

Sudan National Mine Action Standards – SNMAS 06.05

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Dogs Detection System (DDS) in Land Release Process

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1. Introduction

A system is made up of combination of interacting and interlinked processes, as such the dog detection system includes certain interlinked processes ranging from the breeding, selection and training of MDD with handler, accreditation and operational testing, veterinary and health support, food and accommodation, acclimatization up to operational survey and clearance activities, and collection and the use of performance data to maintain confidence in the validity of the system as a whole and of the outputs it delivers.

A Dog Detection System (DDS) comprises the dogs, handlers, supervisors, managers, standards, policies and procedures, health and logistics support, training, accreditation, operational testing and monitoring; that are combined to offer a reliable means of detecting Explosive Ordnance (EO). As with any tool used for explosives detection, DDS shall meet the standard of providing confidence to the stakeholders that the EO will be detected if present.

Dogs have been used in land release operations for a considerable period of time as detection tool. The collection, analysis and transparent dissemination of comprehensive, quality data detailing the performance of DDS, as part of a consistent and comprehensive quality management system including accreditation and monitoring, is the means by which confidence is maintained in the performance of DDS used in land release operations.

Mine Detection Dogs (MDD) can be efficient and cost effective for mine action operations when used under the right conditions. MDD can provide a solution to the problems of locating minimum metal mines and working in ground with a high metallic content including railways and other similar situations where metal detectors cannot be used effectively. The quality and credibility of MDDs in land release operations depend on effective standards, procedures, policies, training in an effective training facility, test and licensing, health care, logistics and considering their limitations during planning and operations and their proper management and maintenance by mine action organizations. Despite the limitations, MDDs can be used in suitable situations and land can be released as a result of their operations in Sudan.

2. Scope

This SNMAS provides standard guidelines and requirements of the use of MDDs in demining operations within the mine action context of Sudan. This standard should be read in conjunction with national standards for Battle Area Clearance (BAC), Explosive Ordnance Disposal (EOD), Mechanical and land release operations especially the SNMAS for technical survey. All mine action organizations intend to use MDDs as part of their land release operations in Sudan shall develop their SOPs considering the requirements of this standard.

3. References

IMAS 09.40, 09.41, 09.42 and 09.44 are the main references for this SNMAS, however, Sudan specific requirements have also been considered.

4. Terms, definitions and abbreviations

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

The term 'Dog Detection System (DDS) refers to the combination of dog, handlers, supervisors, managers, equipment, training facilities, policies, procedures, training management package, and other associated functions, that interact to provide a tool to detect vapour from EO. 'Vapour' may include vapour from the case material and other substances as well as from explosives.

The term 'MDD organization' in this SNMAS refers to any organization (government, NGO or commercial entity) responsible for implementing demining projects or tasks with the use of MDD.

The term 'Mine Detection Dog' (MDD) refers to a dog specifically trained to detect the vapor from mines and ERW, which may be not only explosive vapors but vapor from the case material and other substances.

The term 'target object' is used to describe the object that the MDD is supposed to detect during live mine and ERW detection. The target object may be a mine or ERW, or part thereof, of a type typically found during live operations in the area.

The term 'target odor' is used to describe the scent from the target object.

The term 'test item' is used for any mines or ERW items that are laid in the test site for detection by the MDD.

5. Use of MDD for Mine and ERW Detection

MDDs are commonly used globally as a mine, ERW and sub-munitions detection tool, based on below mentioned reasons:

- 1) If implemented correctly, detection by MDD can be faster and cost effective than manual demining using metal detectors and excavation;
- 2) As part of well-designed and well-managed DDS, MDD can detect mines and ERW with low-metal and no-metal contents, as well as mines and ERW located in areas with high metal background, such as cluster munitions strike sites, former battlefields, railway lines and high mineral ground; and
- 3) MDDs can be used in a complementary role including clearance verification and Quality Control.

