with immediately upon being located, it shall be marked and the clearance lane closed. Before the end of the working day these mines/ERW shall be destroyed unless prior approval has been granted from the NMAA/UNMAS-SS.

2.3.5. Minimum Safety Distances

- a. The following table details the minimum safety distances to be enforced at a mine clearance task:

MINIMUM DISTANCES FOR A MINE CLEARANCE WORK SITE			
Situation		Normal Risk	Increased Risk
1	Adjacent working personnel wearing PPE in suspected anti-personnel blast mines less than 200 gm.	10 metres	15 metres
2	Adjacent working personnel wearing PPE in suspected anti-personnel blast mines 200gm or more.	15 metres	20 metres
3	Adjacent working personnel wearing PPE in suspected anti-tank mine areas.	15 metres	50 metres
4	Adjacent working personnel wearing PPE in suspected anti-personnel stake, bounding or directional fragmentation mine areas.	20 metres	25 metres
5	Between the explosive storage point, hazardous area and other designated areas.	50 metres	
6	Between designated safe areas and the hazardous area.	100 metres	
7	Between personnel not wearing PPE and personnel working in anti-personnel or anti-tank mine areas.	100 metres	

1. *Any reduction to these distances shall only be authorised by the NMAA/UNMAS-SS on a case-by-case basis and shall be required to be included in the detail of relevant Implementation Plans.*
2. *These Safety distances shall be increased when required in accordance to the mine / ERW threat.*
3. *Encroachment of the safety distances IAW Serials 1 to 5 are acceptable, in order to conduct supervisory/QA functions. At these times supervisory/QA personnel should avoid remaining static and spend minimum time inside the safety distance.*
4. *Full PPE shall be required to be worn by all personnel at all times regardless of role on encroachment past the designated PPE HOTLINE whilst clearance is taking place.*
5. *Normal risk. There is no reason to believe that the application of standard manual demining procedures shall result in an unintended detonation.*
6. *Increased risk. The worksite conditions complicate the application of standard manual demining procedures in a way that could be predicted to result in an unintended detonation. (IMAS 10.20 Annex B.6.2.)*

Table 2-1 Minimum Safety Distances for a Mine Clearance Work Site

2.4. Responsibilities

2.4.1. NMAA/UNMAS-SS

- a. Shall develop a policy and establish national standards for the
 - Minimum requirements for the establishment of mine action worksites.
 - Procedures for the establishment of working distances based on risk reduction methodologies.
 - Standards regarding the selection and use of reference points.

2.4.2. Mine action organisations

- a. Mine action organisations shall:
 - Issue, maintain and update their own regulations and SOPs regarding the establishment of mine action worksite.
 - Co-operate with other mine action organisations in the same country to ensure consistency of standards on worksites.



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Chapter 03

3 Marking System

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3.1. Marking Pickets/Posts/Rocks

- a. Boundaries of all areas, lanes and points in mine/ERW clearance operations shall be marked with appropriate markers. The methods to be used shall be wooden pickets/posts and/or painted stones. The appropriate method shall be utilised after consideration of the prevailing ground conditions.

3.1.1. South Sudan Mine/ERW Clearance Marking Standard

- a. To standardise marking the following colour code and identification system shall be adopted (see Figure 1). Organisation may incorporate an enhanced marking system to identify where a specific asset or methodology has worked however this is to be included in their SOP or an amendment shall be submitted as a site specific amendment.
 - **Short red-topped picket / red rocks:** Indicate the boundary between clear and hazardous areas. They shall be spaced at a maximum of 1m intervals; posts shall be a minimum of 30cm above the ground and rocks minimum of 10cm diameter. (Rocks shall be painted 50/50 with red and white paint to enhance the visibility and indicate safe / unsafe areas.)
 - **White-topped picket/white rock:** Indicate the boundary of designated safe areas. Pickets shall be a minimum of 30cm above the ground, rocks minimum of 10cm diameter.
 - **Yellow-topped picket/yellow rock:** Indicate the location of removed or destroyed AP Mines.
 - **Yellow & Black-topped picket/yellow & black rock:** Indicate the location of removed or destroyed AT Mines.
 - **Yellow & Red-topped picket/yellow & red rock:** Indicate the location of removed or destroyed ERW.
 - **Blue-topped picket/blue rock:** Indicate the start of the daily clearance/GP and the location of metal contamination pits.
 - **White-topped blue picket/white blue rock:** Shall be used to indicate the internal QCs conducted by the organisation.
 - **Green-topped picket/green rock:** Indicate the boundaries of the areas processed using MDD.
 - **Long-red topped picket:** These pickets are used to enhance the boundary marking between clear and hazardous areas, during clearance operations in conjunction with short red pickets and rocks at 1m intervals, when the visibility is restricted due to terrain or vegetation they shall be

spaced a maximum of 15 metres apart and a minimum of 1m above the ground. A mine warning sign is normally positioned on the long picket.

- **Crossed Red Pickets:** Used to indicate a clearance lane has been closed.

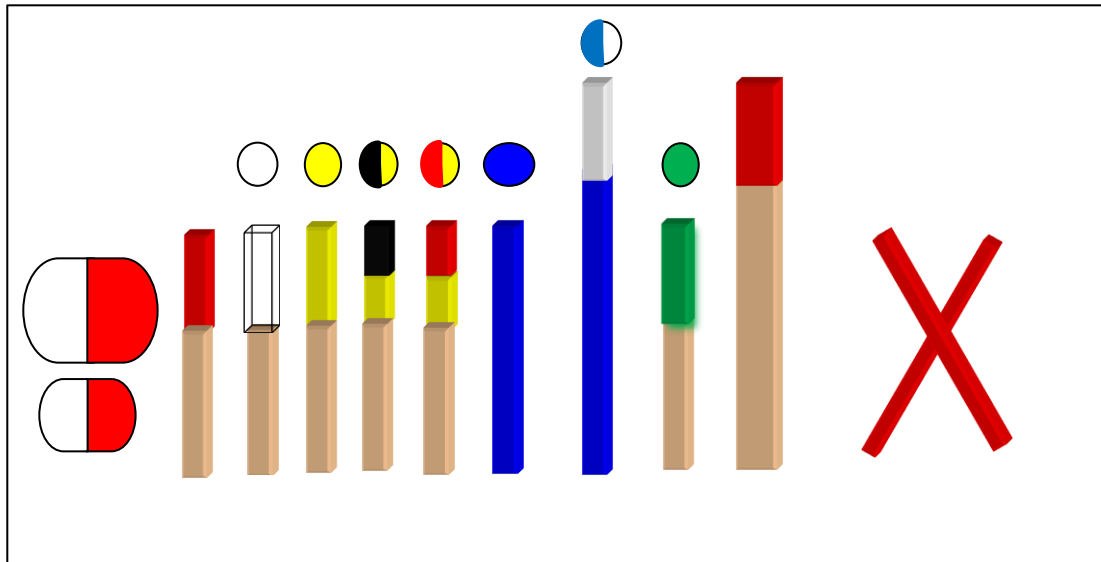


Figure 3-1 South Sudan Mine/ERW Clearance Marking Standard

N.B. The aim of marking is to have one continuous perimeter that at all times clearly defines the hazardous and safe areas throughout the life of the task.

3.2. Base Sticks

- Base sticks are used by deminers to maintain the width of the clearance lane. The figure below shows the recommended design. The rule is that the area behind the base stick is safe (cleared of mines), and in front of the base stick it is unsafe (not cleared of mines). The red portion of the base stick marks the 1m lane width whilst the 10cm white ends indicate the required overlap.

Base Stick

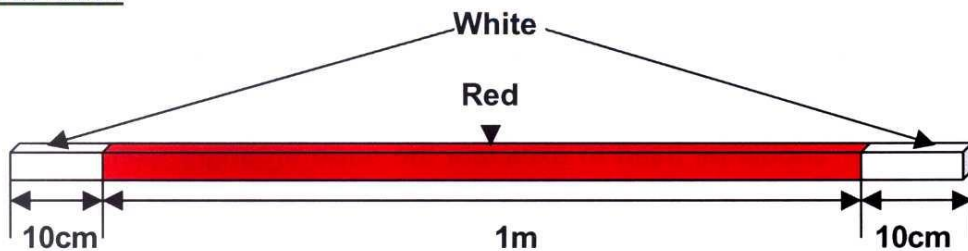


Figure 3-2 Base Stick Design

3.3. Hazardous Area Marking

- a. The triangular or square sign conforming to the diagrams below have been adopted as the recognised sign for a hazardous area in South Sudan.

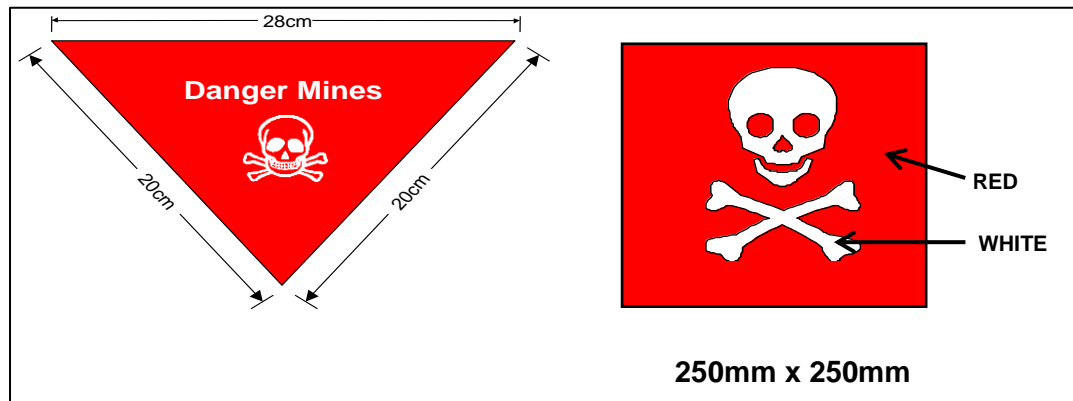


Figure 3-3 Hazardous Area Marking

- b. The rear of the sign shall be white or uncoloured to allow differentiation between safe and hazardous areas with the red side being visible from outside of the area.
- c. Signs printed in English and Arabic should be used.

3.3.1. Hazardous Area Fencing

- a. Permanent hazardous area fencing shall conform to the minimum standards depicted in the following diagram:

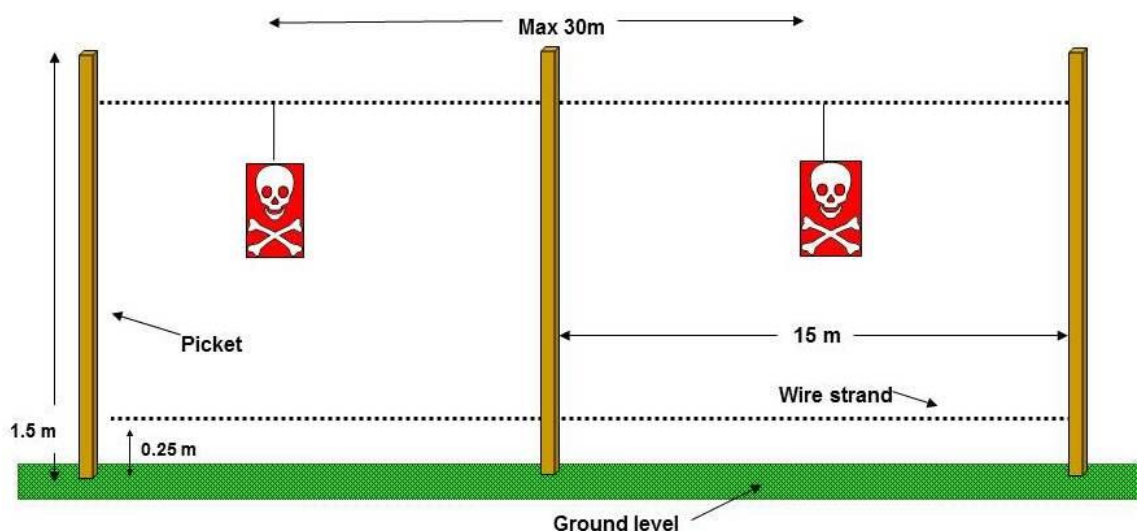


Figure 3-4 Hazardous Area Fencing

- b. All materials used shall be durable enough to resist the deteriorating forces in their environment, and to conform to the length of time of their intended use.

3.4. Marking of a Cleared Area

- a. Marking of a cleared area shall be obvious and permanent. The cleared area marking should have the following minimum basic requirements:
- b. When the entire hazardous area has been cleared and no adjacent areas are suspected to be hazardous the perimeter points are marked using steel pickets, minimum of 30cm long and driven flush with the surface starting at the start point (SP) and preferably working in a clock wise direction. All turning points (TP) shall be marked with a maximum distance of 50m between each point. If the line of sight is obscured then intermediate points (IP) shall be marked. If the ground is such that it is impossible to drive pickets into the ground, then high-visibility paint splashes; a minimum of 30cm in diameter shall be applied to rocks, roads surfaces or walls. Alternatively a DGPS reading shall suffice in meeting this requirement. The positions and relevant details of SP, all TP's and IP's shall be indicated on a map submitted with the IMSMA Completion Report.
- c. In addition a compass bearing and the distance in metres between Benchmark, SP, TP's and IPS shall be recorded on the IMSMA Completion Report.
- d. If only a portion of a suspected minefield is cleared, and hazardous areas remain adjacent, then the cleared area should be fenced with a hazardous area fence allowing for a 1m overlap in from the un-cleared area boundary line.
- e. For details of the requirement for recording of positional data, see Chapter 1.

3.5. Responsibilities

- a. The NMAA/UNMAS-SS shall prepare and publish standards for the design and construction of appropriate and achievable hazard marking systems to be used within South Sudan.
- b. Mine action organisations shall apply the NMAA standards for hazard marking systems.



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Chapter 04

4 Manual Mine Clearance

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4.1. Introduction

- a. Humanitarian demining techniques used during each project may differ according to equipment, the terrain, type of mines / ERW, etc. All procedures used in clearance operations are to be fully explained in step-by-step detail in the mine action organisations SOP.

4.2. Standards, Methodology & Actions On

4.2.1. Clearance Depth

- a. The minimum clearance depth when searching for mines is 13 cm (130 mm), measured from the original ground level. Any reduction must be authorised by the NMAA/UNMAS-SS. The depth shall be increased when required.

4.2.2. Clearance Lane

- a. A manual mine clearance deminer is responsible for clearing a one metre wide lane using one or a combination of the following recognised methods:
 - Hand-held metal detector
 - Excavation
 - Prodding

4.2.3. Visual Search

- a. Prior to conducting manual clearance, a visual search of the immediate unclear area ahead shall be conducted. The deminer is not cross marking or move forward into the unclear area. The following should be considered when conducting the visual search:
 - Possible Tripwires
 - Protruding fuses, mines, ERW, booby-traps.
 - Disturbance to the ground.
 - Depressions, holes, mounds.
 - Suspicious objects (inconsistent to the surroundings).
 - Other mine / ERW indicators (packaging, components, animal remains).

4.2.4. Detection of Tripwires

- a. If the vegetation requires, a tripwire feeler may be used to locate tripwires. This should be made from light-gauge wire and fabricated in such a way to allow the detection of both slack and taut wires. Starting from a crouched/ kneeling or prone position, the tripwire feeler is moved along the ground, forward of the base stick and raised slowly upwards until clear of the

vegetation or head height when standing. This is completed a minimum of three times, over the full width of the clearance lane and overlap. In order to deploy the trip wire feeler safely, the operator should be able to see the end of the feeler at all times. If the vegetation does not allow the use of a tripwire feeler, the search is completed using the eyes and hands. After a thorough visual check of the area, search the area by slowly moving the hands forward, gently parting any thick vegetation that may obscure tripwires. The deminer shall not pull vegetation and avoid touching any trip wires.

4.2.5. Clearance of Vegetation

- a. The clearance of vegetation is to be done in a safe, controlled method, avoiding any disturbance of vegetation outside the width of the lane plus overlap; it shall never be more than 50cm in front of the base stick. If necessary, one hand shall be used to hold the tree, branch, or clump of vegetation, while the other uses the cutting tool. All vegetation is to be cut to as close to the ground as is safely possible and placed in a cleared area, ensuring that it does not become an obstacle. When cutting vegetation, the operator shall ensure that a visual inspection is made and that the tool does not make contact with the ground. Caution shall be taken when cutting vegetation to avoid heavy vegetation from falling into the unclear area.

4.2.6. Use of Metal Detector

- a. Prior to its use, the metal detector shall be checked to ensure that it is functioning correctly. The detector shall be used to check the one metre wide lane and a 10cm overlap either side. No signals shall be investigated outside the lane. The metal detector search shall be conducted to a maximum distance of 50 cm forward of the base stick, ensuring that the area is checked at least twice. The detector search process shall incorporate an overlap, ensuring that the distance moved forward is at least ten centimetres less than the distance searched with the detector, therefore, providing a minimum of ten centimetres safety margin. The sensitivity of the metal detector is to be checked regularly in accordance with the manufacturer guidelines and organisation SOP to ensure that it is capable of searching the ground to the required depth. Details for the calibration of the detector shall be included in the Organisation SOPs.

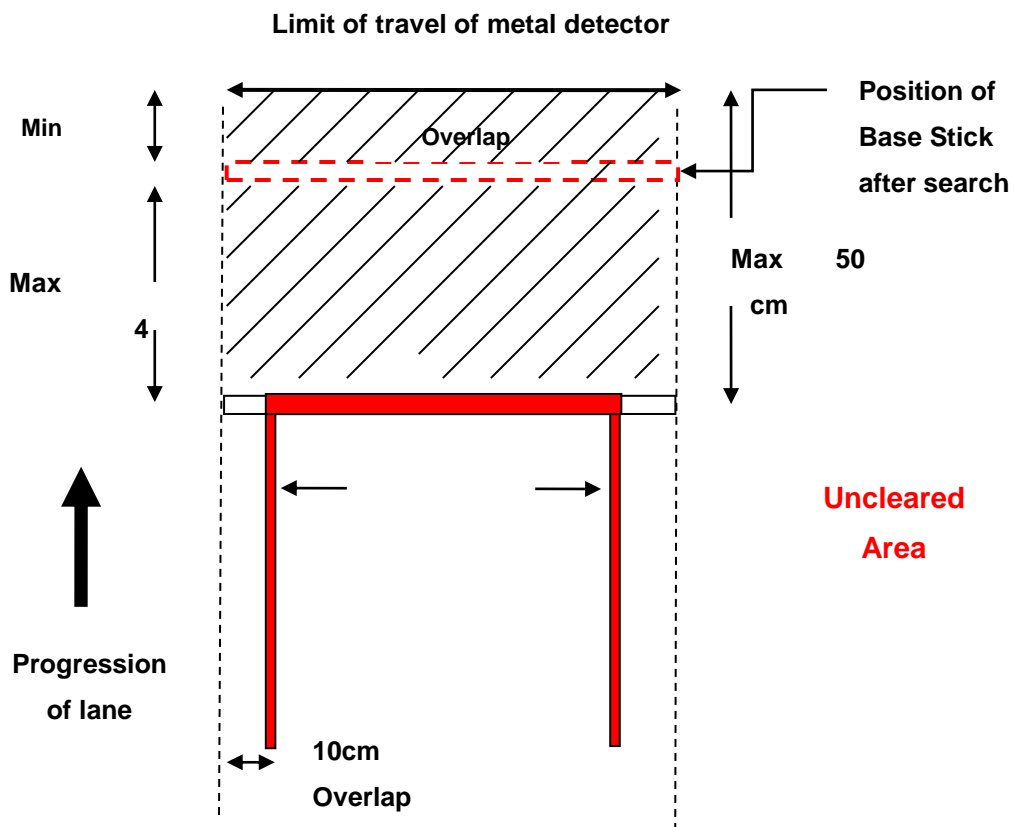


Figure 4-1 Use of a Metal Detector

4.2.7. Detector Signal, Isolation & Marking

- a. Prior to investigating the detector signal, a signal marker shall be placed to the rear of the signal ensuring the excavation works towards the signal. Isolation markers can be used in conjunction with signal markers. Extreme caution shall be taken when placing these markers to ensure that they are carefully positioned and allow enough distance and achieve excavation depth before encroaching on the signal.

4.2.8. Prodding & Excavation

- a. Once the precise location of the signal has been identified using the metal detector, the source of the signal shall be investigated to identify it. This shall be done by prodding and/or excavating.
- b. Prodding shall commence a minimum of ten centimetres back from the nearest point of the signal and to the required width, which, is dependent on the size of the signal. All prodding is to be at an angle of no more than thirty degrees and at maximum intervals of two point five centimetres. The prodder shall be used with an even motion, avoiding any excessive force or

stabbing. The depth prodded shall be dependent on the ground conditions, search depth and tool design. If it is not possible to conduct prodding from the surface of the ground to the required search depth, then a certain amount of excavation shall be conducted in order to achieve the required prodding depth. Alternatively, the prodding procedure may be replaced with excavation (sapping) only. In hard ground, resulting from extremely dry conditions, water shall be used to soften the ground before prodding commences. If the known threat is a No 4 AP mine for safety reasons prodding shall not be conducted.

- c. Excavation (Sapping) is used to reveal the identity/source of the signal. A hole is dug a minimum of ten centimetres back from the nearest point of the signal to a minimum depth of fifteen centimetres. The trowel (or similar tool) is used to slowly remove the soil towards the location of the source of the signal. Any excessive pressure and abrupt movements with the trowel shall be avoided. The prodder may also be used in conjunction with the excavation process. If an object is not located after using the prodder and excavation to the required depth, the Supervisor will decide whether further investigation is required.

4.2.9. Actions on Locating Metal

- a. The metal shall be carefully removed from the ground and placed in the metal contamination pit. The areas where the metal was removed from shall be checked visually and with the metal detector for additional signals, prior to moving forward.

4.2.10. Actions on Locating Mine/ERW

- a. The deminer shall stop mine clearance activities, place a mine marker a minimum ten centimetres before the mine/ERW and notify the supervisor through the chain of command. The supervisor is responsible for ensuring a qualified person carries out all actions relating to the removal or destruction of the mine/ERW in situ. The lane may be cordoned and mine clearance activities started in a new lane. No personnel shall be allowed past a located mine/ERW in a one metre wide clearance lane. In circumstances where the mine/ERW is not destroyed or removed immediately, the deminer shall be moved to an alternative lane.
- b. **Note: The No4 is considered a no touch mine and shall always be destroyed in situ.**

4.2.11. Disposal of Mine/ERW

- a. Where possible all mines/ERW should be destroyed in situ. If this is not possible, or proves to be impractical, the mines/ERW shall be manually neutralised/ disarmed and moved to a secure location. All Anti-Tank mines shall be pulled prior to neutralising/disarming. Any Anti-Personnel mines suspected of been booby-trapped shall be pulled prior to neutralising/disarming. The planned destruction of located mines should be carried out during or after each working day unless a specific safety hazard (or lack/limited amount of explosives) prevents this. Only qualified EOD personnel shall conduct demolitions or render safe procedures.
- b. Where mines/ERW are not destroyed on the day that they are found, they shall be accurately reported in the organisations daily clearance log and destroyed as soon as possible. If they are not destroyed by the end of the working week, the organisation shall ensure they are included on the daily progress report for the task and submitted to the NMAA/UNMAS-SS with an explanation given.

4.2.12. Action on Missing Mines

- a. The Missing Mine Drill shall be applied when the location of a mine, which should have been present in the mine row, is not there. The area to be searched shall depend on the pattern identified on the ground at the specific task site. The Site Supervisor / Team Leader shall be responsible to ensure that a sufficient area has been searched before continuing on with normal clearance

4.2.13. Action on Locating a Tripwire

- a. The deminer shall stop clearance activity and place 3 x small red markers such as stones a minimum of 10cm from the trip wire and in front of the deminer, alongside each other following its direction. (Figure 4.2) and then notify the supervisor. The supervisor is responsible for ensuring that both ends of the tripwire are located and appropriate action is taken depending on what is found at each end. It is stressed that the method employed in tracing the tripwire should at all times ensure that deminers tasked do not become isolated. Conditions should always allow for swift, safe and effective Casevac to be conducted should an accident occur. Whilst tracing a tripwire there shall be no other activities within fifty metres.

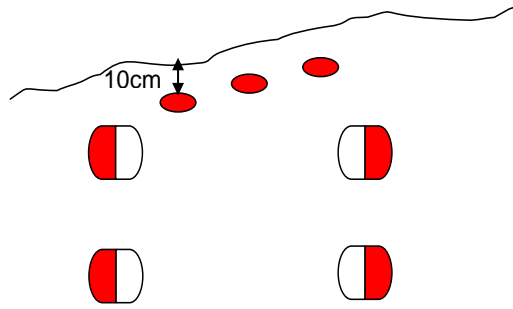


Figure 4-2 Marking of a Tripwire

4.2.14. Pulling Procedures

- a. When it is necessary to remotely pull a mine/ERW or other item, the supervisor is responsible for the pulling procedure. All personnel not involved in the pulling operation shall be withdrawn to a safe area and sentries posted. There are numerous ways and technics of pulling however all safety precautions are to be employed and in place prior to the pull in the event of a detonation. EOD evacuation and safety distance calculations should be used to determine how far the pulling point is located from the item to be pulled. This distance shall only be reduced to a minimum of 50 metres when:
 - b. There is adequate protection from blast and fragmentation in relation to the item to be pulled and the threat from secondary devices.
 - c. The person conducting the pull is wearing full PPE (helmet/visor and body armour) and is close to the ground. This shall only be conducted as a last resort and when there is no alternative protection from blast and fragmentation.
 - d. The following shall be considered when conducting the pulling drill
 - The type of ordnance (e.g., mine, mortar, grenade, projectile, rocket, sub-munition).
 - The function of the ordnance (e.g., blast, fragmentation).
 - The condition of the ordnance (e.g., fuzed/unfuzed, unfired/safe, blind).
 - The explosive quantity of the ordnance.
 - Booby-traps / secondary devices.
 - Proximity of personnel, animals, equipment and buildings.
 - e. Once all safety distances have been implemented and the sentries having given the all clear the final job of attaching the pulling line is attached and the pull commenced. A minimum of 1 min is given on completion of the pull

and 30min soak time in the event any smoke is seen. Once all soak times have ceased the supervisor will approach the item and conduct an evaluation of the item and what appropriate actions are required.

4.2.15. High Metallic Areas

- a. In areas where the metallic content of the soil is high, the metal detector may be ineffective. The detector procedure shall be replaced with a complete prodding and/or excavating procedure to ensure that all mines/ERW are located to the required depth. The minimum depth to be excavated is 15 centimetres and the complete width of the one metre wide lane shall be investigated to this depth. The detector should be used to regularly check the soil contamination level and confirm whether the complete prodding and excavation process can be replaced with the detector procedure. Alternatively, mark the boundary of the high metallic area for clearance by MDD or mechanical means. The size of the area, type of terrain and the availability of alternative clearance assets will determine the most efficient method of clearance to use.

4.2.16. Mountainous & Rocky Terrain

- a. In areas where the ground is mountainous and rocky, there may be a requirement to remove rocks (E.g., physical hazard, suspicion that a mine/ERW is beneath the rocks, 'ghost signal'). Therefore, the Supervisor shall make a decision on the best clearance method(s) (E.g., lifting, detector search, prodding and/or excavation, pulling drill). When removing rocks by hand, caution shall be made so as to avoid disturbing the ground and the rocks should be lifted vertically.

4.2.17. Clearance of Obstacles

- a. During the clearance of minefields, obstacles shall be identified and special clearance drills adopted as required. (E.g., sapping, pulling, EOD). Those obstacles that cannot be cleared immediately shall be marked and if necessary fenced for future clearance operations. The supervisor on site shall give consideration to the approach and clearance method used for each type of obstacle encountered.

4.2.18. Burning of Vegetation in Uncleared Area

- a. Burning of unclear areas may be conducted in order to remove vegetation to facilitate mine clearance operations. Prior to commencing burning, the organisation concerned shall liaise with the NMAA/UNMAS-SS and local

authorities. Caution must be exercised by the organisation and the burning must be controlled in order to prevent the undesired burning of other areas and cause an unacceptable risk to the local population. The results from burning must be considered, such as, the altered state and instability of mines and ERW. Any mine action organisation conducting burning of uncleared areas shall ensure that the following precautions are adhered to:

- Inform the NMAA/UNMAS-SS and local authorities.
- If possible, inform the local emergency fire services.
- If necessary, construct a firebreak to prevent the fire from spreading.
- Ensure that adequate precautions are taken to extinguish any small fires in cleared areas. (e.g., fire extinguishers, sand).
- Calculate the blast / fragmentation safety distance depending on the threat (e.g., mines/ERW) and post sentries accordingly.
- Inform the NMAA/UNMAS-SS and relevant authorities on completion of burning.
- Allow a 24 hour soak time, from the last signs of smoke before conducting demining operations in the burned area.

4.2.19. Working Hours

- a. A manual mine clearance deminer shall not work for longer than sixty (60) minutes before taking a break of at least ten (10) minutes. The working time may vary between organisations and specific situations (e.g., climate); however, the aforementioned times shall be adhered to. A normal working day for a manual mine clearance deminer shall not exceed 6 hours actual mine clearance work a day. In excessive climatic conditions, the working hours may be reduced or the daily routine changed. A safe and sensible approach shall be made by the mine action organisation supervisor in order to achieve the best possible mine clearance results without compromising the safety of demining personnel.

4.3. Human Remains

- a. Human remains and graves are sometimes reported or found during mine action operations. In such circumstances, the organisation shall ensure that appropriate actions are taken.
- b. Human remains encountered during mine action operations shall not be touched or moved. The description of the remains and their location should

be recorded and the information relayed to the NMAA/UNMAS-SS, UNMISS and relevant authorities, as soon as possible.

- c. In circumstances where mine action organisations are requested to conduct clearance to enable safe access to the human remains, the NMAA/UNMAS-SS shall be informed and, appropriate authorization obtained prior to commencing any such operations.
- d. The location of graves and cemeteries shall be recorded during mine action operations and no demining operations shall be conducted within close proximity without prior authorization from the NMAA/UNMAS-SS and relevant authorities.

4.4. Responsibilities

- a. NMAA/UNMAS-SS shall in relation to Manual Mine Clearance operations:
 - Specify the area to be cleared and depth of clearance in contracts and agreements
 - Specify the standards and guidelines for QA and QC to be applied to clearance and agreements
 - Accredite mine action organisations as fit to conduct manual clearance
 - Provide for a system to monitor the work of the mine action organisations
 - Maintain a registry of cleared and uncleared land showing the clearance status for each hazardous area.
- b. Mine action organisations undertaking manual mine clearance operations shall:
 - Gain from NMAA/UNMAS-SS accreditation to operate as a manual clearance teams.
 - Apply the standards as laid down in the NTSG.
 - Ensure that the organisations SOP are in compliance with the NTSG.
 - Maintain and make available documentation of clearance as specified by NMAA/UNMAS-SS
 - Apply management practices and operational procedures which aim to clear land to the requirements specified in the contract and agreements.



South Sudan

National Technical Standards Guidelines

Date: 1st May 2018

Chapter 5

Explosive Ordnance Disposal

1.1. INTRODUCTION

The aim of this chapter is to provide specifications and guidance for the management of Explosive Ordnance Disposal (EOD) operations as part of mine action in South Sudan. It covers general principles and management responsibilities for EOD. It does not provide specific technical guidance for the disposal of particular EO as this shall be covered in detail by the mine action organisations Standard Operating Procedures (SOP).

EOD involves the disposal of Explosive Remnants of War (ERW). For the purposes of these NTSG, ERW is taken to include all unexploded ordnance (UXO), including blind ammunition and emplaced mines as well as Abandoned Explosive Ordnance (AXO) such as discarded ammunition, caches and stockpiles, which may be found in South Sudan.

The range of ordnance commonly found in South Sudan includes air-dropped bombs, guided missiles, rockets and artillery, cannon ammunition, shoulder launched munitions, mortars and grenades. There is no record of the use of nuclear, chemical or biological munitions in South Sudan, so they are not addressed in this chapter. Similarly there is no record of the use of Depleted Uranium so that also is not addressed, but White Phosphorous does exist in South Sudan and any agency operating here should be prepared to deal with it. The wide variety of size and complexity of ERW requires special attention to be given to the management of EOD and the competencies required to deal with the varying devices and situations.

1.2. GENERAL PRINCIPLES

EOD may be undertaken both inside and outside of a minefield, and may involve a single ERW, a number of dispersed ERW in a specific location, or stockpiled ammunition.

The establishment and preservation of a safe and effective EOD capability will require varying levels of expertise.

EOD operators are only authorised to deal with those items and situations for which they have been trained and assessed as competent to undertake.

EOD organizations should only instruct operators to undertake tasks that they are appropriately trained and experienced to carry out.

Whenever EOD operations are conducted the safety of the personnel involved is to be the primary concern, while all reasonable efforts to minimize damage to property should be pursued.

1.3. TRAINING AND QUALIFICATIONS

EOD training and qualifications should be appropriate to the ERW threat encountered in South Sudan. The training and qualifications of deminers carrying out EOD activities shall satisfy the requirements and policies of the NMAA/UNMAS-SS and be in accordance with IMAS 09.30. The following is a guide:

1.3.1 IMAS Qualification Levels

Level One EOD qualification demonstrates the competence to carry out single item in-situ demolitions. It may be restricted to those particular item on which an individual has been trained or limited by the maximum calibre or explosive quantity of the item to be destroyed.

Level Two EOD in addition to the skills of a Level 1 (EOD) qualification, a Level 2 (EOD) demonstrates the competence to determine when an item is safe to move, and the ability to carry out multi-item

demolitions using either ring mains or line mains to connect charges affixed next to each item to be destroyed.

Level Three EOD in addition to the skills of a Level 1 and 2 (EOD) qualifications a Level 3 (EOD) qualification enables the holder to conduct render-safe procedures and final disposal of any type of explosive ordnance on which the individual has been trained – including the conduct of logistical demolitions up to 50kg NEQ.

Level Three + EOD in addition to the skills of a Level 1, 2 and 3 (EOD) qualifications, a Level 3+ (EOD) qualification is for advanced EOD operators who have been trained and are qualified to conduct specialist disposal tasks.

FOR ALL QUALIFICATIONS THE TRAINING INSTITUTION IS REQUIRED TO STIPULATE EXACTLY WHAT ITEMS OR ACTIVITIES THE HOLDER IS TRAINED TO DESTROY OR CARRY OUT, AND UNMAS SUDAN SHOULD CHECK THEIR VERACITY WITH THE CERTIFYING AGENCY.

1.3.2 Explosive Ordnance Disposal Competencies in South Sudan

Within South Sudan the following competencies will be considered core to the evaluation of any individual's capacity to operate in the country.

Level One Disciplines:

- Recognition of mines and Land Service Ammunition deployed in South Sudan.
- In situ demolition of land mines and specific items of ordnance as named on the certification, and using donor charges as stipulated in the respective organisation's SOP
- Safety fuse initiation of explosive charges including the calculation of burning time
- Electrical initiation of explosive charges
- Construction of pre-designed protective work arrangements for single items

Level Two Disciplines:

- Identification of fusing modalities used in ordnance in South Sudan
- Recognition of fired and unfired ordnance
- Determination of whether an item is safe to move
- Pulling drills
- Preparation and use of ring mains
- Preparation and use of line mains
- Incineration of small arms ammunition using a closed incinerator

Level Three Disciplines:

- Open burning of explosive ammunition
- Calculation of range danger areas
- Use of pyrotechnic tools (torches or deflagration powder)
- Render safe of fused ammunition using a de-armer
- Construction of protective works
- Conduct of Multi item demolitions in bulk demolitions according to a pre-determined plan

Level Three + Disciplines:

- Preparation of licenses of Central and Temporary Demolition Sites
- Fuse removal using a rocket wrench

- Disposal of White Phosphorous
- Planning of protective works
- Planning of multi item demolitions in bulk demolitions including formulation of a demolitions order

1.3.3 Accreditation

All operators are required to present their training certificates to UNAMS S Sudan. That certification should detail the exact competencies upon which the individual has been trained, and should be supported by evidence of practical experience in the competencies. It is permissible for any operator to be accredited for additional competencies outside his/her core group. This will be achieved by first demonstrating that the relevant training for the additional skill set has been carried out followed by a demonstration of the competency.

NMAA/UNMAS S Sudan shall accredit all EOD operators prior to them commencing work in South Sudan. The accreditation process shall comprise of both written and practical assessments designed to verify the documented competency of the operator. UNMAS S Sudan shall re-assess any operator after any significant EOD incident in which they are involved or after a failure in a Quality Assurance procedure.

Should any individual fail an accreditation then a period of one week shall be imposed for retraining before re-accreditation shall take place.

Individuals are to be assessed according to the competency sets listed above and will be authorized to conduct those competencies on which they have been accredited.

1.4. DEFINITIONS

The following definitions are not included in the glossary but are applicable in terms of this NTSG:

Central Demolition Site (CDS) – an area authorised for the destruction of bulk ERW this may be for repeated or singular use.

Net Explosive Quantity/Content (NEQ/NEC) – the total amount of explosive material contained within a given item of ammunition .

All Up Weight – the gross weight of a demolition including all ammunition items, packaging, donor charges, and ancillary material used in a demolition

Primary Fragmentation – projected elements from an explosive event fragmentation that were originally part of a mine/ERW.

Secondary Fragmentation – projected elements from an explosive event that were not part of the exploding device, most notably projected stones and earth.

Condensed Explosive – Explosive charges and those items of ammunition such as thin skinned anti-tank mines that contain minimal fragmentation

Safe to move – safe to move ammunition is ordinarily considered to include those items for which there is no inherent danger of detonation through movement.

Ammunition item – any item containing explosives that is not affixed to another item. Thus a fuse is independently considered to be an ammunition item but when it is affixed to a projectile the entire unit is considered to be a single item.

Blind items – blind items are those that are armed and fired which have failed to detonate either through malfunction or design and which therefore have a significant risk of detonation through movement and especially impact or shock.

1.5. REQUIREMENTS AND PROCEDURES

The following requirements and procedures shall be applied during EOD operations:

1.5.1 In situ disposal

Wherever possible and/or practicable mines/ERW shall be destroyed in-situ. This is to be achieved by means of detonation or by pyrotechnic attack.

Agencies are required to indicate through their SOPs for all ammunition natures commonly found in South Sudan, the charge placement that its operators will adopt as well as the minimum size of charge to be used.

Whenever explosives are used a suitable protective cordon shall be established around the item o ensure the safety of the general public. Anyone remaining within the cordon, such as the EOD operator initiating the action should be under protective cover.

Ordinarily the cordon should not be collapsed, other than for supervised/escorted transit through the site, until all items on the day’s disposal plan have been destroyed. Only in the most exceptional circumstances may blind items be left overnight at a demolition site, any intention to do so should be approved by the local UNMAS office.

In South Sudan the following minimum protective distances shall be applied:

Item	Buried	Surface
AP Blast mine	100	100
AP Fragmentation mine	250	250
20-37mm Cannon ammunition	100	100
40mm Grenade	100	100
Hand grenade	100	100
51/60mm Mortar	100	150
81/82mm Mortar heavy bodied	100	150
81/82mm Mortar light bodied	100	100
Cluster munition	100	100
AT Mine	300	300
RPG7	100	150
57mm Rocket	150	200
80mm Rocket	200	250
120mm Mortar	200	250
100mm Projectile	200	250
122mm Projectile	250	400
100kg A/C bomb	300	600
250kg A/C bomb	500	1000
500kg A/C bomb	600	1250

1.5.2 Alternative Techniques

If local conditions prohibit the use of explosive or pyrotechnic attack, on account of damage to infrastructure or local bans on generating explosions, then alternative disposal techniques should be applied. These may include the use of render safe techniques, such as the use of a de-armor, rocket wrench or cracker-barrel to remove the fuze and allow the removal of the ERW to a safe location for disposal, or the use of low-order techniques aimed at minimizing the scale of the blast generated.

Agencies are required to detail, in their EOD SOPs, which alternative techniques they are equipped to deploy and the methodology and constraints for their use.

1.5.3 Movement of blind ammunition

The security and political situation in South Sudan is such that at times operators will be prevented from carrying out in-situ demolitions of blind items. On such occasions there may be reasonable justification for movement.

Should an agency wish to move blind items it must, through its Standard Operating Procedures, detail the conditions under which such an action will be sanctioned. The SOP should further detail the method by which an item is first moved (pulled) and then how it may be transported, and the limitations thereafter, such as how far it may be moved.

The SOP must also detail:

- The internal authority needed to approve the movement of items,
- The supporting evidence that must be gathered in order to approve the movement, and
- The way that the approval is documented and communicated.

The movement of blind items is to be considered an exceptional option and is not to be routinely approved. The Regional UNMAS office is to be informed of all approvals for the movement of blind items.

1.5.4 Range Danger Areas Multi Item Demolitions

Mine action organisations SOPs shall adhere to the formulae presented in IMAS Technical Note 10.20 Explosion Danger Areas¹. These may briefly be summarized as follows:

- **For BULK demolitions of cased ammunition:** **R = 444 (AUW)^{1/6}**
- **For the disposal of condensed explosive²** **R = 130 (NEQ)^{1/3}**
- **For items arranged linearly not stacked³** **R = 370 (AUW largest item)^{1/5}**

In all case R is measured in metres and AUW/NEQ in kg.

A register of all-up weights and net-explosive quantities, to be referred to when calculating range safety limits, shall be maintained by the UNMAS S Sudan Chief of Operations and updated registers distributed to all accredited agencies on a regular basis.

For vertical limits see para 1.13.

In all instances wherever possible, in order to minimize the hazard of projected fragmentation, demolitions should be conducted below ground level in steep sided narrow trenches.

¹ https://www.mineactionstandards.org/fileadmin/MAS/documents/technical-notes/TN_10.20_01_2001_Explosion_Danger_Areas_V_2.0_Amd_1_2.pdf

² Or very thin skinned items such as anti-tank blast mines (i.e. without EFP)

³ See reference 1 for conditions under which this may be applied.

In addition on those occasions where cased ammunition is being destroyed and where the required safety distance cannot be reached, protective works should be put in place to mitigate against the effects of projected fragmentation.

1.5.5 Protective Works

1.5.5.1 General Provisions

Protective works are to be implemented whenever cased ammunition is destroyed and the safety distances for All-Up Weight cannot be achieved.

As a general rule EOD operators should plan on 40 sandbags of soil or earth per 1kg of explosive.

For buried⁴ ammunition 20 sandbags per 1kg of explosive is required

A standard sandbag is taken to be any bag measuring 60cm x 30cm and containing at least 5kg of soil or sand but not filled with rocks or other material that might be projected as fragmentation. Differently sized packaging may be used as long as the required mass of tamping is achieved.

Alternatively items may be buried below ground in square sided narrow trenches in such a way that tamping is achieved through the unexcavated earth that lies above the upper layer of donor charges. An explanation of this methodology and recommended trench depths and tamping levels is included as Annex A to this chapter.

For the disposal of single items standard sandbag surround designs should be included in operator SOPs which their staff may then implement as a routine procedure.

1.5.5.2 Ground Shock

Whenever a large demolition takes place close to an item of infra structure there is a possibility of the shock wave generated by the blast being transmitted through the ground and impacting upon foundations. This concept is known as “ground shock”. In order to mitigate against ground shock a trench is to be dug to a depth of at least 0.7m below that of the item to be protected in order to prevent the direct transfer of pressure. No props are to be used to support the walls in any way that they might facilitate the direct transfer of shock from one wall to the other.

1.6 INITIATION METHODS

Non-electric or Electric detonators may be used to initiate explosive charges. The following applies to whichever initiation method is used:

1.6.1 General

In general when preparing to initiate a demolition the following rules should be adhered to:

- Crimping of detonators, attaching of detonators, final placement of charges and “All Clear Checks” at the completion of a demolition are a ‘**one person drill**’ to minimise the risk to personnel. The ‘All Clear Check’ shall only be completed by the OIC of the disposal site.

⁴ Buried items are those that are 2.5 times their length below ground

- SOPs relating to demolitions shall be strictly adhered to and shall include the following safety precautions when conducting either electrical or non-electrical methods of initiation:
- Electrical Initiation is the preferred method to be used whenever there is a possibility of a cordon being breached.
- SOPs should detail the circumstances under which each method is to be used

1.6.2 Electrical Initiation

- The firing point shall be sited outside of the fragmentation hazard zone or be suitably protected against the effects of fragmentation and blast caused from the demolition.
- All electrical firing circuits shall be sited a minimum distance of 300m from the nearest radio or radar transmitting aerial when the wattage output is unknown.
- The minimum safety distance from all HF vehicle radio transmitters is 160m.
- The minimum safety distance from all VHF radios is 20m.
- Anti-static precautions shall be taken prior to handling any electro-explosive items.
- A wait time of 10 minutes shall be applied for all electrically initiated misfires.

1.6.3 Non-electrical Initiation –

- This may be used when it is considered practical in controlled environments such as minefields.
- The minimum length of safety fuse permitted to be used per firing serial shall be equivalent to two minutes of burning time.
- The first and last 300mm of the safety fuse coil shall be discarded.
- SOPs shall document the rules for safety fuse length calculations.
- In the event of a misfire a minimum period of 30 minutes shall elapse before moving forward to investigate the misfire.

1.7 DISPOSAL OF WHITE PHOSPHOROUS

White Phosphorous (WP) ammunition is found in South Sudan, by its nature it has additional hazards and as such its disposal is subject to additional rules:

- WP ammunition is to be disposed of separately from other ordnance.
- It is to be destroyed on the surface with explosive attack used to either open the case or to consume the filling
- When explosive attack is used to consume WP through detonation then a ratio of 4kg of explosive to 1kg of WP should be used.
- When explosive or pyrotechnic attack is used on the surface, then adequate separation of rounds must be put in place to mitigate against the effects of bursting charges.
- Whenever WP is destroyed the explosive attack should either be laterally to burst charges open or upwards to project WP into the air to burn, but it should not be driven into the ground where it might be suffocated and then ignite on subsequent exposure to the air.
- Whenever WP is stored, transported, or destroyed protective equipment should be used, and tanks of water should be on hand in which any smoking round can be immersed.

Agencies operating in S Sudan should detail the methodology that will be used in the disposal of WP.

1.8 DESTRUCTION OF SMALL ARMS AMMUNITION (SAA)

Small Arms Ammunition is considered to be solid shot rounds of a calibre up to and including 14.5mm. Agencies should wherever possible destroy small arms ammunition in closed incinerators. Mine action organisations are to include an SOP detailing the techniques, equipment and safety procedures for the burning of SAA, as part of their EOD SOP.

For very large quantities of ammunition, especially of 14.5mm calibre, agencies should consider using trenches.

1.9 OPEN BURNING OF AMMUNITION

Open burning of ammunition is a well-established and accepted practice in South Sudan. Prior to conducting any burn the following precautions should be taken.

- All ammunition inspected to determine it is not of a nature that will detonate through burning.
- Items with bursting charges are not to be included in the burning operation
- A safety cordon is established that is appropriate to 2/3rds the limit for a high order detonation of all items involved.
- An initiation method is adopted that allows time for the operator to be in a safe position when explosive begins to burn.

Agencies are required to details their methodology for open burning in their SOPs.

1.10 EOD REPORTING

Comprehensive reports are required following the completion of an EOD task. The destruction of ERW during spot EOD tasks shall be recorded in the IMSMA Survey and Hazard Report, ensuring the appropriate section on EOD spot tasks is completed. All other EOD tasks shall be recorded in the IMSMA Completion Report and highlighted in the organisation daily progress report.

1.11 DEMOLITIONS ORDERS

1.11.1 General provisions

Whenever demolitions involving the stacking of multiple items are carried out a demolitions order should be submitted for approval to the respective regional office of UNMAS/NMAA. That order should clearly indicate:

- The range limits: range in (m), All Up Weight in (kg), NEQ in (kg)
- The sentry positions
- The pit location
- The firing point
- The list of serials to be conducted

1.11.2 For each serial

- The ammunition to be destroyed

- The sequence in which the ammunition will be layered in the pit
- The donor charges to be used
- The means of initiation

Demolitions orders are to be submitted at least 24 hours in advance of the intended initiation time and are to be formally approved by the regional UNMAS office.

All demolitions orders involving the destruction of more than 250kg in a single pit or 1,000kg of ammunition overall are to be approved by the UNMAS Chief of Operations.

A specimen demolitions' order showing the minimum detail to be included is attached as Annex B to this chapter.

1.12 CENTRAL AND TEMPORARY DEMOLITION SITES

1.12.1 General Provisions

The terms Central and Temporary Demolition Sites (CDS and TDS) are inter-changeable. A disposal site is an area authorised for the destruction of munitions and explosives by detonation and burning. These in turn are referred to as demolition grounds and burning grounds and may be co-located on a central disposal site (CDS). Mine action organisations may develop a CDS for use during field operations but these shall be approved and licenced by the NMAA/UNMAS-SS prior to their use.

Wherever possible agencies should aim to avoid using former demolitions sites used by local forces or UN contingents.

CDS shall be sited to ensure that the hazards associated with the destruction operations are reduced to a tolerable level and the environment should be protected. IMAS 11.20 Principles and procedures for open burning and open detonation operations should be read in conjunction with this Chapter.