6. Roles of MDDs in Land Release Operations

6.1 General

MDD can be used in different roles as part of demining tool kit, however they are best at working in areas where there are low concentrations of mines and or ERW. Therefore, they are well suited and commonly used for activities such as:

- 1) Mine and ERW verification;
- 2) Area reduction and delineation of minefield boundaries;
- 3) Searching roads and road verges.

MDDs can also be used in below roles:

- 1) Clearance verification, including the rapid sampling or QC of cleared land, which can be done after both manual and mechanical demining;
- 2) Searching pockets of land unreachable by demining machines;
- 3) Searching railways and sites heavily contaminated with metal; and
- 4) Creation of safe lanes for clearance start points.

6.2 Use of DDS in Technical Survey

- 1) MDD can effectively be used for mine and ERW verification during technical survey to identify the location of mine and ERW;
- 2) MDD are suitable for establishing that there are no EO in an area, confirming “no evidence of” mine and or ERW;
- 3) MDD can support decision about suspected hazardous areas to be released much faster comparing to use of manual demining;
- 4) MDD can work quickly in areas with low EO density and are well suited to the boundary delineation role. However, manual demining teams shall be deployed to deal with confirmed hazardous areas known to contain mines and or ERW;
- 5) MDD are suitable and cost effective in technical survey of roads comparing to manual demining and have less environmental impact than mechanical demining;
- 6) When used in TS role, the following points shall be considered:
 - a) Minimum of two MDDs are used when searching as part of TS operations;
 - b) Provide evidence or “No Evidence of” EO for analysis to support the land release decision-making process.
 - c) MDDs are used as intrusive detection tool, typically into a suspected hazardous area (SHA).
 - d) SNMAS 07.03 is applied when using DDS in TS role; to determine the presence or absence of EO.

DDS may be used in TS role into confirmed hazardous areas, however, manual and mechanical assets are more suitable for the conduct of TS in areas known, or assessed as more likely, to contain EO.

6.3 Use of DDS for Clearance

If DDS are used as the primary detection tool, then all areas shall be searched by at least two different MDDs and another MDD for QC before being considered as cleared.

6.4 Use of DDS during Emergency Response

Specially trained MDDs can be used in cases of urgent medical evacuation.

6.5 Use of DDS in Clearance Verification

When DDS operations are carried out to provide verification following manual or mechanical operations, or confidence building, it shall be ensured that the clearance requirements as specified in SNMAS 06.01 are achieved. However, if EO is found, MDD verification operations shall be stopped and the area shall be rechecked with primary method used.

MDDs are also well suited to be used on roads and other linear features where there is minimum vegetation, tripwires are not expected, and where the reduced environmental impact compared to that associated with the use of mechanical assets, is expected and intended.

7. Test and Licensing of MDD Teams (MDD and Handler)

As part of accreditation process, the test and licensing of MDD teams provide an assurance that the MDD and its handler can be effectively used in land release operations and can achieve the requirements of national and international mine action standards relating to the release of land from the presence and or suspicion of EO. MDD teams accreditation shall be supplemented by QA monitoring of entire DDS including but not limited to the following aspects:

- a) MDD management and maintenance;
- b) DDS facilities;
- c) MDD teams training;
- d) Test and licensing process including test area;
- e) Operations in the field, including documentation and records;
- f) Occupational health and safety;
- g) Logistical support and transportation;
- h) Field training and documentation;
- i) DDS outputs.

Test and licensing of MDD teams shall be carried out at minimum once a year to ensure effective DDS operations and reliable outputs in compliance with national and international mine action standards. For details about MDD teams' test and licensing refer to Annex D of SNMAS 07.02.

In addition to testing, licensing and monitoring by NMAC, it is essential that maintenance training, operational testing and monitoring continue to be undertaken at frequent intervals by DDS using organization; the results shall be recorded and maintain in relate file of each MDD.

8. Limitations on the Use of MDD

MDD cannot be used successfully under all circumstances, the following limitations shall be considered when planning and undertaking MDD operations:

- 1) Presence of dense and thorny vegetation, which can restrict the search pattern of MDDs and result in un-searched areas. Vegetation may also prevent the handler from controlling the search or observing MDD indications and signals.
- 2) MDDs shall not be used in areas where the vegetation has recently been burned, before at minimum four days of soak time.
- 3) High concentration of EO can confuse MDDs that can result in missing some signals and will have safety implications, in addition, the number of indications could make the operation inefficient.

- 4) Scattered explosive as a result of use of demining machines can get MDDs confused and may miss some of the signals.
- 5) Very hot and cold weather has a significant effect on the performance of MDD. Wet and cold weather restrict the dispersal of the scents, while hot weather affects its detection capability. MDDs shall not be used when the temperature is colder than 8^o Celsius or higher than 35^o degree Celsius unless they have been specifically trained and accredited for.
- 6) In certain environments, raining and flow of rainwater may spread target odors widely; making it difficult for MDD to pinpoint EO. MDDs shall not be used when it is raining or until the soil has dried after a heavy rain.
- 7) Consistent high winds can interfere MDD operations by dispersing the vapors which can result in missing signals or multiple false indications. MDDs shall not be used if the wind speed is greater than 4 m/s at ground level especially where the soil surface is very dry, and dust is being raised.
- 8) MDDs shall not be used when the prevailing wind is coming from behind. MDDs should ideally be used to search with a side wind but can also be used when there is a head wind.
- 9) Sudden changes and shifts in working conditions can significantly affect MDDs performance. Retraining and or acclimatization shall be considered if there is a sudden shift in working conditions, either due to unusual weather patterns, or the MDD has been moved to another geographical area.
- 10) MDDs should not work in areas where tripwires are expected, unless they are specifically trained to detect tripwires.
- 11) MDDs shall not be used in steep sloping areas that they may dislodge stones, rocks or boulders or they need to concentrate on maintaining their balance rather than conducting the search.
- 12) MDDs should not be used as follow up tool after demining machines, unless they are specifically trained, tested and licensed for such operations.

9. Minimum Requirements for the Operational Use of DDS

9.1. DDS Records

The following information, as a minimum, shall be established, maintained, retained, updated and documented to provide a continuous record accompanying each MDD through accreditation and during its working life:

- 1) Breed sex, genealogy, age, reproductive history, and any identifying marks, features or tag references;
- 2) Medical details including dimensions and weight;
- 3) Details of all routine health checks and inoculations;
- 4) Details of all illnesses, injuries and treatments, as well as dietary requirements;
- 5) Details of initial accreditation, its extension through periodic reassessment and any periods when accreditation is withdrawn;

- 6) Training records including dates, duration and type of training, instructors and handlers, environmental conditions, operating procedures, target objects and the results of training;
- 7) Records of operational performance including any operational test passes and/or fails, nonconformities specific to the animal identified during operations, and any other significant events relating to the performance of the MDD; and
- 8) Other information as may be required by the NMAC.

9.2. Accreditation

Accreditation shall address all aspects of the DDS, not just the MDD and handler combination, but include field supervision, veterinary and welfare support, facilities, procedures for the selection, training and operation of the DDS and internal quality, safety and information management aspects.

All DDS shall be accredited in accordance with the requirements of SNMAS 07.02 prior to their employment on operational activity. Accreditation shall be approved, maintained or withdrawn in light of the results of:

- 1) Accreditation testing and periodic reassessment testing;
- 2) Operational testing;
- 3) The results of in progress monitoring in accordance with SNMAS 07.03; and
- 4) Other conditions specified in accreditation agreements.

Facilities, and personnel carrying out accreditation testing of MDDs and handlers shall themselves have been accredited to conduct DDS testing, by NMAC. Facilities and personnel carrying out accreditation testing of MDDs and handlers shall be subject to monitoring and inspection by the NMAC Operations and Quality Management departments with technical support of UNMAS.