The minimum details required for the documentation of a demolition site are outlined within the specimen dems order at Annex B, but include:

- Pit location
- Firing point
- Sentry Positions
- Range limits
- Associated Maximum All up Weight
- Associated Maximum NEQ
- Site specific special considerations

Agencies shall document within their own SOPs the rules for the adoption and use of CDS.

1.12.2 Authority and Licencing

Once a suitable CDS has been identified, all details including the explosive limit (maximum NEQ), a map and a scale drawing of the site and an Explosive Safety Trace shall be forwarded, via the regional UNMAS office, to the NMAA/UNMAS-SS. This shall be evaluated and a recommendation for approval/non-approval as appropriate shall be forwarded to the Organisation.

There is no requirement to permanently mark Central Demolition Sites in any way.

A master map and other relevant details of the approved CDS shall be kept with the NMAA/UNMAS-SS.

1.12.3 Closing of a CDS

At the completion of each demolitions serial the following actions are to be taken:

- The range area shall be walked to check that no item containing any explosive content (kick-outs, partial detonations, or stray items of ammunition) remains.
- All ERW scrap shall be removed or buried in which case its location shall be record on the completion form.
- All demolition or burning pits shall be filled and all markings and artificial structures removed.
- UNMAS S Sudan is to be notified and they may conduct an inspection.

1.13 NOTICE TO AIRMEN (NOTAM)

A Notice to Airmen (NOTAM) shall be issued when:

- The NEQ in a single serial of a demolition exceeds 25kg
- The demolition site is within 1k of any airport or main Helicopter Landing Site

In general NOTAMs shall be issued to the relevant UNMAS S Sudan regional office 3 days in advance of the anticipated demolition activity.

The request for the NOTAM shall include the following details:

- Location of the demolition pit
- Maximum NEQ in any demolition serial
- Planned date and time of detonations
- Safety distances for each serial including vertical limit
- Name radio call sign and frequency used by the demolitions officer
- Contact details (including telephone number) of the implementing agency

In calculating the vertical limit for demolitions the following formulae should be used:

For single ammunition item only - $D = 314(AUW)^{1/3}$

For multi-item fragmenting munitions - $D = 470(AUW)^{1/5}$

1.14 OPERATIONAL SEQUENCE

1.14.1 General Sequence

For the process of **bulk demolitions**, **all actions involving aircraft bombs** and all demolitions involving **White Phosphorous** the following sequence is to be followed:

- Implementing agency conducts assessment and drafts demolition order
- Demolition order submitted to UNMAS regional office for approval
- Approval for demolition activity given by regional office

- Demolition process takes place

1.14.2 Stop-No Culture

It is important that all EOD procedures are carried out safely. If, at any phase of an EOD operation, any individual has cause to believe that an activity will fail, or will incur unreasonable risk and particularly incur harm including reputational damage, that person should instruct the procedure to stop and refer it the UNMAS SS Chief of Operations for review.

1.15 RESPONSIBILITIES

1.15.1 NMAA/UNMAS-SS

The NMAA/UNMAS SS shall where applicable establish and/or maintain:

- National standards for the qualification of EOD operators.
- National standards for EOD procedures.
- Review and approve the operational SOPs of all Mine Action agencies conducting EOD in S Sudan
- A process for the accreditation of all organisations and individuals involved in EOD operations.
- The capability to monitor the effectiveness and safety of mine action organisations involved in EOD operations
- National systems for EOD incident reporting

1.15.2 Mine Action Organisations

Mine action organisations shall:

- Establish and maintain SOPs for EOD operations which comply with this NTSG and IMAS, and submit them to NMAA/UNMAS SS for review and approval.
- Recruit, train and maintain appropriate staff to carry out EOD operations.
- Maintain a register of qualified personnel and any amendments to their accredited competencies.
- Apply the detail of accredited SOPs during EOD operations in a consistent, effective and safe manner.
- Cooperate with NMAA/UNMAS-SS staff responsible for implementing policy and monitoring EOD operations.

Annexes

- | | |
|---------|-----------------------------|
| Annex A | Below ground tamping tables |
| Annex B | Specimen Demolitions Order |

Calculation of equivalent tamping mass

When ammunition is destroyed in a backfilled trench 'w' wide and 'l' long with the upper surface of the ammunition at a depth 'd' below ground level, with soil of density 'σ'

Then the total mass of soil M that acts as tamping on that demolition may be calculated using the following formula

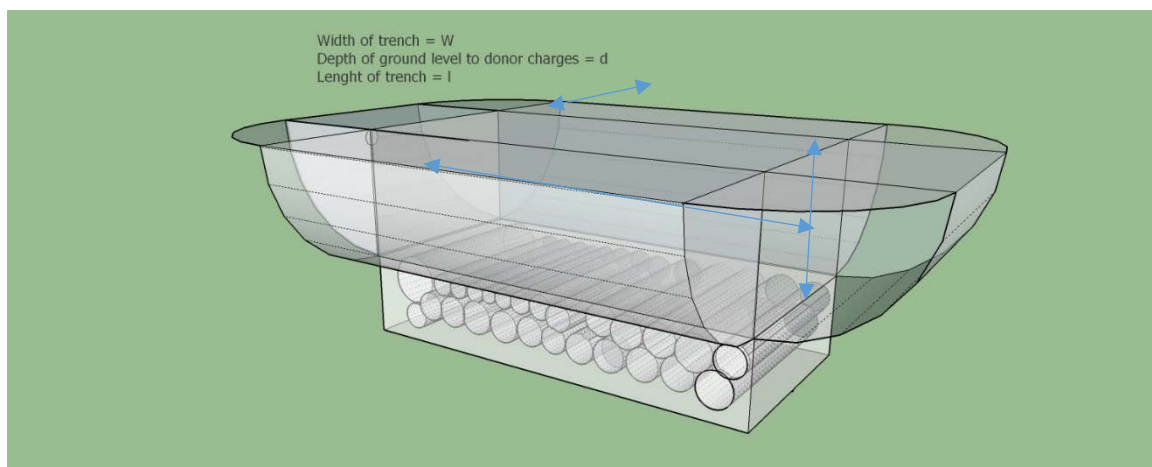
$$M = \sigma ((w \cdot d \cdot l) + 2/3 \pi \cdot d^3 + \pi \cdot d^2 \cdot w/2)$$

And the Net Explosive Quantity of Explosive that this mass of soil will tamp is given by the formula:

$$NEQ = \sigma ((w \cdot d \cdot l) + 2/3 \pi \cdot d^3 + \pi \cdot d^2 \cdot w/2) / k$$

Where k is the equivalent weight of twenty 5kg sand bags or 100kg.

For ease of use the following tables summarize these calculations using 1,500kg as the average soil density:



Tables of Equivalent Tamping for disposal of cased ammunition

Density of Soil 1500 kg/cubic metre

Depth from ground level
to upper surface of
ammunition **0.5 m**

Length of trench	Width of trench		
	0.6	0.7	0.8
1	9.43	10.01	10.60
1.2	10.60	11.19	11.78
1.4	11.78	12.37	12.96
1.6	12.96	13.55	14.14
1.8	14.14	14.73	15.32
2	15.32	15.91	16.50

Figures indicated within the table indicate the Net Explosive Quantity that the trench may contain in order for the demolition to be considered as properly tamped

Depth from ground level
to upper surface of
ammunition **0.7 m**

Length of trench	Width of trench		
	0.6	0.7	0.8
1	18.5	19.6	20.8
1.2	20.8	21.9	23.1
1.4	23.1	24.2	25.4
1.6	25.4	26.6	27.7
1.8	27.7	28.9	30.0
2	30.0	31.2	32.3

Depth from ground level
to upper surface of
ammunition **1 m**

Length of trench	Width of trench		
	0.6	0.7	0.8
1	37.7	40.1	42.4
1.2	42.4	44.8	47.1
1.4	47.1	49.5	51.8
1.6	51.8	54.2	56.6
1.8	56.6	58.9	61.3
2	61.3	63.6	66.0

Organisational
LOGO

**South Sudan
Demolition Order**

Team:			
Location:			
Date:			
Time:			
Key Grids:			
• Nearest Village:			
• Control Point:			
• Demolition Pits:			
• Range Limits	Yes / No	<i>If Yes State</i>	

DESCRIPTION

Source of Munitions

--

Directions from Camp to Demolition Site

--

SPECIAL CONSIDERATION AND DEVIATIONS FROM SOP

--

KEY PERSONALITIES

OIC of Demolitions	
2IC Of Demolitions	
Cordon Commander	
Team size available	

Example Only 1 x T/L in charge of the operation, 3 x Deminers deployed as sentries and help the 2IC to lay firing cable before they are deploy to their sentry positions, 1 x Team medic available for any emergency and Team safety Driver ready for casualty evacuation and Team communication with HQ.

RANGE LIMITS

Distance	
AUW	0
NEQ	0

PIT SERIALS

Fill in the table, one for each serial. List items in descending fashion depending on the charge to weight ratio

Ser	Nature & Designation	N° to Destroy	AUW Per Item	NEQ Per Item	Total AUW (g)	Total NEQ (g)
1					0.00	0.00
2					0.00	0.00
3					0.00	0.00
4					0.00	0.00
5					0.00	0.00
6					0.00	0.00

DEMOLITION STORES

1	Pentolite				0.00	0.00
2	Detcord					
3	Detonator					
4	SM20				0.00	0.00
5	SM33				0.00	0.00
6					0.00	0.00
GRAND TOTAL (Kg)					0.00	0.00

Danger Area: Bulk Dems of Cased Munitions	0.00
Danger Area: Disposal of Condensed Explosives	0.00
Danger Area: Items stacked linearly not stacked	0.00

NOTAM REQUIREMENT [Reference NTSG Part 1, Chapter 6]	Yes	No
<i>If Yes Insert Details:</i>		

DEMOLITION SITE DETAILS

Provide Google Map with following references:

• Demolition pit location labelled on the map?	Yes	No
• Firing point location Yes labelled on the map?	Yes	No
• Each sentry location labelled on the map?	Yes	No
• Diameter/range Superimposed on the map?	Yes	No
• Medical point labelled on the map?	Yes	No

CASEVAC PLAN

• Appropriate Medical Facility:	
• Type of Facility:	
• Location:	
• Evacuation Method:	
• Location of HLS if applicable:	
• Distance:	
• Driving:	

Medical Facility PoC contact details:	Contact Name:
	Contact Number:

EXTERNAL NOTIFICATIONS

(As Applicable)

LOCAL RESTRICTIONS

There **are / are not** any restriction from the local communities.

Dems IC Name: _____

Signature _____

Site Map Showing Danger Area





South Sudan

National Technical Standards Guidelines

Date: 1st October 2015

Chapter 06

6 Notice to Airmen

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6.1. Introduction

- a. A NOTAM shall be submitted when the total of any one explosive charge exceeds 25kg, this includes the explosive quantity of the donor charge. The only exception to this rule is demolitions within 1 km of any airport or main HLS, which require a NOTAM at all times. This guideline shall assist in the authorisation and reporting of the use of explosives by mine/UXO clearance organisations. All explosive demolitions shall be formally co-ordinated by mine action organisations.
- b. Whenever mine action organisations are using explosives for any reason, on or off a recognised Central Demolitions Site (CDS), with or without a NOTAM, they shall inform the local military unit. Demolitions shall not proceed without military knowledge and approval.
- c. It is the responsibility of the mine action organisation carrying out any demolitions to inform and co-ordinate their activities at the local level with military units and where necessary and/or required other national, governmental and local authorities.

6.1.1. Submission of NOTAM

- a. All NOTAMs shall be submitted direct to the NMAA/UNMAS-SS who are to disseminate it to both UNMISS and WFP Air Operations and to the local office of UNDDSS.
- b. A NOTAM shall always be submitted 7 days in advance of a planned demolition. The only exception to this 7 day rule is when exceptional circumstances and the tasking process dictate otherwise.

6.1.2. NOTAM Information

- a. NOTAMs are required in order to warn aviators of the use of explosives in any area, so that these areas are not over-flown at critical times. However the information may also be used to warn/inform other interested parties.
- b. The following details are required:
 - **Location of Demolition:** This shall be in the form of GPS coordinates in longitude/ latitude.
 - **Maximum Quantity of Explosives to Be Used In Any One Detonation:** This shall be reported in kilograms.
 - **Planned Date of Detonation:** If no time zone is shown on the NOTAM, local time shall be stated. If demolitions are to be carried out at the same

time each day, daily timings should be stated on a consolidated weekly NOTAM.

- **Planned time of detonation:** This shall be a stated specific time.
- **Safety distances for charges used:** Horizontal safety distances shall be reported in metres. Vertical safety distances shall be reported in feet. Vertical safety distances shall be calculated by adding 500 feet additional safety distance to the horizontal safety distance. Maximum vertical safety distance allowed within 10km of an airport or main HLS is 1500 feet, unless prior approval is granted through the NOTAM system.
- **Team Details:** Name, radio call sign and frequency of demolition supervisor.
- **Contact Details:** Name and telephone number of contact at mine/ERW clearance organisation's headquarters or field office.
- **Additional Information:** This shall include the reason for the demolition. e.g. destruction of ERW. All ERW, anti-personnel mines and anti-tank mines for explosive destruction shall be assessed by weight of explosives contained inside them, and this figure included in the statement of net explosive quantity (NEQ) in kilograms.

6.1.3. Emergency NOTAM

- a. When an emergency demolition is necessary, such as for the destruction of ERW in a dangerous location which poses a threat to the immediate population or asset the details required for NOTAM shall be passed on to the NMAA/UNMAS-SS.
- b. An Emergency NOTAM shall be dealt with on a case-by-case basis. These should be the exception rather than the rule. In all such cases the means of initiation shall be electrical and the time of detonation shall be carefully controlled to ensure that the airspace is clear of aircraft.
- c. Normal safety precautions shall be taken whenever the explosive destruction of any item of ordnance is carried out. These safety precautions shall include visual inspection of the airspace above and around the demolition area to encompass the implemented safety distance.
- d. If explosive charges or the explosive destruction of ordnance is carried out within 1 km of an airport, the organisation carrying out the explosive demolitions should contact the airport control tower or authority in order that local co-operation is achieved.

6.1.4. Example NOTAM

(NOTAM)

From							
To							
For Information							
Subject		NOTAM Request					
Ref No							
A.	Location (name)						
i.	Co-ordinates	Latitude		Longitude			
ii.	Map Name						
iii.	Sheet No						
B.	Quantity of Explosive per Charge						
C.	Date		Time from		Time to		
D.	Safety Distances; Horizontal (m)			Vertical (ft)		(Horizontal + 500')	
E.	Name & Call Sign of Contact						
F.	Name & Tel of Contact at Org HQ						
G.	Call Sign			Frequency			
H.	Additional Information						

6.2. Responsibilities

- a. NMAA/UNMAS-SS shall assist the mine action organisations in processing NOTAMs and shall conduct any liaison required with United Nations Air Operations.
- b. Mine action organisations shall accurately complete a NOTAM request as displayed in Para 6.1.4 and submit to the relevant NMAA/UNMAS-SS Sub Office at least 7 days prior to the planned demolition.



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Chapter 07

7 Battle Area Clearance

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7.1. Introduction

- a. BAC is the systematic search and controlled clearance of hazardous areas where the hazards are known not to contain mines. It involves the removal and/or destruction of all ERW and their component parts, which would otherwise pose a significant threat to the local population. Whilst individual areas may vary from location to location the basic principles of conduct shall remain the same.
- b. BAC may involve the clearance of bunkers and ammunition stockpiles. This includes stockpiles left in any storage facility whether purpose built or a field storage facility. This type of clearance requires a defined, controlled and systematic clearance
- c. BAC planning shall account for all types of ERW likely to be encountered and the appropriate procedures for disposal. This includes the use of suitably qualified personnel, using appropriate/serviceable equipment, stores and supplies.
- d. Personnel who have successfully completed the Basic Deminer Training Course may be used to man BAC Teams following specific BAC and basic EOD training. BAC Supervisors shall be qualified to EOD Level 3 and BAC Team Leaders shall be qualified to a minimum level of EOD Level 2.
- e. MDD may be used for BAC once accredited; in which case the detailed BAC drill need shall be described in the mine action organisations accredited SOP. Use of MDD in BAC is not described in further detail in this standard.

7.2. Basic Procedures

7.2.1. Phases of BAC

- a. All BAC tasks shall have the following five phases which may differ in proportion and conduct depending on the task type and task priority given by the NMAA/UNMAS-SS.
- b. **Reconnaissance:** This is the identification and selection of a hazardous area for clearance.
- c. **Survey:** This is the definition, registration and mapping of a hazardous area. With areas that have been subjected to sub-munitions strikes this shall mean defining the actual strike footprint.
- d. **Marking:** This is the physical marking of the defined hazardous area which, regardless of the method of search to be employed, shall conform to the requirements of '*Site Preparation and Setting Out*' (see Chapter 2) and

include benchmark, start point, turning points, boundary lines and lanes, intermediate lanes and other defined requirements.

- e. **BAC** This is the clearance by systematic search, detection and removal of all ERW within the marked area.
- f. **Reporting:** This is the accurate recording of the cleared perimeters, mapping and the final handover to the NMAA in the form of a completion report.

7.3. Methods of Search & Minimum Guidelines

- a. The clearance methodology and assets to be used will be dependent on a number of factors i.e. vegetation, terrain, metal contamination and obstacles etc. A combination of different search methods shall normally be employed in order to achieve the desired result. Appropriate levels of PPE to be worn will be determined by the threat assessment and methodologies used.

7.3.1. Methods that may be used include:

- a. **Visual Search:** is the most effective method of removing the immediate threat from a hazardous area. It shall be strictly controlled to ensure that the complete area is systematically searched. The following applies:
 - The vegetation, terrain and environment shall dictate the number of deminers making up a BAC team and the spacing between these individuals.
 - The TL shall ensure he/she is able to see and hear all deminers at all times.
 - Each deminer shall visually search the area he/she is responsible for and be able to hear the TL at all times.
 - BAC teams shall not search continuously for more than 60 minutes without at least a 10-minute break.
 - A team shall be allocated a 'box' to search, which is further segmented into 'lanes' of a width normally around a meter
 - A minimum safety distance of 50 metres shall be maintained between each BAC team but it may be necessary to increase this depending on the fragmentation threat.
 - Once a box has been searched and all ERW found are marked, the team may then move onto the next box.

- Searching shall always be carried out in complete silence, except for instructions given by the TL and on the identification of an ERW by a deminer.
 - Any deminer who identifies an item of ERW shall immediately alert the remainder of the team and the TL. Under no circumstances shall the ERW be moved or disturbed at this stage.
 - After an evaluation by the TL the ERW shall be appropriately marked.
 - In those areas where sub-munition clearance is being conducted, the location of sub-munition strike marks shall be recorded to assist in the identification and future evaluation of the strike area footprint and boundary.
 - All items of ERW that have been identified shall be rendered safe either by disposal by detonation/burning or if safe to do so, recovered to a central storage area for demolition at a later date. The preferable method of destruction for sub-munitions shall be destroying in situ. Unless the threat can be established that they are safe to move for later destruction.
- b. Instrument Aided Visual Search – used to assist visual search procedures when the density, covering and/or spread of vegetation hinder progress, effectiveness, efficiency and safety. Numbers of deminers, allocation of tasks, adequate supervision and overall conduct of this method of search must take into consideration the use of detectors whilst applying the details of paragraph 3.2a (1) to (12) as closely as possible.
- c. Sub-surface Search – may be employed initially or following a visual search of the contaminated area. Dependent upon methodology and equipment used deminers may work singularly, in pairs or more⁴. The minimum BAC Sub-surface clearance depth is 20cm. The following applies:
- The threat shall dictate the composition of deminers and the spacing between each.
 - The TL shall allocate each deminer a box ensuring he/she is able to see and hear all deminers at all times.
 - Each deminer shall visually and instrumentally search the area they are responsible for and be able to hear the TL at all times.

⁴ Whichever entity is used reference to a single entity in this chapter is made by the term 'deminers'

- A deminer shall not search continuously for more than 60 minutes without at least a 10-minute break.
- The allocated 'box' to search and this shall be further segmented into 'lanes' of no more than 2m width taking into account the restrictions detailed in paragraphs (1), (2) and (3) above.
- A minimum safety distance of 25 metres shall be maintained between each deminer involved in excavation of a signal and may be increased or decreased depending on the fragmentation threat.
- Once all signals have been interrogated and items either removed destroyed or remain for later destruction the deminer moves on to another box.
- Searching shall always be carried out in complete silence, except for instructions given by the TL and on the identification of an ERW by a deminer.
- Constant reassessments of the area including threat assessments shall be made At all times any signal from the instrument that may reasonably be expected to be an item of ERW shall be investigated.
- On location of a sub-surface signal, investigation drills shall be employed as per companies SOP and the extent of excavations only enough as to positively identify the item. Every effort shall be made not to jolt, vibrate, strike or otherwise disturb the item being investigated.
- Any deminer who excavates and identifies an item suspected of being ERW shall immediately alert the TL who will in turn evaluate and mark accordingly. A minimum 50m fade out extension is to be instigated from the last known sub-munition position of the outer perimeter of the strike footprint. As displayed in the diagram below.
- All items of ERW that have been identified shall be rendered safe either by disposal by detonation/burning or if safe to do so, recovered to a central storage area for demolition at a later date. All sub-munitions shall be destroyed in situ. However if there is a need to remove to centralised area permission is to be sought from UNMAS before it being moved.

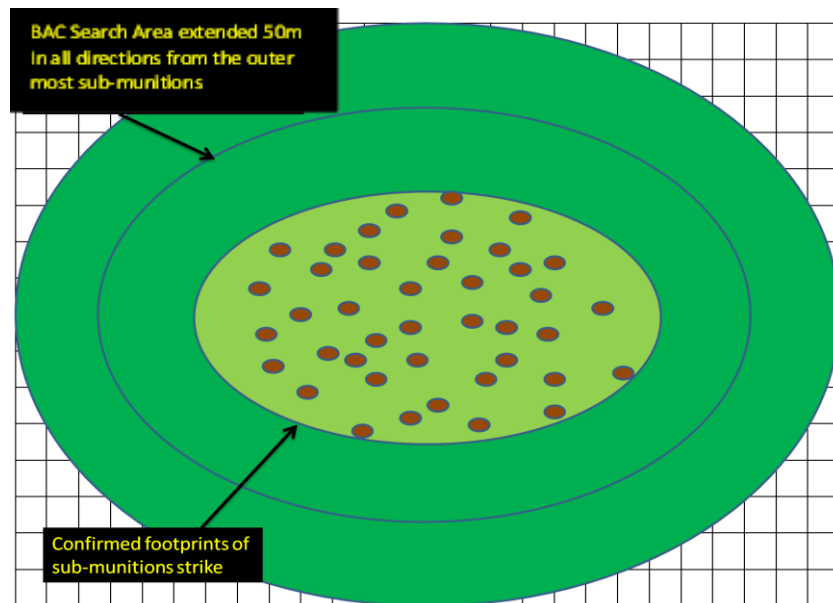


Figure 7-1 BAC Fade Out

- If a mine is found during BAC, the task is to cease immediately and considered as a Mine Clearance Operation with NMAA/UNMAS-SS being informed. A safety procedure to extract the searchers from the minefield is to be defined in the organisations SOP

7.4. Disposal of ERW

- a. All items of metallic scrap, which have been certified, as Free from Explosive (FFE) shall be stockpiled on site and arrangements made for its removal to a final place of disposal.
- b. All ERW shall be disposed of by detonation/burning either in situ (if unsafe to move) or at a CDS (if safe to move) as soon as possible. In circumstances, where disposal cannot take place that day, the item shall be effectively marked, protected and the local inhabitants informed.
- c. Items of ERW that are considered safe to move shall be transported to a pre-designated storage area for future bulk disposal. Excessively large quantities shall not be allowed to accumulate.

7.5. Reporting

- a. Upon completion of a BAC task a Completion Report shall be submitted to the NMAA/UNMAS-SS. This shall include details of all demolitions

conducted, explosive usage, maps indicating the cleared area perimeter points and location of where assets worked. There is also the daily reporting of production and demolitions conducted on the site.

7.6. Responsibilities

a. NMAA/UNMAS-SS shall

- Where possible, specify the area to be cleared and depth of clearance in contracts and agreements.
- Specify the criteria for clearance to allow clearance organisations the flexibility to clear out to the limits of a suspect area.
- Specify the standards and guidelines for QA & QC to be applied to clearance contracts and agreements.
- Accredite organisations to undertake BAC.
- Maintain records of cleared and uncleared land showing the clearance status for each suspected area.
- Specify the core EOD competencies to be applied with clearance organisations.
- Develop national standards for the conduct of BAC operations.

b. Mine action organisations shall:

- Gain accreditation from NMAA/UNMAS-SS to operate as a BAC organisation.
- Establish and maintain SOPs for BAC operations which comply with this NTSG.
- Apply the detail of accredited SOPs during BAC operations in a consistent, effective and safe manner.
- Cooperate with NMAA/UNMAS-SS staff responsible for implementing policy and monitoring BAC operations.



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Chapter 08

8 Mechanical Demining

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8.1. Introduction

- a. Mechanical demining is an essential component of humanitarian mine action and part of an integrated approach with the associated organisational structure, logistic and administrative support to provide sustainability.
- b. Mechanical demining operations may involve a single machine employing one mechanical tool, a single machine employing a variety of tools or a number of machines employing a variety of tools.
- c. A mechanical demining unit refers to one or more machines working as part of a system for example, a front-end loader and a screening plant.
- d. Mechanical tool refers to the working component(s) attached to a machine, such as flails, tillers, sifters, rollers, excavators, ploughs, magnets etc. A single machine may utilise a number of different tools, which may be fixed or interchangeable.
- e. Intrusive machine refers to those machines that are designed to work inside a hazardous area, while the term 'non-intrusive machine' refers to those designed to operate from a cleared or known safe area, with its mechanical tool working in the hazardous area.

8.2. Mechanical Operations

8.2.1. Mechanical Role

- a. When conducting mechanical demining, machines are divided into three distinct roles
- b. Machines designed to detonate hazards – Machines designed to detonate hazards for the purpose of this NTSG shall be referred to as Mine Clearance Machines. These machines are those whose stated purpose is the detonation or destruction of hazards. As a consequence of their use, the necessity for follow-up clearance is reduced,
- c. Ground Preparation Machines – Ground preparation machines may or may not be involved in the detonation, destruction or removal of landmines however they are primarily designed to improve the efficiency of demining operations by reducing or removing obstacles by:
 - Vegetation cutting and clearing
 - Removal of tripwires
 - Loosening soil

- Removal of building debris, boulders, rubble, defensive wire obstacles and other hindrances
 - Processing of soil and debris.
- d. Mine Protected Vehicles For Detection And Survey (MPVDS) – MPVDS are specifically designed to protect the occupants and equipment from the effects of a mine detonation. MPVDS are commonly used during detection and survey operations, where they may carry equipment such as detector arrays, vapour sampling devices or in some cases push or pull a roller. While these operations are not strictly mechanical demining operations involving ‘machines’ and ‘mechanical tools’ some of the work carried out by MPVDS falls into the category of mechanical demining. For example:
- Heavy MPVDS using their wheel tracks to provide an access path for manual sampling teams .
 - MPVDS pushing or towing rollers (a mechanical mine clearance role).

8.2.2. Operational Requirement

- a. **Mine Clearance Machines**: When machines are used for mine clearance operations follow up assets will always be used, before the area is released as cleared. During mechanical clearance where the machine cannot be employed due to the ground conditions these shall be referred to as “Skip areas”. All skip areas shall be marked and follow up clearance shall be conducted before the area is considered cleared.
- b. **Ground Preparation Machines**: When machines are used for ground preparation, they shall always be followed-up by other demining clearance operations such as Mine Detection Dog (MDD), Mechanical Mine Clearance, Manual Clearance
- c. **100% Sub Surface Follow Up** shall be conducted behind the machine and shall be detailed within the mine action organisation’s SOPs. This procedure shall include the following details;
- How the teams shall deploy behind the machine and the methodology employed – MDD, Manual Clearance (Detector/Raking) or Mechanical Mine Clearance.
 - Explain the marking system to be used when conducting the follow up clearance procedure
 - The actions to be taken when a deminer locates an item either in the High or Low Threat Area.

- Clearance procedures for “skip areas”.
 - A 1m safety distance shall be maintained between cleared and uncleared areas.
- d. **Mine Protected Vehicles for Detection and Survey (MPVDS)**: When machines are employed for detection and survey operations, the information they provide shall be followed up as appropriate and determined by an information management process, e.g. leading to a decision to clear the area, mark the area or classify the area as non-hazardous i.e. ‘*no evidence of mines/ERW*’.

8.2.3. Mechanical Land Release

- a. Mechanical land release may be a part of a technical survey process or a part of a clearance operation. Mechanical land release involves a machine being used to indicate or confirm the presence of landmines and/or ERW within a suspected or confirmed hazardous area. The aim is to enable the deployment of other demining assets only in areas proven to contain landmines and ERW.
- b. The scope and extent of mechanical land release operations depends on factors such as the accuracy and completeness of existing information, terrain, vegetation, machine and tool type, mine and ERW types and area reduction procedures used. Generally, the less information available about a hazardous area, the more investigation is required by a machine in order to be able to confirm the location of landmines and define any hazardous areas.
- c. Demining machines may also be used for other functions in support of technical survey and clearance operations. Such functions may include preparing tracks to permit access into areas for demining operations, excavation in support of deep search operations and the removal of debris to enable access to suspected hazards (e.g. under collapsed buildings etc.)

8.2.4. Systems Approach

- a. In mechanical demining, a ‘*systems approach*’ is the application of machines with a combination of tools, or a combination of machines with different tools, or non-mechanical demining procedures applied at different stages during the demining process. The systems approach is about the use of demining machines being integrated with other demining assets (manual or MDD) to ensure the most effective outcome is achieved.

- b. Both ground preparation and mine clearance machines may be used within the systems approach.

8.2.5. Tolerable Risk

- a. Following mechanical mine clearance a risk assessment shall be carried out to determine the type of follow up methodology required before land can be handed over.

8.3. General Requirements

- a. Each machine shall be Tested and Evaluated (T&E) to determine its suitability for the task(s) it is expected to carry out in the conditions in which it shall work.
- b. The operation of each machine shall be assessed and confirmed as safe for the operator and any other person on a mechanical demining worksite.
- c. The protection level for machines shall be sufficient to meet the perceived threat following a risk assessment for the particular task.
- d. SOPs shall be developed for each machine. These SOPs should include:
 - General mechanical operating procedures.
 - Specific operating procedures
 - Procedures detailing the recovery of the machine and extraction of the operator in the event of a machine becoming stranded in a hazardous area.
 - Procedures for the integration of the machine with other machines or demining operations.
 - Procedures to be followed in the event of a fire on a machine covering immediate actions to be taken and ensure the safe extraction of an operator from a hazardous area. (*where an onboard operator is present, machines shall be fitted with fire extinguisher or fire suppressing systems. On no account shall any person be permitted to enter an un-cleared area to fight a fire on a burning machine.*)
- e. On-site accreditation of a machine shall be determined after fulfilling specific T&E and before employment on operations. (Refer to Annex A)
- f. Machines shall not be used with tools, or on tasks, or in conditions for which they do not have on-site accreditation.

- g. Prior to the deployment of any machine to South Sudan, an assessment shall be made to ascertain that suitable in-country infrastructure and support systems are available to ensure that the machine is operationally deployable.

8.3.1. Test & Evaluation (T&E)

- a. T&E of new machines shall be carried out to ensure that a machine is suitable for its intended use in the conditions in which it shall work. IMAS 03.40 should be referred to for guidance on T&E requirements and parameters but in summary the following are the minimum requirements.
 - Performance test – A test to establish whether the machine and its tool(s) is capable of performing the role for which it is intended under comparable and repeatable conditions and to evaluate the manufacturer's specifications
 - Survivability test – Proof of a test to verify that the machine survives the explosive forces used as design criteria.
 - Acceptance Test – A test to ensure that a machine is able to work in the environment it is intended to be used.
 - T&E shall only be conducted in a safe / controlled environment and on authorisation from the NMAA/UNMAS-SS.

8.3.2. Mechanical Records

- a. Mine action organisations shall maintain detailed records of their mechanical and follow-up operations in order to build up a statistical database of information that can be used for an operational decision making.
- b. Reporting on operational performance indicators, such as hours worked, land cleared and landmines and ERW found, is essential to maintain sufficient statistical records. Reporting on non-operational time, such as mechanical breakdowns, transport between sites and logistical delays, may help in understanding the operational constraints and/or in visualising performance trends of particular machines. This may subsequently help an organisation to improve the efficiency of its mechanical operations.

8.3.3. Machine Support

The mine action organisation shall ensure the following:

- a. Appropriate and sufficient provisions for the maintenance and servicing of machines.

- b. Machines are maintained and serviced in accordance with the manufacturers' recommendations.
- c. Maintenance and servicing is carried out by qualified personnel and authorised agencies.
- d. Fire fighting equipment is available at all places where refuelling of machines is carried out.
- e. Routine checks are made on the working components of machines and where working components critical to the effective operation of a machine are damaged or lost they are repaired or replaced before further work continues.
- f. Routine inspections of safety features on machines are carried out and where damage is identified, the damage is repaired before further work continues.
- g. Whenever a machine is subject to a detonation that may have affected the safety of the operation, the machine shall be immediately withdrawn from the hazardous area and inspected.
- h. Where damage to a machine may place personnel in danger from subsequent detonations, the machine shall not return to work until the damage is repaired.
- i. Mechanical operators shall be appropriately trained and qualified in the operation and maintenance of their machines.

8.4. Safety

- a. In addition to routine and normal safety practices employed during humanitarian demining the following safety precautions/procedures shall apply to all mechanical operations:
- b. When using rollers or flails and inspecting the area afterwards through clearance or raking all located mines or mine parts that include the fuse shall be destroyed in situ. Under no circumstances shall these objects be remotely moved, neutralised or recovered because of the possible unstable nature of the mine, firing train or firing train component.
- c. When using ploughs, mines may be remotely pulled to remove the danger of explosive kick-outs when attempting to destroy mines. Once pulled, the mines shall be destroyed by explosive means, either in situ or in a separate disposal area.

- d. If during operations, a hazard is identified which a machine was not designed or approved to be used against, the mechanical operation shall cease and a review of the task shall be carried out.
- e. Machines shall be checked prior to moving from hazardous to safe areas to ensure that no landmines, ERW or hazardous components remain in the working or moving parts of the machine or are attached to the machine.
- f. Communications between the site supervisor, the mechanical operator, the Medic and the sentries shall be in place and confirmed at all times while a machine is working in a hazardous area.
- g. The minimum safety distances as listed in Table 8-1 shall be adhered to.

Ser	Situation	Minimum Safety Distance (m)
(a)	(b)	(c)
1	Between Personnel not wearing PPE and a machine working in suspected AP blast mine areas	200
2	Between Personnel not wearing PPE and a machine working in a suspected AP fragmentation and AT mine areas.	300
3	Between Personnel wearing PPE and a machine working in suspected AP blast mine areas.	100
4	Between Personnel wearing PPE and a machine working in suspected AP fragmentation and AT mine areas.	200
5	Between Supervisor/Remote control machine operator wearing PPE and a machine working in suspected AP blast mine areas.	100
6	Between Supervisor/Remote control machine operator wearing PPE and a machine working in suspected AP fragmentation and AT mine areas.	150
7	Between Supervisor/Remote control machine operator behind an approved blast/fragmentation screen in suspected AP/AT mine areas.	50
8	Between working machines in anti-personnel and anti-tank mine areas.	100
9	Between Personnel not wearing PPE and a machine working in suspected UXO areas.	300
10	Between Personnel wearing PPE and a machine working in suspected UXO areas.	200
1. Any reduction to these distances shall only be authorised by the NMAA/UNMAS-SS on a case by case basis and shall be required to be included in the detail of relevant Implementation Plans.		
2. These safety distances shall be increased when required in accordance to the mine / UXO threat.		
3. When operating a remote controlled clearance machine, from inside a protected vehicle the minimum safety distance from a working machine shall be determined by the level of protection it provides. The manufactures guide for the vehicle should be referred to. In circumstances where this information is not available, the minimum distance for the maximum suspected mine/UXO threat at the task shall be enforced.		

Table 8-1 Minimum Safety Distances for a Mechanical Sites

8.5. Clearance Requirements

- a. The following applies during all mechanical demining operations:
- b. A minimum of 500mm overlap is required for all medium and heavy mine clearance/ground preparation machine attachments during processing lanes.
- c. The clearance lanes should be as straight as possible, which shall ensure a more precise overlap of lanes. If the machine cannot work in straight lines, the overlap should be increased to ensure the required overlap is achieved.
- d. When mechanical clearance has been stopped the operator shall recommence flailing/tilling a minimum distance of 1m back from the location it stopped. This shall ensure an adequate overlap of the area where the flail/tiller operations were interrupted.
- e. An external controller should carefully record all detonations and visible throw-outs of possible mines/UXO. This shall assist the quality assurance and ease the work of manual clearance follow-up afterwards. If the machine is used for technical survey, this information is important in order to determine the exact location of the mined area.
- f. If mines are encountered in an area and the purpose of the clearance is technical survey, clearance should be undertaken from another direction or in another line in order to determine the extent of the minefield.
- g. Prior to deploying machines, certain considerations such as the threat (type of ordnance and depth), the terrain (e.g., vegetation, rocks, slopes), and the purpose of clearance (eg, 100% clearance to the required depth, area reduction, verification, removal of vegetation, loosening of soil) shall be taken into account. Machines may be adjusted accordingly to search for mines at varying depths depending on the task requirement.
- h. The purpose, method and requirement shall be included in the Task Dossier and Implementation Plan. Any deviation to this shall be approved by the NMAA/UNMAS-SS.
- i. Soil expansion (the increase in volume of soil as a result of mechanical processing) shall be taken into consideration when planning follow-up demining. Depth of clearance shall be from the original undisturbed ground level.
- j. Note: The overlap can be measured by doubling the width of either the flail/tiller drum then measure the width of two flailed/tilled adjacent lanes that

have been ground prepared and then subtract the minimum required overlap for either machine/tool, the difference is the “Overlap”.

8.6. Asset Deployment Tool

- a. Table 8.2 details the minimum clearance requirements for mechanical operations conducted in South Sudan.

Table 8-2 Asset Deployment Tool

Asset	Threat	High Threat					Low Threat			
		Items Found			No items found		1st Stage	2nd Stage	Item found	
		1st Stage	2nd Stage	3rd Stage	1st Stage	2nd Stage	1st Stage	2nd Stage	Item found	
Mine Wolf 330 / 370	AP/AT	Tiller/Flail to reach required depth	100% sub - surface follow up	2m x 2m box cleared around item	Tiller/Flail to reach required depth	100% sub - surface follow up	Tiller/Flail to reach required depth	Minimum 50% sub-surface follow up	Revert to HT routine after redefining HT/LT area	
Mine Wolf 240	AP/AT	Tiller/Flail to reach required depth	100% sub - surface follow up	2m x 2m box cleared around item	Tiller/Flail to reach required depth	100% sub - surface follow up	Tiller/Flail to reach required depth	Minimum 50% sub-surface follow up	Revert to HT routine after redefining HT/LT area	
Armtrac 400	AP/AT	Tiller/Flail to reach required depth	100% sub - surface follow up	2m x 2m box cleared around item	Tiller/Flail to reach required depth	100% sub - surface follow up	Tiller/Flail to reach required depth	Minimum 50% sub-surface follow up	Revert to HT routine after redefining HT/LT area	
Armtrac 100	AP Only	Tiller/Flail to reach required depth	100% sub - surface follow up	2m x 2m box cleared around item	Tiller/Flail to reach required depth	100% sub - surface follow up	Tiller/Flail to reach required depth	Minimum 50% sub-surface follow up	Revert to HT routine after redefining HT/LT area	
MV4	AP Only	Tiller/Flail to reach required depth	100% sub - surface follow up	2m x 2m box cleared around item	Tiller/Flail to reach required depth	100% sub - surface follow up	Tiller/Flail to reach required depth	Minimum 50% sub-surface follow up	Revert to HT routine after redefining HT/LT area	
Bozena 4	AP Only	Tiller/Flail to reach required depth	100% sub - surface follow up	2m x 2m box cleared around item	Tiller/Flail to reach required depth	100% sub - surface follow up	Tiller/Flail to reach required depth	Minimum 50% sub-surface follow up	Revert to HT routine after redefining HT/LT area	
Bagger	AP/AT	Tiller	100% sub - surface follow up	2m x 2m box cleared around item	Tiller	100% sub - surface follow up	Tiller	Minimum 50% sub-surface follow up	Revert to HT routine after redefining HT/LT area	

8.7. Responsibilities

- a. The NMAA/UNMAS-SS shall:
 - Accredite mine action organisations' SOPs prior to carrying out on-site accreditation of machines in accordance with the required standard.
 - Develop and implement national standards for the employment of machines on demining operations.
 - Implement QM systems to ensure the safe, effective and efficient use of machines on demining operations.
 - Provide advice to prospective machine user
 - Establish reporting systems and procedures for the gathering of data on mechanical and follow-up demining operations. Such data should be made available to all stakeholders.
- b. Mine action organisations shall:
 - Gain from NMAA/UNMAS-SS accreditation to operate as a mechanical clearance teams.
 - Apply the standards as laid down in the NTSG.
 - Ensure that the organisations SOP are in compliance with the NTSG.
 - Maintain and make available documentation of clearance as specified by NMAA/UNMAS-SS
 - Apply management practices and operational procedures which aim to clear land to the requirements specified in the contract and agreements.

Annex A to Chapter 8 Tiller and Flail Accreditation Test

1. INTRODUCTION

1.1 NMAA/UNMAS-SS in South Sudan are responsible for ensuring that all mechanical assets working within the South Sudan Mine Action Programme (South SUDANMAP) are safe, efficient and fit for their intended purpose. NMAA/UNMAS-SS achieves this by conducting an accreditation process to ensure that the mechanical asset meets the minimum standards as specified within the NMAA/UNMAS-SS NTSG and/or contracts. The objective of the accreditation testing is to assess a mechanical asset for its intended role. Once the testing has been completed, a decision shall be made on whether the machine and the way it shall be utilized is acceptable or not.

1.2 These accreditation tests are designed to ensure that mechanical mine clearance assets used in South Sudan can work in accordance with the NMAA/UNMAS-SS NTSG and/or contract. In particular the tests are designed to ensure that T&E can penetrate soil to a minimum depth of 13cm.

1.3 There shall be three phases to the NMAA/UNMAS-SS T&E accreditation process, which are;

- a. **Review of SOP and machine capabilities:** A thorough review of SOP and manufacturers data shall be carried out by NMAA/UNMAS-SS to ensure that the SOP and the intended use of the machine comply with South SUDANMAP NTSG;
- b. **Ground Penetration Test :** A test shall be carried out in a safe area to ensure that the tiller/flail can reach the required 13cm penetration of the ground;
- c. **On-site Calibration:** The final acceptance test shall be carried out under full field conditions and shall ensure that the tiller/flail can be used in the environment it is intended to be used.

1.4 These tests are designed so that NMAA/UNMAS-SS personnel may confirm a machines ability to operate in South Sudan and demonstrate its ability in safe controlled conditions. The purpose of the tests are to allow early identification of problems or shortfalls which would restrict the deployment of the machine, it shall also show the assessing body where SOP may need to be amended.

2. DEMONSTRATION OF GROUND PREPARATION:

2.1 Once the contractors/organisations SOP have been received and reviewed, it is possible to proceed with the Ground Penetration Test.

3. RESPONSIBILITY:

3.1 The contractor shall be responsible for supplying the profile boards and all other equipment required for the on-site calibration and the operational accreditation.

4. OVERVIEW OF GROUND PREPARATION TEST:

4.1 The ground penetration test is designed to be a practical test involving tiller and flail operations carried out within a test area situated in ground conditions that are representative of normal ground conditions typically found in minefields. Normal ground means ground that is, dry and hard, undisturbed, consists of a clay/sand/rock fragment mixture, and is flat to undulating in contour. The test area shall be located in a known safe area.

5. TEST REQUIREMENTS:

5.1 The purpose of the accreditation test shall be to establish the ground penetration depth achieved by the tiller/flail. The test strip shall be marked in a manner that clearly denotes alignment, start, finish and marking every 5 meters. Narrow trenches parallel to the start/finish lines shall be excavated across the entire width of the test strip and located every five meters. In total there should be 6 trenches in the test strip.

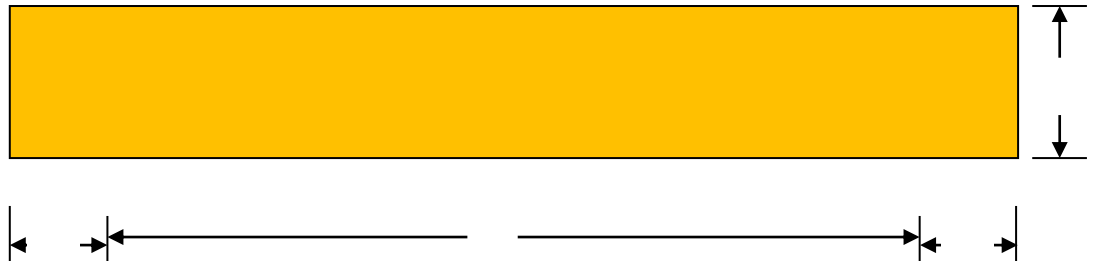
5.2 The trenches should be no wider than 100mm with a depth of 300mm (minimum) or deep enough to allow profile boards to be buried flush to ground level when emplaced. The test strip shall be marked at all 4 corners by markers (such as flags or painted rocks) and be as wide as the flail or tiller drum of the machine being accredited plus a minimum of 10%.

6. EXAMPLE FOR CALCULATING BOARD WIDTH

6.1 According to the MineWolf technical data, the width of the MineWolf tiller is 3480mm, represented as A in the diagram below. It is recommended that the width of the profile board should be a minimum of 10% more than the width of the tiller or flail

head. In this case 10% is an additional 348mm, so the minimum width of the profile board should be 3,828mm.

The profile board shall be made of 5mm chipboard and shall be placed at 5m intervals.



A: = Width of the tiller or flail rotating drum.

B: = Depth of profile board, this shall be a minimum of 300mm.

C: = Minimum of 5% of the width of the tiller or flail rotating drum.

Figure 1: Showing dimensions of profile boards.

For comparison purposes, one extra profile board the same as the buried boards made of 3 – 6 mm chipboard or similar material should be placed on the ground outside the test strip.

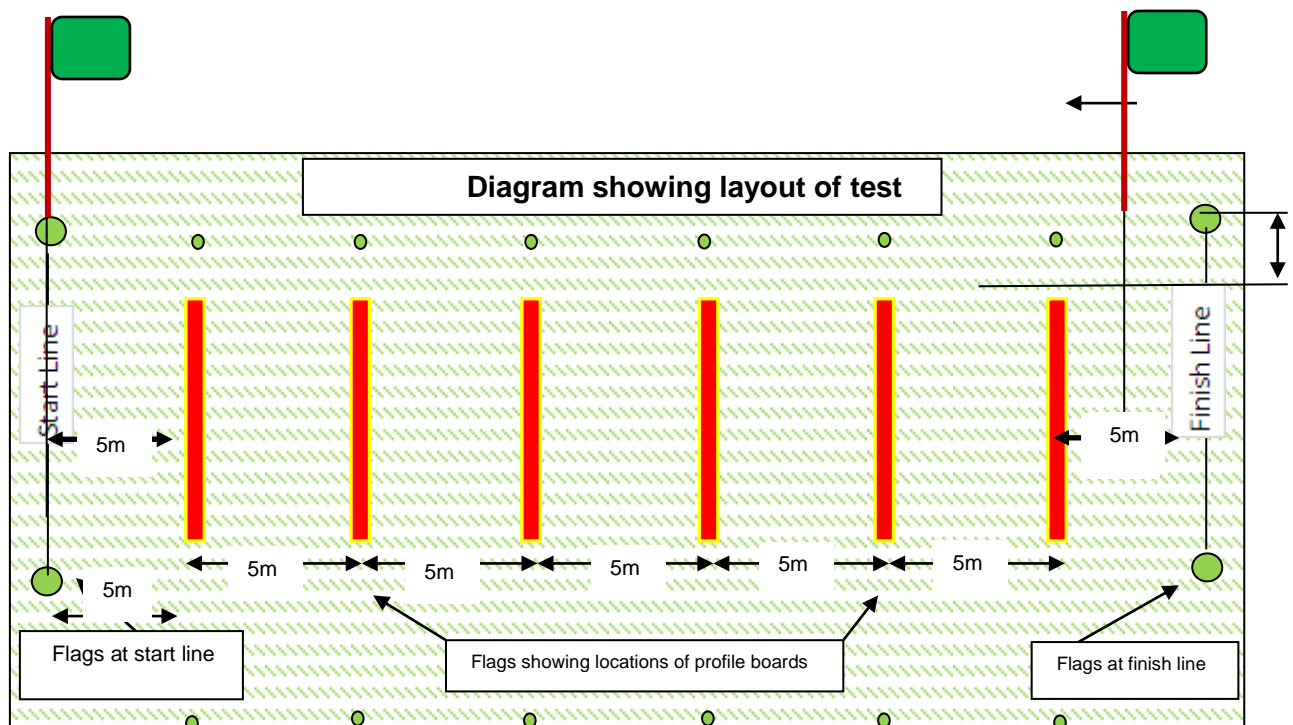


Figure 2: Plan view of test strips

Once the test area is set out and the profile boards are inspected, measured and inserted into the trenches. Before the operation commences the tiller or flail chisels or hammers shall be inspected and photographed for comparison purposes. The timing of the flailing operation should also be timed and the results reported as part of the test report so that these figures may be utilised for planning purposes. Once all ground test strips have been flailed, *Figure 4: Shows the condition of the soil condition on the test strip after one pass of the flail. After each pass the penetration boards should be removed and examined to determine amount penetration inflicted by the flail*

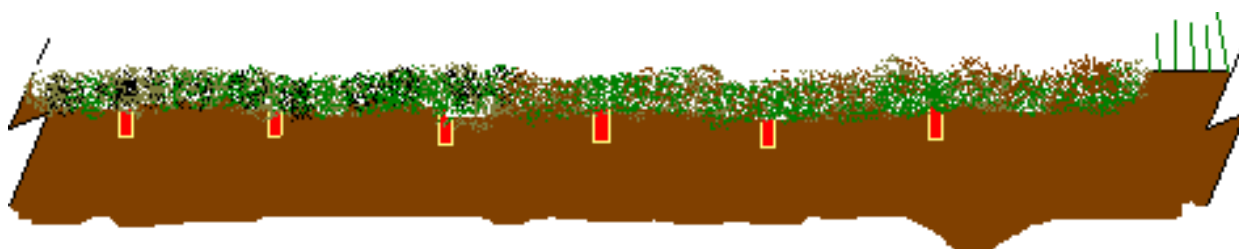


Figure 2: Layout of the test strips, each should be 35m long with trenches dug every 5meters so that the profile boards can be inserted into the ground.