Significant changes relating to DDS that require immediate actions, include:

- 1) Changes of handler and MDD combinations;
- 2) Changes in operating methodology or changes to the known threat.

In case of such changes, organizations shall notify NMAC, and this may result in a suspension of current accreditation and re-testing in accordance with the new changes and requirements before receiving further operational accreditation.

9.3. DDS Inputs

Inputs to DDS shall be identified and subject to appropriate and effective quality management monitoring, inspections and checks. Inputs include:

9.3.1 MDDs

Organizations shall ensure that their Mine Detection Dogs:

- 1) Have demonstrated suitability and competence in the EO detection role in combination with their specified handler, during accreditation testing at NMAC authorized test area and in any subsequent operational testing;
- 2) Have documented evidence of their accreditation, testing and working history;

- 3) Are provided with adequate and appropriate medical, welfare and training support;
- 4) Are subject to appropriate and effective monitoring; and
- 5) Are withdrawn from detection work at any time when there is any reason to doubt their continued ability to satisfy detection or other requirements.

9.3.2 Handlers

MDD handlers shall:

- 1) Have demonstrated suitability and competence in the EO detection role, in combination with their specified MDD, during accreditation testing at NMAC authorized test area and in any subsequent operational testing;
- 2) Have documented evidence of their accreditation, testing and working history;
- 3) Be provided with appropriate and adequate insurance and social welfare cover;
- 4) Be trained on the most up to date version of applicable SOPs, work instructions and other documentation detailing the conduct of operations;
- 5) Be subject to effective supervision;
- 6) Be subject to appropriate and effective monitoring; and
- 7) Be withdrawn from detection work at any time when there is any reason to doubt their continued ability to satisfy detection or other requirements.

9.3.3 Supervisors

DDS Supervisors shall:

- 1) Have been assessed to be competent to act as supervisors in accordance with the competence principles set out in SNMAS 07.03;
- 2) Be authorized as supervisors of DDS by the organization;
- 3) Have documented evidence of their training supervisors;
- 4) Be provided with appropriate and adequate insurance and social welfare cover;
- 5) Be trained on the most up to date version of applicable SOPs, work instructions and other documentation detailing how operations should be conducted;
- 6) Provide effective supervision of DDS operations; and
- 7) Be subject to appropriate and effective monitoring.

9.3.4 Management System

The overall management system applied by DDS using organizations, shall at minimum include but not limited to the following:

- 1) Quality management aspects, including personnel and MDDs selection, operating procedures, equipment procurement and management, training, monitoring and continual improvement of DDS operations;
- 2) Risk management aspects, including risk assessments, identification and application of appropriate and effective risk mitigation measures and periodic review of risk aspects;
- 3) Occupational health and safety aspects, relating to the welfare and performance of MDDs, handlers, supervisors, team members and visitors; and
- 4) Information management aspects, relating to the identification, collection, reporting and analysis of performance data, inputs to land release, and support to operational improvement processes.

9.3.5 Occupational Health and Veterinary Support

Successful DDS operations rely on:

- 1) Proper and appropriate feeding;
- 2) Proper and standard training; and
- 3) Appropriate and timely treatment of MDDs.

Poor attention to the health of MDDs, and their treatment when sick, may result in:

- 1) Prolonged training periods;
- 2) Failure in test and licensing;
- 3) More expenses;
- 4) Limited operational output;
- 5) Death of MDDs as a result of poor health care and inadequate vaccinations and neglected symptoms of disease.

Adequate and appropriate veterinary support shall be provided that included but not limited to:

- 1) Knowledge of health issues associated with working locations;
- 2) Prevailing climatic conditions and diseases; and
- 3) Environmental aspects that cause ill health to MDDs.

Providers of veterinary and medical support to MDDs shall be competent to fulfil their responsibilities and shall have completed appropriate and relevant studies and hold formal qualifications from Sudan government recognized institutions.

The MDDs healthcare system shall include:

- 1) Establishing and maintaining adequate veterinary support;
- 2) Carrying out initial screening of MDDs;
- 3) Satisfying any applicable quarantine requirements;
- 4) Conducting periodic health checks, treatment and vaccinations;

- 5) Providing suitable food and water in appropriate quantities, as and when required to maintain the health and performance of the MDDs;
- 6) Physical and mental exercise to sustain the MDDs' wellbeing and operational performance;
- 7) Providing kennel and shelter facilities of an adequate size that maintain appropriate environmental conditions and with access to daylight, exercise areas and human company;
- 8) Maintaining transportation facilities, equipment and procedures that keep MDDs safe and healthy and that do not adversely affect their operational performance;
- 9) Maintaining a high standard of hygiene at all times; and
- 10) Providing on site medical knowledge, skills, equipment and procedures necessary to treat MDDs and evacuate them to a suitable veterinary facility in the event of an accident.

MDDs shall be subject to:

- 1) Health check each day before starting work;
- 2) As required during the work; and
- 3) At the end of the day on completion of work.

No MDD shall be used in land release operations; if it is suffering from illness, incapacity or other condition that may affect its performance, until a subsequent health check shows that it is fit to work.

9.3.6 Food and Water

DDS using organizations shall make adequate provision of clean and appropriate food and water for MDDs, necessary to sustain them and maintain their ability to conduct DDS operations safely and reliably.

9.3.7 Equipment

Equipment used within the DDS shall be subject to:

- 1) Well-managed procurement;
- 2) Proper storage;
- 3) Regular inspection, test and maintenance;
- 4) Effective repair procedures that ensure their continued suitability and capability to satisfy operational quality and fulfil safety and environmental requirements.

9.3.8 Documentation

As minimum, the following documentation shall be available and accessible in all DDS work sites:

- 1) Task order;
- 2) Site operational plan;
- 3) On-site training record of MDDs;
- 4) Health checks and vaccination of MDDs;
- 5) Accreditation license of MDD and handler;
- 6) Up to date SOPs; and
- 7) Reporting forms.

9.4. DDS Activities

9.4.1 Integration with other Operational Procedures

DDS SOPs should be integrated with procedures applying to other associated survey and clearance activities as part of the land release process, including manual and mechanical operations.

9.4.2 Accommodation and Transport

MDDs shall be accommodated and transported in a proper way to ensure their continued health and ability to perform EO detection functions.

9.4.3 Training

DDS training shall be properly planned, conducted, monitored, regularly reviewed and updated as necessary, to ensure the continued competence and capability of all aspects of DDS support and operations. This shall include but not limited to:

- 1) Establishing clear, relevant training objectives;
- 2) Establishing proper training area with enough training boxes and targets;
- 3) Delivery of training by NMAC and related organization's authorized and competent trainers;
- 4) Ensuring that training sites, targets and conditions correspond to those associated with operational sites and EO threat;
- 5) Monitoring of training, collection and analysis of performance data; and
- 6) Updating training package and program based on review findings and in response to changing circumstances, conditions and standards.

9.4.4 Standard Operating Procedures (SOPs)

DDS using organizations shall develop SOPs to:

- 1) Fulfil accreditation requirements;
- 2) Ensure the safety of MDDs, handlers, supervisors, team members, visitors and land users;
- 3) Ensure that all specified land is searched by the DDS (MDDs, handlers, applying accredited methods) that can detect target items;
- 4) Conduct operations that fulfil the requirements of this standard and other related national and international mine action standards;
- 5) Define working time durations and rest intervals for MDDs and handlers appropriate to operational methodologies and working conditions; and
- 6) Consider changes in circumstances and improvements to operating methods and practices.

9.4.5 Operational Planning

DDS operational plans shall:

- 1) Be properly documented in appropriate format;
- 2) Include integrated operations considering the findings of Field Risk Assessment (FRA);
- 3) Fulfil requirements specified in related national and international mine action standards, task order, contracts and other applicable documentation;
- 4) Consider FRA and the capabilities of the allocated DDS;
- 5) Reflect input from the informants and relevant stakeholders;

- 6) Be appropriate to the prevailing environmental circumstances and conditions including the need for removal of vegetation;
- 7) Be consistent with NMAC accredited SOPs;
- 8) Enhance the efficiency of DDS operations.