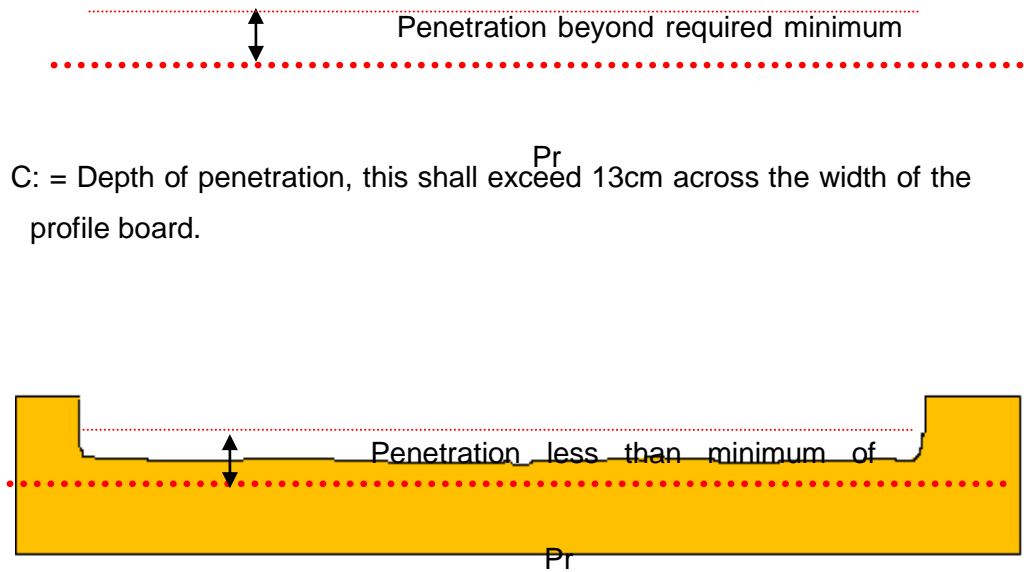
the profile boards to be removed and examined and compared with boards of the original size and dimensions. The profile boards should show penetration across the width of the board to a depth of a minimum of 13cm. If the penetration on the board is less than 13cm then the test shall be repeated with the same boards until the penetration reaches, the required depth, this shall determine the number of passes required by the machine to reach the required depth during clearance operations.

Adequate workers equipped with shovels should be available to bury/recover profile boards pre/post-test.

The test area should be of a size that allows unrestricted movement for the machine being accredited.

Figure 4: Shows the profile of a board which has been properly penetrated to 13cm.





C: = Depth of penetration, this shall exceed 13cm across the width of the profile board.

Figure 5: Shows the profile of a board which has not been properly penetrated to 13cm

Each time the machine tiller/flails a test strip the results are recorded with a pass or fail criteria. If the machine reaches the required 13cm depth on its first pass then the machine moves on to the second test strip and the process is repeated, if the machine again reaches the required depth then the machine moves on to the next stage of accreditation which is on site calibration.

If the machine does not reach the required 13cm depth on its first pass then the process is repeated on the first test strip until the penetration boards are penetrated to the required depth.

7. FINAL ACCEPTANCE:

7.1 The final acceptance test is conducted in 2 phases. Phase 1 involves analysis of documentation and results compiled during the penetration tests. This is required to determine if the minimum standards have been met or not, and whether it is necessary to carry on with the final test under field conditions. If the documentation or results are found to be lacking and/or minimum standards were not achieved during prior testing, discussions between NMAA/UNMAS-SS and the contractor shall occur in order to rectify matters prior to proceeding with the final field test.

The final field test should be carried out in a safe area and should be a full simulation of field conditions, SOP shall be used to verify that equipment and procedures are being used as intended. Certification shall take place during this test.

8. ADMINISTRATION AND LOGISTICS:

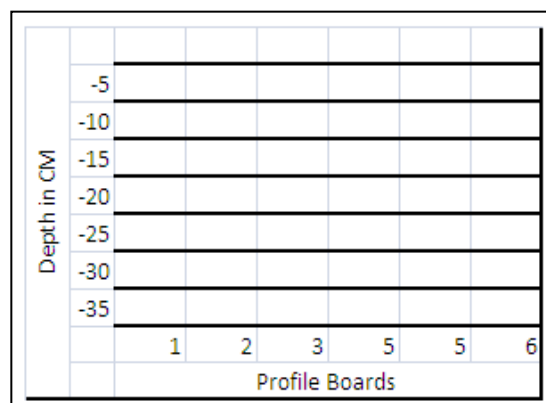
8.1 A successful outcome/completion of each test phase shall occur prior to the commencement of the next phase.

8.2 It is the responsibility of the contractor to complete all documentation to the required NMAA/UNMAS-SS standards and organize all facets of the field testing.

8.3 The results of the accreditation test should be recorded in a table similar to the table below along with photographs showing each step of the process.

Test Strip Number ()	Profile Board Distance (Metres)						Time to complete (Minutes) 35m	Pass/Fail
	5	10	15	20	25	30		
Pass 1 Depth								
Pass 2 Depth								
Pass 3 Depth								
Comments								

Profile tests should also be graphed showing the profile for each run of the tiller or flail over the test strip.





South Sudan

National Technical Standards Guidelines

Date: 1st October 2015

Chapter 09

9 Mine Detection Dogs

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9.1. Introduction

- a. The use of Mine Detection Dogs (MDD) is an effective aid to humanitarian demining especially when used for Technical Survey or when used as an area reduction tool prior to deploying any other clearance assets. MDD may also be used as an alternative to manual clearance and mechanical demining when working in difficult conditions, for example, in areas that have a high metallic content or in areas where known minimal metal mines may be found.
- b. Prior to the MDD undergoing their operational accreditation the MDD shall undergo a period of acclimatisation, in order to become acclimatised to the local weather conditions, vegetation, soil conditions and the surrounding environment.
- c. MDD shall be regarded as a method of confirming the presence of mine contamination rather than identifying the location of individual mines. If MDD are used as the primary detection tool, then all areas shall be searched by two different MDD before the area shall be considered cleared.
- d. However, in cases of an urgent medical evacuation, one accredited MDD may be used on its own.
- e. When MDD operations are carried out to provide secondary clearance or verification, for example; conducting technical survey, following up behind manual or mechanical operations, or when conducting confidence building, then one MDD shall be used, provided that clearance requirements as specified by the NMAA/UNMAS-SS are achieved. However, if mines are found, then the search method with two MDD shall be used.
- f. All MDD shall be subjected to accreditation prior to commencing operational tasks and shall only be tasked for activities that they are accredited for. See the NMAA/UNMAS-SS MDD accreditation process in Para 9.11 of this chapter.

9.2. General Requirements

- a. The mine action organisation shall be responsible for ensuring that the following general requirements are implemented:
- b. Each team (MDD and handler) shall be operationally accredited before commencing any humanitarian demining operations.
- c. A daily evaluation of the MDD shall be undertaken prior to commencing work, this shall include;
 - A health and general well-being check and.

- A detection test
- d. Based on these checks, an assessment shall be made to ensure that the MDD is capable to carry out the required tasks.
- e. **Every 2 months** the mine action organisation shall conduct routine internal training and evaluation of all MDD teams.
- f. Records of all External & Internal QA shall be kept in the relevant MDD logbook and made available for inspection at any time. These records shall include; training, evaluation, accreditation and daily performance records.
- g. MDD SOPs shall cover:
 - Operational Details as listed below
 - Work routine for MDD teams
 - MDD team refresher training and QA, evaluation requirements
 - The integration of MDD with other clearance assets
 - Data collection and recording
 - Administrative and support
 - Reports, records and returns
 - MEDEVAC/CASEVAC plan in case of illness/injury to an MDD
 - Demining accident/incident procedures to include retrieval details of MDD
- h. Operational details for each activity are to include:
 - Team composition
 - Area marking before, during and after clearance
 - Tools and equipment requirements
 - Safety distances
 - Details of specific clearance drills
 - Command and control (to include communications)
 - Marking indications
 - Investigating indications
 - Actions on locating a mine/ERW
 - Marking of mine/ERW
 - Disposal of mine/ERW
 - Retesting and evaluation procedures
 - Manual clearance of areas inaccessible to MDD

9.3. General Safety

- a. The following general safety precautions shall be considered and applied during MDD operations:
- b. All MDD operations shall be conducted under the command and control of the site supervisor who shall be responsible for all aspects pertaining to the work site requirements.
- c. Testing of the MDD for obedience, motivation, and concentration and detection capability shall be carried out on-site each day prior to commencing work. The results shall be recorded within the MDD logbook.
- d. The MDD handler shall determine how long an MDD shall work. This shall depend on the temperature and prevailing weather conditions. The MDD shall not work for more than 60 minutes without having a 10 minute break however, if at any time the MDD handler is not satisfied with the performance of his/her MDD then it shall be withdrawn from work immediately and corrective action taken. The reasons for the withdrawal and the corrective action taken shall be recorded in the MDD logbook. The immediate area where the MDD had been withdrawn is not to be considered searched.
- e. MDD operations shall not be carried out if the wind speed is greater than **7m/s at ground level**. However, this may be reduced if dust is being raised by the wind.
- f. Entry into the hazardous area by other personnel or assets shall be restricted until the hazardous area has been checked by at least 2 MDD.
- g. MDD handlers shall not be permitted to carry mobile phones when deploying into the hazardous area.
- h. Suitable and effective PPE shall be worn by MDD handlers as per the requirements of all other humanitarian demining operations, with the only exception being that 'half-visors' may be used. These visors shall conform to the specifications of IMAS.
- i. Safety lanes shall be cleared to the required search depth to provide safe access for the MDD team when deploying to their work areas. The lanes shall be a minimum of 2 metres wide and a maximum of 30 metres in length.
- j. The site layout of the hazardous area, where the MDD shall be deployed, shall be so that the MDD is visible to the handler at all times during the conduct of operations.

- k. The minimum safety distances when conducting MDD clearance shall be as per the NTSG Chapter 2, Site Preparation and Setting Out. MDD shall be regarded as 'Personnel' when using the Safety Tables of this chapter.

9.4. Limitations

- a. Listed below are common circumstances, which may influence the ability of the MDD to operate effectively.
- b. Areas heavily contaminated by explosives.
- c. Areas of dense vegetation where the handler has difficulties to see signals and indications from the MDD.
- d. Areas where the MDD may have to traverse steep slopes. This may affect the dog's ability to indicate.
- e. Wet areas with a water mirror exceeding 1m² or any areas where the MDD may be required to jump across an obstacle.
- f. Near cliff edges.
- g. High-density minefields.
- h. Areas where tripwires are expected,
- i. Blustery, dusty wind conditions and excessive ground heat.
- j. Recently burnt ground either on purpose or natural.
- k. After an area has been prepared by mechanical asset.
- l. In areas under trees or plantations where there is a large build-up of mulch or sharp stumps from previous cultivation.
- m. Areas which have subjected to previous demolitions.
- n. **Note:** High Temperatures shall affect the ability of the MDD. Planning shall ensure that MDD are utilised during the hours which least impact on their ability to work effectively i.e. avoiding the hottest part of the day which shall alter from season to season. MDD shall not work effectively when the temperature exceeds **34°C**. However, this is only a guide. The MDD shall have proven themselves capable to detect mines/ERW under similar conditions during training and assessment tests. It is the overall responsibility of the mine action organisation to decide when and how to use their MDD assets.

9.5. Tasking

- a. MDD teams may be tasked for the following operations:

- Verification, survey or area reduction of suspected hazardous areas.
- Clearance of low-density mined areas.
- Clearance of suspected mined railroads.
- Clearance of suspected mined roads.
- Clearance in areas where handheld mine detectors are unable to operate (e.g., high metal content areas).
- Quality Control on any clearance task provided that it is suitable for MDD operations.

9.6. Planning

9.6.1. General

- a. The following points shall be considered when planning all MDD operations:
- b. The reconnaissance and survey results from the task and threat assessment shall determine if the task is suitable for MDD operations.
- c. The layout of the area shall be managed to ensure that safety distances between each MDD and other humanitarian demining activities are adhered to.
- d. The prevailing wind direction throughout the duration of the task, the humidity of the soil, the vegetation.
- e. Restrictions/limitations: Personnel working in the vicinity of the MDD may impinge on their safety and effectiveness.
- f. The height of the vegetation. For example vegetation in a suspected Submunition strike area will be cut no shorter than 10cm from the ground.
- g. The training and evaluation boxes are to be established as near to the operational site as possible to mirror the terrain and site conditions.

9.6.2. Mines/ERW used in the training and evaluation boxes

- a. Remain in the ground untouched for a significant period (minimum of 3 weeks).
- b. Be buried at different depths and down to the maximum required depth of clearance.
- c. Conform to the different types of mines/ERW likely to be encountered.

9.6.3. MDD follow up procedures behind Mechanical Operations

- a. The following shall be applied when planning MDD follow up procedures behind mechanical operations:

- b. If the machine has disturbed the soil, the following factors are required to be considered;
 - **7 days soak time** shall be required before MDD follow up procedures may be conducted.
 - If it has **rained once within 2 days** after the mechanical ground preparation has been completed then MDD follow up procedures may be conducted.
 - If the machine has been used to clear an area with a relatively high density of mines, MDD shall not be used since lumps of explosives and bits of mine casings are likely to be widely spread around the area that may confuse the MDD and make the search less reliable.
- c. When an MDD has indicated, a **2m X 2m box** shall be manually cleared around the indication point.

9.6.4. MDD usage after Vegetation Removed

- a. In areas where vegetation has been cut the cutting may disturb the scent picture above the target items and may affect the scent plume. When vegetation cutting is required, irrespective of how the cutting is to be carried out, training and testing shall be carried out prior to any MDD operations takes place to determine the following:
 - The safe time delay required between cutting and an MDD search being conducted.
 - The indication accuracy of the MDD after vegetation cutting has been conducted.
- b. Burning of vegetation may have a negative effect on MDD detection capability therefore; MDD shall not be used to search in areas where the vegetation has been burned unless they have been proven capable of detecting target items in burned areas.

9.6.5. MDD for Road or Verge Clearance

- a. Depending on the method to be employed the following points shall be considered when planning MDD operations:
 - A safe access and egress for the MDD team.
 - The Number of MDD that shall be used safely and effectively.
 - The Method of clearance e.g. from the sides, from one end to the other or from both ends to the middle.
 - The Layout of boxes or lanes shall include safe lanes where relevant.

- Vegetation removal requirements.

9.7. Marking

- a. Area marking prior to, during and after MDD operations shall be in accordance with the details in Chapter 3 of this NTSG. In addition the following shall be applied:
 - Oil and spirit-based spray paints shall be avoided.
 - Painted posts/rocks shall be painted at least 7 days before MDD operations commence.

9.8. Operational Requirements

- a. Pre-deployment Requirements: The following shall be applied:
 - Prior to deployment, all MDD shall be checked by a vet to ensure that they are medically fit for deployment and are capable of working in the environment required.
 - MDD shall be checked by a vet every 6 months to assess the dog's medical fitness and well-being, the results of which shall be recorded.
- b. General Requirements: The following general requirements shall be applied:
 - The MDD shall implement and adhere to the accredited organisation SOPs.
 - The MDD shall have the capability to find mines / ERW to a depth of 13cm.
 - When an MDD has indicated on areas other than those that have been mechanically processed, an area of at least 2m X 2m box around the indication point shall be manually cleared.

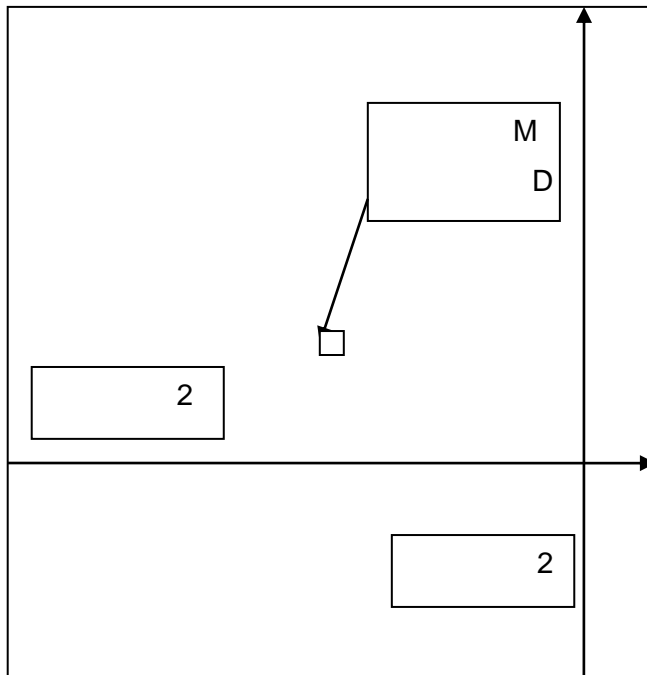


Figure 9-1 Manual Search area After MDD Indication

- b. Command and Control: The site Supervisor is responsible for the overall management and supervision of all assets deployed on the operation and shall ensure that all operations are conducted in accordance with the mine action organisations SOP.

9.9. MDD Clearance Procedure

- a. To ensure that 100% of any hazardous area is cleared the clearance organisation is to detail the procedures to be used in their SOP.

9.9.1. On-site Requirements

- a. The following shall be implemented during all operations:
- b. Sufficient water, at least five litres per MDD per day, shall be available at the beginning of the day.
- The MDD shall be given frequent rests as detailed within this chapter.
 - If it is impossible to motivate the MDD to work, it shall not be deployed.
 - In case of injury or illness, suitable transport shall at all times be available at the task site for the evacuation of the dog to a more suitable health care centre.
 - Procedures for countering the relevant threats from stray dogs and other animals.
 - Adequate provision of shade shall be provided for the MDD.

9.9.2. MDD Equipment

- a. The following listed items shall be the minimum equipment required for each MDD is listed in Table 9-1 MDD Equipment.

Collar	Reward equipment
Lead	Indication markers
Harness	Measuring tape (minimum of 30m)
Tie cable/chain	Compass
Food bowl	1 x Weather instruments per site.
Drinking bowl	(Temperature, wind speed)
Water container	Portable kennel, flight box
Grooming brush	Shade/sun protection (umbrella)
MDD log Book	

Table 9-1 Minimum Equipment per MDD

9.9.3. MDD Recording

- a. The mine action organisation shall ensure that a logbook is prepared for each MDD or group of MDD and that it is available at all times for inspection.

9.9.4. Medical Checks

- a. Listed below are aspects that are to be monitored daily, which will assist the handler to understand the condition of his/her MDD Team. This shall enable him/her to recognise early any sickness or any other problems that may affect the MDD Team.
- b. Handlers are responsible for reporting to their Supervisor and medic any medical / health problems or any unusual out of character behaviour in their MDD Team.
- c. Team medics, with the assistance of the MDD Handler shall be responsible to manage all MDD injuries. The Team Trauma Pack shall be utilised when treating MDD injuries.
- d. It is recommended that only certified handlers/kennel assistants feed, clean or enter the kennels whilst the MDD are housed.

Daily Health Checks	Monthly Health Checks
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 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 between toes.	Check the skin and coat for wounds, ticks, thorns and areas of matted hair, or lumps and bumps.
Examine the tail, anal region and anal sacs. Look for swelling and irritation.	Examine the nose, mucous membranes, 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. Control mucous membranes, throat, tongue and teeth. Look for swelling, changes in colour, inflamed gums, bad breath and foreign bodies/objects and 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 heart and pulse function.
	Check the body temperature.

Table 9-2 Daily & Monthly MDD Health Check

9.9.5. Transportation

- a. MDD shall be transported, loaded and unloaded from vehicles in a manner that ensures the health and wellbeing of the animal at all times. Handlers shall ensure that as a minimum the following are applied:
- b. MDD shall be transported in portable kennels/crates, which are to be secured to prevent movement, tipping, slippage etc
- c. MDD shall be unleashed in the portable kennel/crates during transportation.
- d. Under no circumstances shall an MDD be allowed to jump on or off a vehicle from the kennels/crates.

- e. Care shall be taken to ensure that blocking of ventilation holes is avoided at all times of the portable kennel/crates.
- f. When on long-distances transit the MDD shall be given regular breaks to stretch, exercise and take on water.

9.10. Quality Assurance

- a. Each mine action organisation shall comply with the following:
- b. Routine regular training and internal QA processes shall be implemented and conducted by the mine action organisation in accordance with the detail of this chapter. These details shall be kept on record and presented to NMAA/UNMAS-SS representatives on request.
- c. Every 2 months the MDD Team shall undergo External QA Assessment conducted by NMAA/UNMAS-SS. This shall be conducted either on-site or in the NMAA/UNMAS-SS accreditation field.
- d. Refresher training shall be conducted by the MDD team when returning from a block leave period prior to re-deployment.

9.11. Accreditation of MDD

- a. All organisations intending to use MDD for mine/ERW clearance operations shall ensure that the MDD team have received the necessary accreditation and licensing from the NMAA/UNMAS-SS. The operational accreditation assessment shall be conducted at the designated accreditation area.
- b. Accreditation shall only be given on completion of the desktop accreditation and appraisal of the mine action organisation SOP and the on-site assessment of the MDD teams. The accreditation shall be valid for a period of 12 months from the qualifying date.
- c. Continuous External QA Evaluation shall be conducted by the NMAA/UNMAS-SS to ensure that safe and effective MDD operations are being conducted. Failure to comply with the mine action organisation SOP, NTSG or IMAS shall result in a suspension of the accreditation.

9.11.1. Operational Accreditation Procedure

- a. All MDD operational accreditation procedures shall conform to the minimum standards detailed in IMAS 09.42 and the South SUDANMAP NTSG. The following provides pertinent details to be applied during the MDD operational accreditation procedures.

- b. **Accreditation Area:** All MDD operational accreditations shall be carried out at an approved NMAA/UNMAS-SS accreditation site that should mirror as closely as possible the overall environment of the area where MDD operations are to take place. Details covering the exact location, design and overall size of this area shall be recorded in a 'minefield record' and kept by the relevant NMAA/UNMAS-SS. It should be fenced and secured at all times and entry restricted only to those authorised to enter.
- c. **Weather Conditions:** Operational accreditation of MDD Teams should only be carried out if the weather is similar to that which the organisation would use the MDD during normal clearance. If the weather is not then the operational accreditation shall be called off, to allow improvement in the weather conditions. As a general rule, operational accreditation shall not be carried out if it is too hot, too windy or if it is raining.
- d. **Type of Mines/ERW:** The accreditation site shall consist of mines/ERW likely to be encountered during operations that are buried at differing depths down to the maximum (13cm) required by operations. The type of mines/ERW, exact location, depth and any other relevant detail shall be recorded in the 'Accreditation Site Minefield Record'.
- e. **Search Area:** Boxes of 10m x 10m containing a varying number of mines/ERW shall be used. Each box shall have from zero to a maximum of two mines/ERW. Each MDD shall search a minimum of four boxes (400 m²).
- f. **Training Area:** A training area outside of the accreditation site shall be available to allow mine action organisations to carry out internal 'work up' training before the operational accreditation commences. An organisation may expect 2-5 days of access to these training boxes prior to an operational accreditation. This area shall not provide the space to conduct any major training or to 'work up' new dog handlers. It is the mine action organisation's responsibility to construct a training field for these purposes.
- g. **Maturity:** An operational accreditation box shall have mines that have been in the ground untouched for at least 3 months. No MDD shall be accredited on boxes that have been used recently for the accreditation of other MDD. Ageing time for boxes that have been used for operational accreditation assessments shall be a minimum time period of 3 weeks.
- h. **Clearance Technique during Accreditation:** The area shall be searched in accordance with the SOP of the organisation to be accredited. Some

modification may take place when the procedure in question is affecting the effectiveness of the accreditation e.g. throwing beanbags into the box to indicate a find shall not be permitted. Instead the edges of the box shall be marked to record the position of an indication.

- i. **Search Break:** The MDD handler may ask for a search break at any time during the operational accreditation. A break may be required because of a provisional lapse or if the MDD or the handler may need to drink water. If the MDD handler uses two dogs, he/she may let the first MDD rest and start the search with the second MDD in another box assigned by the MDD QA Officer. If an MDD team is not able to complete the search of all assigned boxes, during one day, then the search may be continued the next day provided that the given time restrictions have not been exceeded.
- j. **Time Restrictions:** The NMAA/UNMAS-SS shall use the mine action organisation MDD SOP policy as a reference for implementing time restrictions during operational accreditations. This shall reflect the times detailed in the SOP to clear an area during live operations, to which shall be added a further 10%. If no time is detailed in the mine action organisation SOP, then a time restriction of 2 hours for 3 boxes and 4 hours for 5 boxes shall be applied. This shall include rest breaks.
- k. **Primary and Secondary Verification of a Box:** During the operational accreditation every MDD shall do a primary search in at least two of the boxes. If the MDD QA Officer suspects that the secondary MDD is not conducting its search properly the primary search dog should be ordered to sit randomly 3-4 times at spots in the box after completion of the search and before the secondary search dog is allowed to search the box.
- l. **Pass Criteria:** The following is the pass criteria:
 - Organisation SOP is followed correctly.
 - 100% indication of all mines/ERW per MDD.
 - All indications are within 100cm of the mine/ERW.
 - A maximum of 2 false indications per box per MDD.
- m. **Failure Criteria:** The MDD shall fail the operational accreditation if it fails to meet or conform to any aspect of the pass criteria or if the MDD dog scratches or digs the ground at any time during the operational accreditation.

- n. **Action on Failure:** If an MDD team fails to pass the operational accreditation, the MDD team shall not be re-assessed within the next 7 days. If more than 75% of the MDD from the same mine action organisation fail the operational accreditation, the NMAA/UNMAS-SS have the right to terminate the operational accreditation for that organisation. If the handler is not performing well, the handler shall be replaced as soon as possible. If an MDD fails a second evaluation, a third operational accreditation should only be undertaken after time period of one month. If an MDD fails the test a third time then the MDD shall not be re-tested until a period of one (1) year has passed.
- o. **Additional Regulations:** The MDD handler has the right to observe the site prior to the operational accreditation and to walk the dog around the accreditation site outside the boundary marking tapes before the operational accreditation commences.
- p. **Marking of Finds:** When a mine/ERW is found, the handler shall mark it in accordance with the mine action organisations SOP. The handler shall not be permitted to throw anything into the box to mark the item during the operational accreditation.
- q. **Accreditation Team:** The MDD operational accreditation shall normally and wherever possible be conducted by the NMAA/UNMAS-SS QA Officer. The manager or the senior supervisor of the mine action organisation which is undergoing operational accreditation has the right to be present during the evaluation if desired.
- r. **Accreditation Forms:** An example of the operational accreditation form shall on request be made available to all mine action organisations, prior to the operational accreditation period. This form shall be completed during the operational accreditation by the NMAA/UNMAS-SS QA Officer and on completion the form shall be signed by both the dog handler, organisation senior supervisor (if present) and the NMAA/UNMAS-SS QA Officer.

9.11.2. External Evaluation of the MDD Team

- a. Continual external evaluation of an accredited MDD Team shall be conducted every 2 months. This should be done at an NMAA/UNMAS-SS MDD accreditation site or at the operational task site where the MDD are

working. The evaluation shall be carried out by NMAA/UNMAS-SS QA Officer. The following are the requirements for the External Evaluation:

- b. A minimum of 200 m² shall be searched per MDD.
- c. At least 0-2 mines/ERW items shall be in each box used.
- d. Test items shall include mines/ERW items common to the theatre.
- e. The pass criteria is:
 - The organisation SOP is followed correctly.
 - 100% indication of all mines/ERW per dog.
 - All indications are within 100 cm from the mine/ERW.
 - A maximum of 2 false indications per box per MDD.
- f. The MDD shall fail if it does not conform to any of the pass criteria or it scratches or digs the ground at any time during the evaluation.
- g. If the MDD fails the evaluation, the dog shall be taken out of work for a minimum of 1 week and it shall undergo re-training. A further evaluation test shall be undertaken. The MDD shall only regain his/her operational accreditation after successfully completing the external evaluation pass criteria.
- h. If one or more MDD are performing badly during a second evaluation, the dog and the whole mine action organisations previous work may be disqualified as well as their licence withdrawn. This shall be decided by a board consisting of the NMAA/UNMAS-SS QA Coordinator, the NMAA/UNMAS-SS QA officer. A new licence shall not be given out until the organisation has commenced proper re-training and a new operational accreditation has successfully taken place.

9.11.3. Accreditation of MEDDS

- a. All organisations intending to use MEDDS for mine/ERW clearance operations shall ensure that the MEDDS team have received the necessary accreditation and licensing from the NMAA/UNMAS-SS. The operational accreditation assessment shall be conducted at the organisation MEDDS facilities.
- b. Accreditation shall only be given on completion of the desktop accreditation and appraisal of the mine action organisation SOP and the on-site assessment of the MEDDS teams. The accreditation shall be valid for a period of 12 months from the qualifying date.

- c. Continuous External QA Evaluation shall be conducted by the NMAA/UNMAS-SS to ensure that safe and effective MEDDS operations are being conducted. Failure to comply with the mine action organisation SOP, NTSG or IMAS shall result in a suspension of the accreditation.

9.12. Responsibilities

- a. The NMAA/UNMAS-SS shall:
 - Accredite mine action organisations' SOPs prior to carrying out on-site accreditation of their MDD teams in accordance with the required standard.
 - Develop and implement national standards for the employment of MDD teams on demining operations.
 - Implement QM systems to ensure the safe, effective and efficient use of MDD teams on demining operations.
 - Provide advice to prospective MDD user organisation.
- b. Mine action organisations shall:
 - Gain from NMAA/UNMAS-SS accreditation to operate as a MDD teams.
 - Apply the standards as laid down in the NTSG.
 - Ensure that the organisations SOP are in compliance with the NTSG.
 - Maintain and make available documentation of clearance as specified by NMAA/UNMAS-SS
 - Apply management practices and operational procedures which aim to clear land to the requirements specified in the contract and agreements



South Sudan

National Technical Standards Guidelines

Date: 1st October 2015

Chapter 10

10 Medical

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10.1. Introduction

- a. All Humanitarian mine action organisations conducting operations in the South Sudan are to be fully compliant with IMAS and these NTSG. Each organisation is to have in place a robust, proven medical capability which can deliver safe effective medical care in the event of an unforeseen accident or Incident, as well as appropriate insurances (certificates) and repatriation mechanisms for injured personnel i.e. AMREF Flying Doctors have clearance to operate in South Sudan air space.
- b. All qualified medical personnel whether employed in the field or at HQ level are to be aware of the religious, ethnic makeup of their personnel when treating a casualty and administer appropriate care where practicable.
- c. This medical chapter covers the minimum standards by organisations required from NMAA/UNMAS, conducting operations in South Sudan. However, each organisation should consider aiming higher to give the best possible care to their employee's pre and post incident.

10.2. General

- a. Appropriate medical supports and a workable casualty/medical evacuation procedure is one of the principles of mine/ERW clearance and shall always be a compulsory requirement for mine clearance.
- b. If the medical cover stipulated in this chapter is removed or unavailable, clearance shall cease immediately until it has been restored.
- c. Teams shall formally exercise casualty evacuation (CASEVAC) at least once a month and upon arrival at new site. These exercises shall be recorded in the clearance task log or by Internal QA reports.
- d. In all cases of accidents/incidents involving an uncontrolled detonation in uncleared areas or areas that were handed over as cleared, a cleared and marked safe lane shall be made up to where the causality is laying for CASEVAC purposes.
- e. No mine/ERW clearance operations shall commence without an acceptable level of medical support and a casualty/medical evacuation plan that everyone involved fully understands, and has practised.
- f. Every mine/ERW clearance and EOD activity shall make provision for adequate medical cover and casualty/medical evacuation. In submitting contract applications, contracting organisations shall state clearly the level of medical support to be provided for their teams. The minimum requirements are:

- g. An accredited Medic who is dedicated to provide Advanced Life Support (ALS).
- h. The team shall be capable to conduct casualty collection and provide Basic Life Support (BLS) within 5 minutes.
- i. Advanced Life Support (ALS) shall be administered to the casualty within 15 minutes.
- j. The medical facilities on site shall be sufficient to stabilise expected trauma injuries as per the organisation's accredited SOPs.
- k. The compulsory minimum medical equipment for a Trauma Care Pack is listed in Table 10:1.
- l. A serviceable and suitable evacuation vehicle containing equipment as per Table: 10.2.
- m. A dedicated driver shall be available to transport the casualty to the nearest higher level medical facility or Helicopter Landing Site (HLS)/Airstrip
- n. A CASEVAC plan shall be included in the task implementation plan.

ITEM	QUANTITY
AIRWAY EQUIPMENT	
Manual ventilation bag with mask	1
Oral airway disposable various sizes 2,3,4	1 each
CANNULATION AND INJECTION EQUIPMENT	
Protective eyewear	1
Sharps disposal container	1
Intravenous Cannula size 14G, 16G, 18G, 20G	2 each
I.V administration set	4
Medical adhesive tape 2.5 cm	1
Venous tourniquet	1
Alcohol swabs	25
Syringe 5ml	5
Syringe 10ml	5
Needle 21G	10
Water for injection or NaCl 0.9% 10ml	10
Surgical gloves	10 pair
TRAUMA SUPPLIES	
Triangular bandages	2
Sterile dressings (10cmx10cm or 10cmx20cm)	10
Bandage 10cm	5
Bandage 15cm	5
Large multi-trauma abdomen/chest dressing (10 x30 inches)	2
Burn dressings	2
Eye pads	8
Pressure dressing / field dressing	4
Antiseptic solution	100 ml

SPLINTS	
Upper limb splint (e.g., Sam, Kramer, cardboard)	1
Lower Limb Splint (e.g., wooden, cardboard)	1
Cervical collar set or adjustable stiff neck collar	1
OTHER ITEMS	
Universal scissors (paramedic shears)	1
Dressing scissors	1
Kelly forceps	1
Dressing Forceps	1
Stethoscope	1
Blood pressure manometer.	1
Casualty triage tags (set 5)	1
Gauze Pads, medium	25
Torch (preferably penlight)	1
Adhesive medical tape	1 roll
DRUGS	
Inj. Morphine 10 mg/ml (or similar drug)	4x 1 ml.
Inj. Naloxone 0.4 mg/ml (if using opioid)	2 x 1 ml.
Inj. Anti-emetic drug (if using opioid)	2 amps.
Ringers lactate 1000ml	2
Normal saline 0.9% 500ml	2

Table 10-1 Minimum Compulsory Medical Equipment for Trauma Care Pack

ITEM	QUANTITY
Stretcher with straps and means of securing the stretcher to the	1
Spinal Board and Head Block set (or similar device)	1
Blanket	2
Water container	10 litres
Proven radio communications (on the UNMISS/UNMAS SS	1
Signal smokes (if possible)	1
Flash light	1
Oxygen supply for 120 mins at 10 litre/min (10 litres 200 Bar)	1
O ₂ manometer and regulator with minimum flow 10 litres/minute	
Manual ventilation bag with oxygen reservoir + mask	1
Hand held suction unit with small flexible oral catheter	1
Non-rebreathing oxygen mask with reservoir bag	2

Table 10-2 Minimum Compulsory Medical Equipment for the Evacuation Vehicle

ITEM	QUANTITY
Laryngoscope (with blades and batteries)	1
Nasopharyngeal airways various sizes	1
Endotracheal tubes sizes 7,8 (cuffed) and Tube check	1 each
ETT Guide stylette	1

Magill forceps size 8	1
Magill forceps size 9	1
KY Gel tube	1
Normal saline 1000ml	4
Chest decompression set	1
Convenience bag	1
Emergency blanket	2
Chest dressing	1
I.V dressing	10
Lidocaine Injection (20 mg/ML)	1
Sterile scalpel /scalpel holder with surgical blades	2

Table 10-3 Recommended additional Medical Equipment

- o. A medical trauma kit contents list shall be included in the organisation's SOPs. All items are to be identified by their medical name and not manufacturer's name.
- p. The method of evacuation in the event of an accident shall always be specified and understood by all and should be by the safest and expeditious method available to an appropriate medical facility. Evacuation by air (if available) should be considered if the CASEVAC by road is expected to take more than 60 minutes or that the injuries may be as worsened because of road movement.
- q. Note: During a CASEVAC, it should be remembered that the comfort and safety of the casualty in transit is more important than speed.

10.3. Preparations before Execution of Mine/ERW Clearance Activities

- a. Before commencement of any mine/ERW clearance activity clearance organisations are responsible for the following:
 - b. Medical health checks shall be conducted before recruitment of clearance personnel, and include both sight and hearing checks.
 - c. A record of known blood groups, allergies and infections from each working personnel shall be available on the site.
 - d. A record of staff vaccination against Yellow Fever and Meningitis.
 - e. An appointed person that shall be responsible for all preparations related to the medical support and evacuation plans.
 - f. Ensure that all Medics recruited by the organisation are qualified in accordance with Table 10.4. The Medic shall have the knowledge and experience of using the medical equipment according to the organisation's SOP.
 - g. On site documentation shall include medical training records of personnel, who are deployed to the site.

- h. Locate, visit and establish the necessary contacts and agreements with the most appropriate medical facility in the vicinity. A list of appropriate medical facilities and their locations shall be provided to the clearance organisations by the NMAA/UNMAS-SS on a regular basis. A list of all staff engaged in demining activities shall on a monthly basis be updated and submitted to NMAA/UNMAS-SS.
- i. Ensure a valid CASEVAC plan to a Level Two Medical Support Facility in theatre and if required a MEDEVAC plan to a Level Three Medical Support Facility in or out of theatre.
- j. Should further surgical treatment or rehabilitation at a Level Four Medical Facility be required, ensure relevant insurance coverage for all members.
- k. Ensure that a HLS is identified and marked in close vicinity of every clearance site. For static clearance tasks, where possible, the HLS should be approved and registered by UNMISS Air Operations and be a minimum 300 metres from the known hazardous area. The HLS coordinates should be provided to the NMAA/UNMAS-SS.
- l. Ensure that effective communication lines are always functional and that every mine clearance operation site has communications with its own headquarters and with its medical support.
- m. All medical personnel shall have adequate skills to use medical equipment and material to undertake their role in providing medical support to casualties and general health care.. Equipment and material shall be replaced before the stated expiry date.
- n. There shall be a minimum of one medical trauma kit per medical team attached to a clearance team. The medical trauma kit shall remain under the control of the team medic.
- o. Mine action organisations are encouraged to develop their own treatment protocols that detail the management of different diseases together with administration of drugs and dosage. Medics shall be asked to prove adequate knowledge and skills to implement those protocols.
- p. All medics shall have immediate access to a copy of the organisation's treatment protocols when deployed in support of mine/ERW clearance operations. A copy of these protocols shall also be submitted to the NMAA/UNMAS-SS as an annex to the emergency medical SOP.

- q. Treatment and emergency protocols shall be written in the English language. An agency may adopt a treatment protocol designed and used by other agencies and referenced treatment guidelines.

10.4. Preparations for a Casualty/Medical Evacuation

- a. To ensure effective casualty/medical evacuation in the event of an accident, the following preparations shall be conducted before clearance commences.
The site Supervisor shall:
 - b. Identify and nominate a road evacuation route from the clearance site to:
 - c. The nearest appropriate medical facility.
 - d. The nearest HLS.
 - e. Clear and mark a HLS (if applicable) and in accordance with regulations
 - f. Ensure communication to headquarters is maintained during operations.
 - g. Ensure that an appropriate and serviceable evacuation vehicle/method is available on site at all times during operations. If this is a vehicle it shall be parked so that it may be loaded with a casualty and leave the site without having to manoeuvre. The driver shall be available at all times. Ignition key should be left in the vehicle at all times when parked at a task site.
 - h. Ensure that the Medics shall be dedicated for medical support at the site at all times during clearance operations and located a maximum of 5 minutes away from the site.
 - i. The medics should be easily identified from a distance as medical support personnel.
 - j. Ensure that all personnel involved in the operation are competent in: Basic first aid, casualty evacuation procedures, and with procedures for loading a casualty and/or stretcher into the identified evacuation vehicle.
 - k. Ensure that the CASEVAC Route Plan for the task site is available in the vehicle/ambulance at all times.

10.5. Casualty Evacuation Procedures

- a. Although the medical evacuation procedure may differ for every clearance site, the responsibilities of personnel within the operation remain the same.
The following responsibilities apply:
 - b. Operators:
 - c. Stop clearance immediately.
 - d. Clear the base line of personnel and equipment not required for the medical evacuation.

- e. Start to give first aid to the casualty at the location of accident.
- f. All Team leaders report to the supervisor.
- g. Supervisor/Senior uninjured person:
- h. Assesses the scene of the accident, including the location and condition of the casualty and possible presence of other mines/ERW.
- i. Organises casualty into the nearest cleared area (if necessary organise deminers to clear lanes to the casualty).
- j. Maintains radio contact with the Medic and, if possible, provide information on the condition of the casualty.
- k. Maintains overall responsibility for the safety of all personnel during the casualty evacuation procedure.
- l. Maintains overall responsibility for the execution of the casualty evacuation.
- m. Takes over the responsibility for the execution of the casualty evacuation procedure, in the event that the Medic is a mine/ERW victim.
- n. Maintains radio communications as per the South Sudan Mine Action Medical Evacuation Plan with the organisation headquarters and provide the correct information when required.
- o. Medic:
- p. Utilises personnel to bring the spine board and medical equipment to a point close to the casualty, but still within a safe area.
- q. Takes appropriate action to stabilise and evacuate the casualty once the casualty has been brought to the safe area.
- r. Recommends the method of evacuation, in accordance with the extent of the casualties' injuries. (By air or road).
- s. Stays with the casualty and reports to the next Level of Medical Facility.
- t. Shall monitor and record on the patient care record form the casualty's vital signs and the treatment that has been given to date? A copy of this documentation shall follow the casualty and handed to the receiving medical authority.

10.6. Procedure in the Event of an Accident

- a. In the event of an accident the following procedure shall be adopted:
- b. Stop all work and inform the Supervisor and Medic that an accident has occurred.
- c. Supervisor shall organise team members to clear around the casualty, if he/she is in an uncleared area, and then move the casualty to a safe area/medical point

- d. The Supervisor informs the headquarters that there has been an accident.
- e. The Medic shall assess and stabilise the casualty in the safe area and arrange evacuation by stretcher from the safe area to the identified evacuation vehicle.
- f. The casualty shall be accompanied with a valid identity card and a copy of his/her valid passport.
- g. Transport casualty to the nearest HLS or next level medical facility. The Medic and the medical kit for trauma / injuries shall where necessary accompany with the casualty until they are at the higher level of medical facility.
- h. Transferring the casualty from the vehicle to the helicopter/medical facility is under the supervision of the Medic.
- i. The headquarters shall confirm the method of evacuation away from the task site. If communications are lost, evacuate by road to the nearest appropriate medical facility.
- j. If evacuation is by road, the vehicle should be driven carefully and escorted by a second vehicle in the event of breakdown.
- k. The headquarters shall ensure the receiving medical facility is notified and arrange all administrative support.
- l. An accident narrative should be kept of all communications and events during the evacuation process for reference during the post-accident investigation.

10.7. Procedure following an Accident

- a. Subsequent to an accident, the following procedure shall be adopted:
- b. Account for all personnel and make sure no one else is injured.
- c. Support those personnel shocked by the accident.
- d. Account for all equipment and stores.
- e. Close off all lanes and the area of the accident.
- f. List all the people who witnessed the accident or worked in the immediate area, where possible separate them and assist them to write their statements.
- g. Return to the base and assist the headquarters staff to conduct an investigation.
- h. Start preparations for the Accident Investigation according to Chapter 15. As soon as possible implement the accident investigation.
- i. A debrief should be conducted with all people that were involved in the accident.

- j. Make available professional counselling services to those shocked by the accident who request professional psychological assistance
- k. An IMSMA ERW Incident/Accident Report shall be completed and submitted to the NMAA/UNMAS-SS within 24 hours after the accident occurred.

10.8. Training & Qualifications

- a. Two levels of Medical training courses shall be imparted under the following terms, qualifications and training standards.
- b. **Basic Life Support Training:** Basic Life Support (BLS) training is a requirement for all demining personnel. Deminers, drivers, and any management staff involved in clearance operations are all required to regularly attend BLS training provided by the mine action organisation. Regular (at a minimum - biannual) refresher courses should be included in the agency’s mission schedule (as submitted in their SOP) as well as forming a part of their routine activities. A BLS course shall consist of at least 20 hours of training with the syllabus included in the organisations SOP. As a minimum, the course shall cover the subjects outlined in Table 10.4. All operational staff shall be trained to the level of basic life support prior to commencing operations.

Theory Subjects	
Principles Of First Aid	Emergency (Casevac) SOP
DRABC Algorithm – Controlling Life Threats	Heat Disorders
Basic Airway Maintenance and Ventilation	Mine Injury
Management Of A Choking Patient	Burn Injury
Cardiopulmonary Resuscitation Theory	Management Of Bites And Stings
Health And Safety	
Safe Lifting	Universal Precautions
Health And Hygiene	Helicopter Safety & HLS Requirements
Healthy Living	
Practical Phase	
Airway Management	Spinal Immobilisation techniques
Ventilation Practical	Safe Lifting and Transport Techniques
Wound Management And Bleeding Control	Assisting the Medic
CPR Practical	Casevac Exercise
Fracture And Dislocation Management	

Table 10-4 Minimum subjects to be covered on Basic Life Support Course

- c. Note: All operational personnel shall complete a BLS course and as a minimum undergo refresher training biannually (every 6 months). Minimum ratio instructor per student should be 1 instructor for 10 students in classroom and 1 for 5 in practice. In the practical phase, some of the practice drills should be conducted after the theoretical lecture that applies to this drill. It should be noted that the focus of medical training should be practical scenario based training where the Deminer is called on to treat a casualty in a systematic approach. These scenario-based exercises shall best prepare the Deminer for treating a casualty in the field setting.
- d. **ALS Qualified Medic** Personnel designated to be Medics shall be recruited according to basic minimum requirements in Table 10.5 and shall be required to attend a trauma life support training course. Based on an understanding of anatomy and physiology, kinematics and mechanism of injury, basic medical and trauma pathology principles the medics shall be able to calmly and systematically provide medical treatment to a casualty.

Theory Subjects	
Introduction to Humanitarian Demining	Abdominal Injury
Anatomy and Physiology of Systems of the Human Body	Pelvis and Limb Injury
Universal Precautions	Embedded Objects
Principles of First Aid	Soft Tissue Injury
DRABC, Algorithm – Controlling Life Threats	Burn Injury
Casualty Assessment and Normal Adult Physiological parameters	Management of Bites and Stings
Obtaining an A.M.P.L.E History	Fractures and Dislocation Theory
Mechanism of Injury & Kinematics	Allergic Reactions and Anaphylaxis
Basic Airway Maintenance	Eye Injury
Management of a Choking Patient	Emergency Field Drugs
Ventilation Techniques	Heat Disorders
Cardiopulmonary Resuscitation Theory	Endemic diseases
Developing a Systematic Approach for Casualty Management (Drill)	Emergency (Casevac) SOP
Respiratory pathology	Triage and Multiple Casualty Incident

	Management
Asthma	Aviation Physiology & Principles of Air Medical Evacuation
Accidental Narcotic Overdose	Mine Awareness & Mine Field Marking
CVS Pathology	Radio Communications
Fluid Resuscitation	Field Medic Documentation
Wound Management	Pain Assessment and Management
Head Injury	Patient Handover
Other Causes of Unconsciousness	Chest Injury
Spinal Injury	
Health and Safety	
Safe Lifting	Healthy Living
Health and Hygiene	Helicopter Safety & HLS Requirements
Oxygen Handling and Storage	
Practical phase	
Bandaging	Minefield Visit
Fracture and Dislocation Management	Emergency Medical Equipment
Chest Injury Practical	Airway Management
Head Injury Management - Practical	Ventilation Practical
Spinal Immobilisation Techniques	Wound Management and Bleeding Control
Safe Lifting and Transport Techniques	Mine Injury Management
Parenteral Administration	CPR Practical
Communications Procedures	Assessment Techniques
Casevac Scenario Exercises	

Table 10-5 Minimum subjects required for Field Medics

- e. Note: Personnel attending the Field Medic course should where possible have completed basic medical training through a recognised national medical institute and have experience in assessing and treating patients. Minimum ratio instructor per student should be 1 instructor for 10 student in classroom and 1 for 5 in practice. In the practical phase, some of the practice drills should be conducted after the theoretical lecture that applies to this drill. It should be noted that the focus of medical training should be practical scenario based training where the medic is called on to treat different pathologies in a calm, systematic, clinical based approach. These scenario-

based exercises shall best prepare the medic for treating a casualty in the pre-hospital setting

10.9. Training & Qualifications

- a. Medics are also trained to provide basic medical attention and medical advice on sanitation, hygiene and the prevention of diseases.
- b. The Medic shall have the knowledge and experience of using the medical equipment according to the organisations SOP.
- c. Medics shall receive an introduction to Mine/ERW clearance operations.
- d. The syllabus for the Medic Training shall be included in the organisations SOP. To maintain medical competence it is desirable, if possible, that the Medics rotate in order to work in a hospital or a clinic.
- e. All Medics will be individual accredited prior to taking up their position on the team, which will also be assessed on medical practices as part of the teams overall operational accreditation.
- f. Medical training programmes are to be submitted to UNMAS SS Medical Coordinator, at least 4 weeks in advance of any training commencing.

10.9.1. Medic Log Book

- a. To ensure that Medics maintain the required knowledge and to prevent skill fade it is essential that there is monitoring of their work and continuous professional development. To that end all medics working with demining organisation in South Sudan are issued by NMAA/UNMAS-SS with a Log Book. The log book details a series of practices which must be demonstrated each month, under the supervision of the organisations Medical Coordinator or the Operations Manager. These log books will be inspected during external QA and signed by the visiting UNMAS officer.

10.10. Medic Recruitment and Accreditation

- a. The medic's training will vary from one country to another, under the context of South Sudan Mine action programme, a medic is a health professional who completed formal health training and obtained an accredited certificate to practice in different aspects of health and Medicine and has obtained an advanced life support training as an additional training to the basic medical training.
- b. To participate on the South Sudan Mine Action Programme the health professional shall undertake advanced life support training conducted in the context of the South Sudan Mine Action Programme.

- c. Basic General Education Attained
- d. The individual medic shall have attended and passed the basic education levels, these levels shall be the minimum requirements;
- e. Secondary school level (Ordinary level, GCE level, Grade 12)
- f. Preferred candidates should have studied basic Science including Biology and Chemistry.

10.10.1. Basic medical training attained

- a. It is preferred to recruit candidates who have had formal medical training before enrolment on the advanced life support course. There may be variations from one country to another on the recruitment and training of health cadres therefore this document serves as a guide during recruitment of individuals for training, if an agency should wish to train medics locally. The formal medical cadres are;
 - Enrolled Nurses, Enrolled midwives or their equivalent
 - Registered nurses / midwives
 - Anaesthetist, Anaesthetist assistants
 - Clinical officers, Physician assistants (PA), Medical assistants (MA), General Medical Technician (GMT)
 - Emergency medical technician, (EMS)
 - Paramedic
 - Orthopaedic Technicians /assistants
 - Physiotherapy Technician / assistants

10.10.2. South Sudan Candidates

- a. Community health workers trained for nine months who served under Primary Health Care and emergency health care programmes for at least two years, preferably those whose basic formal education are at Ordinary level or its equivalent as stated in para. 2 above, candidates however, may be evaluated on an individual basis by agencies, before requesting for guidance from NMAA/UNMAS-SS for recruitment.

10.10.3. CANDIDATES that are considered not suitable

- a. These cadres may be evaluated on individual basis by an agency, it is strongly recommended not to recruit unless on basis of mine action experiences. They include Laboratory assistants, Dental assistants, Psychiatric Nurses, community health officers, nutrition assistants, VCT/ HIV counsellors, EPI vaccinators, medical imaging and radiological assistants, First aiders, dispensers / Pharmacy assistants. Recruitment

under such category may take consideration under Para 4 above and NMAA/UNMAS-SS shall be informed about the individual candidate.

10.10.4. Recruitment appointment of Senior Medic and Medics

- a. The senior medic's role solely relies on the training, internal QA and support of the team medics, it is important that the candidate to be appointed as the senior medic shall have attained a higher qualification than the team medics, preferably at a level of the basic medical training of Registered nurse, Comprehensive nurse, Clinical officer/ Physician assistant orthopaedic/ Physiotherapist technician, paramedic, General Medical technician and a Medical assistant or an equivalent of these cadres or higher. In addition, the senior medic should have undertaken and passed the advanced life support training and should have at least two years of services as a medic. The NMAA/UNMAS-SS Medical Advisor shall be notified when recruitment of medic supervisors and new medics are being conducted by the mine action organisations.

10.10.5. Medic Internal Assessments & External Accreditations

- a. A copy of all medical internal training agendas shall be submitted to the NMAA/UNMAS-SS Medical Advisor. On completion of the internal training and assessments, only the candidates who have passed the assessments shall be presented for accreditation by the NMAA/UNMAS-SS Medical Advisor. The accreditation process shall involve the following:
 - A written test, a pass mark of 70% is required,
 - Technical assessments involving locally endemic diseases, non-communicable diseases, Trauma related to mines and explosive ordnance and its pre-referral care that the medic "MUST" pass before proceeding to the final assessments, the practical CASEVAC for Trauma and medical emergency victims.
 - The internal training agenda should include the names of the medics, basic medical training and qualification of each medic.
 - Knowledge check every 6 months.

10.11. National Medical Evacuation Plan

- a. A copy of the UNMAS SS National Medical Evacuation Plan can be requested from the UNMAS SS Medical body however each organisation is to ensure it has its own medical evacuation plan.

10.12. Responsibilities

- a. NMAA/UNMAS-SS shall
 - Establish and maintain documented standards and procedures for medical support to demining operations.
 - Monitor mine action organisations development and maintenance of demining accident response plans.
 - Evaluate the effectiveness of emergency response plans and assist in implementing appropriate corrective actions.
- b. Mine action organisations shall:
 - Develop and maintain SOPs which aim to reduce the risk of demining incidents occurring.
 - Develop and maintain SOP which aim to reduce the risk of harm resulting from demining accidents
 - Develop and maintain demining accident response plans for each demining worksite.
 - Provide the training and resources needed for the implementation of the demining accident response plan.

10.13. Training Matrix for Basic Life Support Course

- a. Note: All operational personnel shall complete a BLS course and as a minimum undergo refresher training biannually (every 6 months). Minimum ratio instructor per student should be 1 instructor for 10 student in classroom and 1 for 5 in practice. In the practical phase, some of the practice drills should be conducted after the theoretical lecture that applies to this drill. It should be noted that the focus of medical training should be practical scenario based training where the Deminer is called on to treat a casualty in a systematic approach. These scenario-based exercises shall best prepare the Deminer for treating a casualty in the field setting.

Theory Subjects	Remarks	Minimum Time Period
Principles Of First Aid	What is first aid, what are the responsibilities of the first aider, communicating with a casualty and gaining his / her trust, reassurance techniques, calling for help	30 min
DRABC Algorithm – Controlling Life Threats	Immediate Control Of Life Threats: Danger, Response, Airway, Breathing (breathing assessment and sealing open chest injury with palm of hand), Circulation (assessment for	60 min

	pulse and bleeding control)	
Basic Airway Maintenance and Ventilation	Introduction of airway equipment and demonstration of basic airway maintenance techniques, Head positioning, placing a casualty in the left lateral recovery position, jaw thrust technique for suspected spinal injury. Expired air resuscitation, Bag Mask Ventilation	60 min
Management Of A Choking Patient	Signs and Symptoms of choking, airway clearance techniques using finger sweeps, back slaps, Heimlich manoeuvres	60 min
Cardiopulmonary Resuscitation Theory	Techniques for single and two responders for adult CPR as a minimum, The CPR technique shall be conducted as per organizational SOP, (Standard CPR algorithm or American Heart Association 2010).	60 min
Emergency (Casevac) SOP	Deminers shall have a complete understanding of the emergency Casevac procedures and understand the roles of all responsible persons following an accident. Students shall understand the South Sudan evacuation plan and the role of the AME teams and sector hospitals. Deminers shall also be taught the basic principles of multiple casualty accidents	120 min
Heat Disorders	Hyperthermia / Hypothermia prevention, basic treatment	60 min
Mine Injury	Mine injury: blast mine injury, fragmentation mine injury, bleeding control	60 min
Burn Injury	Signs and Symptoms: Thermal burn injury, chemical burn injury, electrical burn injury, and white phosphorous burns. Burn injury management	60 min
Management Of Bites And Stings	Outline of types of snakes and scorpions in South Sudan, mechanism of venom types, Signs and Symptoms of Snake bite and scorpion sting. Management snake bite and scorpion sting	60 min
Health And Safety		
Safe Lifting	Prevention of Back injury, Safe Lifting techniques	30 min
Health And Hygiene	Health and Hygiene Measures, Disease transmission routes, Prevention measures	30 min
Healthy Living	Mental Health, Stress management, Healthy Living	30 min
Universal Precautions	Barrier Protection. HIV, HBV, HCV transmission and prevention, procedures following possible accidental exposure to these viruses	30 min
Helicopter Safety & HLS Requirements	Helicopter safety and HLS requirements	15 min
Practical Phase		
	Remarks	
Airway Management	Placing a casualty in the left lateral recovery position, jaw thrust, chin lifts, airway suctioning, finger sweeps, treating a choking patient.	60 min

Ventilation Practical	Expired Air Ventilation, Bag Mask ventilation oxygen administration using a face mask	60 min
Wound Management And Bleeding Control	Use of pressure point, pressure dressings, elevation, management of different types of wound.	60 min
CPR Practical	Single responder and two – responder CPR techniques using the DRABC approach	120 min
Fracture And Dislocation Management	Signs and Symptoms of a fracture. Management of open and closed fractures using splints, slings and anatomical splinting techniques	60 min
Spinal Immobilisation techniques	In line spinal immobilisation, log roll, use of spine board, use of head block	60 min
Safe Lifting and Transport Techniques	Fore and aft lift, flat lift, chair lift, blanket lift, spinal board lift, stretcher carry, fireman carry, lift and drag method, safe ambulance and (where appropriate) helicopter approach, loading and transport of a casualty	60 min
Assisting the Medic	Provide outline on the job of the medic and how the deminer can assist the medic, preparing tape for IV line, holding IV fluids, controlling bleeding etc	30 min
Casevac Exercise	Practical Casevac exercise conducted in training area	120 min
	TOTAL	1395 min

Table 10-6 BLS Course Structure

Annex A to Chapter 10 Training Matrix for the Field Medic Course

- Note: Personnel attending the Field Medic course should where possible have completed basic medical training through a recognised national medical institute and have experience in assessing and treating patients. Minimum ratio instructor per student should be 1 instructor for 10 student in classroom and 1 for 5 in practice. In the practical phase, some of the practice drills should be conducted after the theoretical lecture that applies to this drill. ***It should be noted that the focus of medical training should be practical scenario based training where the medic is called on to treat different pathologies in a calm, systematic, clinical based approach. These scenario-based exercises shall best prepare the medic for treating a casualty in the pre-hospital setting.***

Theory Subjects	Remarks	Minimum Time Period
Introduction to Humanitarian Demining	Medical support in humanitarian demining operations, IMAS and the NTSG chapter 10, basic outline of structure of national demining programme, Role of NMAA/UNMAS-SS, QA procedures	60 min
Anatomy and Physiology of Systems of the Human Body	Cardiovascular system	60 min
	Musculoskeletal System	60 min
	Respiratory System	60 min
	Nervous System	60 min
	Endocrine System	60 min
	Integumentary System	60 min
	Reproductive System	60 min
	Urinary System	60 min
	Gastrointestinal System	60 min
Universal Precautions	Barrier Protection. HIV, HBV, HCV transmission and prevention, procedures following possible accidental exposure to these viruses	60 min
Principles of First Aid	What is first aid, what are the responsibilities of the medic, communicating with a casualty and gaining his / her trust, reassurance techniques, calling for help	60 min
DRABC Algorithm – Controlling Life Threats	Danger, Response, Airway, Breathing, Circulation (immediate control of life threats)	60 min
Casualty Assessment and Normal Adult Physiological	Assessment techniques and understanding of normal physiological parameters for pulse, BP, respiration, temperature, skin perfusion, conscious status for an adult. Medics shall be taught to assess skin perfusion, blood pressure, pulse rate, respiratory (rate, rhythm & effort),	120 min

parameters	conscious status (using the AVPU scale or Glasgow Coma Scale) (physiological assessment), Full body examination (anatomical assessment)	
Obtaining an A.M.P.L.E History	Obtaining an adequate history is vital for safe and effective treatment, this history includes: Allergies, Medications, Past Medical History, Last Meal, Event (including assessment of Mechanism of Injury)	60 min
Mechanism of Injury & Kinematics	Assessment and understanding of Kinematics and Mechanism of Injury for blunt and penetrating injury. Quick assessment of an accident scene for clues to establish Mechanism of Injury and suspicion for occult injuries.	60 min
Basic Airway Maintenance	Introduction of airway equipment and demonstration of basic airway maintenance techniques, Head positioning, suctioning, airway adjuncts, oxygen administration for trauma and medical emergencies	120 min
Management of a Choking Patient	Signs and Symptoms of choking, airway clearance techniques using finger sweeps, back slaps, Heimlich manoeuvres, ((laryngoscopy and Magill forceps, and cricothyroidotomy (optional – not NTSG requirement))	60 min
Ventilation Techniques	Ventilation techniques using expired air resuscitation and bag/mask ventilation techniques for intermittent positive pressure ventilation and assisted positive pressure ventilation including frequency of ventilation and tidal volume	60 min
Cardiopulmonary Resuscitation Theory	Techniques for single and two responders for adult CPR as a minimum	120 min
Developing a Systematic Approach for Casualty Management (Drill)	Immediate control of life threats, assessment of perfusion status, respiratory status, conscious status, full body examination, obtain AMPLE history and commence appropriate treatment in a calm efficient and systematic manner – “The Clinical Approach”	60 min
Respiratory pathology	Recognition and treatment of respiratory distress, use of accessory muscles, narcotic analgesia administration as a precaution in respiratory distress, positioning techniques for casualties with respiratory distress, oxygen administration	180 min
Asthma	Signs and Symptoms, pathology, trigger factors and treatment of asthma	60 min
Accidental Narcotic Overdose	Recognition of signs and symptoms of accidental narcotic overdose, treatment using Naloxone Hydrochloride and oxygen therapy (ventilation if necessary)	60 min
CVS Pathology	Heart attack, pathology, risk factors, signs and symptoms, treatment fluid resuscitation	240 min
	Causes of shock, signs and Symptoms of Shock, Compensation and decompensation, treatment of Shock	120 min
Fluid Resuscitation	Fluid resuscitation protocols – I.V fluid suitability for different pathologies, crystalloids and colloids, fluid compartments.	60 min
Wound Management	Mine injury: mechanism of injury, blast mine injury, fragmentation mine injury, cavitation, basic ballistics concepts, compartment syndrome, wound infection, blood vessel damage, limb preservation, management. Amputation, laceration, avulsions, abrasions, penetrating	120 min

	trauma, haematoma etc, facial injury, scalp injury, hematemesis, dislodged teeth, wound debridement	
Head Injury	Head injury: signs & symptoms, management of open and closed head injury, primary and secondary head injury	120 min
Other Causes of Unconsciousness	Overdose / poisoning, metabolic disorders, hypoglycaemia, hyperglycaemia, apoplexia (C.V.A), convulsions, syncope, infection, tumours	60 min
Spinal Injury	Spinal injury: mechanism of spinal injury, signs and symptoms, spinal immobilisation techniques, log roll, application of cervical collar application, use of head block, use of spinal board, transportation of spine injured casualty	120 min
Chest Injury	Chest injury: Signs and Symptoms, Penetrating and Blunt Chest Trauma, Pneumothorax, Hemothorax, Tension Pneumothorax, cardiac tamponade, flail chest. Treatment of Chest Injury, ((chest decompression (optional ATLS skill – not a requirement of NTSG))	120 min
Abdominal Injury	Abdominal injury: Signs & Symptoms, penetrating and blunt abdominal trauma, evisceration of organs, treatment of abdominal Injury	60 min
Pelvis and Limb Injury	Pelvis and limb injury including traumatic amputation. Signs and Symptoms, vessel damage, Nerve Damage, Compartment Syndrome. Management of Pelvis and Limb Injury, limb assessment	60 min
Embedded Objects	Embedded Objects: Signs and Symptoms. Management of a casualty with an embedded object.	60 min
Soft Tissue Injury	Signs and Symptoms, sprains, strains, (Rest. Ice application. Compression. Elevation) treatment following injury, treatment in the recovery phase. Use of NSAIDS	60 min
Burn Injury	Signs and Symptoms: Thermal burn injury, chemical burn injury, electrical burn injury and white phosphorous burns. Burn Depth assessment and categories of burns, Assessment of Burn Size, critical burns, management of burns, safety when dealing with thermal, chemical, electrical and phosphorous burns. Dangers of smoke / CO inhalation, S&S of CO poisoning, inhalation injury	120 min
Management of Bites and Stings	Outline of types of snakes and scorpions in South Sudan, mechanism of venom types, Signs and Symptoms of Snake bite and scorpion sting. Management of snake bite and scorpion sting	60 min
Fractures and Dislocation Theory	Signs and Symptoms of fractures and dislocations, types of fractures, complications of fractures and dislocations, principles of splinting	
Allergic Reactions and Anaphylaxis	Basic understanding of allergy, anaphylaxis. Causes of anaphylaxis, signs and symptoms and management	60 min
Eye Injury	Anatomy of the eye, causes of eye injury including penetrating eye injury, chemical burns, and blunt trauma. Considerations for air evacuation, Signs & Symptoms of eye injury and treatment	60 min
Emergency Field Drugs	Medics shall completely understand all emergency drugs they are carrying to ensure safe administration (including presentation, indications, contraindications, side effects,	120 min

	dose, routes of administration, precautions etc). Pre-administration drug checks and safe drug administration, Correct storage and drug accounting procedures.	
Heat Disorders	Medics shall understand environmental hazards and be able to recognise disorders related to heat and treat hyperthermia (heat exhaustion, heat stroke) and hypothermia	60 min
Endemic diseases	Medics shall have an understanding of the pathology of common endemic diseases, causes, avoidance and treatment	120 min
Emergency (Casevac) SOP	Medics shall have a complete understanding of the emergency casevac procedures and understand the roles of all responsible persons following an accident. Students shall understand the SSMAA/UNMAS evacuation plan and the role of the AME teams and sector hospitals.	120 min
Triage and Multiple Casualty Incident Management	Medics shall be taught the principles of triage and management of accidents involving multiple casualties, Triage priorities, role of triage officer, role of supervisor, use and completion of casualty triage tags.	60 min
Aviation Physiology & Principles of Air Medical Evacuation	Medics shall be taught the basic principles of aviation physiology and the principles of air medical evacuation	60 min
Mine Awareness & Mine Field Marking	Medics shall have a basic mine awareness and shall understand the minefield marking system used by the organisation, Indications Of Mine / UXO Presence, Basic Introduction to make up of a Mine, Basic UXO recognition, Minefield Marking System, The Layout of the Minefield, On-Site Requirements, On Site Work Routine, The Concept of Integrated Operations, The Organization of a Demining Team	60 min
Radio Communications	Basic radio communications procedures shall be taught for VHF and HF	60 min
Field Medic Documentation	Medics shall be able to complete a treatment log of a casualty and should record a daily morbidity report and drug register, they shall be trained in the completion of basic field medical documentation.	60 min
Pain Assessment and Management	Assessment of pain using for example mnemonic DOLOR (Description, Onset, Location, Other signs and symptoms, Relief) and severity assessment using a verbal pain scoring system (0 – 10 pain scale or severe – moderate – mild) and pain management through titration of analgesia to reduce pain to comfortable level. Students shall be taught the analgesia administration protocol of the organisation for the drug they shall use in the field	60 min
Patient Handover	Medics are taught how to conduct a concise patient handover. Commencing with introductions of medic and casualty to medical officer, AMPLE history, injuries, initial vital signs, casualty status during transport, last vital signs taken prior to handover. Role playing exercises are helpful in this class	60 min
Health and		

Safety		
Safe Lifting	Prevention of Back injury, Safe Lifting techniques	60 min
Health and Hygiene	Health and Hygiene Measures, Disease transmission routes, Prevention measures, health and hygiene monitoring	60 min
Oxygen Handling and Storage	Oxygen handling, storage and administration	60 min
Healthy Living	Mental Health, Stress management, Healthy Living	60 min
Helicopter Safety & HLS Requirements	Helicopter safety and HLS requirements	15 min
Practical phase	Remarks	
Minefield Visit	Where possible following the theory class on minefield marking and MRE, the students should visit a clearance operation to see the operational set up and should receive a site brief from the supervisor and medic/s	120 min
Emergency Medical Equipment	Medics shall be familiar with all emergency medical equipment that they shall use in an emergency, trauma kit layout, ambulance set up, stretcher function. Medics shall be able to disassemble and reassemble Ambubag and suction equipment, connect oxygen equipment and administer oxygen, disassemble and reassemble laryngoscope etc.	120 min
Airway Management	Placing a casualty in lateral position, jaw thrust, chin lift, insertion of OP & NP airway, airway suctioning, and finger sweeps, treating a choking patient. It is the choice of some organisations to teach endotracheal intubation, cricothyroidotomy (these are ATLS skills and not a requirement for NTSG)	120 min
Ventilation Practical	Medics shall be taught bag – mask ventilation (both intermittent positive pressure ventilation and assisted positive pressure ventilation techniques), oxygen administration using a face mask	120 min
Wound Management and Bleeding Control	Use of pressure point, pressure dressings, elevation, management of different types of wound.	120 min
Mine Injury Management	Specific management of blast mine injury and Fragmentation mine injury, assessment for compartment injury, fragmentation wounds, vascular injury, fractures, ballistics, groin injury, blast wave	
CPR Practical	Single responder and two – responder CPR techniques	120 min
Assessment Techniques	Physiological (skin, pulse, Blood pressure, respiratory status, conscious status) and anatomical assessment (full body examination / secondary survey)	120 min
Bandaging	Bandaging and slings for injuries to different anatomical regions	120 min
Fracture and Dislocation Management	Management of open and closed fractures using splints and anatomical splinting techniques	60 min
Chest Injury Practical	Management of Open Pneumothorax, Decompression of Tension Pneumothorax, flail chest management	60 min
Head Injury Management -	Management of open and closed head Injury (Primary and secondary brain injury)	60 min

Practical		
Spinal Immobilisation Techniques	In line spinal immobilisation, cervical collar application, log roll, use of spine board, use of head block	120 min
Safe Lifting and Transport Techniques	Fore and aft lift, flat lift, chair lift, blanket lift, spinal board lift, stretcher carry, fireman carry, lift and drag method, safe ambulance and (where appropriate) helicopter approach, loading and transport of a casualty	60 min
Parenteral Administration	Aseptic technique, Universal precautions, parenteral drug preparation, safe sharp handling and disposal, I.M injection, I.V injection, S.C injection, Giving set preparation, securing IV line and changing IV soft pack, IV cannulation should be practised on I.V arm where possible. Medics should demonstrate IV cannulation of a person as well during the course	180 min
Communications Procedures	Radio communications procedures and handing over a casualty to doctor – practical scenario training	60 min
Casevac Scenario Exercises	The majority of practical training should be spent doing scenario-based training combining all of the skills learnt over the course to assess and treat a casualty appropriately. In the scenario based training a casualty is assigned injuries and a conscious level. The medic shall then be called to control life threats, assess and provide appropriate treatment for the assigned pathology (medical or trauma emergency)	3000 min
	Total	9030 minutes



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Chapter 11

11 Communications

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11.1. General

- a. Mine action organisations shall ensure that an effective communications network is in place prior to and throughout all humanitarian mine action operations.
- b. No mine action operations shall be undertaken if effective communications cannot be established between the personnel on site and the relevant support elements.
- c. Mine action organisations shall clearly define in their SOP the details of their communications plan.
- d. Communications shall be manned during all operational activities and shall also cover the travel periods to, from, and in between the sites.

11.2. Communication Network

- a. 3 different levels of communications are operated to co-ordinate and control operations:
 - **National Network:** This is the operational network between the NMAA/UNMAS-SS and all mine action organisations.
 - **Regional Network:** This network provides an UNMAS mine action frequency that shall enable all mine action organisations to communicate with each other.
 - **Local Network:** This network provides a link on task-sites between the team supervisor, team leaders, deputy team leaders, clearance teams, team medics and other radio users at task-sites.

11.3. Communication Systems

- a. In ideal circumstance the communication systems are:

System	National Network	Regional Network	Local Network	Remarks
HF Radio	Primary System	Primary System	n/a	
VHF Radio	n/a	Secondary System	Primary System	
VHF TETRA Radio	National network in construction			
Satellite Phone	Emergency Back-up	Emergency Back-up	Emergency Back-up	The use of these systems is limited in so much as they only allow one-on-one communication and
Mobile Phone	Emergency Back-up	Emergency Back-up	Emergency Back-up	

				rely on the individual receiving the call being available and as such should only be used in the context of a 'national or regional communication system' when the primary and/or secondary systems have failed.
Dect Phone	A desk top national telephone system between UN agencies.			
Email	The recognised communication system used for sending text messages, reports and returns and other non-emergency and/or routine communication throughout the network.			

Table 11-1 Communications Systems for Mine Action Operations

11.4. Frequencies & Call-Signs

- a. Frequencies are issued upon request to the South Sudanese Government. This ensures organisations do not cause conflict with national security channels. A current list of frequencies for each region/location is available on request from the NMAA/UNMAS-SS.
- b. NMAA/UNMAS-SS shall coordinate the allocation of calls-signs for mine action organisations.

11.5. Operational Requirements

- a. It is the responsibility of the mine action organisation to ensure that a suitable and sufficient communication system is in place to control the on-going operations and that meets all the necessary requirements to ensure safe and effective operations. Mine action organisations shall implement the following general requirements:
 - b. Communication equipment shall be checked for serviceability on a daily basis prior to operations commencing.
 - c. Communications shall be manned, checked and if relevant confirmed prior to organisations teams/assets departing from bases.

- d. Mine action organisations shall have primary and secondary communication systems established and functioning between the operational site and base camp and/or NMAA/UNMAS-SS before any work commences.
- e. Communications shall also be confirmed internally between the worksite supervisors, all medics, and all supervisory personnel physically supervising the work, ambulance/safety vehicle drivers and, where applicable, individual mechanical operators and other radio users prior to work commencing.
- f. If communications at any level cannot be established and safety is to any degree compromised then work shall not start or shall cease until the situation is rectified or resolved.
- g. On completion of all operations for the day, teams shall advise their higher echelon HQ that work is finished and if relevant that they are returning to base.
- h. The NMAA/UNMAS-SS shall be informed of the net closing down.
- i. Mine action organisations shall ensure that their assets deploy with suitable and sufficient communication equipment and that, where relevant, NMAA/UNMAS-SS call signs have been allocated.
- j. At all times when a mechanical asset is working in a hazardous area, the operator shall have radio communications with the task worksite supervisor.
- k. National and/or Regional communications systems shall be established using HF radio sets and/or satellite phones (mine action organisations shall make an assessment of the most effective, reliable and suitable system and implement its use as the primary means and supplemented by a suitable back-up system).
- l. On-site communications shall be established using VHF hand held radio sets.
- m. Communications shall be appropriately tested at least once every hour.
- n. A communications log of key (important) communications traffic shall be maintained at the task site Control Point.
- o. Details of the mine action organisations communications systems shall be included in Implementation Plans.
- p. Mine action organisations shall be aware of other organisations/agencies whereabouts within the region and should be familiar with their frequencies, channels, and call signs.
- q. Mine action organisations shall ensure that operational locations shall have continuous effective communications with all other relevant organisations.

11.6. General Principles

- a. The following general principles shall be implemented to establish a reliable communications network.
- b. Use of voice procedure, discipline, clarity and brevity by users during radio transmissions.
- c. Use the call sign letters provided by the NMAA/UNMAS-SS.
- d. If no such call sign has been assigned then the NMAA/UNMAS-SS should be contacted for provision of a call-sign.

11.7. Training

- a. Mine action organisations shall ensure that a suitable and sufficient communications introductory and regular refresher training programme is imparted to all its personnel. This as a minimum should include the following (*to include all equipment likely to be used*):
 - b. Basic maintenance and serviceability checks
 - c. Turning on/off of equipment
 - d. Tuning in to required stations and/or frequencies and changing of stations and/or frequencies
 - e. General voice procedure (to include the phonetic alphabet)
 - f. Sending/answering messages
 - g. Recording and/or logging sent/received messages
 - h. Accident/incident reporting
 - i. What to do in the event of an emergency if primary communication systems fail.

11.8. Organisation SOP

- a. The minimum communication procedures to be included in mine action organisations' SOPs are:
 - b. Overall communications system (net diagram) to include details of the systems for all possible operations
 - c. Network station allocation by teams and call sign. This may be in the form of a net diagram.
 - d. Communication systems; primary and secondary, including channels to be used.
 - e. Types of radios held by each net station.
 - f. The requirement to use correct procedures and guidelines for its use.

- g. Operational and specific-to-operation communication requirements.
- h. Accident reporting procedures.
- i. Daily routine communication requirement, responsibilities and routine
- j. Refresher training requirements.

11.9. Restrictions

- a. The following shall be implemented and adhered to by mine action organisations:
 - b. The carriage of radios and/or mobile phones into hazardous areas is restricted to team leaders and/or supervisors. At no time are deminers to carry radios or mobile phones into a hazardous area unless acting in a supervisory role.
 - c. During all operations where the hazard is thought to include electrically initiated ERW, vehicles with radios mounted shall remain at least 160m outside the boundary of any unclear hazardous area. If vehicles have to move inside this distance, radios shall be switched off before doing so. Hand held communication equipment shall be turned off within 20m of any electrically initiated EO or any unidentified ERW.

11.10. Responsibilities

- a. NMAA/UNMAS-SS shall provide a communications link between mine action organisations and UN agencies during all hours of demining operations. They shall provide the frequencies for each organisation to operate.
- b. Mine action organisations shall maintain check communications prior to starting any operations each day and shall maintain communications throughout the day. They shall ensure that each team has functioning communications equipment and is contactable at all times.



South Sudan

National Technical Standards Guidelines

Date: 1st November 2017

Chapter 12

12 Storage, Transportation & Handling of Explosives

12.1. Introduction

This chapter provides details of the minimum specifications and guidelines for the safe storage, transportation and handling of explosives and where applicable ERW, and is based upon guidance found in IMAS 10.50. It does not consider the storage of boxed ammunition or explosive quantities in excess of 250kg, should any agency wish to do so it should do so in accordance with the International Ammunition Technical Guidelines¹.

Whenever and/or wherever possible and/or practicable, these specifications and guidelines shall be followed, adhered to and implemented by mine action organisations. However at all times the operators are advised to make their judgements based on the safety and security of their explosives, rather than the intrinsic hazard it may pose.

When used within this chapter, the term explosives refers to mass detonating items including explosive charges, detonators and ancillaries such as detonating cord.

12.2. Requirements of Responsible persons

All persons charged with, responsible for or involved in the storage, transportation and handling of explosives shall have received appropriate training, shall be suitably qualified and experienced and shall be familiar with the details and guidelines of this chapter.

Persons responsible in whatever capacity for the storage, transportation and/or handling explosives shall be in good health, and the limits of their responsibility shall be clearly identifiable.

At all times a designated official shall be responsible for the storage or movement of explosives. All transportation and storage of explosives, temporarily or permanent shall be recorded in a log book showing the amount of explosives transported or stored and the amount of explosives being used as well as the name and signature of the person receiving or using it.

All transfers must be clearly recorded in an auditable format (logbook), where appropriate a key lock register should also be maintained.

A designated official who is responsible and accountable for the storage, transportation and handling of explosives shall always be appointed by mine action organisations. Records are to be kept and made available for inspection by UNMAS/NMAA or other inspecting agencies.

12.3 Environmental Requirements

Explosives and their packaging degrade when exposed to high temperatures, variances of temperature, moisture and excessive vibration. Minimizing the exposure of explosives to these factors will prolong its working life.

In general, explosives should be:

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

¹ <https://www.un.org/disarmament/un-safeguard/guide-lines/>

12.4 Storage Requirements

The storage of explosives in Mine Action is invariably a trade-off between safety and security. In the current security environment in South Sudan, the primary requirement should be that all times explosives are properly controlled and never left in an area where they cannot be supervised.

If Mine Action organisations construct their own explosive stores then the general requirements for the design of magazines and containers used for the storage and transport of explosives given in IMAS 10.50 shall be applied. In summary:

- Separate containers are to be used for explosives (main charge and detonating cord) and for detonators.
- Explosives should be secured in a lockable box that is wood or Kevlar/Twaroon or other suitable blast resistant material lined.
- Electric detonators shall be always kept in the secured metallic box.
- In general, detonators shall be packed in such a way that they cannot move around inside the box.

Whenever practical and possible operators should seek to adhere to the quantity distances outlined in Annex A to this document.

12.4.1 Separation of Items

The following items should be stored separately. At a minimum a sandbag wall is to be used to divide them:

- Detonators
- Main charges and explosive ancillaries (detonating cord and safety fuse) containing primary explosives
- If ERW is recovered to a team site it should be stored securely and separately from the above items and disposal of such items should take place in a timely manner.
- Blind items should neither be moved or stored
- Non-explosive material should not be held in the explosives store

12.4.2 Permanent and/or main storage facilities

Shall be fire-resistant, theft resistant, weather resistant and ventilated. Consideration should be given to ground and local features during the design and siting of such structures. Where possible the stores should be as far from residential accommodation as the site allows, but at all times the store should be in a place where it can be observed.

Portable storage facilities, such as a skid-mounted container, trailer or semi-trailer shall be theft-resistant, fire-resistant and weather-resistant. The magazine should be constructed of steel with an interior lining of timber. Magazines of less than one cubic metre in size should be fixed to the ground to prevent theft of the entire magazine.

For main stores the separation distances outlined in Annex A should be used. However if concerns regarding the security of the explosives are such that there is insufficient space then reduced distances may be applied.

12.4.3 Minefield/Task Storage

A day box is used for the on-site storage of explosives required for daily mine/ERW clearance operations. It shall be:

- i. Weather resistant and able to be locked and secured to a ground anchor or secured to a fixed point with a vehicle.
- ii. Wherever possible or practical it should be of steel construction but may be wooden boxes or other appropriate containers.
- iii. The box shall contain no more than 10 kg of explosives and or (including) appropriate quantity of initiating means to fire the given quantity of explosives.
- iv. Stored within the admin area amid an earth or sandbag surround in a point where they can be observed at all times that is **at least 15m** from the nearest person.
- v. Detonators and/or other means of initiation shall be stored and carried in a separate box from explosives.
- vi. Electric detonators should be stored and carried in closed metal containers to shield them from EED's (Electro Explosive Devices).

12.4.5 Use of vehicles for explosive storage

There will be occasions where the most secure option for a demining team is to store its explosives in a vehicle. Vehicles may be used as overnight storage facilities provided:

- i. The explosives is secured to a strong point within the vehicle,
- ii. The vehicle is locked, and preferably alarmed
- iii. The keys held remotely, and that
- iv. There is a guard posted close by.

12.4.6 Fire extinguishers

Fire is a primary cause of concern and teams should make all reasonable effort to protect their explosives from fire. As a minimum this means.

- i. Removing all vegetation from within 5m of a proposed storage location.
- ii. Maintaining serviceable fire extinguishers wherever explosives are stored.
- iii. Maintaining fire beaters on site to prevent bush fires

12.5 Audit and Accounting

As a minimum, and at every location where explosives are stored, accurate records are to be made of the following:

- i. All stocks of explosives and ancillaries.
- ii. All consumption of such items.
- iii. All transfers of such items, including the date of receipt or handover, and the agency or team to/from the explosives were transferred.

Records are to be maintained for a period of twelve months, and be available for inspection at all times, a paper record must be maintained, and an electronic record is an optional extra.

A designated official shall be responsible for managing the receipt, storage, guarding and issuing of explosives at all levels

Only authorised persons shall enter the storage facility and where appropriate and relevant shall be escorted at all times.

Rules regarding contraband at explosive storage areas should be maintained within an agencies SOPs but in general should prohibit the entry of all smoking materials, including cigarettes, matches, lighters etc. and any object or item that might cause fire from entering the storage facility. Signage indicating prohibitions should be displayed.

The storage facility shall not be used for anything other than storing explosives. It should be kept free from any other tools, equipment of items and should at all times be kept as clean and tidy as is practicable.

Facilities should be constructed in such a way as to provide protection from static electricity.

In the event that the facility requires repairing, all explosives and explosive accessories shall be removed before repairs are started.

12.6 Transport of Explosives

The official responsible for the transportation of explosives shall ensure:

- i. That suitable communications systems are available that will allow for communication from the vehicle to the organisation throughout the complete journey.
- ii. That an appropriate communication plan (covering as a minimum a radio check prior to leaving the start location and informing on arrival at destination) is in place for the journey.
- iii. That the driver and drivers assistant are aware of all actions to be taken covering all likely eventualities during the journey i.e. breakdown, accident, robbery, etc. and that all other team members are briefed on their roles.
- iv. Explosives are to be securely packed in appropriate boxes that shall be closed and which prevent any loss or spilling and moisture ingress during transport. If the vehicle is not a covered vehicle, boxes shall be covered with a waterproof cover.
- v. Detonators shall be securely packed in a separate metal box from explosives. Boxes containing detonators shall be carried in a separate compartment of the vehicle from boxes containing explosives.
- vi. UNDER NO CIRCUMSTANCES ARE DETONATORS TO BE CARRIED IN THE SAME BOX AS EXPLOSIVES.
- vii. Detonators and explosives shall be loaded on to the vehicle in such a way that they do not move about during transportation.
- viii. Vehicles employed to transport explosives shall be roadworthy, well maintained, and in good working order. Persons in charge of the transport of explosives shall check the following prior to any movement of vehicles carrying explosives.
 - ix. Appropriate fire extinguishers shall be carried.
 - x. No smoking shall be allowed in the vehicle.
 - xi. The vehicle shall not be left unattended.

12.7 Alternative Techniques

Whenever transport regulations do not permit the carriage of explosives operators should consider the use of alternative disposal techniques and the provision of materials that can be safely transported.

12.8 Inert, Drill, Instructional or Replica Mine & Ammunition

Inert, drill and replica items are to be clearly marked that they are free from explosives and stored separately from live items.

A written log of all such items must be maintained and checked regularly.

All items shall also be marked with a unique serial number. This unique serial number should be in the following format: (Location/3 digits/type – For example DAM/001/AP No4)

12.8.1 Registration & Accounting for Inert or Drill Mines & Ammunition

The mine action organisation shall maintain a master register of all inert, drill, instructional or other replica mines and ammunition that it has responsibility for. This register shall include the following information:

- Serial number
- Type of mine/ERW
- Current location.

12.9 Free From Explosive Items

The mine action 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. It is recommended that this is based on their live ammunition accounting system.

12.9.1. Free From Explosive (FFE) Certificate

All inert, drill, instructional or replica mines and ammunition shall be visually inspected and physically examined by an official of the organisation who has been tasked to ensure that the item contains no explosive, pyrotechnic, lachrymatory, radioactive, chemical, biological or other toxic components or substances.

The EOD technician shall then certify the item is free from explosive (FFE). The certificate shall contain the following information:

- i. Unique serial number.
- ii. Date
- iii. Name of inspecting EOD technician
- iv. Brief description of item
- v. A declaration that the items is free from explosive

The statement and should be written in English and Arabic.

12.10 Live training items

Agencies will from time to time need to hold explosive filled items for training purposes. Such items must be strictly recorded, and their whereabouts known at all times. These items must be subject to regular audits.

Mines left in the ground for the purposes of testing and training of mine detection dogs should have their detonators removed, be clearly marked on their exterior to indicate live training and have the firing train adapted in such a way that the mine cannot be reactivated.

12.11 Temporary storage of ERW

On those occasions when items that are safe to move cannot be destroyed on the day in which they are encountered organisations will have a requirement to store items of ERW overnight. In such situations:

- The items are to be individually registered with details of the date the item was first stored and the name of the official who designated it safe to move.
- The date of destruction is also to be recorded.
- The net explosive quantity of the items is to be detailed and, should this raise the total explosive held beyond the agreed threshold then the item(s) should be separated and suitably protected, usually by placing the item in a deep channel and covering it with earth filled sandbags.
- ERW should be destroyed at the earliest practical opportunity.
- Records of ERW held by Mine Action teams are to be submitted to UNMAS each Friday so that they can track the timely disposal of such items.

Table of distances for the storage of explosive materials

Net Explosive Quantity (NEQ) (kg)		Distance (m)							
		Inhabited Building Distance (IBD)		Public Traffic Routes (PTR) (Traffic Volume)				Inter Magazine Distance (IMD)	
				Less than 3000 veh/day		More than 3000 veh/day			
Over	Less Than	Barricaded	Unbarricaded	Barricaded	Unbarricaded	Barricaded	Unbarricaded	Barricaded	Unbarricaded
0	3	21.3	46.6	9.1	19.3	15.5	33.6	1.8	4.1
3	5	29.4	56.1	11.7	23.3	21.2	42.4	2.6	5.3
5	10	34	68.9	13.9	27.7	25.1	50.1	3.7	6.2
10	15	39	79	15.6	31.1	29.0	57.9	3.4	6.5
15	20	43.6	87.8	17.2	34.5	32.0	64.1	3.8	7.7
20	25	48.2	93.9	19.5	39.1	35.6	71.3	4.4	8.8
25	35	53.1	105	21.6	43.3	39.5	78.9	4.6	9.3
35	50	58.2	118	23.0	46.0	42.7	85.3	4.9	9.9
50	65	62.8	129	25.0	50.0	46.8	93.7	5.6	11.2
65	80	70	138	28.1	56.3	52.0	104	6.2	12.5
80	100	74.8	148	30.6	61.1	55.6	111	6.7	13.4
100	120	79.6	158	32.6	65.3	59.1	118	7.1	14.3
120	150	84.5	169	34.4	68.8	63.0	126	7.6	15.2
150	200	92.3	186	37.5	75.0	69.0	138	8.4	16.8
200	250	100	201	40.2	80.5	74.4	149	9.1	18.2

Note: Barricaded means the effective screening of the magazine containing explosives from a building containing explosives, or other building or railway or roadway by a natural or by an artificial barrier. A straight line from the top wall of a building or magazine containing explosives to the eaves line of any other building or a point 3.5m above the centreline of any roadway or railway shall pass through such a barrier. It is also often referred to as traversing.

Note: Artificial barricade is an artificial mound or revetted earth wall not less than 90 cm thick.

Note: For small quantities (up to 18 Kg NEQ) a 68cm thick brick wall situated 1m from the ammunition/explosives and extending to 2° (but a minimum of 60cm) above the top of the ammunition/explosive (see IATG 05.30 for details).

Note: Natural barricade means natural feature of the ground such as hills or timber with sufficient density that the magazine cannot be seen from the building or features requiring protection when the trees are bare of leaves.

Note: These distances are intended for blasting explosives and the like. This table is therefore only for use with demolition stores where there is very little fragmentation hazard. This table shall not be used for APM, ERW, stockpiles or similar where military ammunition may be involved.

Note: When an operational EOD Demolition Box is being used away from the team's HQ location, it is regarded as being 'in use' at all times. The distances in this table apply between the 'in use' box and areas/facilities which are not connected with the team, e.g. houses, roads etc. **where practicable**. The distances should be applied between the 'in use' box and the team's temporary accommodation, garaging etc. where these distances are possible given the security climate of the area they are in.

Note: This table can be used to calculate safety distances for an organisation's main bulk holdings of demolition explosives and accessories up to 250kg NEQ as long as there are no fragmentation hazards from any of the items. Above 250kg NEQ IATG 02.20 is to be used.

Note: When storing APM, ERW, CM and stockpiles which include military ammunition, and therefore carry the risk of fragmentation, the quantity distance tables in IATG 02.20 are to be used.



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Chapter 13

13 Training Qualifications

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13.1. Introduction

- a. Training is essential in order to ensure safe and effective operations therefore Mine action organisations are responsible for ensuring that their personnel have received suitable and sufficient training in any activities they are to be involved in and for ensuring they are competent, qualified and have sufficient experience, aptitude and proficiency to conduct their role in a safe and effective manner.

13.2. General Requirements

- a. All mine action organisations are responsible for ensuring that the minimum training standards as outlined in this chapter are achieved prior to conducting humanitarian mine action operations.
- b. Mine action organisation personnel shall receive suitable and sufficient training in all aspects of operations they are likely to be involved in.
- c. Personnel shall not conduct any operations for which they have not received appropriate training.
- d. Training shall be designed and conducted in such a way as to ensure that mine action organisations are able to assess an individual/teams competency in the role(s) they are likely to be involved in prior to being qualified.
- e. As part of the accreditation process, mine action organisations shall be required to sign a Training Declaration confirming that all training has been in conformance and/or to a standard that ensures compliance with these NTSG (refer to Chapter 19).

13.3. Standard Operating Procedures

- a. Mine action organisations SOPs shall contain, as a minimum, the following information:
- b. Details of their training policy.
- c. Types and schedules of training – to cover **all** activities the organisation is to be involved in.
- d. Responsibilities and resources in the training.
- e. Methods of quality assurance designed to evaluate the suitability and effectiveness of the training.
- f. Details of assessments/testing for all courses.
- g. Details of the activities that an individual/teams shall be competent in on successful completion of the training.

- h. Provide details of requirements when additional refresher training or updating of training shall be necessary.
- i. A policy on the recording of training and qualifications and the holding/storing of these records.

13.4. Qualifications & Experience

- a. Mine action organisations shall have suitably qualified international staff members who are experienced in humanitarian mine action operations that they are responsible for or are to be involved in and who are capable of training national staff in their area of expertise.
- b. Mine action organisations shall submit proof of these individuals' qualifications and experience to NMAA/UNMAS-SS that shall substantiate that they are adequately qualified to conduct their respective role.
- c. All personnel completing the training shall be able to perform at the level established by NMAA/UNMAS-SS under the guidance of NTSG/IMAS/SOPs.

13.5. Training Courses & Qualifications

- a. The majority of courses necessary for conducting safe and effective humanitarian mine action operations/activities at the various practical and management levels are well known and the syllabuses are generally similar for most organisations depending on the approach to the activity by that organisation.
- b. Mine action organisations shall ensure syllabuses adequately cover all aspects of the activity (ies) the training course is designed to deliver. All courses shall include theory and practical lessons, assessments and/or examinations:
- c. Mine action organisations shall conduct syllabuses that are modified to include specialised training specific to that organisations role.
- d. All personnel attending a specific training course shall be given certificates of competency, achievement and qualification on successfully completing the course or after a suitable probationary period (three months is recommended).
- e. Mine action organisations shall record an individual's training, his/her qualifications, the period the qualification is applicable for prior to requiring refresher training and the achievements/awards/results. This information shall be forwarded to NMAA/UNMAS-SS as per the details of Chapter 21, and kept as records by the organisation

- f. The following are typical courses conducted. Course titles may vary between organisations and additional courses e.g. mechanical mine clearance, MDD etc. shall be conducted as required.
- g. Surveyor: The following minimum training requirements apply:
- Mine /ERW identification
 - Mine clearance procedures
 - Map reading
 - Sketch drawing
 - Land navigation and surveying techniques
- h. Mine / ERW (Deminer) Training: The following minimum training requirements apply:
- Mine/ERW identification
 - PPE
 - Equipment & tools
 - Minefield layout and marking
 - Manual clearance procedures to include: detector, investigating a detector signal – prodding and/or excavation, actions on: vegetation, trip-wires, high metal contamination, obstacles, locating mines, ERW, trip-wire, controlled demolition, animals or people entering minefield and pulling drills.
- i. BAC Training: The following minimum training requirements apply
- Mine & ERW identification
 - PPE
 - Equipment & Tools
 - Site Layout and marking
 - Clearance procedures to include: surface, shallow and deep and sub-surface clearance techniques
- j. EOD: All personnel involved in EOD operations shall have received suitable and sufficient training in EOD applicable to the role and responsibilities for which they are appointed. Details of training and qualifications requirements are as per Chapter 5 and also in IMAS but should also include country specific training to ensure the person is fit for the role.
- k. Team Leader Training: Personnel selected as a team leader shall have either successfully completed a leadership course applicable to the selected role or have been operating on the ground in the applicable role for a period of not

less than 6 months. For all future or designated team leaders the following minimum training requirements shall apply:

- Basic Leadership
- Instruction techniques
- Supervisory roles and responsibilities
- On job training shall be conducted on the applicable tasks required of a team leader.
- DGPS and GPS

- l. Team Supervisor Training: Personnel selected, as a Team Supervisor shall have been employed as a Team Leader in the specific role on the ground for a period of not less than 6 months. They shall have successfully completed a training course reinforcing all of the Team Leader training and covering specific responsibilities and general supervisory responsibilities. Prior to being appointed they shall show competency and knowledge in all activities for which they are responsible.
- m. Medical Training: All personnel shall receive medical training as per details in Chapter 10.
- n. Refresher Training: Refresher training is designed to be a period of condensed revision of drills and theory after the following occasions:
 - o. Following a planned or unplanned break of 10-days or more.
 - p. Introduction of a new procedure or any significant changes to current procedures.
 - q. After an accident.
 - r. When requested by the NMAA/UNMAS-SS after a breach of safety which results in a non-compliance being awarded and thus failing an External QA assessment.
 - s. Other circumstances specified by the mine action organisation.When there are changes in the team appointments.