9.4.6 Operational Testing of MDDs

Testing that takes place outside the confines of accreditation test and licensing is termed operational testing. Operational testing of DDS shall take place in accordance with the requirements of Annex A to this SNMAS. As a minimum operational testing shall take place:

- 1) As required to maintain operational accreditation, especially after a leave period;
- 2) Each day prior to the conduct of MDD search;
- 3) When there is change in operating conditions, the local environment or the target type, after reaccreditation, if required;
- 4) As minimum, twice a week after the operational hours by the organization to maintain confidence in consistent reliability of the DDS; and
- 5) Whenever a handler, supervisor, quality assurance officer or other authorized persons, has reason to doubt the reliability of the performance of a MDD or its handler.

If a MDD fails an operational test, all land searched by that MDD since it last passed an operational test, shall be subject to review, and where necessary re-search by other MDD that has passed the operational test. To achieve this, the daily search of DDS shall be properly recorded and documented.

9.4.7 Conduct of Operations

Sites where DDS operations take place shall be managed as demining worksites in accordance with relevant standards (SNMAS 05, 06 and 08 series). DDS operations shall be conducted in accordance with NMAC approved and accredited SOPs of the DDS using organization.

9.5. Outputs of DDS Operations

9.5.1 Land

Land released as a result of the use of DDS shall be defined and managed in accordance with the definitions and requirements specified in 05.01 and 05.03 Land Release and Technical Survey (TS).

9.5.2 Data and Information

Data relating to the release of land shall fulfil the minimum requirements set out in SNMAS 05.01, 05.03 and SNMAS 06 series of clearance requirements and SNMAS 10.01 of Information Management. DDS performance data shall be collected, recorded in the right format, reported and analyzed in order to:

- 1) Support ongoing land release decisions;
- 2) Maintain confidence in the quality of DDS operations;
- 3) Enhance understanding of EO relevant to subsequent land release planning, prioritization and operations;
- 4) Enhance understanding of DDS operational performance; and
- 5) Support improvement in the performance of DDS.

The following specific information relevant to DDS shall be recorded and be traceable to the worksite:

- 1) Unique identification of individual MDDs;
- 2) Unique identification of handlers, traceable to related MDDs;
- 3) Identification of DDS supervisor;
- 4) Details of worksite and locations searched by DDS;
- 5) False and positive indications, and the period of operations;
- 6) Number of EO discovered and their locations;
- 7) Role of DDS, survey or and clearance;
- 8) Operational testing results;
- 9) Health check and treatment record;
- 10) Environmental and weather data.

9.5.3 DDS Outputs as Inputs to other Land Release Processes

Where land searched using DDS is subject to further processing by manual or mechanical assets, DDS supervisors shall ensure that the detailed information about the status of land and any items discovered, are handed over to follow-on asset supervisors. Such information may include DDS used in a TS role before full clearance or DDS used for clearance, but spots or parts of the land may have been deemed unsuitable for DDS search; including excessive explosive scent, slopes, anthills, puddles, trenches or bushes that may prevent MDD sniffing activity.

9.6. Measurement, Monitoring, Analysis and Improvement of DDS

Monitoring of DDS operations and activities including administrative, accommodation, medical, training and work sites aspects, should be carried out in accordance with the requirements of SNMAS 07.03.

9.6.1 Identification and Traceability

DDS using organization shall collect, record and document data relating to:

- 1) MDDs;
- 2) Handlers;
- 3) Supervisors; and
- 4) Procedure used.

And their traceability to:

- 1) Specific operational worksites;
- 2) Operating period and times;
- 3) Specific locations within worksites as required for quality management purposes.