13.6. Monitoring of Training Courses

- a. As part of the accreditation process, mine action organisation training shall be regularly and routinely monitored throughout its duration by relevant NMAA/UNMAS-SS Ops/QA officers in order to provide advice and guidance as required and to assess compliance with SOPs and NTSG.

13.7. Responsibilities

- a. NMAA/UNMAS-SS shall:

- Establish and maintain national standards, regulations and procedures for the management of training within South Sudan.
 - Ensure that capacity development forms an essential part of the work of each organisation.
 - Perform periodic external assessment of training conducted by the mine action organisations to ensure the training is in accordance with the training plan and national standards.
- b. Mine action organisations shall:
- Ensure that capacity development forms an essential part of their work and the work of Technical Advisors providing support to any training.
 - Produce comprehensive training plans.
 - Ensure that their training plan is in compliance with the organisation SOP and with the national standards
 - Ensure that training is based on a Training Needs Analysis.
 - Ensure training activities, whether formal or on-the-job, are written into the strategic and work plans.
 - Submit training plans to NMAA/UNMAS-SS for approval prior to any training taking place.
 - Conduct internal monitoring and evaluation as essential part of the training.
 - Maintain records of training for the life of the programme.
 - Ensure the training is being delivered by qualified and experienced trainers.

13.8. Recruitment of Mine Action Organisation Staff

- a. All mine action organisations conducting de-mining activities in South Sudan shall comply with the rules and regulations of the Republic of South Sudan. The following minimum recruitment requirements shall be adhered to by all mine action organisations;
- Positions such as team leaders, medics, logistics assistants, finance assistants, mechanics, drivers, cooks and cleaners shall be nationalised where possible.
 - Recruitment shall be in accordance to the NMAA rules & regulations.
 - The selection of mine action employees shall be fair and free
 - Recruitment of de-miners/EOD operators shall be conducted through the NMAA in collaboration with the SPLA Corps of Engineers.

- All mine action related training shall be conducted with the approval of NMAA/UNMAS-SS.



South Sudan

National Technical Standards Guidelines

Date: 1st November 2017

Chapter 14

14 Quality Management System

1. Introduction

The South Sudan National Mine Action Authority has charged UNMAS SS with the development and implementation of a quality management system. This ensures that the standards of humanitarian demining activities, and the processes and procedures implemented whilst conducting them, are in accordance with IMAS South SUDANMAP NTSG, and the mine action organisations' own SOP and/or implementation plans.

This shall be achieved through the appointment of a monitoring body responsible for developing and maintaining the programme's overall Quality Management (QM) system and the implementation of it, under the terms of their accreditation by all mine action organisations.

2. General Principles, Implementation and Conduct of the QM System

The overall objective is to provide the authoritative bodies and donors with the confidence and assurance that mine action organisations have applied and adhered to standards that are in accordance with IMAS, NTSGs and their own SOPs, and that safe, effective and efficient humanitarian demining processes and procedures are implemented.

The QM system comprises the following:

- Internal Quality Assurance (QA)/Quality Control (QC) processes throughout the life-cycle of a task.
- External QA processes and procedures carried out prior to the commencement of and during humanitarian demining activities.
- External QC processes when practicable and justified on the completion of humanitarian demining activities.

The system aims to scrutinise all aspects of a mine action organisation's processes and procedures prior to, during and on completion of humanitarian demining activities.

3. Levels of the QM System

The complete system process comprises of the following:

3.1 Accreditation: This is the overall process of determining an organisation's, individual's or team's suitability, competency and ability to plan, manage and conduct humanitarian mine action activities safely, effectively and efficiently. For all information and detail concerning the accreditation process within South SUDANMAP see Chapter19.

3.2 Internal Monitoring: Internal monitoring is conducted within a mine action organisation by its own personnel. The process will include the completion of IMSMA compatible QA forms that record the elements of the mine action process that have been reviewed.

3.3 External Monitoring: Regular external monitoring visits shall be conducted aimed at examining the entire process. To achieve this, assessors shall audit the internal monitoring processes of the mine action organisation, conduct external QA checks and assessments of the mine action organisation's QA activities and monitor and remark where relevant on the processes, practices and procedure being carried out. This shall be done with reference to the information contained within the agencies' SOPs, within NTSGs and within any relevant Implementation Plans.

4. Quality Management and Auditing of the QM System

A Quality Management Body shall periodically conduct reviews of external QM reports to assess the recommendations made and actions taken. The Quality Management Body will also periodically accompany the external QA assessors during visits to monitor the style in which EQA is being conducted.

5. QM System Bodies - General Responsibilities

5.1 Mine Action Organisation - Internal Monitoring:

It is the responsibility of individual mine action organisations to maintain sufficient management personnel to carry out the monitoring requirements detailed in this NTSG. Failure to maintain sufficient internal monitoring capacity may result in the withdrawal of an organisation's operational accreditation. Individual mine action organisations must also maintain and share sufficient documentation relating to their monitoring activities to allow external bodies to review the work that has taken place and understand the effectiveness of the monitoring.

5.2 UNMAS South Sudan / External Quality Assurance Office:

UNMAS South Sudan is charged with the conduct of external monitoring activities. This function may be carried out directly by UNMAS SS, delegated to a contracting organisation, or both.

5.3 Quality Management Body

This is a body comprised of senior personnel from UNMAS SS and the NMAA that has the responsibility to monitor and coordinate the implementation of the overall QM system and to ensure that it is implemented with integrity.

6. Specific Methodology

6.1 Internal Monitoring:

The aim of internal monitoring is to ensure that the activities being conducted are in accordance with the respective organisation's SOPs. This is part of the general management process and thus should focus on those areas of greatest concern to the management. To this end formal internal monitoring recording shall be done on the basis of constituting either a FULL or a GENERAL ASSESSMENT. Both assessments will result in the completion of the UNMAS South Sudan IQA Monitoring form (dated 1 September 2017). The requirements outlined below are the minimum obligation of operators and may be complemented by additional checks by operators in order to comply with their on quality management policies.

FULL ASSESSMENTS – Whenever a full assessment is carried out all elements of operational activity shall be reviewed. Thus a full assessment is expected to include:

- Site briefing
- Revision of clearance/deployment plan
- Casualty evacuation exercise
- Review of demolitions procedures
- Assessment of marking

GENERAL ASSESSMENTS – General Assessments is more discretionary form of assessment. It takes the same form as the full assessment but it is up to the assessor to determine, in discussion with the respective headquarters, which aspects of the assessment will be undertaken.

For each team only one fully completed General Assessment form, compiled over the duration of the month, is to be submitted to the UNMAS Field Office for review and subsequent entry into IMSMA. However organisations are encouraged to do whatever additional internal quality assurance that they deem appropriate.

6.2 Frequency of assessments

Full assessments are to be carried out on a minimum frequency of one full assessment per demining team or supervisor per month.

General Assessments are to be undertaken on a minimum of one assessment per team or supervisor per week, and all elements contained within the General Assessment must be assessed at least once per month, in addition to the Full Assessment that must be undertaken.

Additionally programme management should aim to review all aspects of the demining process, and not be limited to those particular activities detailed in the reporting forms.

6.3 Critical and Non-critical Non Conformities

During the conduct of the IQA process the assessor shall record all critical and non-critical non-conformities identified during Internal QA/QC (if a critical non-conformity is identified then work shall cease immediately and the NMAA/UNMAS-SS OPS/QA officer shall be contacted immediately in order to confirm the non-conformity and to advise on the suitability of the rectifying action, as well as to discuss the underlying cause of the non-conformity).

Store hard copies of completed internal IMSMA QA forms on site and make them available for inspection/review by the external monitoring body during external QA.

Ensure appropriate follow-up action is implemented and adhered to following external monitoring body's recommendations.

7. External Monitoring

7.1 General Introduction to External Monitoring

External Monitoring in South Sudan will be done through a layered approach. The first review shall take the form of a desk review of daily progress reports, internal quality assurance records, and Survey and Hazardous Area reports. These will be reviewed to see that the actions being conducted are in accordance with the Implementation Plans (IPs) and SOPs. The reviewer will also check for consistency and thoroughness in the documentation process and for patterns or inconsistencies (either good or bad) in performance outputs. Such inconsistencies should then be followed up by External Quality Assurance checks. The second layer of monitoring shall take the form of field assessments and takes place primarily to validate the IQA reporting.

7.2 Desk Assessments

The NMAA/UNMAS South Sudan Quality Control process will ensure reporting compliance by the clearance agencies and will evaluate all agency quality assurance reports and aims to identify any

trends that, if left without action, may result in critical non-conformities. These trends will be highlighted to the agency for action and will be subject to further attention as part of the quality assurance process. A monthly overview of each agency's quality assurance reports will be compiled and sent to the agency with comments (and where appropriate on a project by project basis). These reports will also form part of a country-wide monthly quality management report to be submitted to the UNMAS Chief of Operations.

7.3 Field Assessments

The NMAA/UNMAS South Sudan Quality Assurance process will actively monitor the clearance agencies whilst they conduct their internal quality assurance, this will be by way of QA officers or other officials visiting clearance sites and observing the internal quality assurance process, checking on site documentation, and commenting and reporting to both the agency and to the UNMAS QA manager the results of the visit. The essence being put on the external Quality Assurance of the Internal Quality Management process.

As a minimum it is expected that an External Quality Assurance (EQA) visit will consider the following

- Inspect the results of internal QA that has been conducted since the last visit, by ways of reviewing the details recorded on internal QA IMSMA forms, hard copies of which shall be maintained on-site at all times.
- Conduct an external QA inspection that shall include the accurate and full completion of the UNMAS SS IMSMA External QA Monitoring form that shall be registered and submitted to the Quality Manager on a weekly basis.
- Compare the recordings/results of completed external IMSMA QA Monitoring forms against the most recent internal IMSMA QA Monitoring forms for accuracy and take appropriate action dependant on findings.
- Identify any non-conformity and take appropriate action depending on the circumstances and severity of the non-conformity.
- Identify and recommend corrective actions through discussions with the mine action organisation and ensure they are implemented by agreeing and documenting a follow-up plan.
- Record all non-conformities and the general results of the visit.

When an external QA inspection team conducts a site completion an external QA Form is also to be submitted with the IMSMA Completion report. The Completion QA should be submitted to the Quality Manager on a weekly basis

Ensure appropriate follow-up action is taken on the Quality Management Body's' recommendations.

8. Documentation

8.1 On site documentation

The following documentation should be available for inspection "on-site" by the external Operations/QA officer;

- Site visitors log
- Detector log
- Medics' logbooks
- Deminers' logbooks
- Explosive log

- Daily reports
- List of items found
- Site attendance sheet
- Stores lists including medical equipment etc.
- Copies of all quality assurance reports
- Quality assurance log – detailing dates of inspections, by whom and the results along with any recommended follow up action
- Casualty evacuation practice log
- Organisational SOPs
- Task map showing the progress and deployment of each clearance asset
- Approved Implementation Plan

Additional documentation may be requested by the QA official.

8.2 **Head Office Documentation**

The clearance organisation shall also maintain within administrative “in-country” head-quarters at least the following documents that will be available for inspection as part of the external quality management process.

- Copies of all the documentation that is on site
- The Organisation’s signed Quality Management statement
- Quality Management /Control / Assurance schedule of events / program
- Copies of all reports as sent to the NMAA/UNMAS-SS Quality Management office
- Copies of all reports sent to the organisation from the NMAA/UNMAS-SS quality management office

9. **Outputs**

9.1 **External Monitoring Body**

The external monitoring body shall deliver the following outputs:

The NMAA/UNMAS-SS sub-office OPS/QA officer shall provide a Weekly Summary based on the previous week’s external monitoring activities, to the NMAA/UNMAS-SS National QA Officer/Chief of Operations.

As part of the NMAA/UNMAS-SS Quality Management process there will be monthly / bi-monthly meetings with all agencies / interested parties to discuss any Quality Management / Control / Assurance issues, and to evaluate and improve the process where necessary, these meetings would be subject to an agenda and shall be minuted, the minutes would be circulated to all attendees and to the NMAA/UNMAS-SS Chief of Operations / Program Manager.

9.2 **Quality Management Body**

The specific responsibilities of the individuals and/or the body as a whole are to:

- Ensure compliance with the QM system at all levels by reviewing completed IMSMA QA Monitoring forms.

- Accompany the external monitoring body whenever possible or practicable to ensure general standards and the details of this chapter are being adhered to and met.
- Identify shortcomings in individual QA skills, overall practices, non-conformities with the system at any level and improvements to the system.
- Identify and suggest corrective actions to the internal and external monitoring processes and ensure they are implemented
- Develop and keep a database in order to identify trends of performance by teams/mine action organisations.

10. Conduct of EQA

10.1 General Responsibilities of Mine Action Organisations

Mine action organisations have the following general responsibilities:

Accredited mine action organisations shall fully cooperate with any external QA process or inspection and shall provide access to all tasks/sites, personnel, buildings and other facilities which are visited in order to implement any stage of the QM system. Reasons for not wishing to do so should be verbally relayed to the external body senior representative and appropriately recorded in writing by the mine action organisation appointment in charge of the task/site and submitted to NMAA/UNMAS-SS QA Coordinator within 24-hours .

In particular, the mine action organisation representative in charge of the task/site should record in writing on the completed external IMSMA QA forms any response to the written records of the external QA body prior to it leaving the task/site.

As a minimum requirement, the mine action organisation representative in charge of the task/site shall be required to:

- a. Provide a safety brief to the external QA body.
- b. Sign the relevant completed IMSMA QA Monitoring forms that record the results of an external QA inspection, prior to the departure from site of the external QA body.

It is the responsibility of the mine action organisation representative in charge of the task/site to inform their organisation of the results of or any concerns resulting from an external QA inspection.

Mine action organisations shall, on request, make available all original records and related documentation recording the details of the implementation of any aspect of the QM System to external QA bodies and to other appointed authoritative bodies i.e. internal investigation bodies, Board of Inquiry bodies etc.

Mine action organisations shall report their internal QA forms completed on a weekly basis to the respective Quality Management Office.

All Internal QA forms are to be submitted to the relevant UNMAS sub – office once completed.

Mine action organisations shall prepare and maintain records of all site visits/inspections, and any information needed to understand and interpret them. All records shall be safely stored for a period of at least five years.

Mine action organisations shall ensure that appointed managerial and/or supervisory personnel of tasks/sites are fully aware of and have the documentation listed in paragraph 8.1 available to assist external QA inspections.

10.2 Conduct of the EQA team - General Responsibilities of External QA Bodies within QM System

The following guidelines should be followed:

- a. When an external QA team arrive at a task site, the senior NMAA/UNMAS-SS representative shall report to the Control Point and introduce him/herself to the mine action organisation representative in charge of the task/site and state the purpose of their visit.
- b. A safety brief shall be given prior to commencement of the external QA inspection after which all safety instructions shall be adhered to.
- c. The team should be firm, polite and objective when making any judgements. They shall remain impartial at all times and not let personal opinions; family ties, friendships, religion, gender, political views, and tribal influences affect their judgement and performance of their duties.
- d. The body shall not make general commitments to any individual from within the mine action organisation on behalf of the NMAA/UNMAS-SS.
- e. The body shall not get involved in any argument with any member of the mine action organisation during the conduct of an external QA inspection. If a heated situation does develop the team shall leave the site and draft a written report detailing the incident to the Quality Management team.
- f. The body shall not conduct a debrief of the organisation's site supervisor/team leader in front of the organisation's clearance staff, the body should attempt to conduct "positive criticism" de-briefing away from the team, possibly seated in a vehicle, these de-briefings should be conducted professionally, calmly and politely at all times.
- g. Inappropriate or unjustifiable reason for denying and/or hindering any part of the external QA process shall be recorded in writing by the teams representative and submit to the Quality Management Body at the earliest opportunity.
- h. The team shall not make changes to techniques that are in accordance with accredited SOPs. The team may only annotate recommendations or changes on the IMSMA QA monitoring form for possible subsequent further action.

The Operations / QA Officer will conduct the QA / monitoring visit using the UNMAS-SS QA monitoring form.

At all times objective evidence shall be used to base decisions upon. Comments based on prior experience of the team may be made, however it is important that that any decisions or recommendations subsequently arrived at are based purely upon factual observations.

10.3 EQA Reporting Process

The results of the EQA inspections shall be discussed with the mine action organisation representative in charge of the task/site in the way of a full debrief prior to departure from the site, drawing attention to any concerns, particularly those involving safety.

All conclusions, recommendations and the details of debriefs shall be recorded in writing by the body on the relevant IMSMA QA monitoring form. This recording shall be presented to the mine

action organisation appointment in charge of the task/site for review and as confirmation of any discussion/debrief prior to departure from the task/site.

The mine action organisation appointment in charge of the task/site shall be encouraged to provide a written response on the IMSMA QA monitoring form to the aforementioned written recordings of the body.

Completed external IMSMA QA monitoring forms shall be signed by appropriate appointments prior to the departure from site of the external body.

Ideally a fully completed 2nd copy of any IMSMA QA monitoring form should be presented to the mine action organisation appointment in charge of the task/site however, it is acknowledged that this often may not be possible; this may be done electronically on site by way of a signed PDF copy.

Following the completion of the visit any completed and signed external IMSMA QA monitoring forms shall be submitted to the QA Manager on a weekly basis. On completion of this information transfer the original QA evaluation form shall be stamped, signed and placed in archives.

Serious concerns resulting from the inspection, especially where the safety or wellbeing of any individual is concerned shall be brought to the attention of the Quality Management Body as soon as possible. Appropriate further action shall then be implemented.

The external monitoring and Quality Management bodies shall on request make available applicable original documentation relating to and/or recording the details of implementation of any aspect of the QM System to each other and to other appointed authoritative bodies i.e. mine action organisations, internal investigation bodies, Board of Inquiry bodies etc.

11. Critical & Non-critical Non-conformities

11.1 General

Internal and/or external QA inspections may identify non-conformities being conducted. All instances of non-conformities shall be appropriately recorded as previously described in this chapter. The circumstances and/or severity of non-conformities shall determine the subsequent actions taken. The following paragraphs provide guidance on non-conformities.

11.2 Non-critical Non-conformities:

Non-critical non-conformities may generally be defined, but should not be restricted to

- Breaches of SOPs that are not considered as life threatening and/or:
- Breaches of SOPs that may be rectified immediately without further training or additional resources being required to be deployed.

11.3 Critical Non-conformities

Critical non-conformities are generally defined as 'breaches of SOPs that are considered to present significant safety, environmental or quality risk'. The following list, although not exhaustive, gives examples of critical non-conformities:

- When the prescribed communication network is not fully functioning.
- When there is no medical support in accordance with the organisation's SOP and/or NTSG.

- When there is insufficient or incorrect marking of hazardous areas where activities are being conducted.
- When any personnel within the hazardous area during operations are not wearing prescribed PPE.
- Where there is inadequate supervision in accordance to the clearance organisation's SOP.

There may be occasions when non-conformities outside of the scope of SOPs may occur. The following list, although not exhaustive, provides examples of such non-conformities that may be recorded:

- The repeated failure to apply accredited management systems
- Refusal to allow monitoring or inspection to take place
- Interference with monitoring or inspections
- The premature release of cleared land
- Application of processes known to place staff or the local population at unacceptable risk.

In all instances where non-conformities occur, effort should be made by both the operator and the QM staff to identify the root cause of the problem and that this is used to identify appropriate steps to remedy the failing and to use this knowledge to improve the manner in which operations are conducted.

It should also be recognised that not all failings are intentional, and may well be the unintended consequence of otherwise benign and sensible actions, and that there is no obligation within the process to apportion blame.

12. Sanctions and Penalties

If and when an agency is found to be either showing trends within the quality reporting process that are indicative of potential failing or should the agency be found to not be following their accredited Quality Management /Control /Assurance processes then this will result in action being taken by the National Authority/UNMAS which could include any or several of the following.

- Task suspension
- Placed on special QA monitoring
- Cancel/suspension of accreditation
- Required to conduct remedial training
- Removal of identified staff from the project and their replacement by more suitable and competent personnel.

12.1 Suspension of Tasks

12.2 Suspension of Activities

There may be cause to suspend tasks for safety reasons. The following list, although not exhaustive, gives examples when the relevant body may suspend a task on behalf of NMAA/UNMAS-SS:

- Where a number of non-critical non-conformities are observed that either individually or as a whole either cannot be adequately and effectively rectified immediately or that as whole constitute a threat to life.
- Where a critical non-conformity has been identified.
- Where there is a current or imminent threat from external factions to the security and safety of the body, mine action organisation or other personnel.

- When there is any encroachment into hazardous areas that cannot be resolved.
- Where there is a reoccurrence of non-critical non-conformity/ies within a team identified during separate visits.
- As a result of a demining accident/incident (refer to Chapter 15).
- In circumstances where it is considered the demining organisation is breaching the terms of its accreditation, or where there is concern for the safety or wellbeing of any individual, the team is authorised to immediately suspend mine action activities on that task/site. In such circumstances the team shall explain the reasons for this action to the mine action organisation appointment in charge of the task/site and shall record said reasons for later reference. The team shall notify NMAA/UNMAS-SS Office of the decision and the reasons for it at the earliest opportunity. Further necessary actions shall then be addressed.

Following the suspension of any task, the Quality Management Body shall be immediately informed and all relevant information shall be clearly and appropriately recorded. Only when the issues have been resolved/rectified and only on the authorisation of the Quality Management Body shall suspended tasks be allowed to recommence.

As a general principle the suspension of tasks should be seen as an extreme measure and all parties shall collaborate to ensure that the disruption to mine action activities is minimized. The suspension of a task may result in the suspension or termination of an operational accreditation.

12.3 Special QA Monitoring

Special QA Monitoring shall be conducted by the External Monitoring Body.

Special QA Monitoring aims to identify and confirm that problems, non-conformities and/or other such issues have been resolved. Such inspections shall be conducted in an open manner in consultation with the management of the particular clearance organisation. The Quality Management Body shall ensure objectivity and impartiality of conducting Special QA Monitoring evaluations.

If, after conducting QA Special Monitoring on at least two separate occasions, identified concerns have not been resolved, the Quality Management Body in consultation with the Chief of Operations shall review the accreditation licence.

It shall be appropriately and clearly annotated that Special QA Monitoring is being conducted on the particular asset in question.

The following are examples of circumstances when special monitoring may be required:

- After the suspension of a task as described in paragraph 12.2.
- Starting a task in an unfamiliar area.
- Working on a difficult or hazardous task (e.g., undulating ground, rocky, highly vegetated, residential, trip-wires and improvised mines).
- A change in supervisory personnel or when inexperienced personnel are managing a task.
- Handover to national staff as part of the capacity building process.
- Commencing operations after a lengthy period away from operations or after completing a training course.
- Introduction of new demining procedures or equipment.
- Conducting field trials with equipment and machines. Multiple assets working at a task.

12.4 Remedial training

The Quality Management Body, or the UNMAS Chief of Operations, may instruct that (re-)training be carried out as a remedial action if a critical non-conformity indicates that a lack of knowledge or skills exists. Remedial training can be instructed for the entire team or to a particular individual such as the site manager. The extent of trainings will relate to the nature and severity of the identified non-conformity, and should only be conducted once it has been established that the drills being taught are not themselves part of the root cause of the problem that the training is attempting to rectify.

When a period of re-training is instructed the respective organisation's management shall submit a remedial training plan to UNMAS COO and to the NMAA for approval prior to the training commencing. Special monitoring will normally take place upon the completion of remedial training with the number of special EQA visits dependent on the severity of identified non-conformities.

12.5 Removal of staff

In extreme cases, such as those of gross misconduct, one or more employees of an organisation may be identified as being unsuited to either work or supervise activities in the Mine Action sphere. In such cases the Quality Management Body, or the UNMAS Chief of Operations may recommend to the individual's employer that his (or her) employment be terminated or that he be demoted within the management structure of the organisation. Any such termination or demotion must be carried out in accordance with the labour laws of South Sudan.

12.6 Suspension and cancellation of accreditation

The suspension of accreditation shall normally be considered as a temporary sanction that is applied when the performance of an individual or team has shown critical irregularities that require additional training or the advancement of technical resources. When corrective measures have been tried and have not resolved an identified failing, then the accreditation of an individual, a team or an entire organization may be applied.

The suspension of accreditation may be extended to an entire Mine Action organization when critical irregularities are identified in more than one demining team that indicate systemic problems at the organizational level.

The decision to suspend or remove the accreditation of a demining organisation can only be instructed by the Quality Management Body.

13. IMSMA Forms for Internal and External QA Inspection

Internal and External QA shall be documented using the relevant UNMAS S Sudan QA evaluation reports. Specialist reports relating to specific disciplines such as Risk Education shall also be used when appropriate.

Each mine action organisation shall be required to complete the form in full in Full Assessments and those sections that have been assessed where relevant on General Assessments.

Completed IQA forms shall be submitted on a weekly basis to the respective NMAA/UNMAS-SS sub-office OPS/QA officer.

It is the duty of the Ops /QA office to review the IQA form and once clarifications have been sought to submit the corrected report to the IMSMA office.

External Quality Assurance forms are to be completed by the UNMAS/NMAA staff and registered within the IMSMA system.

14. Summary

The NMAA/UNMAS-SS QM system has been designed to ensure that an appropriate, suitable and sufficient QA monitoring process that consists of regular monitoring visits and auditable processes at all stages of operations is implemented. If implemented correctly at all levels it shall enhance the safety, effectiveness and efficiency of operations whilst not impinging on or disrupting operations in any way.

The NMAA/UNMAS-SS QM system is aimed at confirming that mine action organisations are applying their accredited management processes and operational procedures in a manner that shall result in the safe, effective and efficient clearance of land.



South Sudan

National Technical Standards Guidelines

Date: 1st October 2015

Chapter 15

15 Investigations Mine/UXO Accidents & Incidents

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15.1. Introduction

- a. Effective reporting and the thorough investigation of mine/ERW accidents and incidents play an essential part in mine action management. Information collected and presented in a clear and accessible format will contribute to the 'lessons learned' process and assist in any future emergency response, improving the quality of the demining process and reducing the likelihood of future demining accidents and incidents.
- b. The aim of this NTSG is to provide standards and guidelines on the minimum requirements for the reporting and investigation of mine/ERW accidents and incidents within the South SUDANMAP. This NTSG is based on the guidelines and principles outlined in IMAS 10.60.

15.2. Reporting of Accidents/Incidents

- a. Accidents and/or incidents shall be reported to the NMAA/UNMAS-SS accordingly, in the following circumstances:
 - When an event involving mine/ERW or explosives results in harm to a mine action organisation employee, a site visitor or a member of the local population at a demining workplace.
 - When an event involving mine/ERW or explosives results in damage to equipment or property.
 - At all times when a mine/ERW is located in an area previously cleared, recorded as cleared or marked as cleared.
 - Where mine action organisation employees, site visitors or the local population are exposed to intolerable risk that results from the application of the SOP or the failure of equipment issued to employees.
 - When any unplanned detonation of a mine/ERW or explosives occurs irrespective of the cause or outcome.
 - If a non-mine/ERW or non-explosive related accident occurs that requires the urgent evacuation of a casualty to an advanced medical facility for treatment, involving UN personnel, contractor or sub-contractor of the UN, or UN-issued vehicles or equipment.
 - The NMAA/UNMAS-SS on receiving reports of mine/ERW accidents and/or incidents, that highlight inadequacies of equipment, standards or approved SOPs, or that indicate the presence of new types of hazard, shall disseminate a general warning to all mine action organisations

applying the same equipment, standard or SOP, or likely to meet the same new hazards.

b. **Initial Contact Report.** Provides essential information about the accident/incident, which permits the NMAA/UNMAS-SS Headquarters to assist with any emergency response and if necessary to provide a general warning to other mine action organisations. Submitted via appropriate in place communications system to the NMAA/UNMAS-SS Headquarters within 30 minutes of the mine/ERW accident/incident occurring. The minimum information required is:

- **WHEN** – Time of accident.
- **WHERE** – Location, province, district, Task No, lat / long coordinates.
- **WHO** – Organisation, C/S and/or name, nationality and blood group of injured.
- **WHAT** – Brief summary of available information (cause and injuries).
- **CASEVAC INTENTION** – What is intent at this time
- **ASSISTANCE** – Is immediate assistance required and if so what
- **CONFIRM** - VHF/HF radio channel / telephone number for further contact.

c. **Follow-Up Report.** Upon receipt of the Initial Contact Report the NMAA/UNMAS-SS Headquarters shall continue to monitor the situation and to provide support where required. As soon as the casualty is successfully transferred to a hospital and is in suitable medical care, a more detailed verbal report shall be made by the mine action organisation to the NMAA/UNMAS-SS Headquarters. This is generally made via telephone. A confirmation e-mail shall be sent within two days of the telephone call that includes the information that was discussed. The telephone correspondence and the confirmation e-mail shall include the following:

- Confirmation that the casualty is in suitable medical care and that no further immediate assistance is required.
- Confirmation of the details contained in the Initial Contact Report.
- Confirmation that all other mine/ERW sites where the same organisation is operating are shut down and that the scene of the mine/ERW accident/incident is as secure as possible, pending the arrival of the Internal Investigating Officer.
- In addition to the above, the follow-up confirmation e-mail shall include the name of the persons on the telephone call, and the time and date of the call.

- d. **Written Report.** The mine action organisation shall complete an IMSMA Database Demining Report and attach as much relevant detail as possible and submit it to the NMAA/UNMAS-SS Headquarters within 48hrs of the incident. If this form is not relevant to the incident then an appropriate written report covering all details shall be drafted and submitted.

15.3. Investigation Requirements

- a. All employees of mine action organisations shall provide complete and accurate information about the circumstances surrounding the accident/incident and opinions on ways to improve procedures that may assist in preventing a reoccurrence. The NMAA/UNMAS-SS shall have the final decision on whether an accident/incident warrants or requires an investigation however and the following provides details of occasions and/or circumstances which should result in an investigation:
- An accident resulting in injury or death.
 - An incident resulting in damage to property.
 - An incident causing damage that may result in a major claim for compensation from a member of the public.
 - An incident involving a major event causing significant damage.
 - An incident involving the discovery of a mine or ERW in an area previously cleared, recorded as cleared or marked as cleared.
 - An incident where mine action organisation employees, site visitors or the local population are exposed to intolerable risk that result from the application of approved standards or procedures including the failure of equipment.
 - An incident involving the unplanned detonation of a mine, ERW or explosives.
 - An incident which could attract media attention or media report.
 - When considered necessary by the NMAA/UNMAS-SS a non-mine, ERW or explosive related accident, involving UN personnel, contractor or sub-contractor of the UN, or UN-issued vehicles or equipment.

15.4. Investigation Types

An accident/incident formal investigation may consist of one of three levels of investigation:

- a. **Board of Inquiry (BOI):** Ideally any BOI should shall be comprised of a principal member from the NMAA/UNMAS-SS, a member from a third party

mine action organisation and one member from the mine action organisation involved in the accident/incident but this shall not be any person directly involved in the accident/incident. In light of both the transition process of mine action from NMAA/UNMAS-SS to the national authorities, and the importance of capacity building, the BOI Convening Order shall include one representative as a member from the relevant national authority (i.e., NMAA representative). Additionally, it is recommended that a lawyer should be a member on each BOI.

- b. **Independent Investigations:** An appropriately qualified and experienced independent investigation officer appointed by the NMAA/UNMAS-SS Headquarters shall carry out the independent investigations.
- c. **Internal Investigations:** An appropriately qualified and experienced member of the mine action organisation involved shall carry out the internal investigation, but this shall not be any person directly involved in the accident/incident.

15.5. Investigation Procedure

On the initiation of any formal investigation NMAA/UNMAS-SS shall ensure that:

- a. The investigation commences as soon as practicably possible.
- b. The personnel selected to conduct a formal investigation had no involvement with the accident/incident and have the qualifications, experience and skills needed to conduct a full and thorough investigation.
- c. The accident/incident site is preserved as far as possible, until released by the BOI or Investigating Officer, in order to prevent loss of valuable information.
- d. When an investigation team is to examine or extract evidence from an accident site, under no circumstances shall personnel enter an accident/incident area prior to a cleared access lane being opened.
- e. Photographs of the accident/incident site are taken immediately.
- f. Unless exceptional circumstances exist, the investigation report is submitted on time and that it is complete, clear, concise and accurate (including conclusions and recommendations for improvement).
- g. The Convening Authority subsequently on reviewing the findings, shall consult with necessary parties within the national authorities, the programme, UNOPS, and UNMAS for their respective comments, as required.

- h. Should the senior in-country appointment of the mine action organisations involved wish to have any additional comments annexed to the report, he or she shall submit them in writing and they shall be added to the report subsequent to distribution.
- i. The senior in-country appointment from the mine action organisation, in consultation with NMAA/UNMAS-SS, shall ensure that recommendations are implemented without delay. The NMAA/UNMAS-SS shall ensure that summaries of lessons learnt are distributed to all mine action organisations as soon as possible.
- j. Within three months of the BOI report findings, NMAA/UNMAS-SS shall produce a follow-up report that describes how the recommendations were applied. If some of the BOI recommendations were not applied, it should explain the reasons for this decision.

15.6. Investigation Reports

The following reports shall be produced as applicable:

- a. **Internal Investigations and the Detailed Investigation Report:** Detailed Investigation Reports shall be automatically initiated for all known accidents/incidents by the mine action organisations involved. The Detailed Investigation Report is the result of an Internal Investigation carried out by the mine action organisation involved in the accident/incident. An Internal Investigation Officer shall complete the report, but this shall not be any person directly involved with the accident/incident. It shall be completed as soon as practically possible after the accident/incident and passed to the NMAA/UNMAS-SS Headquarters within 2 working days of its completion. A Detailed Investigation Report should precede a BOI and/or an independent investigation if required and should then form part of the formal BOI Report or Independent Investigation Report.
- b. **BOI and Independent Investigations:** BOI or Independent Investigations are initiated by the NMAA/UNMAS-SS. For both investigations a Convening Order shall be issued and personnel shall be appointed to carry out the investigation.
- c. **BOI and Independent Investigation Report Findings:** On completion of the BOI/Independent Investigation, the investigation report shall be presented to the Convening Authority (CA). The CA shall discuss with the BOI/Independent Investigation Team matters of report writing and whether they have answered the questions posed in the convening order.

- d. Following this it shall be signed, bound and produced as four copies for distribution as follows:
- 1 x copy (each) for the NMAA/UNMAS-SS Headquarters.
 - 1 x copy for the mine action organisation in country senior appointment.
 - 1 x copy for the mine action organisation parent HQ.
 - NMAA/UNMAS-SS Headquarters shall hold an additional electronic copy.

15.7. Reporting of Accidents to Local Authorities & Immediate Family

- a. Reporting of Accidents to Local Authorities AND IMMEDIATE FAMILY
- b. The senior in-country management of the mine action agency/agencies involved in the accident shall ensure that the accident is reported to local authorities and immediate family. In addition NMAA/UNMAS-SS shall confirm that the accident is reported to local authorities and immediate family.
- c. Cultural and religious beliefs shall be considered when informing the immediate family of the deceased/injured and dealing with the repatriation.

15.8. Procedure Following an Accident

- a. Subsequent to an accident, the following procedure shall be adopted:
- Account for all personnel and make sure no one else is injured.
 - Support those personnel shocked by the accident.
 - Account for all equipment and stores.
 - Close off all lanes and the area of the accident.
 - Photos shall be taken of the accident area and submitted with the reports.
 - List all the people who witnessed the accident or worked in the immediate area, where possible separate them and assist them to write their statements.
 - Return to the base and assist the headquarters staff to conduct an investigation.
 - Start preparations for the Accident Investigation according to Chapter 15. As soon as possible implement the accident investigation.
 - A debrief should shall be conducted with all people that were involved in the accident.
 - Make available professional counselling services to those shocked by the accident who request professional psychological assistance
 - An IMSMA Mine/ERW Incident/Accident Report shall be completed and submitted to the NMAA/UNMAS-SS within 24 hours after the accident occurred.

- All on-site documentation shall be collated and held for the BOI investigation.

15.9. Responsibilities

a. NMAA/UNMAS-SS Responsibilities

- Establish and maintain procedures for the reporting and investigation of mine/ERW accidents and incidents in accordance with this NTSG.
- Appoint personnel to investigate mine/ERW accidents and incidents in accordance with this NTSG. Only one Point of Contact (POC) shall be the focal point for relaying correspondences between the investigation team and relevant HQs. This is to control the flow of information and avoid confusion and contradictory statements.
- Disseminate the findings of all investigation reports to all mine action organisations operating in South Sudan, and importantly to UNMAS-SS, who may then extract information for other National Mine Action Authorities.
- Coordinate with NMAA/UNMAS-SS in the reporting and investigation process.

b. Mine Action Organisation Responsibilities

- Report all known mine/ERW accidents and incidents to the NMAA/UNMAS-SS in a timely manner.
- Take immediate photographs of the accident/incident site, and then preserve it until the site is inspected and released by the Board of Inquiry (BOI) or investigating officer.
- In the event of demining accidents/incidents only one Point of Contact (POC) from the mine action organisation/contractor shall be the focal point for relaying correspondences between the investigation team and relevant HQ's. This is to control the flow of information and avoid confusion and contradictory statements from the field.
- Provide access and necessary administrative support to BOI personnel.
- Make available for the investigation the original worksite records, SOPs, training records, radio log and any other pertinent documentation as requested.
- Assist personnel that have been appointed by NMAA/UNMAS-SS to investigate mine/ERW accidents and incidents in any way requested in order for them to meet their aims and objectives.

- Mine Action Organisation Employee Responsibilities
- Apply appropriate standards and SOPs designed to prevent mine/ERW accidents and incidents from occurring.
- Report perceived weaknesses in equipment training and procedures that may lead to a mine/ERW accident/incident to appropriate managers.
- Report any known mine/ERW accidents and incidents; and assist in the investigation as required to appropriate managers.

Annex A to Chapter 15 Mine Accident & Incident Formal Investigation Guide

	Type of formal investigation		
	Board of Inquiry	Independent Investigation	Internal Investigation
1. A Demining Accident resulting in:			
a. Minor injury to a demining worker.			
b. Serious injury to a demining worker.			
c. Death of a demining worker.			
d. Any injury to a non-demining worker.			
e. Death of a non-demining worker.			
2. A Demining Incident:			
a. Resulting in damage to demining organisation equipment of value less than US\$ 5,000.00.			
b. Resulting in damage to demining organisation equipment of value from US\$ 5001.00 to US\$50,000.00.			
c. Resulting in damage to demining equipment of value more than US\$50,000.00.			
d. Causing damage that may result in a major claim for compensation from a member of the public.			
e. Involving a major event that caused significant damage.			
3. A Demining / Mine Incident:			
a. Involving the discovery of a mine or ERW in an area previously cleared, recorded as cleared or marked as cleared. (Due to historical records not being available, NMAA/UNMAS can use the most appropriate type of investigation to resolve such incidents)	Note: Depending on task history and the availability of historical information, NMAA/UNMAS will select the type of investigation needed on a case by case scenario.		
b. Where demining workers, visitors or the local population are exposed to intolerable risk that results from the application of approved standards or procedures including the failure of equipment.			
c. Involving the unplanned detonation of a mine, ERW or explosives on a demining worksite.			
d. Which could attract media attention or media report.			
4. A non-mine, ERW or explosive related accident:			
a. On a demining worksite that requires the urgent evacuation of a casualty to an advanced medical facility for treatment.			
b. On a non-demining worksite, involving UN personnel, contractor or sub-contractor of the UN, or UN-issued vehicles or equipment			

Annex B to Chapter 15 Mine/ERW Accident & Incident Detailed Investigation Report Guide

MINE / ERW ACCIDENT AND INCIDENT DETAILED INVESTIGATION REPORT

From: _____ Date report submitted: _____
To: NMAA/UNMAS-SS
Subject: **MINE/ERW ACCIDENT AND INCIDENT DETAILED INVESTIGATION REPORT**
Serial Number: (Year/Report Number⁶)

References:

To Include:

- Initial Contact Report.
- NTSG's and / or IMAS.
- Demining organisation SOPs.
- Map References.
- Part one – INTRODUCTION
- To Include:
 - Demining organisation name.
 - Organisation sub unit, site office/project number, team name/number.
 - Name of Worksite Supervisor.
 - Location of Accident / Incident (province, district, village, task no, grids etc).
 - Date and time of Accident / Incident.
 - Type of Accident / Incident.
 - Executive Summary of Accident / Incident, to include main conclusive findings (Preventable / Non-preventable).

Part two – DETAILS OF ACCIDENT / INCIDENT

To Include:

- General description of how the Accident / Incident occurred including locations; timings; demining personnel (demining teams, MDD teams and mechanical teams) and any non-demining personnel involved.
- Details of mines, ERW or explosives involved.
- Details on past history of area, to include military units, positions, area usage, known mining activities etc.
- Details of vehicles / equipment involved.
- Photographs, diagrams and plans (location plan and detailed site plan).

⁶ E.g., if it's the tenth Investigation Report of 2014 then the number will be 2014/10

- Post-Accident / Incident Investigatory Activities by Investigating Officer.

Part three – ACCIDENT / INCIDENT SITE CONDITIONS

To Include:

- Describe the conditions on the Accident / Incident site at the time of the Accident / Incident in terms of worksite layout and marking, ground and terrain, vegetation and weather:
- Worksite layout and marking. Describe the layout of the worksite in relation to the location of the Accident / Incident covering control areas, general worksite markings and specific worksite markings in the location of the Accident / Incident. Include dimensions and cross reference to SOPs where appropriate.
- Ground and terrain. Describe the ground in terms of type of soil, density or hardness and moisture content. Describe the terrain in terms of flat, undulating or hilly. If required use slope ratios (i.e. 1 in 25) to identify maximum/minimum slopes.
- Vegetation. Describe the vegetation in terms of type, density, size and root structure. Provide dimensions such as height of grass/crops/bush and maximum size of the vegetation stems. Indicate if the roots had an effect on the work or if the vegetation had been burned or cleared in any way.
- Weather. Describe the weather at the time of the Accident / Incident.
- Provide photographs of the site to highlight the Accident / Incident site conditions.

Part four – TEAM AND TASK DETAILS

To Include:

- Team Composition. Provide details of the size and composition of the team (deminers, section leaders, team leaders, supervisors, medics etc), including MDD and mechanical teams.
- The qualifications and experience of personnel directly involved in the Accident / Incident.
- Original Statements of personnel directly involved in the Accident / Incident.
- The results of recent QA monitoring (both internal and external) carried out on the team; and any known problems with the team.
- Task Documentation, Sequence and Procedure of Tasking details. Provide details of the task to include the survey work carried out (general and technical); Implementation / Clearance plan for the task, which should include area to be cleared and depth of clearance.

- Any known mine laying techniques or patterns; the planned use of the land after clearance; time worked on the task; progress in terms of area cleared as a percentage of the total area to be cleared; types and numbers of items found and any problems encountered with the task.
- Include copies of survey reports, Implementation / Clearance plans, task progress reports or any other relevant demining organisation or demining worksite administration documentation.

Part five – EQUIPMENT AND PROCEDURES USED

To Include:

- Equipment used. Provide details of the equipment being used on the site relevant to the Accident / Incident. This may cover detection equipment, Personal Protective Equipment (PPE), deminers toolkits, demolition equipment, communication equipment, medical equipment, vehicles and mechanical equipment. For electronic detection equipment provide details of on-site testing requirements.
- Procedures used. Provide an overview of any procedures used related to the Accident / Incident with reference to SOPs and NTSG's.
- Work routines. Provide details of the work routines being followed on the task at the time of the Accident / Incident and the number of hours worked by personnel (including those involved in the Accident / Incident) on the day prior to it occurring. If work routines involve handovers between personnel, provide details of when the last handover occurred prior to the Accident / Incident and the details of what is covered during handovers for example, detection equipment checks, briefings etc, with reference to SOPs.

Part six – EXPLOSIVE HAZARDS INVOLVED

To Include:

- Details of any mines, ERW, explosive devices or explosives that were involved in the Accident / Incident, such as common names, a detailed description of the components (name, type, size or weight) and construction details.
- For items located also include the position in/on the ground (i.e. surface or buried and if buried depth and attitude in the ground) and whether item was trip wired, command detonated or booby trapped.
- For incidents involving a detonation provide details of blast holes (size and depth); mine/ERW or other debris located and any known or suspected items involved.

- Photographs for any items located or photographs of blast holes and debris.

Part seven – DETAILS OF INJURIES

To Include:

- Details of all personnel (including non-demining workers) injured as a result of the Accident / Incident. Include names, occupation, details of injuries and cross reference the names to the activities that the personnel were carrying out at the time of the incident. All injured personnel no matter how minor the injuries they received are to be included.
- The location of the injured personnel, immediately after the Accident / Incident occurred, should be shown on the Accident / Incident detailed site plan.

Part eight – EQUIPMENT/PROPERTY/INFRASTRUCTURE DAMAGE

To Include

- Details of all equipment, property or infrastructure damaged as a result of the incident:
- For equipment include detailed descriptions to include owner, make, model, age, serial numbers (where applicable), current value (if known), details of damage, insurance held by the owner/organisation and if possible an assessment of the cost of repair/replacement.
- For property and infrastructure provide details of the owner(s), damage incurred, insurance held by the owner(s) and if known the cost of restitution or repair.
- Details of any PPE involved in the Accident Incident by type/function, make, model or any other identifying details. Describe any damage to the PPE and provide comment as to the effectiveness or otherwise of the PPE in preventing injury (or more serious injury) to personnel involved in the Accident / Incident.
- Photographs of damaged equipment, property or infrastructure and copies of any other supporting evidence (ownership papers, property deeds, insurance details, repair quotes etc).

Part nine – MEDICAL AND EMERGENCY SUPPORT

To Include:

- Details of the medical and emergency support (communications and evacuation transport) available at the incident site prior to the Accident / Incident occurring. This may be cross referenced to SOPs. Also if applicable to the Accident / Incident, include details of the frequency of

demining Accident response plan practices and the date the last practice was carried out.

- Provide timings for key activities during the casualty evacuation for example the evacuation of the casualty(ies) off the Accident / Incident site, the arrival at the initial medical facility, departure from the initial medical facility and arrival at the final medical facility.
- Comment on the effectiveness or otherwise of the medical and emergency support in terms of planning and preparation, medical equipment and supplies, communications, evacuation transport, medical treatment facilities and external support (from other mine action organisations) to the casualty evacuation. Where deficiencies were identified provide details and recommendations for improvements.

Part ten – REPORTING PROCEDURES

Comment on the effectiveness or otherwise of the initial Accident / Incident reporting procedures carried out.

Part eleven – SEQUENCE OF EVENTS.

Provide a sequential list of events (timings and dates), from the initial time of the Accident / Incident through to and including the casualty evacuation procedures; also to include actions of the Investigating Officer.

Part twelve – CONCLUSIONS AND RECOMMENDATIONS

Based on the Accident / Incident findings, sequentially detail full and detailed conclusive comments on all salient findings.

Based on the Accident / Incident conclusions, sequentially detail full and detailed recommendations on all conclusions.

Signature of Investigating Officer

Name of Investigating Officer

Position of Investigating Officer

Annexes:

To Include:

- Copy of the initial Accident / Incident Contact Report.
- Witness statements.
- Accident / Incident map location and detailed site plans.

- Site photographs.
- Training records, QA monitoring reports, survey reports, Implementation / Clearance plans, task progress reports or any other demining organisation or demining worksite administration documentation required.
- Photographs and technical details of items located, blast holes or mine/ERW debris.
- Medical records or injury data sheets.
- Photographs of damaged equipment, property or infrastructure.
- Copies of equipment/property ownership documentation (ownership papers, property deeds, insurance details etc).
- Damage repair quotes/estimates.
- IMSMA Demining Accident / Incident Report and Casualty Report.

Annex C to Chapter 15 Formal Investigation Convening Order & Terms of Reference

**EXAMPLE OF A FORMAL INVESTIGATION CONVENING ORDER AND
TERMS OF REFERENCE**

CONVENING ORDER FOR ACCIDENT / INCIDENT INVESTIGATION BOARD OF
INQUIRY

File reference (incident serial number): (Year/Number⁷)

Date:

References:

- A. Demining Organisation Accident/Incident Detailed Investigation Report
- B. National Technical and Safety Guidelines (NTSG)
- C. Demining Organisation Accredited SOPs

1. The Head of the South Sudan NMAA/UNMAS-SS hereby appoints the following members to form a BOI / Independent Investigation Team to investigate the [insert brief description of Accident / Incident] that occurred on the *DATE*.