9.6.2 QA Monitoring

Monitoring of DDS operations shall be carried out in accordance with the requirements of SNMAS 07.03.

Focus shall be applied to survey and clearance activities. Monitoring shall include appropriate effort to confirm the suitability and effectiveness of all aspects of the DDS including, but not limited to:

- 1) Management capability of DDS using organization;

- 2) Logistic, support and health and veterinary aspects of the DDS;
- 3) The quality and validity of training;
- 4) Internal quality management including operational testing;
- 5) Conduct of field operations;
- 6) Use of information to support ongoing risk, quality and environmental management decisions;
- 7) Quality of information; and
- 8) The identification and management of nonconformities and opportunities for improvement.

9.6.3 Output and Monitoring

Outputs of DDS operations including land and information that shall be subject to inspection and monitoring in accordance with the requirements of SNMAS 07.03 and SNMAS 10.01.

The quality of land searched by DDS, whether released directly through MDD clearance or reduced after TS, or in conjunction with follow-up clearance using another mine action asset, should be monitored by:

- 1) Internal and external QC sampling inspection by other search and clearance assets;
- 2) Analysis of the findings of follow-on land release assets; and
- 3) The results of long-term monitoring of the land following its handover.

Additional outputs of DDS, including data, reports and records, shall be subject to proper quality check in accordance with the requirements of SNMAS 10.01.

9.6.4 Managing Nonconformity

Nonconformities associated with DDS shall be managed in accordance with SNMAS 07.03. DDS using organization shall implement effective measures to ensure that nonconformities are identified, analyzed, assessed, corrected and appropriate preventive measures are taken to ensure continual improvement.

DDS using organization shall make information relating to nonconformities, and their management response, available to NMAC and UNMAS.

9.6.5 Managing Improvement

NMAC and DDS using organization shall implement effective measures to ensure that opportunities for improvement are identified, assessed and acted upon.

Opportunities to improve DDS operations shall be properly pursued, which can be identified through:

- 1) Root cause analysis of a nonconformity;

- 2) Regular review and analysis of performance data;
- 3) Recommendations from the field, including team members and customers;
- 4) Operations management review; and
- 5) Internal or external monitoring reports.

10. Responsibilities

10.1 National Mine Action Centre (NMAC)

As national mine action authority in Sudan, NMAC is responsible to:

- 1) Develop, maintain up to date and implement national mine action standards that include requirements for training, testing, accreditation and use of DDS in land release operations in Sudan;
- 2) Accredite mine action organizations and their DDS;
- 3) Ensure transparent sharing of DDS performance information;
- 4) Facilitate provision of appropriate training and test areas to DDS using organizations;
- 5) Facilitate provision of training targets to the DDS using organizations for their training areas;
- 6) Establish training, test and accreditation area with required number targets and test boxes to undertake test and accreditation there;
- 7) Undertake regular monitoring of DDS activities, and maintain records;
- 8) Investigate in DDS related incidents and major nonconformities, as required.

10.2 Mine Action Organizations

DDS using mine action organizations shall:

- 1) Develop and maintain SOPs up to date for the use of DDS in land release operations, in compliance with SNMAS;
- 2) Gain accreditation from NMAC for the management and use of DDS in Sudan;
- 3) Undertake operational testing of MDD teams as required by SNMAS and to maintain confidence in operations and outputs of DDS;
- 4) Ensure that the competence of MDDs, handlers and supervisors are maintained and improved through proper and effective training, monitoring and regular performance review;
- 5) Make DDS performance data and information available to NMAC and UNMAS;
- 6) Establish systems, processes and procedures and facilities to ensure the occupational and general health care of MDDs and handlers;
- 7) Ensure the quality of DDS operations.

10.3 Donors and Clients

Contracting or funding entity of mine action operations shall:

- 1) Specify and agree their service and output requirements to DDS using mine action organizations in clear and unambiguous terms;
- 2) Assist the development and implementation of SNMAS relating to the training, operational testing, accreditation and use of DDS within Sudan.