Chairman- *NAME AND POSITION HELD*
Member- *NAME AND POSITION HELD*
Member- *NAME AND POSITION HELD*
Member- *NAME AND POSITION HELD*

2. The BOI / Independent Investigation Team shall carry out a full investigation and provide a written report to the undersigned by *DATE*. In the event that the completed report is not able to be submitted on the date indicated, an interim report outlining progress with the investigation and the reason for the delay shall be submitted on that date and further interim reports provided every day until the completed investigation report is submitted. The report shall be written in the English language.

3. The Report of the BOI / Independent Investigation Team shall consider the details as specified in Annex A and those annotated at Appendix 1 to this Convening Order. It should be noted that these details however are by no means exhaustive and are not intended to limit your investigation.

4. The BOI / Independent Investigation Team shall also review Reference B and C as they relate to this incident/accident, in particular as they may relate to the actions taken leading up to the incident/accident. The BOI shall comment on the adequacy and effectiveness of Reference B and C, and where appropriate make recommendations for amendments.

⁷ e. g., if it's the tenth Convening Order of 2014 then the number shall be 2014/10

5. The BOI / Independent Investigation Team shall comment on the adequacy of the relevant IMAS and make recommendations for review as appropriate.

6. The BOI reports to the Convening Authority (CA). The CA shall discuss with the BOI matters of report writing and whether they have answered the questions posed in the convening order. Following this, it shall be signed by the BOI/Independent Investigation Team and distributed by the CA.

NAME
POSITION
DATE

Appendix 1 to Convening Order *DATED*

CONTENTS OF REPORT FOR ACCIDENT / INCIDENT INVESTIGATION

The Report of the Board of Inquiry should consider the following details, if applicable:

Introduction.

Documentation, Sequence and Procedures of Tasking.

Geography and Weather.

Priority and Type of Task.

Site Layout and Marking.

Management, Supervision and Discipline on site.

Quality Assurance and Quality Control.

Communications and Reporting.

Medical, including injuries sustained.

Personalities, Team Identity Numbers and Interviews.

Training and experience of personnel involved.

Equipment and Tools.

Details of the Mine/ERW involved.

Evidence of re-mining.

Dress and Personal Protective Equipment.

Use of Dogs.

Use of Machines.

Particulars of Deminer(s) Insurance.

Detailed chronological account of the activities on the day of the Incident.

Summary.

Conclusion.

Recommendations.

If applicable, the following documents should also be included with the report:

- A copy of this Convening Order.
- A copy of the Demining Organisation's Detailed Investigation Report.
- Witness statements.
- Sketches, diagrams, location and site plans as appropriate.
- Photographs highlighting important aspects of the incident for example site conditions; mines, ERW, explosive devices or explosives involved; blast holes and blast debris; injuries to personnel; and equipment, property or infrastructure damage.
- Task documentation, which may include survey reports, clearance plans, demining worksite plans or demining worksite documentation.
- Extracts from Reference B and C where applicable.
- Medical records or coroner's reports.

9. Any further documentary evidence gathered during the investigation.

**The South Sudan NATIONAL Mine
Action Authority/
United Nations Mine Action Service**

Ref No. Year/BOI Number⁸

BOARD OF INQUIRY (BOI) INVESTIGATION REPORT

Report Category

Incident: DEMINING MINE
Accident: DEMINING MINE

Cause

Uncontrolled detonation of mine/ERW by:

Human MDD Vehicle Machine Animal

Missed mine/ERW by:

Human MDD Machine Other: (survey only conducted)

Report Compiled By

Agency: NMAA/UNMAS-SS Name: Position:

Location of Accident/Incident: **Date of Accident/Incident:**

Casualty(s): Human MDD Other None

Agency Involved:

**BOARD OF INQUIRY REPORT
FOR ACCIDENT/INCIDENT INVESTIGATION**

Table of Contents

No.	Title	Page
1.	Introduction	
2.	Accident Details	
3.	Location of the Accident	

⁸ e. g., if it's the tenth BOI of 2014 then the number shall be 2014/10

4. Casualties
5. Witnesses
6. Details of Activities on the Day of the Accident
7. Details of the Mine/ERW involved
8. Evidence of Re-mining
9. Particulars of Insurance
10. Relevant Documentation
11. Conclusions and Recommendations

Annexes

- A. Convening BOI Order dated _____
- B. A copy of the Demining Organisation's Detailed Investigation Report dated _____
- C. Sketches, diagrams, location and site plans as appropriate.
- D. Photographs highlighting important aspects of the incident for example site conditions; mines, ERW, explosive devices or explosives involved; blast holes and blast debris; injuries to personnel; and equipment, property or infrastructure damage.
- E. Quality Assurance Evaluation Report (*most recent to the time of the accident/incident*)
- F. Relevant Standard Operating Procedures of Organisation(s) involved
- G. Task documentation, which may include survey reports, clearance plans, demining worksite plans or demining worksite documentation.
- H. Medical Reports of Those Injured in the Accident, if applicable
- I. Statements of Witnesses, if applicable:
 1. Name of Witness
 2. Name of Witness
- J. MEDEVAC/CASEVAC Training Records, if a person was injured
- K. *Add any other relevant information as annexes to the BOI.*

The above order of the annexes should be the same in every report. If an annex is not relevant to a particular report, insert a page in that Annex section that states it is not relevant.

Add any other relevant sections to the table of contents. Other relevant sections may include, but are not limited to:

- Geography and Weather
- Priority and Type of Task
- Site Layout and Marking
- Management, Supervision and Discipline on site
- Quality Assurance and Quality Control
- Communications and Reporting
- Training and experience of personnel involved
- Equipment and Tools
- Dress and Personal Protective Equipment
- Use of Dogs
- Use of Machines

(Please number all paragraphs accordingly)

1. Introduction

1.1 [Insert a brief description of the event leading to this investigation, including the date of the accident/incident]. In accordance with the National Technical Standards and Guidelines (NTSG), the Programme Manager of NMAA/UNMAS-SS issued a written convening order on [DATE] for a Demining Incident Board of Inquiry (BOI) to explore the findings of the preliminary investigation. (See Annex A)

1.2 The Board members are:
Chairman: Name, NMAA/UNMAS-SS
Member: Name, Organisation
Member: Name, Organisation
Member: Name, Organisation

1.3 The entire Board convened in [insert location] on [DATE].

2. Accident/Incident Details

2.1 *Provide a detailed account of the events leading to the accident/incident and the actual accident incident. Also, include an analysis of the situation.*

Add additional paragraphs as necessary and number accordingly.

3. Location of the Accident/Incident

3.1 *Provide the history of the location site, such as the time it was identified as a dangerous area, etc. Include a detailed description of the location of the accident/incident. If possible, list the approximate coordinates of the accident/incident.*

4. Casualties

4.1 *List any persons who were injured or fatally injured in the accident. Include a short description of the injuries.*

5. Witnesses

The BOI interviewed the entire list of witnesses provided below.

Name	Title	Remarks

--	--	--

Other Witnesses

Name	Title	Remarks

6. Details of Activities on the Day of the Incident/Accident

6.1 *All timings listed below are estimated times with a margin of error of plus or minus 5 minutes.*

- Time Description of Event

7. Details of the Mine/ERW involved

7.1 *Include a description of any mine/ERW involved in the accident/incident.*

8. Evidence of Re-mining

8.1 *Explain any evidence of re-mining. If the investigation concludes that it is not the case of re-mining, describe the evidence that led to this conclusion.*

9. Particulars of Insurance

9.1 *Describe the particulars of the insurance that is relevant to the accident/incident. For example, if a person was injured, describe the health insurance that was available for that person.*

10. Relevant Documentation

10.1 *Explain which documentation was considered and any necessary documentation that was missing.*

11. Conclusions

11.1 Conclusion X

11.2 Conclusion Y

Add additional paragraphs as necessary and number accordingly.

12.2 Recommendations

12.1 Recommendation X

12.2 Recommendation Y

Add additional paragraphs as necessary and number accordingly.

Please note that each recommendation should have a direct correlation to the conclusion and should be ordered accordingly.

This report is the complete, final record of the Board of Inquiry into this accident

Signature
Name
Position
Chairman of BOI
Date

Signature
Name
Position
Member of BOI
Date

Signature
Name
Position
Member of BOI
Date

Signature
Name
Position
Member of BOI
Date

Annex E to Chapter 15 Responsibilities for Reporting Accidents / Incidents

Demining Organisation	Chief of Operations NMAA/UNMAS-SS	Head of NMAA/UNMAS-SS
<p>Initial Contact Report: Immediately provide essential information about the accident/incident to NMAA/UNMAS-SS</p>	<p>Follow-up Report: Upon receipt of initial contact report should inform NMAA/UNMAS-SS Headquarters and</p>	<p>Communicate with UNMAS and UNOPS about any accident or incident as soon as possible</p>
<p>Written Report: Within 48 hours, shall complete an IMSMA Database Demining Report and attach as much relevant detail</p>	<p>E-mail Confirmation must be sent within 48 hours, confirming the information discussed via telephone for the</p>	<p>Determine whether a BOI or Independent Investigation shall be conducted</p>
<p>In the case of an accident, senior in-country management shall ensure that it is reported to local</p>		<p>In the case of an accident, confirm that it is reported to local authorities and immediate family.</p>
<p>Conduct an internal investigation and draft a report to be submitted to NMAA/UNMAS-SS</p>	<p>Collate the initial information of the accident/incident</p>	<p>Initiate an Independent Investigation or BOI, if appropriate under the NTSGs</p>
<p>Provide any documentation and assistance to the Independent Investigation/BOI in a timely and efficient manner</p>	<p>Provide any documentation and assistance to the Independent Investigation/BOI in a timely and efficient manner</p>	<p>Review the report findings and distribute copies to appropriate offices. Also, ensure recommendations are implemented and</p>



South Sudan

National Technical Standards Guidelines

Date: 1st October 2015

Chapter 16

16 Environmental, Health & Safety

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16.1. Introduction

- a. Several of the components of mine action are inherently dangerous and pose threats to the environment as well as personnel. However, by ensuring that mine action personnel are well prepared, that safe work practices are applied and that due consideration is given to environmental impact, the level of risk to personnel and the environment can be greatly minimised.
- b. NMAA/UNMAS-SS as the authority for mine action within South Sudan, are charged with the responsibility for establishing the requirements for Environment, Health and Safety (EH&S) management systems for mine action and for ensuring that mine action organisations correctly apply them.

16.2. Scope

- a. This standard describes the requirements for EH&S management systems in mine action in South Sudan and the key elements of those systems.

16.3. Work Routines

- a. The urgency of humanitarian demining places strong pressures on mine action organisations and individuals to achieve results quickly. Such pressures are understandable, however they shall not be allowed to override the controls and monitoring necessary to ensure humanitarian demining is conducted as safely as possible.
- b. In recognition of this need, all mine action organisations shall conform to the work routines described below. These routines apply equally to humanitarian and development demining.
- c. Daily Work Routines: Personnel employed on humanitarian demining activities shall not '*work*' more than a total of 10 hours in any work day of which no more than 6 hours, excluding breaks, shall be physical demining. For the purposes of this standard, the term '*work*' does not include travel times to and from the task-site, set-up/pack-up processes, briefings/debriefings, organized breaks, movement to and from the control-point to/from the place of work and any other activity prior to the commencement of works signal/order or cessation of works signal/order. Personnel employed on demining, including supervisors, shall be given a minimum break of 10 minutes for every 60 minutes of demining work.
- d. Rest Days: Personnel employed on demining operations shall not work more than 21-days without a break. Breaks should be applied on a minimum ratio of 1-day off for every 6-days worked.

- e. Long-Term Routines: All personnel employed on demining, including supervisors, shall have a break of at least 7 consecutive days for each four month period worked.

16.4. Staff Insurance Cover

- a. All national staff employed by mine action organisations in South Sudan shall be provided, at no cost to the individual, with insurance cover.

16.5. Environmental Requirements

- a. Humanitarian demining activities shall be carried out in a manner that ensures, where practicable, that:
 - b. Previously hazardous areas are left in a state in which they are suitable for their intended use.
 - c. Non-hazardous areas affected by demining operations are left in a similar condition to that before demining operations commenced.

16.6. Worksites & Accommodation Facilities

- a. Worksites and Accommodation Facilities: The following should be considered and wherever practicable be implemented:
 - Preservation of the environment shall be considered in the site selection and layout for worksites and accommodation facilities.
 - Temporary accommodation facilities shall be located in consultation with local communities to ensure that they do not affect local economic activities or social and cultural values. They shall comply with all national or local regulations concerning the construction of temporary facilities.
 - Temporary accommodation sites shall be well drained and, if necessary, have sufficient soil depth to permit the digging of toilets, wastewater soak pits and rubbish pits.
 - The establishment and operation of temporary accommodation facilities shall be carried out in a manner that avoids or minimises erosion and the discharge of silt into any watercourse.
 - Toilets shall be properly constructed and shall be used on all demining worksites and temporary accommodation facilities. If cultural norms require, separate toilets shall be constructed for male and female team members.
 - Personnel shall not deposit human waste on the soil surface or in water courses.

- Toilets shall be provided at a minimum of one for every 20 persons and they shall be located at least 20m from any demining worksite control point, accommodation or food preparation areas, watercourses or wells.
- Where toilets are dug into the ground, the depth of the hole shall be sufficient to allow 0.5m of earth cover over the toilet pit when it is filled in.
- All domestic rubbish shall be removed from the site, buried or burned on a daily basis.
- Solid waste and ash left over from burning shall be either removed from the site or buried.
- Containers used for storing domestic rubbish shall be vermin proof and constructed to contain spilled liquids.
- Rubbish removed from the site shall be appropriately disposed of.
- Any rubbish spilled during the removal process is to be cleaned up.
- Rubbish shall only be buried with the approval of the local communities and then in locations agreed to by them.
- Rubbish pits shall be properly located away from accommodation and food preparation areas, watercourses and wells, and shall be located and constructed so as not to contaminate groundwater.
- Rubbish pits shall be deep enough to allow at least 1m of earth cover over the rubbish when they are filled in and shall be constructed large enough to take all the rubbish from the site.
- Where possible, rubbish in pits shall be burned or covered over on a regular basis.
- Burning for cooking, domestic heating and for rubbish disposal shall only be carried out provided the burning is supervised, fire fighting equipment is provided and adequate precautions are taken to ensure that fire does not spread. As a minimum, fire fighting equipment shall be serviceable and should comprise of a suitable fire extinguisher.
- Waste water from washing, bathing or kitchen areas shall be drained into properly constructed soak pits constructed large enough to take the amount of wastewater generated. .
- Waste water shall not be released if it may enter watercourses.
- The supply of domestic water shall be carried out in a manner that does not affect the supply of water to the local communities; unless the local communities have been properly consulted on this matter and have agreed to any arrangements made.

- When applicable, mine action organisations shall implement preventive measures for the control of vermin and disease carrying insects.
- On completion of operations all buildings, equipment, surplus materials, fencing (except that marking hazardous areas) and other such items shall be completely removed. Toilets soak pits and rubbish pits shall be filled in, covered with soil and the surface stabilised to prevent erosion and to allow natural regeneration of vegetation. As far as is practicable, all disturbed areas shall be restored to their original condition.
- Debris, rubble and wire and any other remains of obstacles removed from a demining worksite shall be dumped in a cleared area adjacent to the worksite. When applicable, local communities shall be consulted when locating this dump site.
- Watercourses shall not have the flow of water obstructed during operations unless it is necessary to divert or dam the watercourse to allow demining to be conducted. If it is necessary to divert or dam a watercourse, the landowner or local community shall be consulted and their agreement obtained before the dam is constructed.
- Any toxic waste products of demining operations shall not be buried. They shall be collected and removed to an approved disposal area.
- When mine action organisations are conducting operations, they are to remain aware of the location of local communities, the prevailing wind conditions in the area and the ability of these prevailing winds to carry smoke, dust and toxic fumes to local communities. They shall ensure that the impact on local communities of any degradation of air quality is minimised.
- Mine action organisations shall liaise with local communities and authorities to explain the scope, scale and duration of any likely air degradation and the long-term benefits to be achieved as a result of this short-term inconvenience.
- When mechanical operations are conducted, the ground over which the operations were conducted should be left as close as possible to its original state such that it is suitable for its intended use. Where vegetation is removed from ground that is subject to erosion, measures are taken to stabilise the ground on completion of mechanical operations.

- When mechanical assets are serviced or repaired in the field, any used parts or by-products from the work shall be collected and disposed of in an environmentally acceptable location and manner.
- The dumping of oil or other materials onto the ground or into any watercourse is prohibited.
- Drained oil or other materials shall be contained using a drip pan or other suitable receptacle and disposed of in an environmentally acceptable manner.
- Mechanical assets shall only be operated within the designated demining worksite, within the boundaries of any temporary accommodation facilities or any other areas approved by the NMAA/UNMAS-SS for training or testing purposes.
- Mechanical assets shall be properly maintained. Any fuel or oil leaks that occur shall be promptly repaired.
- Mines, ERW and AXO shall be disposed of without creating any danger to people, property or infrastructure. If mines, ERW or AXO must be destroyed in-situ and there is a risk to property or infrastructure, protective works shall be used. If, even with protective works, there is still a risk of damage to property or infrastructure, the NMAA/UNMAS-SS shall be informed and local communities or authorities consulted about the operation.
- When carrying out EOD operations involving potentially toxic or hazardous components, consideration shall be given to the contamination of the surrounding area by toxic or hazardous substances, for example, white phosphorus.
- When EOD operations cease, the area used shall be refurbished in accordance with the requirements of the local communities, and if necessary, the land formally handed over. As a minimum, the refurbishment shall include the recovering and disposal of all large items of scrap; the filling in of any pits and craters made by bulk disposal operations; and the fencing of and marking of any areas where there may be residual non-explosive hazardous material left in the ground.
- Mine action organisations shall ensure that previously safe areas are not contaminated through the unauthorised or unplanned movement of mines or ERW.

- Mine action organisations shall ensure all personnel are aware of, and comply with, the prohibition on the movement of mines and ERW from work sites unless as part of a disposal activity.
- When moving mines or ERW as part of a disposal activity, take an accurate count of the items moved and confirm that they have all been destroyed in the new location.
- Conduct thorough 'Free From Explosives' (FFE) inspection of any packaging material moved from a worksite or any mines or ERW that are to be used for training aids.
- Thoroughly check the immediate environs of all mechanical clearance or disposal worksites to ensure that no of mines or ERW have been 'thrown' into these areas.
- Where it is necessary to establish fuel storage facilities, proper precautions shall be taken to ensure that fuel, oil and lubricants are stored safely and does not contaminate the soil or groundwater.
- No fuel storage facilities shall be positioned closer than 30m to a watercourse.
- All storage tanks, containers and fuel dispensing equipment shall be regularly maintained to ensure that there are no leaks.
- Vehicle and equipment fuelling should be undertaken on a hard surface or over drip pans to ensure that any spilled FOL is contained.
- Adequate fire fighting equipment shall be positioned at the fuel storage facility. As a minimum, this shall be a serviceable CO₂ fire extinguisher.
- When maintenance, repair or washing of vehicles and equipment is required on worksites, specific areas shall be designated for this activity.
- Waste water from vehicle washing shall not be released so that it may enter watercourses. If necessary, soak pits shall be constructed.
- The dumping of oil on the ground is prohibited. Drained oil shall be contained using a drip pan or other suitable receptacle and disposed of in an environmentally acceptable manner.
- Any used parts, by-products of the maintenance or other rubbish (except waste oils) shall be disposed of as for domestic rubbish.
- During the transportation of any hazardous, toxic or flammable materials with the potential to damage the environment, the precautions that shall be taken to ensure that risk is minimised shall include:

- All materials shall be transported in containers that will minimise or prevent spills or leakage.
- Materials shall be securely loaded in the transport.
- Appropriate fire precautions shall be taken relevant to the materials being transported.
- Vehicles carrying hazardous material shall be driven in a safe and careful manner.
- Prior to commencing operations, mine action organisations shall investigate the immediate vicinity of the worksite to identify any areas of cultural or historical significance. They shall also liaise with local communities and authorities to aid in the identification of such sites.
- Having identified any areas of cultural or historical significance, mine action organisations shall take all possible steps to prevent damage to these sites. Such action may dictate that any mines or ERW found at the work site are removed to another area for destruction. If these items are unsafe to move and in-situ demolitions are necessary, protective works shall be used.
- If any article is located during mine action operations and is suspected of being of cultural or historical significance, work in that area shall cease and the matter shall be immediately reported to the NMAA/UNMAS-SS.
- At each worksite, mine action organisations shall maintain an 'Environmental Incident Register'. This register shall record the details of any environmental incident that may occur, the action taken to remedy the situation, the likely lasting results of the incident and the liaison carried out with the local communities or authorities in relation to the incident. The register shall be made available to NMAA/UNMAS-SS on request.
- All significant environmental incidents shall be reported to NMAA/UNMAS-SS along with details of results and action taken, as soon as practicable after the incident.

16.7. Reviews

- a. The EH&S management systems of individual mine action organisations shall be reviewed by NMAA/UNMAS-SS during the accreditation process.
- b. NMAA/UNMAS-SS reserves the right to review the current EH&S system of any mine action organisation at any time to ensure it remains valid for current

conditions. Should deficiencies be found, the mine action organisation shall be given a suitable period to remedy them.

16.8. EH&S Responsibilities

- a. NMAA/UNMAS-SS should establish a system to issue or approve regulations, codes of practice, SOPs or other suitable guidance on EH&S in the working environment in order to:
 - Provide information and advice in an appropriate manner, to employers with a view to eliminating hazards or reducing them as far as practicable.
 - Co-ordinate activities concerned with EH&S which are exercised nationally.
 - Undertake or promote studies and research to identify hazards to safety and health and find means of overcoming them.
- b. Mine Action Organisations. Each mine action organisation shall develop a detailed, comprehensive and suitable EH&S management system prior to receiving accreditation to conduct mine action in South Sudan. The organisation shall:
 - Provide a written policy covering EH&S detailing the key responsibilities, commitments and procedures.
 - Provide and maintain safe work places, machinery and equipment, and adopt safe work practices and procedures with a view to eliminating hazards or minimising them as much as practicable.
 - Provide adequate supervision and training, including development and refresher training where appropriate.
 - Provide, at no cost to the individual, adequate Personal Protective Equipment (PPE) and protective clothing.
 - Provide, at no cost to the individual, adequate health care and emergency medical support in case of accidents.
 - Set out the EH&S system in writing and ensure this information is delivered to all staff in a language or medium each individual readily understands.
 - Verify the implementation and application of the EH&S system and periodically conduct systematic, detailed and comprehensive audits of the EH&S system.
 - Appoint a designated EH&S officer and ensure that all staff have access to this person.

- Ensure that all accidents and incidents concerning EH&S are reported, recorded and investigated by the EH&S officer, and that the findings of such investigations are promulgated to all staff and acted upon.
 - Notify NMAA/UNMAS-SS of all demining incidents in accordance with Chapter 15.
 - Ensure that adequate insurance cover against death, disablement and injury is provided for all staff, including a complete designation of beneficiaries form for any accident or death insurance policy payout.
 - Develop and implement work practices that minimise unnecessary detrimental impact on the environment.
 - Each mine action organisation shall conduct an annual review of its EH&S policy to ensure it remains valid for their particular operating environment. Additionally, the organisation shall review, and amend as necessary, its EH&S system each time it introduces new methodologies or technologies.
- c. EH&S Responsibilities of the Individual. Along with the mine action organisation, each individual staff member has a responsibility for his or her own health and safety. Each individual shall:
- Take all reasonable care for their own safety and that of other persons who may be affected by their acts or omissions at work.
 - Comply with instructions given for their own conduct and safety.
 - Use safety devices and PPE consistently, correctly and as directed and take all due care of these items.
 - Immediately report to their supervisor or superior any situation which they have reason to believe could present a hazard and which they cannot themselves correct.



South Sudan

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Date: 1st October 2015

Chapter 17

17 Management of Demining Operations

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17.1. Demining Process

- a. The practice of managing Demining Operations may not always be linear and the activities may not always be consecutive however there will always be a general sequence and logical progression involving the four stages of the demining management process:
 - Planning
 - Preparation
 - Clearance
 - Post-clearance
- b. Specific mine action activities i.e. technical survey, clearance, EOD, MDD operations etc, that form part of the demining process are not detailed other than making a reference to them when applicable. For further detail concerning the conduct, processes, procedures, requirements and standards the relevant Chapters in this NTSG should be referred to.

17.2. Planning

- a. Planning is the collection, assessment and processing of information to determine an appropriate way to proceed and subsequently formulate a detailed method by which a task shall be carried out. This requires accurate and timely information on the form, scale and impact of the threat posed by mines and other ERW.
- b. A national mine action programme shall generally commence with the Non-Technical Survey (NTS). The processes, procedures, requirements and standards for a NTS are detailed in chapter 1 of this NTSG and should be applied accordingly. In summary the aim of the NTS assessment is:
 - To assess the scale and impact of the landmine problem on the country and individual communities;
 - To survey all reported and/or suspected locations of mine or ERW contamination, quantities and types of explosive hazards; and
 - To collect general information such as the security situation, terrain, soil characteristics, climate, routes, infrastructure and local support facilities, to assist the planning of future mine action projects.
 - To provide an indication of the size and scope of the problem, the resources needed to meet it, the national capabilities and potential to address the problem, and the need for external assistance including financial, human skills, material and information.

- The information collected should be sufficient to enable the national authority, with assistance as necessary, to establish priorities and develop a coherent national mine action programme.

17.3. Preparation

- a. Preparation includes all enabling activities that help to clarify the clearance requirement and develop the capacity of a mine action organisation and its sub-units to carry out a clearance task.
- b. At the national level preparation should also include:
 - Equipment preparation;
 - Establish methods of victim reporting;
 - Establishing a network of community volunteers, or linking with existing community volunteer networks;
 - Coordination activities;
 - Links with other sectors; and
 - The management of the NTS assessment.

17.4. Clearance

- a. Clearance when referred to in the context of humanitarian demining is the location, identification, removal and/or destruction of mines and ERW, and for EOD may also involve access, diagnosis, render safe, final disposal and (where appropriate) protective works.
- b. The clearance requirements should be achievable and affordable, and should be consistent with the clearance requirements being applied to similar categories and uses of land.
- c. Clearance covers and/or includes many phases, aspects and activities including but not restricted to manual clearance, use of MDD and/or mechanical means, EOD/ERW activities, BAC, quality assurance and other.

17.5. Funding

- a. The funding of demining programmes may be provided by the government of the mine-affected country, from donor governments, the United Nations or other international organisations, benefactors, philanthropists or from many other sources.
- b. It is important that the funds match the true cost of demining and that a long term commitment is provided by the donors in order for major projects that

require the mine action organisations to make major investments in staff, equipment and training.

17.6. Contract Preparation

- a. The definition of the work to be undertaken (Implementation Plan in South Sudan) should ideally be in the form of a contract, task, or other such formal agreements. The preparation of a contract enables the national government of the mine-affected country, together with the donor agency, to specify the clearance requirement in detail. The contract should give details of the risk and quality management processes to be adopted during the clearance work. It also should outline the reporting requirements, and the progress and financial milestones to be achieved.

17.7. Training

- a. Mine action organisations shall employ appropriately trained and qualified managers, deminers and other required personnel as appropriate. Although some centralised training for senior national managers and technical advisors may be appropriate, the majority of training should be conducted in the mine-affected country, not only for cultural and linguistic reasons, but also for access to details of the mine and ERW threat.

17.8. Information

- a. The effective management of demining programmes requires accurate, appropriate and timely information. National mine action authorities and mine action organisations should establish and maintain effective management information systems. The UN's Information Management System for Mine Action (IMSMA) has been developed to provide the facility to collect, collate and distribute relevant information at field and headquarters levels in a timely manner. IMSMA is available to all mine action programmes.

17.9. Equipment, Tools & Assets

- a. It is the responsibility of the NMAA/UNMAS-SS to allocate the proper teams/assets in the most effective manner to ensure that priorities may be achieved depending on the clearance situation.
- b. Demining programmes have traditionally relied on manual practices, procedures and drills and in many cases these methods may be the most appropriate and effective means of detecting, removing or destroying mines and ERW. However, in some programmes the greater use of equipment may

enable clearance (and other elements of demining) to be conducted more safely, effectively and efficiently.

- c. Demining technologies may be grouped in three general categories according to their technical maturity and availability:
 - Equipment that has been fully developed, tested and evaluated (T&E), and may be introduced into demining programmes without any major modification or changes;
 - Those technologies that have been proved to work but require further development and formal T&E
 - Those technologies that may have an application in mine action activities but have yet to mature and have not yet been formally demonstrated.
- d. Mine action organisations should focus their equipment procurement on the first category, but whenever possible should assist in the development and fielding of those technologies in the second category. Some new technologies have the potential to generate major improvements in safety and cost-effectiveness; donors should provide assistance and encouragement to those mine action organisations fielding new technologies, and their T&E.

17.10. Accreditation & Licensing

- a. All mine action organisations shall be required to undergo the full accreditation process in order to be formally recognised as being competent and able to plan, manage and carry out relevant mine action activities safely, effectively and efficiently.

17.11. Community Liaison

- a. Community liaison is a specialist function of the mine action organisation and plays a major part in:
 - Confirming the correct area for clearance; and
 - Ensuring a high level of confidence from the community in the quality of the finished product (i.e., cleared land).
- b. The general requirements of the community liaison function may be filled by specialist members of the demining team, or the capacity may be subcontracted to a specialist MRE agency. This should also be addressed at a national level.

17.12. Safety & Occupational Health

- a. Mine action organisations shall achieve a safe working environment by providing effective management and supervision, by developing work practices that contribute to risk reduction, by selecting equipment with inherently safe design, by providing appropriate training throughout the structure and by making available effective personal protective equipment (PPE).
- b. They shall develop and maintain management procedures and processes that shall enable safety and occupational health (S&OH) risks to be identified, evaluated and reduced in a systematic and timely manner, for each demining task and for each demining worksite.

17.13. Post-Clearance

- a. The inspection of cleared land aims to provide confidence that the clearance requirements have been met, and as such forms an essential part of the overall clearance process. An important aspect of this procedure is to clarify the ownership of any residual risk and to ensure that the local community have been fully briefed.
- b. Prior to the handover of cleared land, the area shall be surveyed and marked, and all necessary documentation shall be prepared, including a formal handover certificate.
- c. Wherever possible, mine action organisations should conduct a formal post project review (PPR) to identify lessons-learned during the planning, preparation and clearance phases of the operation. The PPR should include a report on the suitability of the equipment, procedures, training and support. Issues of concern should be identified and prioritised, and solutions proposed.
- d. PPRs should be distributed to NMAA/UNMAS-SS and to donors or sponsors. Where PPRs highlight shortcomings in established equipment or procedures, particularly issues involving safety, they should be more widely distributed.

17.14. Quality Management

- a. The effective management of demining operations aims to clear land in a safe and efficient manner achieved by developing and applying appropriate management processes, by establishing and continuously improving the competency of mine action organisation personnel, by obtaining accurate and timely information on the mine and ERW threat, by applying safe and

effective operational procedures, and by using appropriate and efficient equipment.

- b. The process and procedures that aim to achieve this continuous improvement to an organisation's management system and operational practices is commonly referred to as quality management.
- c. A quality management system shall be developed, the purpose of which is to ensure that the 'products' or 'services' delivered meet the agreed needs.
- d. Mine action organisations shall apply the principles of quality management as per the NTSG.

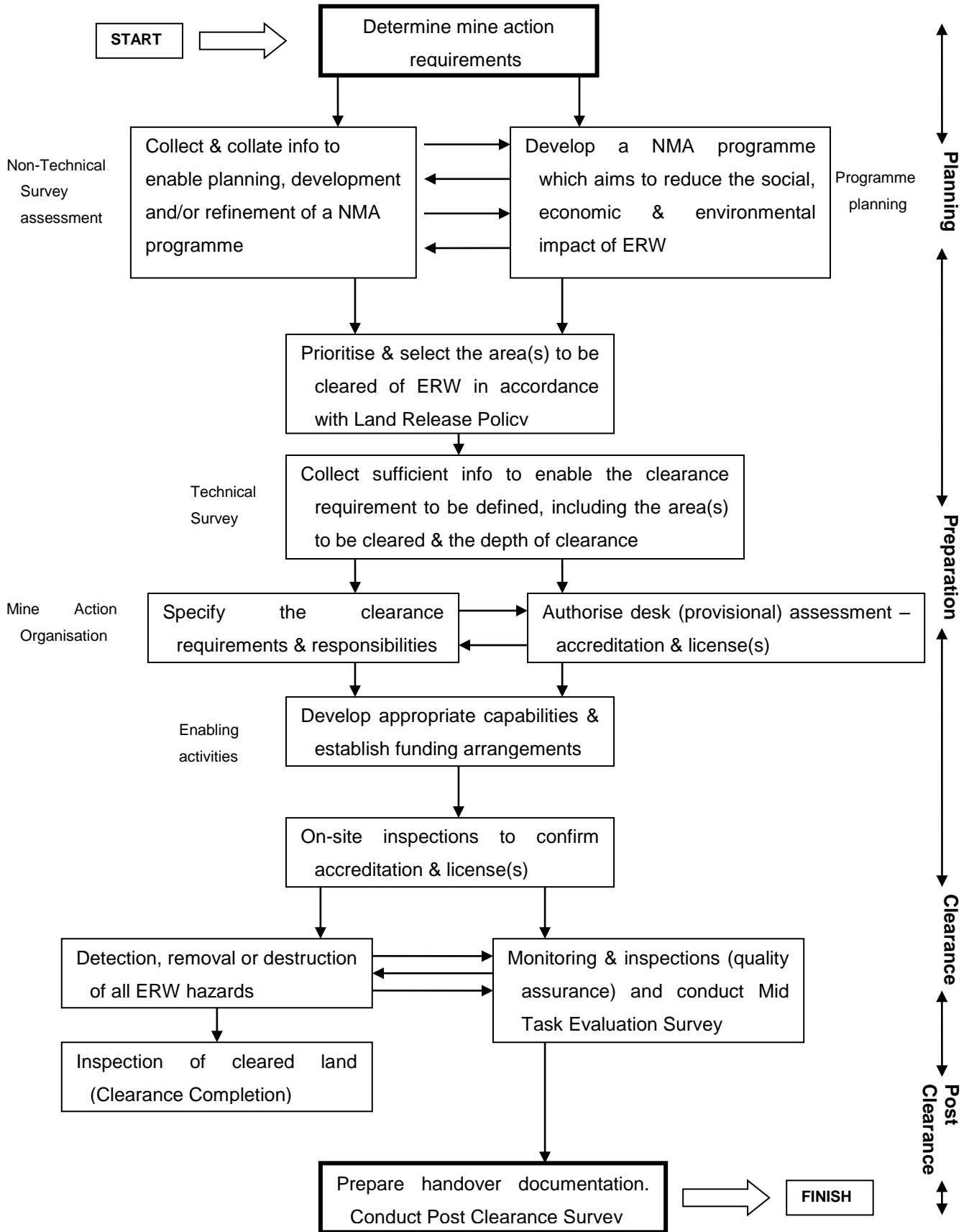
17.15. Responsibilities

- a. **National Mine Action Authority.** The national mine action authority, or the organisation acting on its behalf, is responsible for ensuring the national and local conditions that enable the effective management of mine action projects and for establishing and maintaining national regulations and procedures for the management of mine action operations in accordance with IMAS. The national mine action authority is ultimately responsible for all phases of a mine action project within its national boundaries, including defining the clearance requirement, the accreditation and licensing of mine action organisations, the monitoring of mine action organisations during clearance, and post-clearance inspections prior to accepting full responsibility for the cleared land.
- b. **UNMAS-SS.** UNMAS-SS has a general responsibility for the effective management of mine action programmes within South Sudan, supporting the NMAA, by continuously refining the NTSG to reflect developing mine action norms and practices, and incorporating changes to international regulations and requirements such as those produced by the International Organisation for Standardisation and the International Labour Organisation. UNMAS-SS applies IMAS to its mine action programmes, activities and contracts unless the local situation precludes their effective use. In such circumstances, when one or more IMAS is not appropriate, the UNMAS provides alternative, specifications, requirements and guidance.
- c. **Donors.** Donor agencies are part of the management process, and as such have a responsibility to ensure that the projects they are funding are managed effectively, and in accordance with international standards. This involves strict attention to the writing of contract documents, and ensuring that mine action organisations chosen to carry out such contracts meet the

accreditation and licensing criteria. Donors, or their agents, are also partly responsible for ensuring that the standards and guidelines for quality management are applied. This responsibility and accountability is even greater when the national mine action authority is in the process of formation, and has not had the opportunity to gain experience.

- d. **Mine Action Organisations.** Ultimately, it is the mine action organisation which is required to establish an appropriate and effective management system, demonstrate it to the NMAA/UNMAS-SS, and apply it throughout the project.

Annex A to Chapter 17 Demining Process





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Chapter 18

18 Remote Explosive Scent Tracing

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18.1. General

- a. Remote Explosive Sent Tracing (REST) has proven itself to be an effective tool for area reduction in humanitarian mine clearance, especially for use during the verification of roads.
- b. This chapter provides specifications and guidelines for the planning, preparation, accomplishment and management of vapour sampling and remote analysis operations. It also describes the sampling process, the analysis process and the follow-up of mine suspected areas subsequent to the completion of the analysis process.
- c. This Chapter has been written taking into consideration and in accordance with IMAS 09.43 and other applicable IMAS. Mine action organisations are to refer to these where appropriate for further guidance. Where appropriate the standards detailed in other applicable Chapters of this NTSG are to be applied.

18.2. Definitions

The following common terms and definitions apply:

- a. The term 'target odour' is used to describe the scent from the target item.
- b. The term 'scent trapping' is used to refer to the process of collecting target odour in filters.
- c. The term 'breaching' is in the context of this IMAS used to describe the provision of safe access lanes for people involved in scent trapping.
- d. The term 'sampling operation' is used to describe the overall field operation established for the purpose of collecting scent on filters. The term comprises the breaching and scent trapping functions as well as other related activities, such as field logistics, rescue services, medical back-up and communications.
- e. The terms 'indication' or 'indicated' are used to describe the trained response given by a sniffer animal which is used to return a filter as suspect positive.

18.3. Overview of the Process

- a. The system has four principal elements
- b. The breaching and rescue element – the provision of safe access
- c. The scent trapping element – the systematic collection of air by suction through filters.
- d. The analysis element – the analysis of the filter cartridges.

- e. The follow-up demining element – verify the presence of mines or ERW in the sectors that have been identified by the analysis element as potentially mined and to carry out the requisite clearance
- f. Sampling operations involves the scent trapping of air and/or dust containing explosive traces near the ground surface, typically undertaken using vehicle mounted or portable sampling machines capable of sucking air through filter cartridges fitted to the end of plastic tubes. The tubes are typically placed in single or double-headed tube assemblies at the end of a long suction pipe, which is attached to the sampling mechanism. The filter cartridges currently in use in REST are made from coiled polyvinyl chloride (PVC) netting, which has the ability to attract TNT molecules. The filter cartridges are placed in a sampling mechanism, which is then carried over a "leg" of 100 – 300 m at steady walking or driving pace. During this movement, there is continuous suction, with the pipe being systematically moved from side to side in a 2-4 meter wide pattern. At the end of this "leg", the filter cartridges are changed, and the used cartridges are systematically marked and stored in plastic containers.
- g. Positional recording of the start/end of legs is to be done using DGPS, map readings or manual measurement and each filter cartridge representing that particular leg shall be appropriately marked / recorded.
- h. The filter cartridges are then to be checked for traces of the target odour.
- i. When the filter cartridges have been analysed, a follow-up clearance will be required of all the sectors indicated as possibly contaminated. Filter cartridges with no explosive trace represent mine/ERW free sectors, and these sectors will be assessed as having no further need for mine clearance. The re-checking of "positive" sectors is normally undertaken using free-running dogs to pinpoint the exact location of mines/ERW. Manual deminers or other suitable and accredited demining methods shall be used to finally be used to uncover and deal with the finds.

18.4. Samples

- a. Samples taken are always unknown until they have been tested. They are therefore to be referred to as '**probable positives**' when they are taken in the field around a confirmed item of explosive ordnance. '**True positives**' can only be made in a controlled environment, using known quantities.
- b. An area declared as positive has been tested and indications have been made in the test facility and further investigation shall be done by using

clearance assets. This does not guarantee the presence of mines/ERW as some false indication may occur or scent/odour may have been picked up outside the perimeters of the sampled area, e.g. an ERW in the proximity but outside the area sampled.

- c. An area declared as negative has had filters tested with no indications.
- d. When referring to it must be considered whether or not it contains the target substance (normally TNT).

18.5. Applications

- a. Whilst the REST system has no application in areas with regular or patterned minefields, it may have an application if the objective is to determine whether there is a potential mine/ERW threat in a particular area, or where the edge of such a mined area might be.
- b. The REST should not be used for general area elimination without prior testing to ensure its effectiveness and reliability.
- c. The REST system may be applied as a verification and elimination method when the objective is to check one or more houses for booby traps. Confined rooms with entrapped air may be ideal for the application of REST.

18.6. Specific Roles & Responsibilities

- a. The mine action organisation is responsible for appointing specifically trained and qualified personnel to plan and conduct all aspects of the sampling operation. It is acknowledged that different organisations may be tasked to carry out the different elements of sampling operation that they may refer to appointments differently. As such the following shall be applied appropriately and relevantly:
- b. A project manager shall be responsible for managing the implementation of all field activities and for co-ordinating the breaching and scent trapping elements of the REST operation. His/her responsibilities include but are not limited to:
 - Planning and management of the overall sampling operation
 - Co-ordination between the breaching and scent trapping team
 - Establishment of appropriate security and safety arrangements
 - Establishment of appropriate medical evacuation procedures
 - Establishment of appropriate communications procedures
 - Establishment of appropriate rescue back-up procedures
 - Establishment of the appropriate logistic support elements

- Establishment of appropriate procedures for the preparation and storage of records including the preparation of maps with plots and records of the exact location of each change of filter cartridge, marking of the filter cartridges, container boxes and other relevant information (landmarks, road condition etc)
 - Confirmation that prevailing procedures for the storage of blank and used filter cartridges are implemented and followed
 - Co-ordination of rescue operations in the event of accidents or vehicle breakdown.
- c. A team leader shall be appointed to head the scent-trapping team. He/she is responsible for all activities undertaken by his/her team before, during and after the sampling operation. These include but are not limited to:
- Inspection of sampling equipment and sampling staff before sampling operations start
 - Monitoring the sampling staff during sampling to ensure that sampling is undertaken at the correct speed and that the search pattern and change of filter cartridges are undertaken in accordance with the prevailing SOP
 - Ensuring that the filter cartridges are changed exactly at the spots marked by the marking staff
 - Ensuring that the sampling staff walk steady in the centre of their lanes and that the roles of the primary and secondary scent trappers are rotated frequently
- d. The breaching operation is typically mechanised but breaching may also be manually undertaken or by means of mine dog detection. When mechanised breaching is used, a breaching team leader who is responsible for his/her team before, during and after operations shall head the team. This includes but is not limited to:
- Inspection of vehicles, accessories and other needed tools/assets prior to the breaching.
 - Ensuring that all personnel sitting inside the mine-proof vehicles are correctly strapped in during the breaching process.
 - Inspection and evaluation of the situation of the road and, if working off-road, on the work area and the suitability of the mine proof vehicles to operate on such roads or areas.
 - Inspection of the patterns created by the wheels of the vehicles during the operations with subsequent recommendations as to whether further

marking of the vehicle track is required to ensure that the sampling staff can identify the right tracks to walk in.

- The breaching team leader is normally located in the first mine-proof vehicle during operations. Radio contact is to be maintained with the second mine proof vehicle (and the third if available) as well as the project manager and the scent trapping team leader.

18.7. Team Compositions & Responsibilities

a. A mechanised breaching team may be put together in different ways, and its personnel may have different titles and roles and responsibilities to those suggested in this standard, due to the unique character of each operation. A typical breaching team however should compose of 9 – 14 people, and their positions and responsibilities should be in line with the following principles:

- Breaching Team Leader – typically responsible for the management of the breaching team including all safety, quality and operational aspects, including the maintenance of vehicles and equipment
- Medic – responsible for emergency treatment in the event of mine/UXO accidents, other accidents or illness. The medic is responsible for establishing adequate field routines for medical evacuation/treatment including management and the preparation of medical equipment.
- Driver(s) – typically responsible for driving and for first order maintenance of the vehicles
- Mechanic – typically responsible for the establishment of maintenance routines, repair of vehicles and planning/preparing the spare part requirements during the operation. The mechanic may be one of the drivers
- Logistic staff – typically responsible for logistic support during breaching and scent trapping, including fuel supply for the scent trapping teams, placing and picking container boxes on/from the ground, measuring the driving distance, plotting the exact location of change of filter cartridge and registration/storage
- Marker – typically responsible for the accurate marking and recording of the sectors that have been sampled, including the spots where filters have been changed. The marker may use a measuring tape or another measuring device to measure out the exact distance between each change of filter cartridge. The Marker typically walks behind the first mine-

proof vehicle but in front of the sampling team. He/she marks the spots where filter cartridges are to be changed

- Deminers – typically responsible for emergency manual demining in the event of accidents, vehicle breakdowns or similar.
- b. Scent Trapping Team. A suggested manual scent trapping team is described below, and its basic functions are outlined. In practice, such a team may be composed in any form, so its personnel may have different titles and roles due to the unique character of each operation, but the basic requirements remain. A functional breakdown of positions and responsibilities should incorporate the following principles:
- Team Leader – typically responsible for the planning and accomplishment of the sampling process. The Team Leader will normally follow behind the sampling staff where he/she monitors their walking steadiness/speed, search pattern and change of filter cartridge as well as the marking of the safe lanes provided by the breaching team. The team leader normally has a supervisory and command role.
 - Primary scent trappers – typically responsible for the manual scent trapping. They will normally walk in the safe lanes/tracks (one in each lane) where they will sweep the area with the flexible tube attached to the sampling machines
 - Secondary scent trappers – will typically walk 2-3 m behind the primary scent trappers. Their role is to monitor the sample pattern and the walking speed of the primary scent trappers and to change filter cartridges and decontaminate the cartridge assemblies at the long end of the flexible tube. The scent trappers are normally responsible for the maintenance of the sampling equipment and they may also be responsible for the handling, marking and storage of the filter cartridges.

18.8. Safety

- a. The mine action organisation tasked with conducting any element of the sampling operation is responsible for ensuring that the operations is safe at all times. All processes, procedures, roles and responsibilities are to be clearly detailed in the organisational SOP. The following minimum safety standards shall be implemented:
- Mine action organisations shall ensure people carrying sampling machines are provided safe walking access along mine suspected roads, over areas and/or into houses by taking appropriate actions.

- Consideration must be taken during planning of the probable level of mine/ERW contamination, as this will affect the effectiveness of the sampling operation.
- REST shall not be applied if the safety of the people involved is at risk.
- Scent trappers are to be given adequate rest periods appropriate to the current elements and in accordance with these NTSG.
- Primary and secondary scent trappers shall be frequently rotated.
- A medic shall be available at all times as per the details of Chapter 10.
- At least two vehicles shall be used in pair to support one sampling operation.
- Tracks (safe lane) created by the vehicle should be at least 30 cm wide.
- Tracks should where necessary be marked along the centre tape/paint or similar while driving to clearly distinguish them.
- The driver and other staff in the mine proof vehicle during breaching shall always be sufficiently strapped to prevent a throw-out whilst the vehicle is moving.
- All equipment carried inside the cabin of vehicles shall be adequately strapped and secured.

18.9. Rescue Plan

- a. A rescue strategy and plan shall be prepared prior to the start of sampling operations. The rescue plan should at minimum take into account the following factors:
 - The use of safe lanes – the mental and physical strains undergone by the people inside a detonation wrecked vehicle, these people should not be allowed to walk out of the area in safe lanes created by the wrecked vehicle. The shock pressure may have caused dizziness and inability to walk steadily
 - Manual demining element – every sampling operation shall have a manual demining element capable of demining wider safe lanes from a safe area to the wrecked vehicle. Team members with other primary functions may be used as deminers provided that they have been trained and operationally accredited for manual demining. The manual deminers may also have to demine a safety zone around the wrecked vehicle, to facilitate its repair or recovery

- Secondary vehicle for rescue of personnel – a secondary vehicle may assist by transporting rescue staff closer to the wrecked vehicle. It should, however, not drive all the way up to the wrecked vehicle without prior manual demining of tracks since it is likely that other mines may detonate in the same area. It is, however, possible to demine safe lanes manually in support of the secondary vehicle
- Secondary vehicle for rescue of the wrecked vehicle – the REST system normally relies on the use of a second mine proof vehicle to rescue a wrecked vehicle. This rescue can sometimes be extremely difficult due to access limitations. The mine action organisation shall establish a rescue policy incorporating a series of different access and rescue alternatives dependent on potential situations on the ground.

18.10. Mine Protected Vehicle

- a. If mine proof vehicles are to be used, the following principles shall be applied:
 - The vehicles shall be designed to withstand anti-tank mine detonations without putting its personnel at intolerable risk
 - The vehicle should be able to withstand anti-tank mine detonations with no substantial or irreparable damage inflicted to the vehicle itself.
 - The primary vehicle's main function is to provide safe access for the scent trapping staff. The secondary vehicle's main function is to provide rescue support. The second vehicle shall therefore be sufficiently equipped in terms of towing hooks and cables, crowbars, spares and medical equipment;
 - The vehicle shall provide a ground pressure, which by far exceeds the pressure caused by walking sampling staff equipped with protective clothing and the sampling machines.

18.11. External QA/QC

- a. The purpose of a quality management system is to confirm that the sampling operation is functioning properly and that positive and negative areas are identified accurately. Mine action organisations are expected to implement their own internal quality management procedures to ensure that their systems and processes function in accordance with approved SOPs.
- b. NMAA/UNMAS shall implement an external quality management system to satisfy its own need to ensure that approved processes are followed, since it is responsible for recommending to the local authorities to accept

Handover/Completion Certificates when they are submitted by mine action organisations.

- c. The following is to be adhered to:
- **Monitoring of the scent trapping:** Process, including the handling and shipping of filters shall be done in accordance with accredited SOP written by organisations charged with the REST function and that have been developed for this purpose.
- d. **Sampling:** Sampling shall be carried out in three ways:
- Checking areas declared as *negative* by using another demining asset to process the ground. Before this is done the QA Officer shall collect information regarding environmental factors during sampling, using form 'Fact & Environmental factors'. The areas shall be identified by NMAA/UNMAS at random or on suspicions. If any ERW containing explosives are found the organisation is considered to have failed the inspection and an investigation board shall be set up to determine reason for the non-conformance. All operational work shall cease until the reason for the failure is determined. Action shall be taken to ensure it won't happen again before work can resume again. All results shall immediately be reported to both the sampling and testing components. Areas declared as *positives* shall always be checked by other means and are therefore not subjected to sampling as described.
 - Checking an area using REST. This shall be done on some areas that have been declared as negative. The areas shall be identified at random by NMAA/UNMAS and in the vicinity where the organisation is currently operating. Areas declared as positive shall also be checked if there are suspicions that too many positives have been recorded on negative areas during the initial process (reason being that too many false positives contradict the purpose of the system). If the result shows that an area previously declared as negative comes back as positive the QC is not considered to have failed the process until a mine/UXO is found in the area. If no items are found, the QA Officer shall inform the organisations scent trapping and testing components. If this occurs on a regular basis, more than 1 out of 4 areas, an investigating board shall determine the reason why. If mine/UXO is found, the QA is considered to have failed and all operational work shall cease until the reason for failure is

determined and action taken to make sure it won't happen again before work can commence again.

- Prepare test filters using the organisations personnel and equipment, but supervised by NMAA/UNMAS staff. The purpose of this is to test the sniffer animal's consistency of performance on samples from South Sudan and its ability to accurately measure the correct discrimination between positive and negative filters at the same time. These samples shall be prepared in the same way as any other operational samples. These test filters will be from areas proven to be negative (or considered to be negative) and an area containing mines/ERW. The 'probable positives' shall be taken from an area where it is known that there are TNT or any other target substance present. These test samples will then be processed through the organisations normal chain and the results will be compared with the origin of the filter. The mine action organisation shall be informed of the results as soon as they have been compared. Any corrective actions shall be determined together with the sampling organisation. The following shall be taken into consideration when preparing these test filters:
 - Follow organisations SOP
 - Use correct equipment and methods
 - Each tube must be used for the same amount of time as an operational tube would be e.g. a tube must be sampled for 5-20 minutes depending on technique. Not only in the air but make sure dust is sucked up, as per SOP, so that the filters get the same exposure as an operational sample would.
 - The 'scent' of explosive is not always on top of a mine/ERW but around it, trapped in the dust, on the ground, on the bushes and/or on the grass and it is therefore very important to collect around the ERW at many different locations. This is due to the way we believe vapour is moving and getting trapped in dust and the crust on the surface. A minimum of 10m² shall be sampled, maximum 5m away from the target, never from only one spot and never directly on top of the target.
 - The number of 'probable positives' taken as well as position in the group of filters shall be unknown to the organisation. The number of 'probable positive' prepared should be between 5-20% of the total

numbers of test filters prepared and sent in, normally the total number of test filter prepared should be between 24-100.

- Following results are considered to be passed QC; 90% or more of the probably positives comes back as positives and maximum 25% of the probably negatives comes back as positives. If these numbers are not matched the QC is considered to have failed the process.

18.12. Internal QA/QC Process

- a. The mine action organisation shall detail their internal QA/QC process in their SOP. As part of the Internal QC process the organisation shall send a minimum of 3 'probable positive' with each group of samples leaving the country for testing. This should ensure that the organisation themselves can pick up any mistakes in handling and transport. The result of this Internal QC shall be available during any External QA/QC.

18.13. Organisation SOP

- a. Organisational SOPs are to clearly define and detail, but are not limited to, the following:
 - Roles and responsibilities
 - General and specific safety
 - Medical requirements
 - Operational processes and procedures – sampling pattern, sweeping technique, filter changing procedures
 - General logistics requirements – storage of cartridges/filters, management of filters
 - Scent trapping equipment to be used – type, maintenance, servicing, care, daily use, checks, repair process
 - Breaching equipment to be used – type, maintenance, servicing, care, daily use, checks, repair process
 - Recording and mapping procedures – planning map, master map, master trace, clearance maps
 - Analysis process – site, location, back up filters, testing, storage of filters
 - Details of Mechanical and Manual Mine Action follow up – must comply with relevant Chapters of this NTSG in all aspects
 - MDD – refer to Chapter 9 of this NTSG and include details for all activities MDD are to be used for.

- Internal QA processes and procedures
- Reporting



South Sudan

National Technical Standards Guidelines

Date: 1st October 2015

Chapter 19

19 Accreditation of Mine Action Organisations

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19.1. Introduction

- a. Prior to any mine action organisation conducting demining operations in South Sudan they are to be accredited by the NMAA/UNMAS-SS Accreditation Board.
- b. The board shall assess the mine action organisation's ability to plan, manage and conduct demining operations safely, effectively and efficiently in compliance to IMAS and the NTSG. On completion of the accreditation process, the board shall recommend whether or not the mine action organisation should be issued accreditation to conduct demining operations in South Sudan.

19.2. Accreditation Process

- a. The accreditation process shall only commence in the following circumstances:
 - On receipt of a written application from any national organisation.
 - On receipt of a written application from an international organisation providing:
 - They shall provide evidence of a relevant contract in South Sudan and/or appropriate funding and
 - They shall provide evidence of registration as a UNOPS vendor,
 - The company are registered with the NMAA.
- b. Accreditation shall be completed over three phases, each phase only being undertaken on successful completion of the previous one. Within the South SUDANMAP, accreditation shall be conducted by boards specifically formed for a particular phase of the accreditation process. The three phases are as follows:
- c. **Phase One - Desk Assessment**: This initial phase is an examination of relevant and appropriate documentation submitted by the mine action organisation in order to assess and determine the organisational and individual capabilities, experience and competency to conduct humanitarian demining in accordance with the NTSG and IMAS in a safe, effective and efficient manner. This phase is further segmented into 'organisational' and 'operational' assessments where specific documentation pertinent to each aspect is examined. The mine action organisation should also submit their Code of Conduct, which includes gender related issues. The status of the applying organisation and specific circumstances surrounding the application

shall determine the documentation that is requested by NMAA/UNMAS-SS to be submitted.

- d. **Phase Two - Pre-deployment Quality Assurance:** All mine action organisations shall conduct pre-deployment operational training pertinent to their contracted activities. Training shall be routinely and regularly monitored throughout by the NMAA/UNMAS-SS Ops/QA officers and specialists as applicable. All aspects of the mine action organisations' capabilities shall be assessed including but not restricted to planning, logistics, administration, medical and relevant pertinent humanitarian mine action activities i.e. manual, MDD, mechanical etc. On completion of the training the organisation shall immediately submit a signed training declaration; see Annex A to this chapter and the relevant accompanying records. One copy of Annex A shall be submitted for each team/asset requiring accreditation. In exceptional circumstances i.e. the unavailability of NMAA/UNMAS-SS Ops/QA resources; on receipt of the signed training declaration, NMAA/UNMAS-SS may provide written authority to the mine action organisation allowing their team/asset to deploy to the allocated mine action task designated by the NMAA/UNMAS-SS. In such circumstances the operational accreditation assessment shall be conducted on-site as soon as is practically possible after deployment.
- e. **Phase Three - Operational Accreditation Assessment:** This is an assessment of the mine action organisations competency in practically planning, managing, conducting and/or performing humanitarian demining activities in an operational environment and capacity for which the organisation wishes the said teams/assets to be accredited and licensed to perform. The assessment shall evaluate the relevant task activities that the team/assets are contracted to conduct to ensure that they are performed in a safe, effective and efficient manner in accordance with the organisations own SOPs, the NTSG and with IMAS. The following applies:
- Whenever practical and possible operational accreditation assessments shall be conducted on completion of training and prior to their task deployment (MDD & Medical Assets i.e. medics shall always be assessed prior to deployment and shall only be allowed to deploy into an operational environment when accredited).
 - Operational assessment shall commence on request of the mine action organisation and on submission/receipt of Annex A Training Declaration.

- The assessment shall cover ALL specific mine action and associated activities being undertaken by the team/assets at the particular site/task and that the mine action organisation team/asset is seeking accreditation for. It shall cover the competency of individuals, teams, support, supervisory and managerial elements in all relevant facets of the pertinent activity.
- In exceptional circumstances i.e. the unavailability of NMAA/UNMAS-SS accreditation resources, the mine action organisation may be granted ‘Operational (Provisional) Accreditation’ accompanied by written authority allowing it to deploy specified team/assets to NMAA/UNMAS-SS designated mine action tasks. In such circumstances operational assessment shall be conducted on-site as soon as is practically possible after deployment.

19.3. Certification

- a. **Desk (Provisional) Accreditation Certificate**: On successful completion of Phase One a Desk (Provisional) Accreditation certificate shall be issued to the mine action organisation. This shall be pertinent to the organisation as a whole and shall authorise them to commence Phase Two of the accreditation process. This certificate shall be valid for the duration that the mine action organisation is deployed on the South SUDANMAP.
- b. **Operational Team Accreditation** – On successful completion of Phase 3 the mine action organisation shall be issued with an Operational Accreditation Certificate indicating that the specific team assessed is authorised to conduct those activities for which it has been assessed as competent. This certificate shall apply to specific teams i.e. MTT, NTS/EOD, ICC teams etc. Belonging to mine action organisations and detailing those specific mine action activities contained/detailed within the SOP for which accreditation has been awarded and for which this asset has been operationally assessed and deemed competent.
- c. **Individual Operational Asset Accreditation** – On successful completion of Phase 3 the mine action organisation shall be issued with an Operational Accreditation Certificate indicating that the specific asset assessed is authorised to conduct those activities for which it has been assessed as competent. This certificate shall apply to specific individual assets i.e. medics, MDD/Handlers, Mechanical Operators etc belonging to mine action organisations and detailing those specific mine action activities

contained/detailed within the SOP for which accreditation has been awarded and for which this asset has been operationally assessed and deemed competent.

- d. Certificates shall be in force for the duration of the demining season or for a period of 12months. However, due to extenuating circumstances i.e. amendments to the NTSG, changes to mine action organisation key personnel, new/additional processes being employed etc; a review may /be required of the team/asset accreditation.
- e. On the completion of the accreditation process the QM system and routine QA monitoring, as outlined in Chapter 14, shall take precedence and shall be implemented on mine action organisations' tasks for the remaining period that operational accreditation is in force.

19.4. Accreditation Board Composition

- a. Depending on which phase of accreditation is being undertaken accreditation boards shall be formed that comprise, but not restricted to, some or all of the following appointments:
 - NMAA/UNMAS-SS QA Coordinator
 - NMAA/UNMAS-SS OPS/QA Officers
 - NMAA/UNMAS-SS OPS/QA Officer Assistants
 - NMAA/UNMAS-SS Chief of Operations
 - NMAA/UNMAS-SS Specialist
- b. The following applies:
 - The board shall comprise of appointments suitably qualified and experienced in the roles for which they are appointed and shall be able to apply the accreditation requirements in a fair and equitable manner.
 - When accreditation is required for specialist activities i.e. MDD, medical, MRE etc then the accreditation body shall include the relevant NMAA/UNMAS-SS 'specialist' or in his/her absence an NMAA/UNMAS-SS representative with relevant qualifications and operational experience that shall allow him/her to carry-out the relevant role and responsibilities.

19.5. Board Responsibilities

- a. Each board shall be responsible for conducting the desk assessment and the operational accreditation assessment of mine action organisations. The accreditation board have the following general responsibilities:

- Respond and/or react in a timely fashion to queries and/or applications from prospective or current operational mine action organisations concerning accreditation.
 - Assess applications in a timely manner ensuring delays do not impact unnecessarily on the operational effectiveness of the applicants.
 - Specify and provide national standards and guidelines for the accreditation of mine action organisations and operations.
 - Provide operational accreditation assessment guideline scenarios to the mine action organisation teams/assets prior to their assessments.
 - Accredite mine action organisation teams/assets.
 - Act with independence, impartiality and integrity during the accreditation process.
 - Issue certificates authorising mine action organisations to conduct operational mine action activities/tasks that they have been accredited to conduct.
- b. Whenever possible and/or practicable boards shall comprise of those appointments detailed with '**primary responsibilities**'. Depending on the accreditation phase, on the practicalities and circumstances, on the specific requirements and availability of appointments at the time, the board may require input or assistance from some or all of the other appointments listed.
- c. Desk (Provisional) Accreditation Board:
- The Head of the NMAA/UNMAS-SS – primary responsibility for authorising desk (provisional) accreditation to the mine action organisation that is required to conduct mine action activities on the South SUDANMAP.
 - NMAA/UNMAS-SS Chief of Operations – primary responsibility for conducting desk (provisional) assessment and for the production and issuing of the relevant certificates.
 - NMAA/UNMAS-SS Ops/QA officers and specialists to support and assist as requested.
- Operational (Provisional) Accreditation Board:
- NMAA/UNMAS-SS Chief of Operations – primary responsibility for authorising operational (provisional) accreditation and for the production and issuing of the relevant certificates.

- NMAA/UNMS-SS Ops/QA officers/specialist – primary responsibility for recommending operational (provisional) accreditation and for coordinating and conducting pre-deployment quality assurance assessments.
 - NMAA/UNMAS-SS QA Coordinator to support and assist as requested.
- b. Operational Accreditation Board:
- The Chairperson/Programme Manager of NMAA/UNMAS-SS – primary responsibility is to authorise the mine action organisation teams/assets to conduct mine action tasks that they have been accredited for on the South SUDANMAP.
 - NMAA/UNMAS-SS Chief of Operations – primary responsibility for organising and conducting operational accreditation assessments and for the production and issuing of the relevant certificates.
 - NMAA/UNMAS-SS Ops/QA officers/specialists – primary responsibility for assisting in conducting operational accreditation assessments.
 - NMAA/UNMAS-SS QA Coordinator, to support operational accreditation assessment processes as requested.

19.6. Duration, Suspension and/or Termination of Operational Accreditation

- a. **Duration**: The period of operational accreditation shall last for a period of no more than 12 months from the date the team/asset was accredited, if there are no key manning appointment changes to the asset or for the duration of the demining season (Oct 01st – Jun 30th).
- b. **Suspension**: The following list, although not exhaustive, details possible reasons when suspension of operational accreditation may be invoked against a mine action organisation.
- If monitoring results in the suspension of a task (refer to Chapter 14, paragraph 8).
 - In the case of improper use of the accreditation agreement.
 - In the event of failure to disclose major and significant management or operational changes.
 - Failure to uphold management capabilities of the Mine Action organisation
- c. **Termination**: The following list, although not exhaustive, details possible reasons when the NMAA/UNMAS-SS may recommend the termination of the accreditation:

- If monitoring results in the suspension of a task (refer to Chapter 14, paragraph 8).
 - If the accredited organisation goes out of business.
 - If the accredited organisation does not wish to prolong the accreditation agreement.
 - If the requirements or provisions of standards or laws are changed and the accredited organisation cannot or will not ensure compliance with the new requirements or provisions.
 - If inadequate measures are taken following the suspension of an accreditation.
 - Failure to uphold management capabilities of the Mine Action organisation.
- d. **Note:** Before the termination of an accreditation agreement, the NMAA/UNMAS-SS shall determine measures to be taken to re-clear land released prior to the cancellation of the accreditation agreement. The responsibility for re-clearing land and the cost of such re-clearing shall either lie with the mine action organisation or another party. The responsibilities should be specified in the contract of work.

Annex A to Chapter 19 Training Declaration

TRAINING DECLARATION

This document declares that:- (print asset(s)/resource(s)sub-units designation) - _____

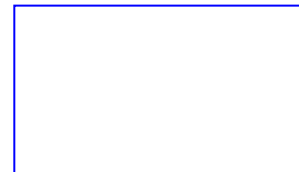
Of:- (print organisation name) - _____

has/have undergone suitable and sufficient internal training that has complied with accredited organisational SOPs and NTSGs and is considered by the signatory as fit for purpose, capable and competent to conduct those mine action activities for which it has/they have been contracted/employed.

*I, (print name) - _____ as the authorised representative of:-
(print organisation name) - _____ confirm the details of this declaration:*

Signature: _____ Organisation Stamp:

Date: _____



The following documentation is attached and submitted in support of this declaration:

- | | |
|--|--------------------------|
| <i>Course Outline/Programme</i> | <input type="checkbox"/> |
| <i>Nominal Roll of Students</i> | <input type="checkbox"/> |
| <i>Attendance Records</i> | <input type="checkbox"/> |
| <i>Instructor Details</i> | <input type="checkbox"/> |
| <i>Examiner Details</i> | <input type="checkbox"/> |
| <i>Evaluation/Interim Test Results</i> | <input type="checkbox"/> |
| <i>Final Test Results</i> | <input type="checkbox"/> |
| <i>Pass/Fail Criteria Results</i> | <input type="checkbox"/> |
| <i>Other Applicable Documentation</i> | <input type="checkbox"/> |

A copy of this declaration is to be sent immediately upon completion of each training course to the NMAA/UNMAS-SS QA Coordinator.

On written acknowledgement from the NMAA/UNMAS-SS QA Coordinator (in his absence the Chief of Operations) confirming receipt of this declaration, an 'Operational (Provisional) Accreditation' may be issued or an operational accreditation assessment shall be arranged.

In certain circumstances, the acknowledgement of receipt of this declaration may be accompanied by written authority to deploy the indicated assets/resources/sub-unit on to operational tasks authorised by NMAA/UNMAS-SS.

Annex B to Chapter 19 Accreditation Process Checklist

Serial	Process description	Responsibility			Remarks
		Mine Action Organisation	Accreditation/Monitoring Body (Sub-office QA/Ops personalities & others as req'd)	NMAA/ UNMAS-SS QA Coordinator	
PHASE ONE – DESK ASSESSMENT					
1	Submits enquiry to conduct mine action	✓			Shall be by letter, email or fax
2	Receives and acknowledges receipt of enquiry			✓	By email or letter
3	Sends organisation the NMAA/UNMAS-SS introduction letter			✓	Within 10-working days
4	Submits documents as required in introduction letter	✓			Preferably in e-format (Memory stick, CD-ROM etc) or as an email
5	Acknowledge receipt of documentation			✓	By email or letter
6	Conduct desk assessment based on documentation			✓	
7	Inform organisation of decision			✓	By email or letter
8	Does application and supporting information meet the desk assessment requirements stage ?			✓ YES or NO	If YES go to Ser 12.
9	Notify applicant of additional information needed to process the application			✓ If NO in Ser 8	By email or letter
10	Applicant provides additional information	✓ If NO in Ser 8			Preferably in e-format (Memory stick, CD-ROM etc) or as an email
11	Does application and supporting information meet the desk assessment requirements for this stage ?			✓ YES or NO	If NO continue process as in Ser's 9/10 until process is exhausted or complete

12	Applicant download the current NTSG from UNMAS-SS website.	✓			
13	Applicant drafts organisational SOPs covering all proposed mine action activities that comply with NTSG and submits to NMAA/ UNMAS-SS QA Coordinator for appraisal/review	✓			Preferably in e-format (Memory stick, CD-ROM etc) or as email attachment that can be printed
14	Appraisal/review of submitted SOPs			✓	If an organisation is working on the South SUDANMAP, then SOPs shall be reviewed by the NMAA/UNMAS-SS.
15	Do SOPs meet the desk assessment requirements and comply with NTSG?			✓ YES or NO	If YES go to Ser 19.
16	Notify applicant of required amendments, changes to SOPs.			✓ If NO in Ser 15	Send appraisal form attached to email/letter



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Chapter 20

20 Route Verification

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20.1. ROUTE VERIFICATION

- a. For the purpose of this NTSG Route Verification means the Non-Technical Survey, Technical Survey and Clearance of roads, routes and tracks used by vehicles and/or pedestrians. This Chapter defines the minimum standards and procedures for Route Verification in South Sudan and shall be read in conjunction with other relevant chapters within this NTSG. All activities detailed within this Chapter shall be conducted in accordance with approved and accredited SOP's of the organisation conducting the Route Verification.
- b. The three distinct phases for the route verification in South Sudan are listed below:
 - Phase 1 Route Survey (NTS/TS).
 - Phase 2 Route Clearance (8m, 26m wide).
 - Phase 3 Route Rehabilitation and Reconstruction.
- c. It is possible that different organisations or teams will be involved in each phase, therefore full and detailed task/IMSMA documentation shall be handed over from one phase to the next through the NMAA/UNMAS-SS.

20.2. Phase 1 Route Survey Planning

- a. During the planning phase of any Route Survey all potential sources of information shall be considered. Survey teams shall be the principal provider of information gathered from a multitude of sources. All sources of information should be explored and analyzed to determine their authenticity and accuracy in order to develop an efficient plan that achieves the greatest results. Valuable information may also be obtained from 'technical' sources such as satellite images, aerial photographs, military dossiers and hospital records.
- b. Organisations conducting Route Survey in South Sudan shall use the Survey and Hazard report form to collate all the acquired information. Some sources of information that shall be covered in the survey are:
 - The local populous who know the area.
 - Knowledge of any previous mine UXO accidents / incidents along the route or in the area.
 - Security threat in the area.
 - History of conflict in the area.
 - Previous vehicle use of the route.
 - Weather and terrain – route conditions, obstacles.

- Other general information of the area.
- c. The listed information sources are not exhaustive and should be expanded as and when required. In order to ensure that a sufficient quantity of credible data is made available a number of samples and resources should be acquired.
- d. The authenticity and accuracy of survey data shall be determined by analyzing the **Type, Source** and **Details** as per Chapter 1
- e. Survey information gathering shall provide a source of continually updated data and not merely a 'single snap-shot' of the situation.

20.2.1. Assessment of Survey Information

- a. The assessment of information obtained from the survey shall involve the detailed examination and cross referencing of each item of information with as many creditable sources as possible, an evaluation of these results and then the identification of significant facts of information concerning the route, leading ultimately to appropriate conclusions being made.
- b. Route Survey shall always be conducted by suitably qualified specialists. The objective of assessing information is to ensure an accurate threat assessment and classification in order to prevent avoidable accidents/incidents from occurring.
- c. Following the Survey, routes shall then be classified into the following categories:
 - Not Surveyed - Annotated the colour **GREY** on NMAA/UNMAS-SS maps.
 - No Evidence of Mines/UXO – Annotated the colour AMBER on NMAA/UNMAS-SS maps.
 - Mined – Annotated the colour **RED** on NMAA/UNMAS-SS maps.
 - Cleared – Annotated the colour **GREEN** on NMAA/UNMAS-SS maps.
- d. This classification allows Operation Managers to plan future clearance activities on or near mined Routes or mined areas and shall allow the UN and other agencies to include appropriate safety and security measures in planning the movement of assets and personnel.

20.2.1. Not Surveyed

The “**Not Surveyed**” category is further defined within the following parameters:

- a. No recognised Route Survey has taken place along the route with regards completing the Road/Route Questionnaire and obtaining a comprehensive inventory on:

- All reported and/or suspected locations of mine/UXO contamination
 - The quantities and types of explosive hazards
 - Information on the local soil characteristics, vegetation and climate.
- b. **Note** If insufficient information is collected during the conduct of the survey, to confidently categorise the road as “No evidence of Mines/UXO” then its category shall remain “Not Surveyed”.

20.2.2. No Evidence of Mines/UXO

Category is further defined within the following parameters:

- a. A recognised Survey has taken place along the route with regards completing the Route Questionnaire and:
- There is no information or suspicion of mines being laid or mine incidents / accidents on the route
 - The route has been frequently used by local population and large vehicles without incidents / accidents
 - The route is easily identifiable
 - There is no information regarding any military activity or cross line fighting having taken place
 - No defensive positions or ambush sites have been identified

20.2.3. Not Surveyed

The “**Mined**” Category is further defined within the following parameters:

- a. A recognised Survey has taken place along the route with regards completing the Route Questionnaire and:
- Although the route is in use, there have been mine incidents / accidents in the past
 - There is information that mines were laid in the area and that there have been some mine incidents / accidents reported
 - There is information that hostilities took place in the area, although, no recorded mine incidents / accidents
 - There is reliable information that mines have been laid and there have been a number of recent mine incidents / accidents
 - There is credible information that the route has been mined
 - The local population believes the route to be mined but cannot give details of specific incidents.

20.2.4. The “Cleared” Category is defined as

- a. “A route, that has been physically and systematically processed by a demining organisation to ensure the removal and/or destruction of all mine and UXO hazards to a specified depth in accordance with NTSG’s”.

20.2.5. Route classification

- a. Route classification is a continuous process which aims to accurately reflect the true threat. In particular, changes to assumptions and to the reliability of sources of information should be revisited on a regular basis, and the implication of these changes examined fully.

20.3. INFORMATION MANAGEMENT

- a. Records and information gathered during Route Survey shall be retained and a copy of the survey result included in the task dossier for any future mine action process required on the route, including the cancellation of “Hazardous Areas”. All information shall be made available to all demining organisations and other organisations with a vested interest in the road/route.
- b. Information should be made available in a form which is appropriate for its use and subsequent review. This may include reports, summaries, maps, GPS tracking, and electronic media. Whenever possible, use should be made of standard and proven information management systems and GIS, such as IMSMA.
- c. The Route Survey information shall be used to justify the judgement used in the classifying of route portions, or cancellation of previously reported danger areas, either ‘no evidence of mines’ or ‘mined areas’. This information shall be referred to during all internal and external quality assurance checks and future route enquiries.

20.3.1. RESPONSIBILITIES

- a. It is the responsibility of all mine action organisations that undertake Route survey to conduct this process in accordance with this NTSG using only accredited assets and SOP.
- b. It is the responsibility of the mine action organisation to complete the Survey and Hazard Report Form for all identified hazardous areas they encounter during the conduct of the survey, even if these hazards do not directly impinge on the Road/Route.

- c. NMAA/UNMAS-SS shall issue maps, updated at regular intervals that should show the current state of roads. Any further clarification needed shall be directed through the NMAA/UNMAS-SS Chief of Operations.

20.4. PHASE 2.ROUTE CLEARANCE

- a. Following the Phase 1 Route Survey, those areas that have been categorised as being “Mined”, shall initially require a further assessment and following this integrated clearance assets to systematically process and clear the area.

20.4.1. Depths:

- a. During route clearance operations the mine action organisation shall ensure the removal and/or destruction of all AT mines and UXO from the road/route to a depth of **20cm**; all AP mines shall be removed and/or destroyed to a depth of **13cm**. These clearance depths shall only be varied by an amendment to the Implementation Plan, which requires appropriate authorisation from NMAA/UNMAS-SS.

20.4.2. Width:

- a. The stipulated clearance width shall be initially 8m wide (4m each side of centreline), taking the centreline of the road/route as the marking line (this can be recorded as a DGPS track if physical marking is inappropriate); this width allows for a workable twin lane trafficable road/route. Following this initial clearance the route may then be widened to 26m (13m each side of centreline) which shall be a sufficient area for road construction to take place. These distances may be amended with the approval of NMAA/UNMAS-SS Chief of Operations if a specific threat is identified that requires the distances to change and/or there is a specific clearance width requirement from a donor.

20.4.3. Route Clearance Concept of Operations.

- a. It may be that sufficient information was made available from the Route Survey regarding specific hazardous areas to allow for clearance to take place without any further follow up assessment, when this is the case integrated clearance assets shall be tasked directly by the NMAA/UNMAS-SS to clear those identified contaminated areas.
- b. When insufficient information is made available from the Route Survey regarding specific hazardous areas, then a further assessment shall be conducted to identify those specific hazardous areas. In order to expedite

the assessment and identification of specific hazardous areas and to allow for the subsequent clearance, one or more of the following assessment tools may be utilised:

- Explosive Vapour Samples.
 - Electronic (Magnetic) Readings and/or Measurements
 - Ground Penetrating Radar
 - Mine Detection Dogs (MDD)
 - Rollers
 - Detection systems with a Data Logging capability
- c. In addition to the above assessment tools, location information in the form of DGPS readings shall also be taken along the route (centre line)
- d. The assessment tools shall be suitable to operate throughout the varying types of terrain commonly found in South Sudan, which vary from bush track to very poorly maintained roads.
- e. On completion of the assessment the information shall then be analysed to verify identified hazardous areas. Following this identification a mine action organisation shall be requested to submit an Implementation Plan to the NMAA/UNMAS-SS for approval. Following the approval those previously identified hazardous areas shall be cleared by integrated clearance assets.
- f. All information, including but not limited to, DGPS readings and any subsequent mapping shall become the property of the NMAA/UNMAS-SS.
- g. This concept of operation shall dramatically increase the speed of assessment by which actual mined areas of routes are identified and subsequently cleared.

20.4.4. Route Clearance Method of Operation

- a. The NMAA/UNMAS-SS Chief of Operations may authorise a variation to these specific methods of operation to suit specific situations, provided the required and defined level of detection and clearance is still being achieved.
- b. During MDD and manual follow up clearance, individual signals located within the **specific identified hazardous areas** shall be investigated. The minimum area to be cleared shall be a 2m x 2m box around the signal (with signal being the centre point). This distance shall be extended in accordance with the Implementation Plan.

- c. In areas where the hazardous area cannot be detailed nor specified due to a high concentration (Lines of Disengagement), then the route shall be cleared using a Linear Feature Road/Route Clearance Method of Operation. Presently there are two Methods of Operation currently employed:
- “Follow On”
 - “Arrow Head Formation”
- d. Both methods of operation are completed in much the same way as any linear feature is cleared such as a road, track, pipeline, power line or other such linear feature.
- e. It should be noted that during linear type clearance tasks require a high degree of command and control, as clearance teams are often spread out over a large distance and visual contact may be lost, particularly when there is vegetation present.
- f. The demining procedures and safety precautions are exactly the same as for any demining task; only the setting of the clearance lanes is different.
- g. The following applies during the conduct of clearance using follow on:
- The task shall start from a baseline which is set out at the beginning of and at right angles to the linear feature.
 - A 2 wide metre access lane should then be cleared parallel to and at the edge of the linear feature. The access lane should (Shall) be cleared by clearing (2) two 1metre wide adjacent lanes.
 - As the access lane progresses and on reaching 50 m (or 75m for directional / fragmentation mines), the first crossover lane may then cleared at the 26m point at right angles to the linear feature and past the opposite edge of the linear feature to the required clearance width requirement (8m or 26m).
 - Crossover lanes should be at 25m or 50m spacing depending on the mine type hazard. The task is then simply cleared using the access lane as the base lane and progressively clearing the crossover lanes at right angles to the feature.
 - When a mine or item of UXO is found by the main clearance party the item shall be marked, the lane closed and another lane worked. The item shall be destroyed at the end of the working day.
 - If MDD assets are utilised to initially clear the area then the task should start again from a 2m baseline which is set out at the beginning of and at right angles to the linear feature. As the access lane progresses and on

reaching 10 m, a crossover lane may then be cleared at right angles to the linear feature and past the opposite edge of the linear feature to the required clearance width requirement (8m or 26m). Crossover lanes shall then be cleared at 10m spacing, a 10 x 6m search and clearance block has now been prepared for the MDD assets to clear.

- The task is then simply cleared using the access lane as the base lane and progressively clearing the crossover lanes at right angles to the feature at 10m intervals to prepare and subsequently clear the 10m x 6m search and clearance blocks.

h. The following applies during the conduct of clearance using follow on:

Arrow Head Formation

- The task should again start with a 2 metre wide baseline which is set out at the beginning of and at right angles to the linear feature; once this is completed the first clearance lane may be started at right angles to the base lane.
- As the first clearance lane progresses and on reaching 25 m (or 50m for directional / fragmentation mines), the second clearance lane may then be started at right angles to the base lane.
- When a mine or item of UXO is found by the main clearance party the item shall be marked, the lane closed and another lane worked. The item shall be destroyed at the end of the working day.
- The task is simply cleared by placing more clearance lanes at right angles to the base lane when the safety distance is achieved. Annex B to this NTSG Chapter details the “Arrow-Head Formation” Method of Operation.

20.4.5. Post Road/Route Clearance Marking

- a. In those highly hazardous concentrated areas (Lines of Disengagement), where contamination still exists to the flanks of the cleared route and it is not possible to conduct clearance operations in the immediate future, Permanent Fencing shall be erected as detailed at NTSG Chapter 3. This shall act as a physical and visual barrier to stop any possible movement of humans and/or livestock.
- b. The Permanent Fencing should extend at least 10m each side of the outer boundaries of the contaminated area, with both sides of roads being fenced; the fencing itself shall be placed 50cm inside the actual cleared area.
- c. The marking of any cleared area following clearance has to be unambiguous and permanent. The Bench Mark, Start Point and each

Turning Point shall be physically marked and situated in accordance with NTSG Chapter 2.

- d. If following the assessment no specific hazardous areas are identified, then the centreline of the route shall be used as the marking line; it is this marking line that shall be utilised for the turning points/perimeter coordinates with the information being recorded with DGPS.
- e. For those areas where specific hazards are identified and subsequently cleared, perimeter coordinates for the whole area (polygon), are required. The information shall be recorded again with DGPS.
- f. All turning points / perimeter coordinates shall be indicated on the IMSMA Completion report and associated map submitted. Instances where the ground may be unsuitable for metal picket insertion, then a large rock / pile of rocks shall be placed. When marking for a Suspension Task, the rocks shall be painted red/white and when marking for a Completion Task the rocks shall be painted white.

20.4.6. Post Route Clearance Documentation

- a. When following route clearance that results in no residual contamination existing to the flanks of the road/route, then this shall be clearly annotated on the IMSMA Completion Report. If however following clearance, residual contamination still exists on either flank of the route and HA's have only been partially cleared then a Completion report shall be submitted clearly indicating the area cleared and a new Survey and Hazard report shall be compiled clearly explaining the area yet to be cleared.

20.4.7. Road/Route Rehabilitation and Reconstruction

- a. Following the route clearance and prior to the actual route being reconstructed (Phase 3), all HA's remaining to the flanks of road/route shall be marked with permanent fencing so as to allow work to continue safely.



South Sudan

National Technical Standards Guidelines

Date: 1st October 2015

Chapter 21

21 Explosive Detection Dogs

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21.1. Introduction

- a. Explosive Detection Dogs (EDD) can be used in many different roles within risk mitigating operations. They are to be seen as a complement to existing security framework. As such, they are well suited for activities such as Entry Control Point (ECP)-search, luggage/cargo verification, facility security screening, IED incident response and support to military search operations etc.
- b. There are a variety of security scenarios in which EDD teams can be utilized. These National Standards (NS) are based on common principles that can be applied to all EDD operations and therefore must be considered when establishing operational procedures for deployment of EDD teams.

21.2. Scope

- a. This standard provides specifications and guidelines for operational procedures to be adopted for EDD operations. For the purposes of this standard, 'operational procedures' means procedures to be applied as part of an EDD operation. They include, but are not limited to operational accreditation, planning for EDD operations, preparation for EDD operations, EDD search procedures, EDD operations, environmental factors affecting EDD operations and rest and rotation of EDD, use of logbooks, and EDD health and capability checks.

21.3. Operational accreditation of EDD

- a. Experience has shown that a period of 1-2 weeks may be required to allow the dogs to become acclimatized to the local weather conditions and surrounding environment. It is recommended that all EDD deployed into South Sudan undergo this acclimatization period before being deployed operationally.
- b. All organizations intending to use EDD, as part of a security operation, must ensure that the EDD teams (dogs and handler) have received the required operational accreditation.
- c. The organizational accreditation, valid for twelve (12) months, will only be given subsequent to an evaluation of the organizations Standard Operating Procedures (SOP), outlining the operational procedures which will be applied by the organization. Additionally an operational accreditation (licensing), valid for six (6) months, following a practical on-site assessment of each EDD team

is required prior to operational deployment. The on-site assessment will be repeated every 6 months following procedures outlined in Annex 1.

- d. NS 'Accreditation' details the information required from the organization on application for accreditation. The organization shall ensure that detailed CVs of each dog handler is submitted, as well as information about each of the dogs intended for deployment. This includes; name, chip number, breed, sex, age, training records, previous accreditation, vaccinations and limitations. A certified veterinarian must certify each EDD to be in good health and evaluated suitable for service in South Sudan. This should be done at least once per year and records are to be submitted to UNMAS South Sudan during the accreditation process.
- e. The most important element of the accreditation is the on-site assessment. The following general rules shall apply when licensing the EDD teams:
- Evaluation Area. All evaluations will be carried out at an UNMAS South Sudan approved site/area/facility following guidelines detailed in **Annex 1**.
 - Weather Conditions. Evaluation of EDD will only be carried out if the weather is similar to that in which the organization would use the EDD during normal operations. If the weather is such that the organization would not use the EDD and **this is stated in the SOP**, the evaluation will be called off awaiting improvements in the weather conditions.
 - Type Of Explosive/Substance. The evaluation will be conducted using reliable controlled /verified scent signatures and/or samples of live explosives detailed in "Substance list" Annex 1.
 - Search area. Search area will reflect Statement of Work (SOW) of awarded contract i.e. vehicles, luggage/cargo, buildings/facilities, open areas etc. Each assigned search area will contain from zero (0) to 6 (six) hides of explosives/substances according to attached substance list.
 - Search technique during the evaluation. The assigned search area (vehicles/items/area) must be cleared from presence of explosive substances, in accordance with the SOP of the organisation to be evaluated.
 - Search break: The dog handler may ask for a search break any time during a search. A break may be required because of a provisional lapse, or the dog or the handler needs to drink water.
 - Time restrictions: Time restrictions will be decided by the test-manager depending on type of test conducted.

f. Pass Criteria

- The organization SOP is followed correctly.
- 100% indication of all explosive hides per EDD.
- No false indications are reported by the handler.

g. Failure criteria's

- Less than 100 % of all the explosive hides found per EDD.
- False indications are reported by the handler
- The EDD scratches or physically manipulates the scent source
- The EDD actively/intentionally manipulates/damages the environment (operational contact allowed).

21.3.2. Action on failure

- a. If an EDD team fails to pass the evaluation, the team cannot be re-evaluated within the next 7 days. If a team fails a second evaluation, a third evaluation will only be undertaken after thirty (30) days. If a team fails the test three times, then the team will be denied a re-tested for a period of one (1) year.
- b. If critical non-conformities are identified for several of the EDD teams belonging to an organisation, the accreditation board will have the right to terminate the accreditation for the overall EDD operation of that organisation.

21.3.3. Additional regulations

- a. The EDD handler has the right to observe the assigned search area prior to the evaluation.

21.3.4. Marking of Finds

- a. When the presence of explosive substance is indicated by the EDD and the handler reports the indication as correct to the test manager, the test manager will exclude a relevant area surrounding the reported indication, and the handler can recommence the search. The test manager will not confirm if the indication is correct.

21.3.5. Evaluation

- a. The evaluation board shall consist of an UNMAS assigned Test Manager and two UNMAS assigned board members. The assigned Test Manager (chairman of the board) shall have well documented EDD experience and is responsible for preparing and conducting the on-site assessment.

- b. The manager, or the senior supervisor, of the organisation being evaluated has the right to be present during the evaluation if desired. If the EDD Team Leader shall undertake on-site assessment as EDD handler, he/she has the right to be the first EDD team tested, and afterwards observe the tests of the remaining EDD teams.

21.3.6. Evaluation Forms

- a. An example of the evaluation form will be made available to all organisations prior to the evaluation period.

21.4. Training, internal and external evaluations of EDD

21.4.1. Training

- a. Training areas where dogs will perform weekly maintenance training must reflect the operational work environment. Organization shall have access to sufficient training aids / training substances for daily use. UNMAS South Sudan will provide organization with live substances/explosives when appropriate. Substances will be stored by UNMAS South Sudan and signed out for use by the organizations only during supervised training and then returned for storage with UNMAS South Sudan.
- b. In order to maintain required performance and safety during operations, the EDD and their handlers shall undergo weekly refresher training and evaluation by the organization's supervisor.

21.4.2. Internal Evaluation

- a. Internal evaluation shall be undertaken by the organisation at least every second month. The internal evaluation process shall be outlined in the SOP. Results from the evaluations shall be recorded properly, including area searched, substances used, time, and indications (correct/unwanted) and signed by the person responsible for the evaluation.
- b. If an EDD fails the evaluation, the EDD shall be taken out of operation for re-training until the identified problem is solved. A new evaluation shall be conducted and passed before the dog can be operationally deployed again. Records from the internal evaluations shall be submitted to UNMAS-SS Sub-Office
- c. Dates of the forthcoming monthly evaluations shall be reported to UNMAS-SS Sub-Office during weekly QA/QC meetings in good time before the evaluations. The UNMAS-SS Sub-Office Operations and QA Officer has the right to be present during those evaluations.

21.4.3. External QA Evaluation

- a. The UNMAS-SS Sub-Office and QA officer will conduct external QA evaluation reviewing the performance of the EDD teams following National Standards for EDD operations.
- b. An UNMAS South Sudan approved evaluation site will be used. The following are the minimum requirements for the external evaluation:
- c. Pass Criteria
 - The organization SOP is followed correctly.
 - 100% indication of all explosive hides per EDD.
 - No false indications are reported by the handler.
- d. Failure criteria's
 - Less than 100 % of all the explosive hides found per EDD.
 - False indications are reported by the handler
 - The EDD scratches or physically manipulates the scent source
 - The EDD actively/intentionally manipulates/damages the environment (operational contact allowed).
- e. If an EDD fails the evaluation, the EDD must be taken out of operation for re-training until the identified problem is solved. A new evaluation must be conducted and passed before the EDD can be used for operations again.
- f. An example of the evaluation form will be made available to all organisations prior to the evaluation period. The manager or the senior supervisor of the organisation, being evaluated, has the right to be present during the evaluation if desired.

21.5. Planning for EDD operations

- a. Before an EDD operation can be undertaken it is necessary to plan the progression of search.
 - Assessment of the threat prior to the search. The EDD team shall only be deployed for categories of search accredited for. If the EDD-team is only accredited to undertake e.g. ECP duty (vehicle and luggage/cargo) it shall not be used for area/facility search.
 - Assessment of the type of threat believed to be present in the area. If some different explosives or substances to those, which the EDD is trained to detect, are suspected, the EDD shall be tested against these new types prior to operational search.
 - Demolitions of mines, ERW and IED in those areas where the EDD will be working can disturb the EDD due to trace elements of explosives and

pieces of destroyed mines, ERW or IED. The demolition can contaminate large areas and make it difficult to efficiently use EDD. EDDs shall not be used in areas with visible contamination of explosives, ERW or IED.

- The EDD shall constantly be visible to the handler. If the environment is such that the dog handler is not able to observe the dog at all times during the search, the area shall be divided into several smaller parts. If working with the EDD “un-leashed”, the handler is to ensure that the EDDs movements are observed at all times.

21.6. Preparation for EDD operations

21.6.1. Search procedures

- a. Search-methods may vary dependent on how the EDD is trained according to the SOP of each organisation. In general terms the following procedure should be followed:
 - The EDD shall search the whole area with no parts remaining unchecked and the handler must make sure the EDD searches the area with full concentration at all time. If the EDD is not fully focused, that specific area shall be searched again.
 - The EDD shall follow the search pattern described in the clearance organizations SOP.
 - A break of 10 to 15 minutes should be considered for every working hour.
 - When presence of explosives is detected, the EDD shall indicate the discovery as per the organisations SOP (sitting/lying/standing) close to the find, without moving around or onto the find. Barking and scratching is not acceptable.

21.6.2. Safety

- a. The minimum safety distance between two working handlers with dogs shall be determined according to the task and situation where they are working.
- b. Where a hazard, which poses a greater threat, than identified during the threat assessment, is identified during EDD operations, the safety distance being applied is to be immediately changed to reflect the increased threat.

21.6.3. Environmental factors

- a. Temperature. EDD have a limited capability for working for long periods in hot climates. During hot or arduous conditions the EDD handler shall ensure frequent change of the EDDs to ensure optimal efficiency of the team.
- b. **Atmospheric pollution** Atmospheric pollution may prevent a EDD from working effectively; therefore EDD shall not be used in areas where the atmosphere is excessively polluted by gases, smoke or odours from petroleum products, fertilizer, chemicals, domestic burning or factory exhausts, markedly affecting the EDD capability to detect. UNMAS South Sudan Ops/QA Officer in cooperation with EDD Handler will conduct evaluation of circumstances.
- c. **Environment** If the environment and circumstances are such that it will prevent the EDD from searching/covering the whole area, or the EDD handler has limited visibility of the EDD or search area, EDD are not to be used.

21.6.4. Rest and rotation of EDD

- a. Dogs are highly individual in their characters. While some EDD are capable of working continuously for several hours, others need frequent breaks. Environmental conditions also influence the work of EDD.
- b. Organizations shall establish procedures for the rest and rotation of EDD that takes into account environmental conditions and the individual natures of the EDD.
- c. **Length of search periods**
 - The length of search periods shall be determined solely by the handler based on the capabilities of the EDD and the conditions under which the EDD are working.

21.7. Use of logbooks

- a. Logbooks are to be maintained for all EDD employed in South Sudan and updated daily by the EDD Team Leader/Supervisor or handler. If the EDD handler has not written the logbook himself, he is to sign the log after each entry to confirm its accuracy.
- b. Log books are to record details of:
 - Daily operations/progression.
 - Indications given.
 - Daily health checks.

- Comments on the work carried out that day and on the EDD performance.
- Disease, sickness or injury to the EDD, including any comments made by a veterinarian.
- Any other matters of relevance that may affect a EDD health or performance.
- In addition to the logbook, each EDD shall have a detailed Training Record (TR), specifying all conducted maintenance training, outcomes, findings and actions taken. This TR shall be included in a monthly report, and be made available to UNMAS South Sudan QA Officer upon request.
- The logbook is to remain in the possession of the EDD handler at all times during operations in the field and is to be available for inspection by external QA inspection teams as required.

21.8. Medical, healthcare, kennels and feeding

- a. Whilst the EDD are in kennels, only certified handlers/kennel assistants should feed, remove dogs, clear or enter the kennels. The EDD should be thoroughly examined and monitored on a daily basis.
- b. The handlers are responsible for reporting any medical or health problems with their dogs to their supervisor. The following points must be considered before an EDD is allowed to start work or to continue to work after a rest period:
 - The EDD must be fully fit and not suffering from any ailment that will affect its performance.
 - Sufficient shade and sufficient water must be available at the task site. This will be at least five litres per dog per day.
 - The dog must be given frequent rests. The rest intervals may vary from dog to dog. The climate will also influence rest intervals. If it is impossible to motivate the dog for work, the EDD team should be replaced by another licenced EDD team. In case of injury or illness, suitable transport must be available at the task site for evacuation of the dog to a more suitable health care centre.
- c. IMAS 09.44 further details standards of occupational and general dog care. These standards shall apply to EDD deployed in South Sudan where applicable.

21.9. Quality Assurance (QA)

- a. The EDD team, within each organization shall conduct the following internal QA checks:
 - Weekly training of the dogs in the field environment where the dogs are working. Kept on Training record and be presentable on an external QA visit.
 - Internal Evaluation of the dogs every second month in the field environment where the dogs are working. Kept on record and be presentable on an external QA visit.
 - Be prepared to undergo external QA evaluation by the UNMAS-SS Sub-Office.
 - Proper health examination of the dogs before work.

Annex A to Chapter 21 - Guidelines for UNMAS South Sudan EDD Accreditation test

Substances are divided into groups based on the origin. UNMAS / UNOPS will use substances from applicable groups, either “live” substance or reliable controlled/verified scent signatures. Substances used will be recorded in on-site assessment protocol.

Group	Examples of Products / Substances
Ammonium nitrate group	Amatol, Ammonal, Amatex, ANFO, ANNM
Hexogen group	RDX, C4, PE4, COMP A-3, M112, HEXAL, SHEET
Octogen group	HMX, LX-14, LX-17-0, PBX-9502, PBX-9503
Penthrite group	Nitropenta (PETN)
Tolite	TNT, Trotyl
Nitrocellulose	Propellant powder
Sulphur	Black powder /gun powder
Other products	Semtex, TATP, Blasting gelatine

Test procedure

1. General conditions

- test is performed in controlled circumstances
- dog handler will follow instructions given by the Test Manager
- dog must be in good health / physical condition
- dog must be silent during the exercises
- commands will be given to the dog in normal tone (verbal correction is not allowed)
- assessment will be performed with the dog on and off leash as instructed by the Test Manager
- exercise starts and ends on the command of the Test Manager
- passive indication: static and silent indication (without leaving the indicated source)

2. Disqualification situations

- the dog shows uncontrolled submissive or aggressive behaviour
- the dog handler is not able to control the dog during assessment
- threatening commands, intimidating behaviour or physical punishment is used
- reinforcing items are used
- dog handler doesn't follow the instructions of the Test Manager
- dog shows uncontrollable barking (loud / high sounds) behaviour
- spike collars or e-collars are used
- assessment rules or animal right laws are violated
- suspicion of fraud in collar use (e.g. rubber band, hidden spikes)

3. Order of the exercises

Exercises shall be performed by the dog handler, in four sessions, following the below established order, under the supervision and following the instructions of the Test Manager.

Exercises shall reflect awarded contract and SOW.

4. Re-test procedures

In case of failure the EDD team will be given the opportunity to be re-tested following below sequence:

1. Accreditation test. If failed;
2. After 7 days (1 week), re-test. If failed:
3. After 30 days (one month) re-test. If failed:
4. After 365 days (one year) re-test.

5. Exercise description and items benchmark

Exercise number: 1

Exercise name: search and indication for explosives hidden in transportation means

Exercise description:

- **Area for searching in transportation means:** a search area including 1 – 6 types of transportation means
- **Requirements:** Search shall be conducted on and/or off leash, according to organizations SOP, following the instructions of the Test Manager. Passive indication is mandatory. Type of indication is announced by the handler before starting the exercise. The handler must await acknowledgment from the Test Manager before approaching / communicating with the dog during indication. Finding and correctly indicating all hides in the exercise is mandatory. No false indications are allowed.
- **Set up:** The number of hides is unknown for the handler (1 to 6). Products / substances used in the evaluation are in accordance to the substance list in this document.
- **Provided information:** The search items will be presented by the Test Manager. The dog handler has no knowledge about how many hides are to be found and she / he is instructed - in case of indication – to continue to search the remaining transportation means.
- **Exercise timing:** up to 25 minutes for the entire exercise.

Exercise number: 2

Exercise name: search and indication for explosives hidden indoors

Exercise description:

- **Area for searching indoors means:** a search area i.e. accommodation, hotel, airport, office buildings, stores, storage house etc. The search area can vary from 50 to 500 m².
- **Requirements:** Search shall be conducted on and/or off leash, according to organizations SOP, following the instructions of the Test Manager. Passive indication is mandatory. Type of indication is announced by the handler before starting the exercise. The handler must await acknowledgment from the Test Manager before approaching / communicating with the dog during indication. Finding and correctly indicating all hides in the exercise is mandatory. No false indications are allowed.
- **Set up:** The number of hides is unknown for the handler (1 to 6). Products / substances used in the evaluation are in accordance to the substance list in this document.
- **Provided information:** The search area will be presented by the Test Manager. The handler has no knowledge about how many hides are to be found and she / he is instructed - in case of indication – to continue to search the remaining area.
- **Exercise timing:** The search time will be set by the Test Manager according to the size of the search area before each exercise.

Exercise number: 3

Exercise name: search and indication for explosives hidden outdoors

Exercise description:

- **Area for searching:** a search area i.e. open field, industry areas, parking lot, forest, railways,

train platforms, bridges, stadiums, etc. The assigned search area will be between 500 to 10000 m² and it can be divided into several parts

- **Requirements:** Search shall be conducted on and/or off leash, according to organizations SOP, following the instructions of the Test Manager. Passive indication is mandatory. Type of indication is announced by the handler before starting the exercise. The handler must await acknowledgment from the Test Manager before approaching / communicating with the dog during indication. Finding and correctly indicating all hides in the exercise is mandatory. No false indications are allowed.
- **Set up:** The number of hides is unknown for the dog handler (1 to 6). Products / substances used in the evaluation are in accordance to the substance list in this document.
- **Provided information:** The search area will be presented by the Test Manager. The dog handler has no knowledge about how many hides are to be found and she / he is instructed - in case of indication – to continue to search the remaining area.
- **Exercise timing:** The search time will be set by the assessors according to the size of the search area before each exercise

Exercise number: 4

Exercise name: search and indication for explosives in luggage / objects rows

Exercise description:

- **Area for searching:** objects are lined up after each other in several rows. The distance between each object is approximately 1 meter. Each object shall be searched. The objects can be: i.e. luggage, bicycle, tires, boxes, envelopes, home appliances, computer etc. The number of objects will be between 10 and 30.
- **Requirements:** The entire exercise shall be assessed based on search procedures both tactically and technically. Passive indication is mandatory. Type of indication is announced by the dog handler before starting the exercise. The dog handler must await acknowledgment from the Test Manager before approaching / communicating with the dog during indication. Finding and correctly indicating all hides in the exercise is mandatory. No false indications are allowed.
- **Set up:** The number of hides is unknown for the dog handler (1 to 6). Products / substances used in the evaluation are in accordance to the substance list in this document.
- **Provided information:** The search items will be presented by the Test Manager. The dog handler has no knowledge about how many hides are to be found and she / he is instructed - in case of indication – to continue to search the remaining objects.
- **Exercise timing:** The search time will be set by the Test Manager according to the number of objects before each exercise



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Chapter 22

22 Task Administration

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22.1. GENERAL

- a. Efficient and effective administration is necessary at all stages of humanitarian demining. The ability of the mine action organisation to correctly administer clearance tasks is first assessed during the initial accreditation process. There is an expectation that the level of administration being applied during a successful accreditation shall continue throughout operations.
- b. This Chapter provides information on the administration process for clearance tasks in South Sudan.

22.2. TASK CYCLE WITHIN SOUTH SUDANMAP

- a. Diagram 1 depicts the life-cycle of a task that is applied and implemented within the South SUDANMAP.

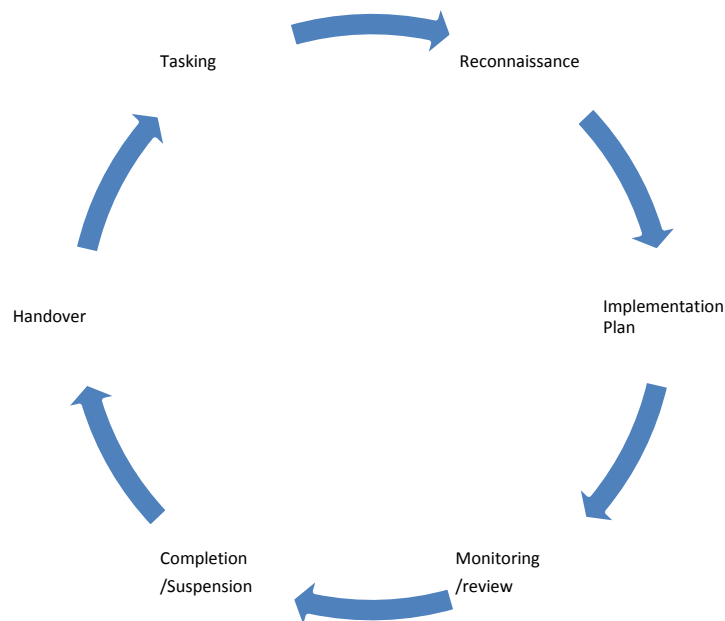


Figure 22-1 Task Cycle

22.3. Tasking

- a. The NMAA/UNMAS-SS sub-office is responsible for co-ordinating and implementing the tasking for all mine action organisations operating in their area of responsibility (AOR). The tasking process begins once a relevant task is identified, the selection of the task will be dependent on humanitarian and National priorities as well as the available resources required for completing the task.
- b. Task Dossier The production of the Task Dossier is the responsibility of the NMAA/UNMAS-SS sub-office Operations Officer. All available information and documentation pertaining to the task are included in the dossier and should be appropriately indicated. The dossier is a 'living document' throughout the life cycle of a task and therefore can and should be added to and appropriately updated by the relevant demining organisation as and when appropriate.
- c. Task Order Once ready, the task dossier shall be issued to the relevant mine action organisation. On acceptance the authorised mine action organisation representative shall sign the tasking order. The NMAA/UNMAS-SS sub-office is to then archive a copy of the complete task dossier along with the signed task order.

22.4. Joint Reconnaissance

- a. After the Task Dossier has been issued a joint reconnaissance should be planned and conducted by the mine action organisation representative(s) and the NMAA/UNMAS-SS sub-office Operations Officer. A joint discussion and assessment shall then take place culminating in the formulation and agreement of a proposed plan.

22.5. Implementation Plan

- a. All the details collated to date shall be utilised in order to produce an implementation plan. This is the responsibility of the mine action organisation issued with the task.

22.6. Implementation Plan Approval

- a. Once completed by the demining organisation the implementation plan shall be submitted for approval to the NMAA/UNMAS-SS. The following approval process applies:

- b. Mine Action Organisation Responsibility The implementation plan shall be completed, prepared and signed by the authorised individual from the mine action organisation. It shall be submitted to the NMAA/UNMAS-SS sub-office that issued the task within 4 working days from the signing of the tasking order or 4 working days after the completion of the joint reconnaissance if one is conducted. The mine action organisation shall ensure it clearly identifies and details all pertinent information. In particular any planned deviation from accredited SOPs shall be clearly highlighted.
- c. NMAA/UNMAS-SS Sub-office Responsibility. The NMAA/UNMAS-SS sub-office Operations Officer shall review the implementation plan to ensure it complies with any appropriate agreements and with the standards, processes and procedures detailed in the mine action organisations accredited SOPs. The review shall consider and decide if any proposed deviations from accredited SOPs are necessary and/or acceptable. The review should include an assessment that the implementation plan is able to meet the aims of the task in a safe, effective and efficient manner. The sub-office Operations Officer shall confirm and if necessary verify any relevant or appropriate detail e.g. minefield polygon coordinates if established. The Operations Officer should refer all concerns with regards to the implementation plan to the mine action organisation in an attempt to resolve them at this level. If resolution is not achieved, pertinent issues shall be raised with the NMAA/UNMAS-SS Chief of Operations. Once satisfied the Operation Officer shall sign-off on the implementation plan and then submit it to the NMAA/UNMAS-SS Chief of Operations. This should be completed within 48 hours of receipt. Any deviation from accredited SOPs and any other critical issues shall be clearly annotated.
- d. NMAA/UNMAS-SS Chief of Operations, if satisfied with the implementation plan, shall sign it off and return it to the relevant authorised appointment(s) within 24 hours. On approval of the implementation plan at this level the mine action organisation shall be informed that they can commence the task.
- e. NMAA/UNMAS-SS. The Operations Assistant shall file the signed implementation plan and copies of the completed document shall then be distributed for filing, storing or further action as appropriate. .The signed and approved implementation plan shall become a mini-contract from a contractual point of view between the NMAA/UNMAS-SS and the mine action organisation.

22.7. Task Monitoring and Review

- a. During the task implementation, monitoring, review and quality assurance shall be conducted by both the NMAA/UNMAS-SS sub-office and the mine action organisation as per chapter 14 of this NTSG. In addition the mine action organisation shall submit a Daily Report / Weekly IMSMA Progress Report. Once the information from the Progress Report is verified, it shall be entered into IMSMA. Progress Reports should be kept in all copies of the task dossier until completion/handover of the task and then filed/archived with the rest of the task documents.

22.8. Amendments to Implementation Plans

- a. Any amendments to the original implementation plans that do not compromise safety or major deviations from the original IP shall be consulted with NMAA/UNMAS-SS for authorisation and can be agreed on site with NMAA/UNMAS-SS representatives. Recorded on the site operations sheet and signed by NMAA/UNMAS-SS and organisation representatives. Amendments concerning safety shall be required to be forwarded to the NMAA/UNMAS-SS Chief of Operations. In general the following shall constitute IP amendments;
 - Change in threat assessment
 - Change in methodology,
 - Request for a Task Specific amendment to the demining organisations SOP.
 - New information becomes available that was not available at the time of planning and will impact on the completion of the task.
- b. Each implementation plan amendment shall be numbered and appropriately filed and recorded in all copies of the task dossier.

22.9. Task Completion

- a. Task implementation shall only be considered complete once the mine action organisation has submitted the Completion Report to the NMAA/UNMAS-SS sub-office. The NMAA/UNMAS-SS sub-office QA Officer/Ops Officer shall conduct a final QA and sign-off the appropriate section of the completion report indicating the task is ready for the formal handover. The completion report shall then be entered into the IMSMA and appropriately filed and recorded in all copies of the task dossier. The following applies:

- All original documentation belonging to NMAA/UNMAS-SS shall be handed to NMAA/UNMAS-SS with the completion report.
- Attached to the completion report shall be 2 x A3 scale maps indicating the different assets that completed the task.
- The completion report shall be used to verify that the task has been completed as per the tasking order and the implementation plan.

22.10. Task Suspension

- a. When a task is suspended, the NMAA/UNMAS-SS sub-office QA Officer/Ops Officer shall conduct a QA evaluation with the mine action organisation and generate an IMSMA Suspension Report. If and when the task recommences a joint reconnaissance shall be conducted by the NMAA/UNMAS-SS sub-office Ops Officer/QA Officer and the tasked mine action organisation. If a different mine action organisation is employed, the NMAA/UNMAS-SS sub-office QA Officer/Ops Officer shall conduct a QA handover evaluation preferably with representatives from both mine action organisations present. Following this, the new mine action organisation shall generate a new implementation plan and the complete process shall recommence.

22.11. Formal Handover/Declaration

- a. After all documentation processes are complete a formal Handover and Declaration Certificate as at Annex A shall be generated. The following applies:
 - A copy of the completion survey report and an A3 scale map shall be attached to the Formal Handover and Declaration Certificate.
 - This shall be signed as followed:
 - Authorised representative from the mine action organisation.
 - Authorised representative of any supporting mine action organisation i.e. sub-contractor.
 - Acceptance signature from NMAA/UNMAS-SS (usually the Chief of Operations).
 - Final receipt by responsible authority.

22.12. Archiving Task Documentation (NMAA/UNMAS-SS)

- a. Once all documentation as per the contents sheet are compiled and recorded the task shall be considered complete. The final action shall be for the

IMSMA Officer to verify all information against the database. Thereafter the documentation shall be archived.

22.13. TASK MAP

- a. Accurate mapping of mine and UXO clearance operations is extremely valuable for operational planning, conducting task briefings and as a testimony to the clearance conducted. Demining organisations are encouraged to use electronic map making tools, such as Map Source, Map Maker and Track Maker.
- b. Mine action organisations shall ensure that all mine/UXO clearance supervisors are capable of producing an accurate map of the clearance conducted, which should be updated regularly in order to reflect the actual clearance on the ground. The following applies:
- c. Each separate clearance task shall have its own map which should depict all clearance activities conducted during the task duration.
- d. The production of the map shall start when clearance commences and should be finished on completion of clearance.
- e. A copy of the map and all coordinates should be submitted with the completion report.
- f. In circumstances where a task is suspended, the mine action organisation shall ensure that the map accurately reflects all clearance conducted and that it is included with the suspension report.
- g. In situations where a task is divided into smaller tasks (eg, SS-50A, SS-50B, SS-50C), it may be necessary to produce separate maps.
- h. The map should be drawn on graph paper and the scale used should be sufficient to ensure that the details are unambiguous. It is recommended that the minimum scale used is 1:1000 (1cm = 10m).
- i. Non-permanent markers (e.g., pencils) should be used to draw the map, therefore, allowing for alterations if required.

22.13.1. Preparing a Task Site Map

- a. Stage One –
 - From the Benchmark, record the bearing and distance to the Start Point.
 - From the Start Point, record all perimeter coordinates (bearings and distance) to each turning point, using a DGPS or compass and measuring tape, returning to the Start Point.
 - Ensure that the information is gathered in one direction only.

- b. Stage Two –
 - Select a point on the map for the Benchmark and the Start Point, plot all perimeter coordinates from the Start Point onto the map using a protractor and ruler. Ensure that the perimeter coordinates are plotted in one direction only.
- c. Stage Three –
 - Draw/record all other relevant symbols and information
- d. Stage Four –
 - The map should be updated regularly, ideally at the end of each working day.
- e. The task map shall have the following information:
 - Map name
 - Task number and start date
 - Team Leader's Name
 - BM and grid reference
 - SP and grid reference
 - North Pointer
 - Scale
 - Legend
 - Control Point/administration area
 - Mines/UXO located
 - Cleared areas
- f. In addition, the task supervisor should have the following information available at the task:
 - List of perimeter coordinates (in sequence)
 - Map symbols sheet (if not included on map)
 - Mine/UXO information (type/quantity/depth) located
 - Accidents / Incidents
- g. The following colours are recommended for use on task maps:
 - Red – mines/UXO
 - Blue – water features
 - Green or yellow – cleared areas, working lanes
 - Black – other symbols.

22.14. VISITORS BRIEF

- a. All task visitors shall be given a brief by the task supervisor in a designated safe area (e.g. control point or administration area) prior to being allowed into the worksite. The briefing shall be conducted in the pertinent language to ensure that all visitors understand the content of the brief.
- b. The operations brief should include the following:
 - Ground orientation
 - History – what, when, where, who, why, how?
 - Map brief – marking, symbols and clearance.
- c. The safety brief should include the following:
 - Organisation marking system, in particularly, clear/unclear areas.
 - Actions on controlled demolitions.
 - Actions on uncontrolled explosion.
 - Casualty evacuation plan.
 - Conduct of visitors (do's and do not's).
 - Wearing of PPE (Personal Protective Equipment).

Annex A to Chapter 22 Handover & Formal Declaration Certificate

HANDOVER AND FORMAL DECLARATION CERTIFICATE

<u>GENERAL INFORMATION</u>			
1. TASK DOSSIER NUMBER:		10. DESCRIPTION OF CLEARED AREA:-	
2. TASK ID (IMSMA NAME:)			
3. ORGANISATION			
4. TEAM ID			
5. STATE			
6. COUNTY			
7. PAYAM			
8. MAP SERIES:			
9. LOCAL AREA NAME:			
<u>DETAILS OF CLEARANCE OPERATIONS</u>			
11. NUMBER AND TYPE OF MINE / UXO CLEARED:		15. FINAL DISPOSAL METHOD OF MINES / UXO:	
12. CLEARANCE METHODOLOGY USED:		16. IS AREA METAL FREE?	
13. QUALITY ASSURANCE METHODOLOGY USED:		17. QUALITY ASSURANCE INSPECTOR NAME:	
14. CLEARANCE DEPTH: 13cm		18. DATE OF COMPLETION EVALUATION.	
<u>DECLARATIONS AND ACCEPTANCES</u>			
HANDOVER AND DECLARATION ON BEHALF OF DEMINING ORGANISATION		QUALITY ASSURANCE DECLARATION BY THE UNMAS QA OFFICER	
I CERTIFY THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF THE AREA AND DEPTH SPECIFIED IN THIS HANDOVER AND FORMAL DECLARATION CERTIFICATE HAS BEEN CLEARED OF ALL MINE AND UXO HAZARDS.		I CERTIFY THAT THE AREA AND DEPTH SPECIFIED IN THIS HANDOVER AND FORMAL DECLARATION CERTIFICATE HAS BEEN INDEPENDENTLY ASSESSED TO BE CLEAR OF ALL MINE AND UXO HAZARDS.	
NAME:		NAME:	
POSITION:		POSITION:	
DATE:		DATE:	
SIGNATURE:		SIGNATURE:	
ACKNOWLEDGEMENT AND ACCEPTANCE BY THE UNMAS SUB-OFFICE OPERATIONS OFFICER		ACKNOWLEDGEMENT AND ACCEPTANCE BY THE UNMAS REGIONAL OPERATIONS COORDINATOR	
I ACKNOWLEDGE THAT THE INFORMATION CONTAINED IN THIS HANDOVER AND FORMAL DECLARATION CERTIFICATE IS CORRECT AND ACCEPTABLE.		I ACKNOWLEDGE THAT THE INFORMATION CONTAINED IN THIS HANDOVER AND FORMAL DECLARATION CERTIFICATE IS CORRECT AND ACCEPTABLE.	
NAME:		NAME:	
POSITION:		POSITION:	
DATE:		DATE:	
SIGNATURE:		SIGNATURE:	
ACCEPTANCE BY THE NATIONAL AUTHORITY			
I ACCEPT RESPONSIBILITY OF THIS AREA ON BEHALF OF THE PEOPLE OF SOUTH SUDAN. I UNDERSTAND THAT THE SPECIFIED AREA HAS BEEN CLEARED OF MINES AND UXO TO THE DEPTH SPECIFIED IN THIS HANDOVER AND FORMAL DECLARATION CERTIFICATE.		NAME:	
		DATE:	
		SIGNATURE:	

Maps / Images of released area to be attached: (Completion Maps / images)



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Chapter 23

23 Land Release

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23.1. Introduction

- a. Land release back to the community is the overall aim of any particular mine action activity and this NTSG provides a basic methodology to be applied in using the demining assets available in South Sudan. This methodology relies upon the mine action organisation and the NMAA/UNMAS-SS to grade all Hazardous Areas (HA) into high and low threat areas and then into areas where mines/UXO have or have not been found.
- b. The land release process may be applied to a minefield; a suspect hazardous area (SHA); and a confirmed hazardous area (CHA) right from the beginning of tasking (in other words to hazards which are already reflected in the IMSMA database) or it may be applied to potential hazards which are not yet reflected in the IMSMA database. This allows the hazard or suspected hazard to be subjected to the same probing process of confirming, clearing and or releasing areas based on actual threat rather than the perceived threat.

Table 23-1 Decision Making Tool

Asset	Threat	High Threat					Low Threat				
		Items Found			No items found		1st Stage		2nd Stage		Item found
		1st Stage	2nd Stage	3rd Stage	1st Stage	2nd Stage	1st Stage	2nd Stage			
Mine Wolf 330 / 370	AP/AT	Tiller/Flail to reach required depth	100% sub - surface follow up	2m x 2m box cleared around item	Tiller/Flail to reach required depth	100% sub - surface follow up	Tiller/Flail to reach required depth	Minimum 50% sub-surface follow up	Revert to HT routine after redefining HT/LT area		
Mine Wolf 240	AP/AT	Tiller/Flail to reach required depth	100% sub - surface follow up	2m x 2m box cleared around item	Tiller/Flail to reach required depth	100% sub - surface follow up	Tiller/Flail to reach required depth	Minimum 50% sub-surface follow up	Revert to HT routine after redefining HT/LT area		
Armtrac 400	AP/AT	Tiller/Flail to reach required depth	100% sub - surface follow up	2m x 2m box cleared around item	Tiller/Flail to reach required depth	100% sub - surface follow up	Tiller/Flail to reach required depth	Minimum 50% sub-surface follow up	Revert to HT routine after redefining HT/LT area		
Armtrac 100	AP Only	Tiller/Flail to reach required depth	100% sub - surface follow up	2m x 2m box cleared around item	Tiller/Flail to reach required depth	100% sub - surface follow up	Tiller/Flail to reach required depth	Minimum 50% sub-surface follow up	Revert to HT routine after redefining HT/LT area		
MV4	AP Only	Tiller/Flail to reach required depth	100% sub - surface follow up	2m x 2m box cleared around item	Tiller/Flail to reach required depth	100% sub - surface follow up	Tiller/Flail to reach required depth	Minimum 50% sub-surface follow up	Revert to HT routine after redefining HT/LT area		
Bozena 4	AP Only	Tiller/Flail to reach required depth	100% sub - surface follow up	2m x 2m box cleared around item	Tiller/Flail to reach required depth	100% sub - surface follow up	Tiller/Flail to reach required depth	Minimum 50% sub-surface follow up	Revert to HT routine after redefining HT/LT area		
Bagger	AP/AT	Tiller	100% sub - surface follow up	2m x 2m box cleared around item	Tiller	100% sub - surface follow up	Tiller	Minimum 50% sub-surface follow up	Revert to HT routine after redefining HT/LT area		
Manual	AT/AP	Breach into HTA	Full clearance		Breach into area	Normal clearance drills	% Tech Survey as per NTSG	10 x 10 around items found.	Revert to HT routine after redefining HT/LT area		
BAC	ERW	Full sub-surface			Full sub-surface	Normal clearance drills	Surface clearance	% sub surface as per NTSG	20 x 20 subsurface box around item found		

23.2. Implementation & Tasking

- a. Refer to Chapter 22 of South SUDANMAP NTSG's.

23.3. All reasonable effort

- a. "All reasonable effort", in the South SUDANMAP is the process of deciding when land may be released from suspicion, is the level of effort required to achieve the desired level of confidence that the land is free of mines/ERW. "All reasonable effort" may, at one extreme, only be the conduct of a non-technical survey which finds absolutely no evidence of mines/ERW. The commitment of additional resources in this case is unlikely to justify the expected additional information about the area. However, if the non-technical survey confirms some evidence of mines/ERW, it would be reasonable to expend more effort to gain more confidence about which areas are free of mines/ERW and which are not. In this case, "all reasonable effort" may mean that a technical survey or clearance should be conducted.
- b. "All reasonable effort" for the release of previously suspected land (SHA/CHA/DHA) is reached at a point where sufficient and reliable information has been obtained to conclude, with confidence, that there is no evidence of mines/ERW. Varying levels of clearance and survey shall be conducted to reach this point. In relation to the achievement of confidence in mine action activities, the point at which it is unreasonable to expect more effort to be expended to achieve the desired result should be determined by NMAA/UNMAS-SS.

23.4. Methodology

- a. The Land Release methodology is based on the universal application of the references in IMAS; the NMAA/UNMAS-SS Land Release Process and the Asset Deployment Guidelines against both suspected and confirmed hazardous areas.
- b. The application of land release assumes a level of risk based on verification of threat. It recognises that just because a hazard is reflected on the IMSMA database, the details are not necessarily accurate and that all hazards benefit from thorough application of the LRP at all levels of intervention.

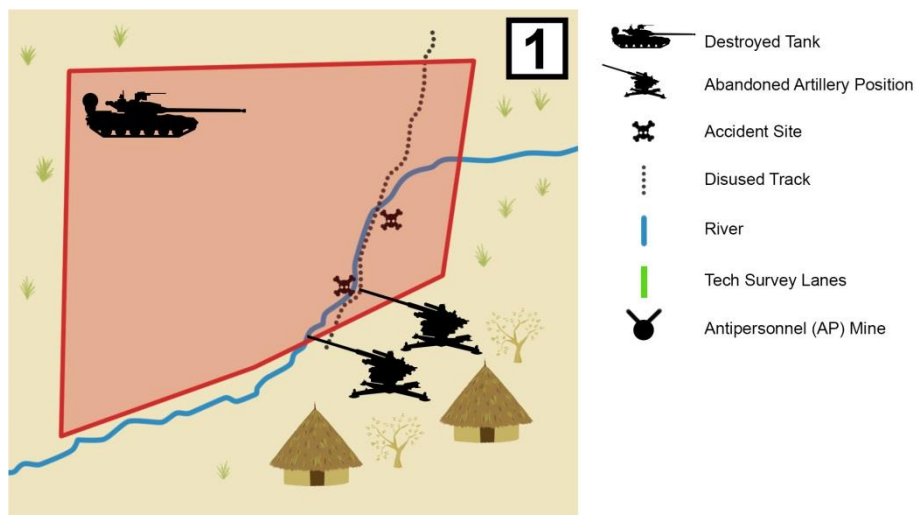
23.5. Asset Deployment Decision Making Tool.

- a. The Asset Deployment Decision Making Tool is a guide on how to deploy clearance assets in high threat and low threat areas. This is the minimum

requirement which should be implemented on each land release site. On site where mechanical assets are deployed, calibration tests or ground conditions may dictate that further passes of the flail or tiller are required to achieve the required depth. If so then this shall be recorded and applied.

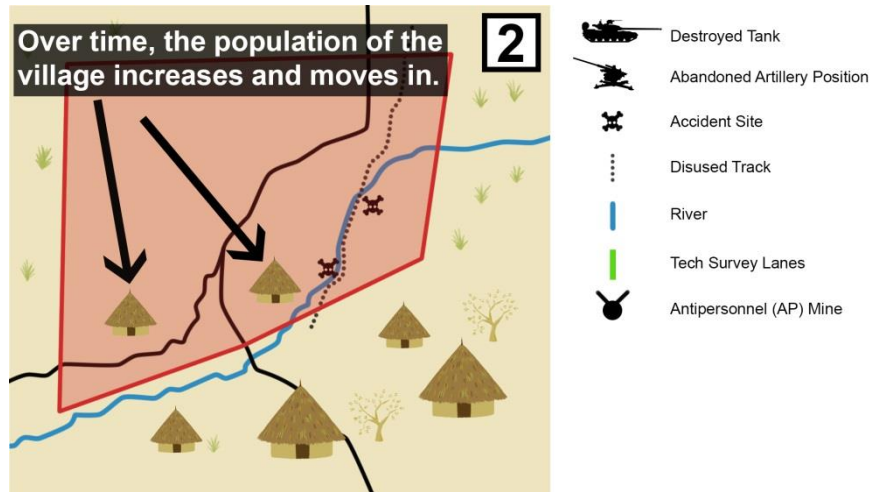
23.6. Land Release Process

- a. The following is structured in a user friendly format with both pictograph representation of decision making points and a work/document flow chart.
- b. The pictographs are numbered – the user may choose at which point to enter into the decision making process depending on the perceived threat and the amount of information available on the SHA/CHA.

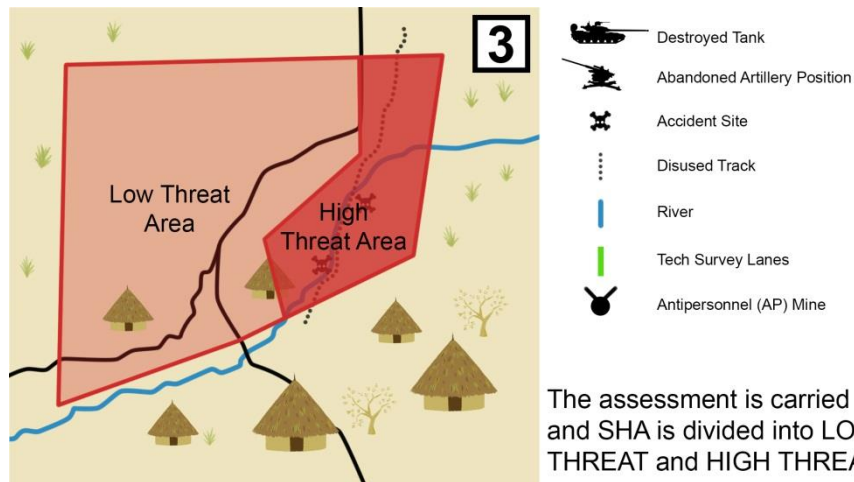


- c. Further explanation of each pictograph is described below:
 - The Original SHA from the IMSMA Database.
 - The original survey has produced a large polygon of an SHA based on information gathered during the non-technical survey. Often there was very little time to assess the true extent of contamination in a community and frequently the polygons produced were exaggerated in size. In many cases after years of habitation or cultivation the perceived threat has been removed and there is no need for clearance and the area should be cancelled from the IMSMA Data base by carrying out a resurvey of the area and by completing an IMSMA Cancelled Area Report (attached as Annex A to this chapter) and submitting a Completion.

- Pict. Two: Information Gathering



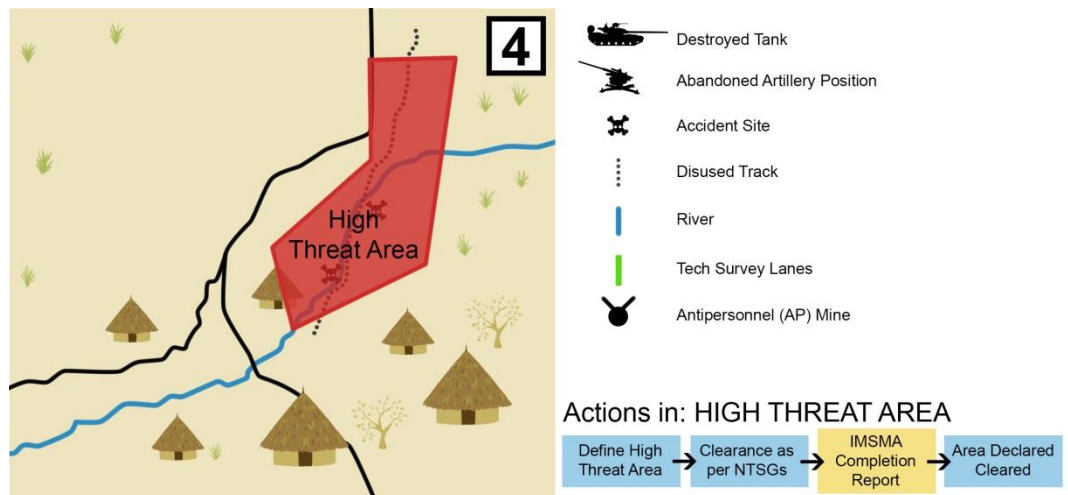
- During the resurvey of the HA the use of local sources of information identified the areas which the community still considers to be hazardous and the areas which the community is happy to use on a daily basis.
- Pict. Three: The result of the resurvey.
- An assessment is then carried out of the SHA and in consultation with the



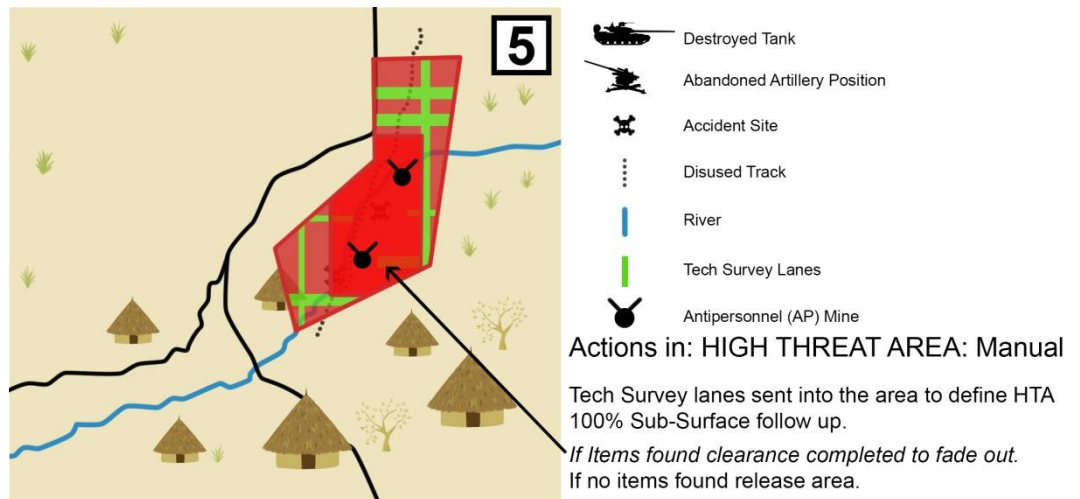
The assessment is carried out and SHA is divided into LOW THREAT and HIGH THREAT.

local community the SHA may then be sub-divided in to - Low Threat Area (LTA) and High Threat Areas (HTA).

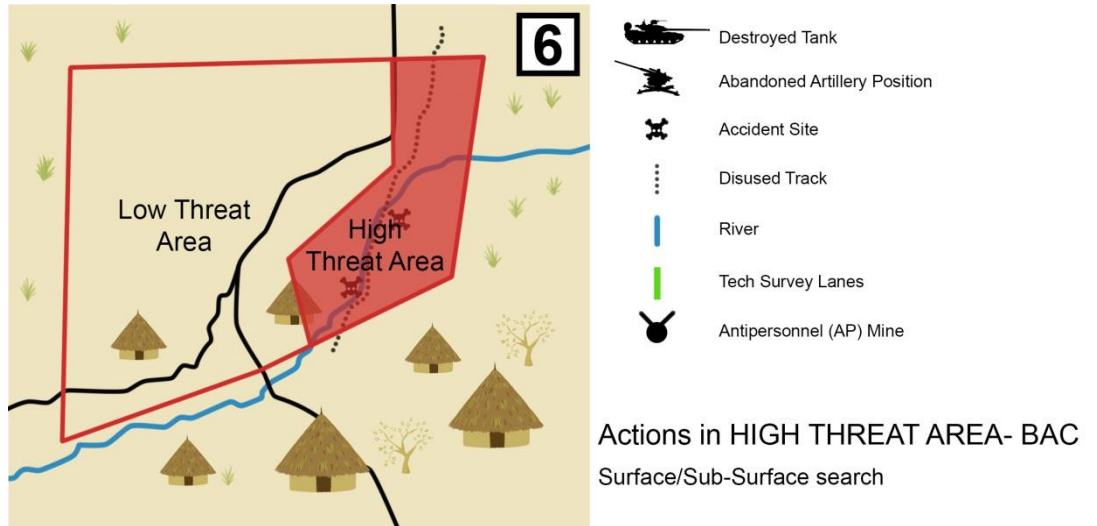
- Pict. Four: Actions in the high threat area (HTA)– Mechanical



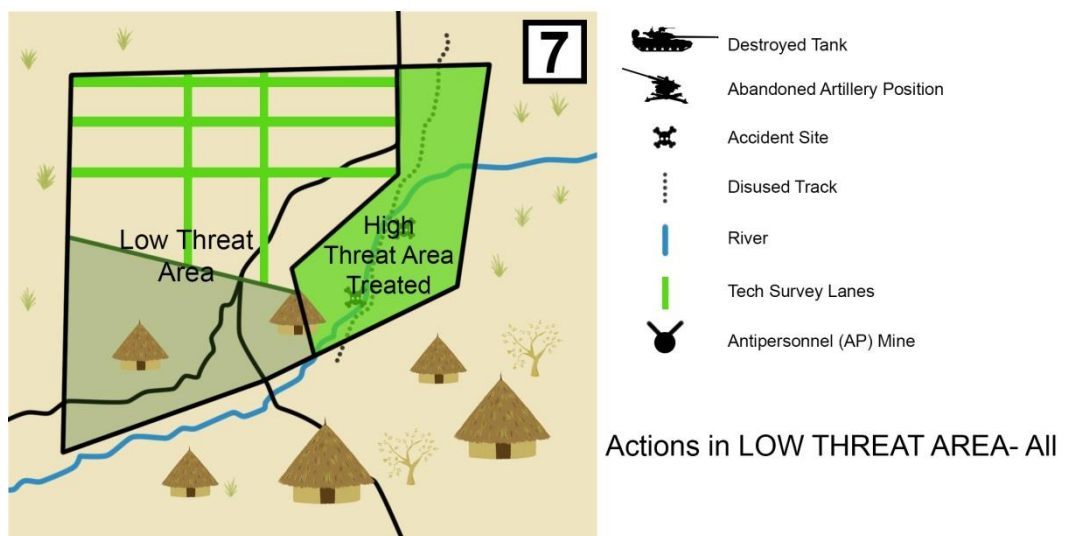
- Mechanical: Due to their productivity and efficiency, the South SUDANMAP relies heavily on machines to treat high threat areas. If machines are available, the entire high threat area should be treated following Chapter 8 for an area with mines found and then the remaining High Threat Area may be processed using the “No Mines Found, High Threat Area” as described in the decision making tool.
- Pict. 5: Actions in the high threat area – Manual



- With manual clearance teams the object should be to get into the mined area as quickly as possible and only clear the area which is known to be mined. When the mined area has been cleared the remaining area should be considered low threat area and should be treated accordingly. In nuisance mined areas rather than technically survey the entire area the clearance teams shall breach into the site of previous accidents or incidents and work out from the seat of the mine accident applying procedures as per “high threat, no mines found” guidelines.
- “Fade out” should also be applied when treating the high threat area, a buffer of a minimum of 20 meters should be applied to mines found. Clearance should continue 20 meters past the last mine found in a patterned minefield. In a nuisance minefield a buffer of “double the distance between the last and second last mines found” may also be applied.
- Fade out distance can also be site specific and may be dictated by the patterns of mines found, any deviation from the distance stated above should be agreed between NMAA/UNMAS-SS and the clearance organisation.
- Pict. 6: Actions in a high threat area – BAC



- “Fade out” should also be applied when treating the high threat Battle Area Clearance (BAC) task, a buffer of a minimum 50 meters should be applied to the last item found, either surface or sub-surface. Where UXO are found outside a known “footprint” then a box of 20 x 20m is checked around the item, surface/sub-surface depending on the tasking.
- Fade out distance can also be site specific and may be dictated by the patterns of items found, any deviation from the distance stated above should be agreed between NMAA/UNMAS-SS and the clearance organisation.
- Pict. Seven: Survey Calculation

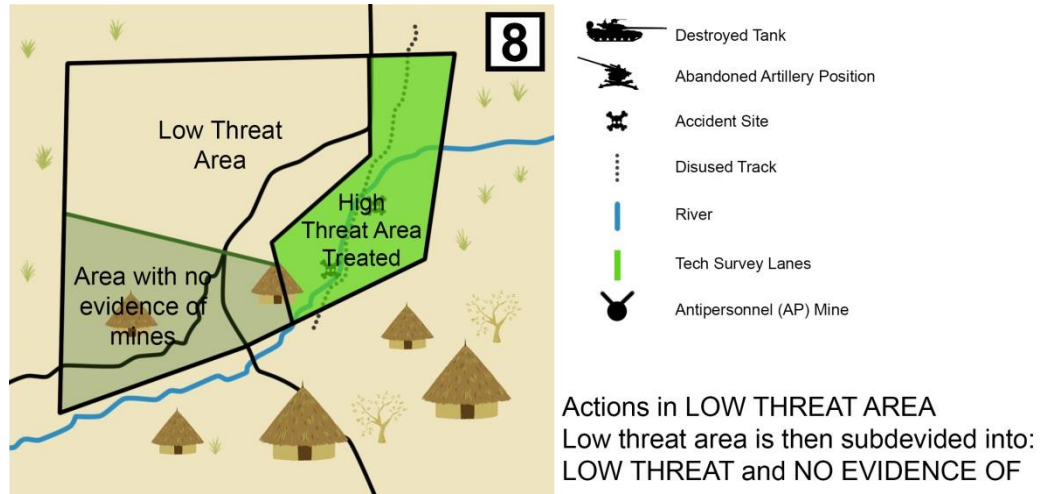


- The percentage of ground in the low threat area which should be subjected to technical survey should be based on the quality of

information collected. All information collected during non-technical survey shall be classified based on the following criteria;

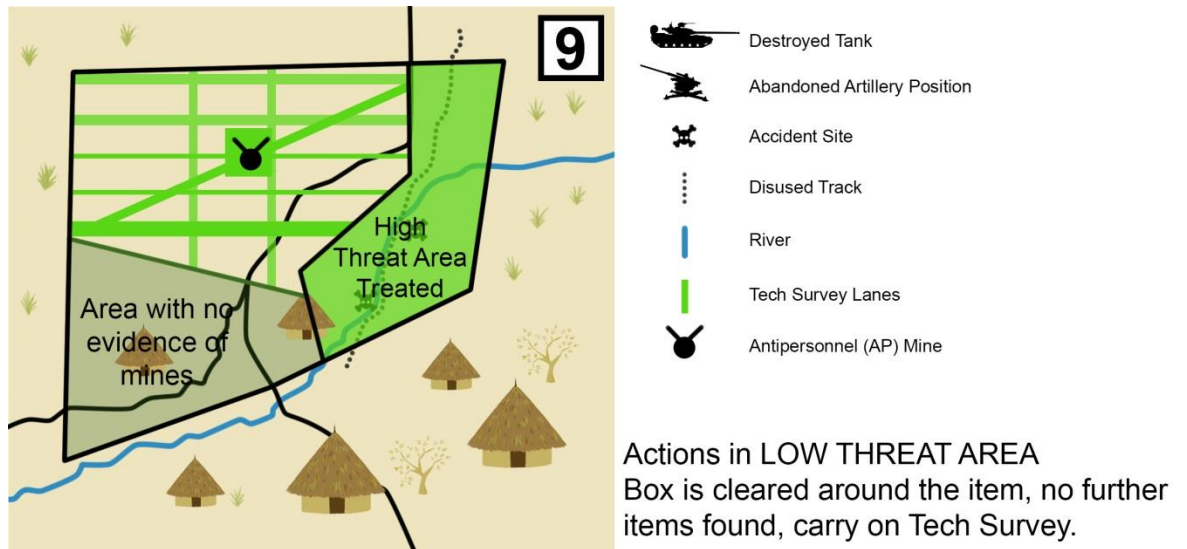
- Low Quality Information: This is information gathered from people or institutions who have newly arrived into an area or have no direct knowledge of the presence or location of mines. This may also include information from villagers of dubious repute. Where there is only low quality information available, it may be necessary to technically survey between 40-60% of the low threat area.
- Medium Quality Information: This is information gathered from people and institutions that did not form part of, or observe the mine laying or accidents but have been told about the mine threat. Second-hand sources of information may include villagers, pedestrians, local authorities, farmers, hunters, hospitals etc. Where only medium quality information is available then it may be necessary to technically survey between 30-50% of the low threat area.
- High Quality Information: This is information gathered from people and institutions with first-hand knowledge of the threat. First hand sources of information may include military, police, victims, others who observed mine laying or accidents etc. Where high quality information is available it may be only necessary to technically survey between 20-30% of the low threat area.
- Technical Opinion: The mine clearance organisation along with NMAA/UNMAS-SS may also determine the percentage of ground which shall be technically surveyed based on the technical opinion of the operations officer. This percentage may be based on carrying out a tactical appraisal of the former battlefield or conflict area.
- Survey Calculations – BAC
During BAC Operations the above criteria may be used to calculate the percentage of ground in the low threat area which should be subjected to sub-surface clearance.

- Pict. Eight: Actions in the low threat area.



- Once the High Threat has been treated and the Low Threat Area has been surveyed and no further items have been found, the remaining low threat area is assessed as per the criteria below to verify that no further action is required.
- A systematic assessment of how land has been used, how long it has been used, and how many people have used it should be made. Attention shall be given to the precise limits of areas used, together with any areas which have not been used,
- A systematic assessment shall be made of whether mines or ERW have been found during the use of the land, the circumstances under which these hazards were found, and how long ago they were found.
- If land has been used extensively for cultivation over a number of seasons and no evidence of mines/UXO has occurred, this should be deemed sufficient information to remove this area of land from the database.
- Community involvement in the verification process is necessary to ensure that they have confidence in the methods used and that the threat has been removed from the area.

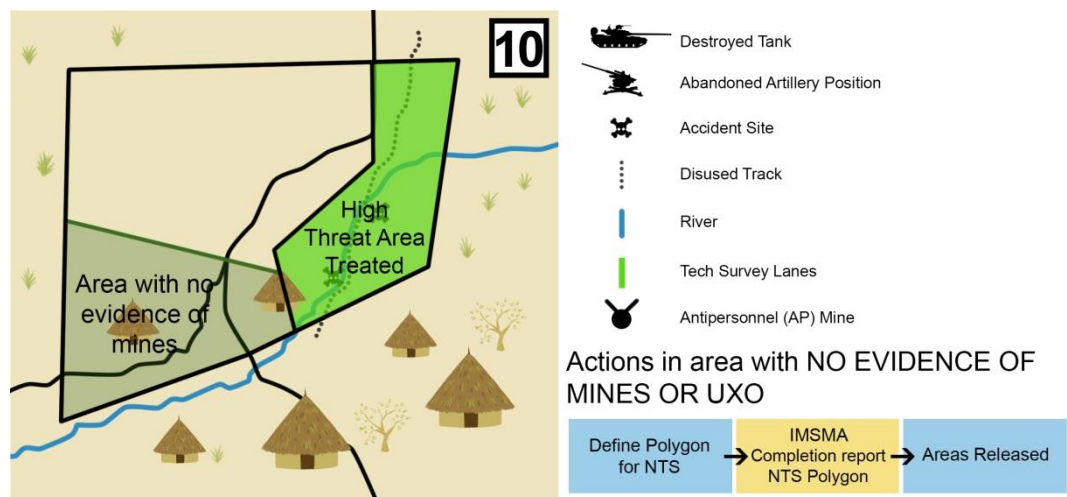
- Pict. 9: Procedure when an item is found in the low threat area.



- Finding a mine in a low threat area – Mine clearance
- Finding a single mine in the low threat area does not necessarily mean the area should be treated as a high threat area. If a mine is found during Tech Survey of the low threat area a 40m box (1600m²) is cleared around it; redefinition of the area should be undertaken before clearance continues

- Finding an item in a low threat area – BAC
- Finding a single item in the low threat area does not necessarily mean the area should be treated as a high threat area. If an item is found during BAC surface search of the low threat area a 20m sub-surface box (400m²) is cleared around it; redefinition of the area should be undertaken before clearance continues

- Pict. Ten: Removing the area with No Evidence of from the database.



- After the high threat area has been cleared and the low threat area has been surveyed the remaining piece of land shall be classified as “no evidence of” and shall be removed from the database using an IMSMA task completion report, stating the square metres of area cancelled through non-technical survey and or technical survey.

Annex A to Chapter 23 Cancelled Area report

SHA No:

Nearest Town:

IMSMA recorded SHA,

located in the vicinity of

at Grid Reference

Longitude:
Latitude:

Start Date:

This SHA is matched with TD No. SS-XXX

Comments:

“No mine/ERW hazards were located during a comprehensive survey, therefore it is requested that this previously recorded minefield/hazardous area should be cancelled and removed from IMSMA and the target list”

“We the undersigned agree that the reported hazardous area should be cancelled in accordance with NTSG requirements”

Name: Name:

Signature:Signature:

Clearance Company: Community Liaison Assistant

Local Contact Person No.1*Occupation:

Address:

Ph:

Signature:

Date:

Local Contact Person No.2*

Occupation: