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Guide for the management of demining operations

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Contents

Foreword

International standards for humanitarian mine clearance programmes were first proposed by working groups at an international technical conference in Denmark, in July 1996. Criteria were prescribed for all aspects of mine clearance, standards were recommended and a new universal definition of 'clearance' was agreed. In late 1996, the principles proposed in Denmark were developed by a UN-led working group and the *International Standards for Humanitarian Mine Clearance Operations* were developed. A first edition was issued by the UN Mine Action Service (UNMAS) in March 1997.

The scope of these original standards has since been expanded to include the other components of mine action and to reflect changes to operational procedures, practices and norms. The standards were re-developed and renamed as *International Mine Action Standards* (IMAS).

The United Nations has a general responsibility for enabling and encouraging the effective management of mine action programmes, including the development and maintenance of standards. UNMAS, therefore, is the office within the United Nations responsible for the development and maintenance of IMAS. IMAS are produced with the assistance of the Geneva International Centre for Humanitarian Demining.

The work of preparing, reviewing and revising IMAS is conducted by technical committees, with the support of international, governmental and non-governmental organisations. The latest version of each standard, together with information on the work of the technical committees, can be found at http://www.mineactionstandards.org/. Individual IMAS are reviewed at least every three years to reflect developing mine action norms and practices and to incorporate changes to international regulations and requirements.

Introduction

The general principles and requirements for the establishment of mine action programmes are covered in IMAS 02.10. This Guide focuses on the management requirements for demining operations.

Demining, as a generic term, is carried out by many different types of organisations, such as NGOs, commercial companies, national mine action teams or military units (when carrying out humanitarian demining). It may be a humanitarian intervention, or it may form part of a development programme where emphasis will be given to establishing a national mine action capacity. Despite differences in approach, and possibly even different objectives, common core activities exist, which carry common responsibilities, and it is these that are explored in this Guide.

Demining involves the clearance and return to mine affected communities of contaminated land by the detection, removal or destruction of all mine and UXO hazards. The effective management of demining operations aims to clear land in a safe and efficient manner. This is achieved by developing and applying appropriate management processes, by establishing and continuously improving the skills of managers and deminers, by obtaining accurate and timely information on the mine and UXO threat, by applying safe and effective operational procedures, and by using appropriate and efficient equipment. But management is not just about planning and supervising current tasks. It is about reviewing current practices and procedures to improve safety, effectiveness and efficiency and ensuring a constant link between demining operations and the mine affected communities.

The process and procedures that aim to achieve this continuous improvement to an organisation's management system and operational practices are commonly referred to as Quality Management (QM). One method of demonstrating QM for an organisation is to become ISO 9000 compliant. There is a great deal of general information and training material available for national mine action centres and demining organisations who may choose to adopt the ISO 9000 approach.

This Guide examines the demining process and recommends a management system needed to ensure the safe, effective and efficient conduct of demining. The relevance of ISO 9000 is examined, and its suitability as a framework to promote good management practices is proposed.

Guide for the management of demining operations

1. Scope

This Guide establishes principles and provides guidance for the effective management of demining operations.

Although this Guide focuses on demining, the principles can be applied to other mine action activities including national technical assessment missions, impact surveys, Mine Risk Education (MRE) projects and stockpile destruction.

2. References

A list of normative references is given in Annex A. Normative references are important documents to which reference is made in this Guide and which form part of the provisions of this standard.

3. Terms, definitions and abbreviations

A list of terms, definitions and abbreviations used in this Guide is given in Annex B. A complete glossary of all the terms, definitions and abbreviations used in the IMAS series of standards is given in IMAS 04.10.

The term 'National Mine Action Authority (NMAA)' refers to the government department(s), organisation(s) or institution(s) in each mine-affected country charged with the regulation, management and coordination of mine action. In most cases the national Mine Action Centre (MAC) or its equivalent will act as, or on behalf of, the 'NMAA'. In certain situations and at certain times it may be necessary and appropriate for the UN, or some other recognised international body, to assume some or all of the responsibilities, and fulfil some or all of the functions, of a NMAA.

The term 'demining organisation' refers to any organisation (government, NGO or commercial entity) responsible for implementing demining projects or tasks. The demining organisation may be a prime contractor, subcontractor, consultant or agent. The term 'demining sub-unit' refers to an element of a demining organisation, however named, that is operationally accredited to conduct one or more prescribed demining activities, such as technical surveys, marking, manual clearance, Explosive Ordnance Disposal (EOD) or the use of Mine Detection Dog (MDD) teams.

4. Demining process

The demining management process is shown in outline in Annex C. In practice, the process may not be linear and the activities may not always be consecutive. Nevertheless the process indicates the general sequence and logical progression from defining the problem to handing over cleared land to its intended beneficiaries. The four stages of the demining management process (planning, preparation, clearance and post-clearance activities) are addressed below.

4.1. Planning

Planning is the collection, assessment and processing of information, selection of an appropriate way to proceed, and subsequent formulation of the detailed method by which a task is to be carried out.

Planning for mine action requires accurate and timely information on the form, scale and impact of the threat posed by mines, UXO and other explosive hazards. Such information will come from local knowledge, assessment missions and surveys and from ongoing local mine action (including MRE) projects and tasks.

The decision to develop a national mine action programme will normally be as a result of sufficient information gathered demonstrating such a need. The process of gathering this information is a combination of formal/deliberate and informal activities and can be referred to as a General Mine Action Assessment (GMAA) process. This process is a continuous process of information gathering, through any relevant means, relating to mine accidents, incidents and other mine related information. The process effectively starts when the first piece of information is received indicating that there is a mine or UXO problem in the country and ends effectively when all the information about the mine and UXO problem is known.

The GMAA process is continually updated as more and more information is received. The GMAA process:

a) collects and analyses information to assess the scale and impact of the landmine and UXO problem in the affected country and individual communities;

b) provides information on which to decide the necessity to survey reported and/or suspected locations of mine or UXO contamination, quantities and types of explosive hazards; and

c) collects 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 activities and projects.

Information gathered during the GMAA process should provide a growing indication of the size and scope of the problem (if any), an assessment of the resources needed to meet it, the national capabilities and potential to address the problem, and an assessment of the need for external assistance including financial, human skills, material and information. The information collected will, at some stage, be sufficient to enable a national authority, with assistance as necessary, to establish priorities and to begin to develop a coherent national mine action programme and plan.

Guidance on the requirements for the GMAA process is given in IMAS 08.10. Guidance on the planning for community mine action liaison is provided in IMAS 12.10.

For possible future mine action programmes, the planning process should ideally start with a formal assessment[1] of the country situation. This assessment will draw heavily on existing information provided by former warring factions, and from agencies and organisations familiar with the mine-affected country or region. Where UN assistance is requested, a multi-disciplinary assessment team may deploy to the country to validate and update existing information, and to determine at first hand the scale and impact of the landmine situation. The country assessment should determine whether a national mine action programme is required, and whether such a programme is possible. Full recognition should be given to ongoing work, including local community-based demining projects.

4.2. Preparation

Preparation includes all enabling activities that help clarify the clearance requirement, and develop the capacity of a demining organisation and its sub-units to carry out a clearance task. This includes the selection and accreditation of demining organisations as prescribed in IMAS 07.30.

At the national level preparation should also include:

a) equipment preparation;

b) establish methods of victim reporting;

1. This is not the same as the GMAA but is a part of it.

c) establishing a network of community volunteers, or linking with existing community volunteer networks;

d) coordination activities;

e) links with other sectors; and

f) the management of the GMAA process.

4.2.1. Technical survey

Technical survey is the detailed topographical and technical investigation of known or suspected mined areas identified during the planning phase. Such areas may have been identified during the initial stages of the GMAA process, which technical survey is part of. The primary aim of a technical survey is to collect sufficient information to enable the clearance requirement to be more closely defined, including the area(s) to be cleared, the depth of clearance, the local soil characteristics, and other topographical and technical information. The technical survey may also involve area reduction, the process through which the initial area indicated as contaminated is reduced to a smaller area as a consequence of collecting more reliable information on the extent of the hazard area.

Sometimes, the technical survey will represent just the first phase of a clearance project, and a detailed technical understanding of the mine and UXO threat will develop as clearance progresses. This will often be the case during early humanitarian interventions, such as the rapid survey and clearance of routes needed to deliver humanitarian aid or to assist the movement of refugees and internally displaced persons (IDPs). Guidance on the requirements of technical surveys is given in IMAS 08.20.

4.2.2. Clearance requirement

The target of humanitarian demining is the identification and removal or destruction of all mine and UXO hazards from a specified area to a specified depth. The area to be cleared and the depth of clearance should be specified by the NMAA, and agreed with the demining organisation, but it shall also meet community needs. 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.

There may be circumstances in the early stages of a new mine action programme, where a demining organisation is given the mandate to identify its own clearance tasks based on general priorities provided by the donor and/or the NMAA. In such circumstances, the demining organisation should, in advance of clearance, formally record the area and depth of the intended clearance for each project. Guidance on defining clearance requirements is given in IMAS 09.10.

4.2.3. Funding (mobilisation of resources)

The funding for demining programmes comes from many sources. Funding may be provided by the government of the mine-affected country, from donor governments, the United Nations or other international organisations, or in some cases from benefactors and philanthropists. Demining NGOs may raise funds directly from public and private sources or from public collections. Funds may be held in trust funds or some other form of controlled accounts. Regardless of the source of funding it is important that the funds match the true cost of demining and that a long term commitment is provided by the donor. This is particularly important for major projects that require the demining organisation to make major investments in staff, expensive new equipment such as mechanical ground processing systems, and specialist capabilities such as the training of MDD.

4.2.4. Contract preparation

The definition of the work to be undertaken should ideally be in the form of a contract, tasking order or other such formal agreement. The preparation of a contract or tasking order 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.

Guidance on clearance contracts is given in IMAS 07.20.

4.2.5. Training

Demining programmes require well-qualified managers and well-trained deminers. 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 UXO threat.

4.2.6. Information

The effective management of demining programmes requires accurate, appropriate and timely information. There are many sources of information at local, national and international level that have an application to the needs of programme planners, managers and the donor community. Often access to such information is restricted and the accuracy of critical data cannot be confirmed.

NMAA should make every effort to fully involve the mine affected communities within the general information flow and management process. This can be done through the establishment of community based reporting mechanisms and commitment to community involvement throughout the national mine action process.

NMAA and demining 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.

Guidance on information needs, information management and the application of information systems to demining operations is given in IMAS 05.10.

4.2.7. Equipment and tools

It is the responsibility of the NMAA to allocate the proper tools in the most effective manner to ensure that priorities can be achieved. This can be done through maintaining a reserve capacity at the national level that can be allocated on an as required basis depending on the clearance situation.

Demining programmes have traditionally relied on manual practices, procedures and drills. In many situations, manual methods (using metal detectors and hand tools) will be the most appropriate and effective means of detecting, removing or destroying mines and UXO. 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.

Demining technologies can be grouped in three general categories according to their technical maturity and availability:

a) equipment that has been fully developed, tested and evaluated (T&E), and can be introduced into demining programmes without any major modification or changes;

b) those technologies that have been proved to work but require further development and formal T&E; and

c) those technologies that may have an application to demining, but have yet to mature and have not yet been formally demonstrated.

Demining 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 demining organisations fielding new technologies, and their T&E.

Guidance on the application of equipment to demining is given in IMAS 03.10.

4.2.8. Accreditation

The accreditation process consists of two parts. Organisational accreditation is the procedure by which a demining organisation earns formal recognition as being competent and able to plan and manage effectively and efficiently. Operational accreditation is the procedure by which a demining organisation earns formal recognition as being competent and able to carry out demining activities. Accreditation will be awarded to the headquarters of an organisation (the in-country office) for a finite duration, normally for a period of two to three years. Operational accreditation applies to the capabilities needed to carry out a particular demining activity such as survey, manual clearance or the use of MDD.

Guidance for the accreditation of demining organisations is given in IMAS 07.30 and guidance on the accreditation of MRE organisations is given in IMAS 07.31.

4.3. Clearance

Clearance is the location, removal or destruction of mines and UXO, and for EOD may also involve access, diagnosis, render safe, final disposal and (where appropriate) protective works.

Guidance on defining clearance requirements is given in IMAS 09.10.

4.3.1. Clearance procedures

The need for effective and safe operational procedures is essential. Some operational procedures are based on international norms and 'best-practice', such as the destruction of mines in-situ, safety distances and the handling of explosives. Some are based on the local mine and UXO threat and ground conditions. Some reflect equipment characteristics and performance. And some reflect local preferences, such as the position adopted for prodding and excavation.

Standing operating procedures (SOPs) should be prepared for all operational procedures, practices and drills. SOPs are instructions that define the preferred method of conducting an operational task or activity. Their purpose is to establish recognisable and measurable degrees of uniformity, consistency and commonality within an organisation, with the aim of improving operational effectiveness and safety. SOPs should reflect local requirements and circumstances.

4.3.2. Explosive Ordnance Disposal (EOD)

Unexploded ordnance (UXO) has many definitions, but for the purposes of IMAS the term applies to all munitions other than landmines, that present a significant risk to human life. UXO may be cleared as part of a demining contract, or they may be cleared under separate arrangements by a contractor specialising in EOD, or both situations may occur in parallel. For the purposes of IMAS, both activities are defined as EOD operations.

The majority of UXO found during demining are small items of ordnance such as sub-munitions, grenades and mortar ammunition. But UXO also includes larger items such as artillery ammunition, guided missiles, air-dropped bombs and cluster munitions. The wide variety of size and complexity of UXO requires special attention to be given to the management of EOD.

Guidance for the management of EOD as part of demining programme is given in IMAS 09.30. It covers general principles and management responsibilities. It does not provide specific technical guidance for the disposal of particular Explosive Ordnance (EO).

4.3.3. Specialist capabilities

4.3.3.1. Use of Mine Detection Dogs (MDD)

The use of MDD to detect the vapour from buried mines and munitions has become increasingly common in recent years, and some programmes now use a large number of dogs. There have however been variations in the performance claimed for detection dogs. Some users have claimed increases in clearance rates by factors of five and above, while other users, even in the same area, have expressed doubts about the effectiveness and reliability of their MDD programmes. Similar variations have occurred with dog trials.

IMAS 09.40 provides guidance to NMAA and to demining agencies using MDD.

4.3.3.2. Mechanical application

An increasing number of mechanical devices have been produced, that aim either to detonate, destroy or isolate mines. Early machines were often unwieldy, unreliable and under-powered, and the clearance achieved fell below the minimum UN requirement, unless they were part of an integrated manual-mechanical procedure. At present, where such machines are used, their operation is usually confined to the reduction of risk by the removal of vegetation and trip-wire operated mines, and some mine destruction as part of area reduction.

Procedures for introducing new and untried mechanical systems were developed in 1998 at the Karlsruhe International Conference on Mine Action Technology. The Conference recommended that all mechanical systems should be formally evaluated to confirm that they are safe, effective and reliable. This recommendation was subsequently accepted by the United Nations for all UN-supported mine action programmes.

Ideally, trials (and the subsequent evaluation of trials data) should be carried out before mechanical systems are introduced into mine action programmes. However, sometimes it may be necessary for the evaluation to be carried out after a programme has commenced.

Note: The UN with the assistance of the GICHD has carried out a study of the current mechanical mine clearance equipment, giving better and more objective assessments of its efficiency, productivity and cost-effectiveness. This will lead to a Guide on the use of mechanical mine clearance equipment, and its role in mechanically assisted mine clearance. This will be issued as IMAS 09.50, and it should give guidance to those demining organisation who use, or wish to use, mechanical equipment as part of their clearance process. It should also help donors to assist in the funding of mechanically assisted mine clearance programmes.

4.3.4. Quality Assurance (QA)

The definition of 'clearance' involves the establishment and monitoring of management processes and operational procedures before and during the clearance process. Internal QA will be conducted by demining organisations themselves, but external inspections by an external monitoring body should also be conducted.

The purpose of QA is to confirm that management practices and operational procedures for demining are appropriate, and will achieve the stated requirement in a safe, effective and efficient manner. Monitoring should involve structured discussions with management and deminers, and formal inspections of SOPs, reports and records.

The NMAA may appoint an agent to carry out the monitoring and inspections of the demining organisation and its sub-units under its authority and responsibility, exercised under conditions agreed in the contract or formal agreement. Any agent so appointed by the NMAA will be required to have all the facilities, staff, management systems and SOPs necessary for adequate monitoring.

IMAS 07.40 provides guidance on the monitoring requirements and detailed responsibilities.

4.3.5. Community liaison

Community liaison is an integral part of the clearance process and plays a major part in:

a) confirming the clearance requirements; and

b) ensuring a high level of confidence from the community in the quality of the finished product (i.e., cleared land).

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.

The NMAA should include the community liaison capacity of an agency in its overall monitoring plan. It may be necessary in some instances to undertake a linking role in order to establish links between demining organisations and MRE programmes to ensure an adequate community liaison function is established and maintained.

4.3.6. Safety and Occupational Health (S&OH)

Managers of demining programmes are required to 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, and by making available effective personal protective equipment (PPE). Given the wide range of operational settings and demining activities, it is not possible to provide a precise and complete set of specifications that apply to all situations. Demining organisations should develop and maintain management procedures and processes that will enable S&OH risks to be identified, evaluated and reduced in a systematic and timely manner for each demining task and for each demining worksite.

Guidance for the development and implementation of S&OH management systems for use in demining operations is given in IMAS 10.10. Guidance on demining worksite safety is given in IMAS 10.20. Guidance on PPE is given in IMAS 10.30. Guidance on medical support to demining operations is given in IMAS 10.40. Guidance on the storage, transportation and handling of explosives is given in IMAS 10.50. And guidance on the reporting and investigation of demining incidents is given in IMAS 10.60.

4.4. Post-clearance

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. IMAS 09.20 provides guidance on the implementation of a management system for inspecting the quality of land by sampling. 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.

Prior to the handover of cleared land, the area should be surveyed and marked, and all necessary documentation should be prepared, including a formal handover certificate. IMAS 08.30 provides guidance on post-clearance handover requirements and management responsibilities.

Wherever possible, demining 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 and should have all accident/incident reports appended. Issues of concern should be identified and prioritised, and solutions proposed. The requirement for PPRs should be included in clearance contracts by donors and national authorities. PPRs should be distributed to national mine action authorities, to the United Nations (UNMAS, UNDP and UNOPS), and to donors or sponsors. Where PPRs highlight shortcomings in established equipment or procedures, particularly issues involving safety, they should be more widely distributed.

5. Quality Management (QM)

The effective management of demining operations aims to clear land in a safe and efficient manner. This is achieved by developing and applying appropriate management processes, by establishing and continuously improving the skills of managers and deminers, by obtaining accurate and timely information on the mine and UXO threat, by applying safe and effective operational procedures, and by using appropriate and efficient equipment. But management is not just about planning and supervising current tasks. It is about reviewing current practices and procedures to improve safety, effectiveness and efficiency.

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 QM. One method of demonstrating QM for an organisation is to become ISO 9001:2000 compliant.

There is much general information and training materials available for national MAC and demining organisations that choose to adopt the ISO 9001:2000 approach. A summary of the ISO 9001:2000 approach is given in Annex D. In essence, ISO 9001:2000 is a series of international standards for quality systems. They specify requirements and recommendations for the development of a management system, the purpose of which is to ensure that the 'products' or 'services' delivered meet the agreed needs. In the case of demining, the product is cleared land that is safe for its intended use.

Managers of demining organisations are encouraged to examine how to apply the principles of QM to mine action. In doing so they should take particular note of two issues. First, how special processes (such as demining) should be planned, implemented, monitored and reviewed. And second, they should note the responsibilities of all managers and deminers to identify and take advantage of opportunities for improvement to the process.

6. Areas of responsibility

6.1. United Nations

The United Nations has a general responsibility for ensuring the establishment of a regime conducive to the effective management of mine action programmes by continuously refining IMAS 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 (ISO) and the International Labour Organisation (ILO). UNMAS is the office within the United Nations Secretariat responsible to the international community for the development and maintenance of IMAS, including this Guide.

The United Nations 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 UN provides alternative, specifications, requirements and guidance.

6.2. National Mine Action Authority (NMAA)

The NMAA, or the organisation acting on its behalf, is responsible for ensuring the national and local conditions that enable the effective management of demining projects. The NMAA is ultimately responsible for all phases of a demining project within its national boundaries, including defining the clearance requirement, the accreditation of demining organisations, the monitoring of demining organisations during clearance, and post-clearance inspections prior to accepting full responsibility for the cleared land.

The NMAA is responsible for establishing and maintaining national regulations and procedures for the management of demining operations. These procedures should be consistent with IMAS, other relevant national and international standards, regulations and requirements.

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

6.3. 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 demining organisations chosen to carry out such contracts meet the accreditation 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 NMAA is in the process of formation, and has not had the opportunity to gain experience.

6.4. Demining organisation

Ultimately, it is the demining organisation, of whatever type, which is required to establish an appropriate and effective management system, demonstrate it to the NMAA, and apply it throughout the demining project.

Where the NMAA is in the process of formation, the demining organisation is also responsible for assisting the formation process, by giving advice and assistance including the framing of national standards.

Annex A
(Normative)
References

The following normative documents contain provisions, which, through reference in this text, constitute provisions of this part of the standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of the standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid ISO or EN:

a) IMAS 02.10 Guide for the establishment of national mine action programmes;

b) IMAS 03.10 Guide to the procurement of mine action equipment;

c) IMAS 04.10 Glossary of mine action terms, definitions and abbreviations;

d) IMAS 05.10 Information systems and communications;

e) IMAS 07.20 Guide for the drafting of mine action contracts;

f) IMAS 07.30 Accreditation of demining organisations and operations;

g) IMAS 07.31 Accreditation of MRE organisations and operations;

h) IMAS 07.40 Monitoring of demining organisations;

i) IMAS 08.10 General mine action assessment;

j) IMAS 08.20 Technical survey;

k) IMAS 08.30 Post-clearance documentation;

l) IMAS 09.10 Clearance requirements;

m) IMAS 09.20 The inspection of cleared land: Guide to the use of sampling procedures;

n) IMAS 09.30 Explosive Ordnance Disposal;

o) IMAS 09.40 Guide for the use of mine detection dogs;

p) IMAS 09.50 Mechanical application;

q) IMAS 10.10 S&OH - General requirements;

r) IMAS 10.20 S&OH - Demining worksite safety;

s) IMAS 10.30 S&OH - PPE;

t) IMAS 10.40 S&OH - Medical support to demining operations;

u) IMAS 10.50 S&OH - Storage, transportation and handling of explosives;

v) IMAS 10.60 S&OH - Reporting and investigation of demining incidents;

w) IMAS 12.10 Planning for mine risk education programmes and projects; and

x) ISO 9001:2000 (E).

The latest version/edition of these references should be used. GICHD hold copies of all references used in this standard. A register of the latest version/edition of the IMAS standards, guides and references is maintained by GICHD, and can be read on the IMAS website (http://www.mineactionstandards.org/). NMAA, employers and other interested bodies and organisations should obtain copies before commencing mine action programmes.

Annex B
(Informative)
Terms, definitions and abbreviations

B.1.
demining organisation
refers to any organisation (government, NGO, military or commercial entity) responsible for implementing demining projects or tasks. The demining organisation may be a prime contractor, subcontractor, consultant or agent.

B.2.
demining sub-unit
an element of a demining organisation, however named, which is operationally accredited to conduct one or more prescribed demining activities, such as technical surveys, manual clearance, EOD or the use of MDD teams.

B.3.
National Mine Action Authority (NMAA)
the government department(s), organisation(s) or institution(s) in each mine-affected country charged with the regulation, management and coordination of mine action.

Note: In most cases the national MAC or its equivalent will act as, or on behalf of, the 'NMAA'.

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

B.4.
quality
degree to which a set of inherent characteristics fulfils requirements. [ISO 9000:2000]

B.5.
Quality Assurance (QA)
part of quality management focused on providing confidence that quality requirements will be fulfilled. [ISO 9000:2000]

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

B.6.
quality control
part of quality management focused on fulfilling quality requirements. [ISO 9000:2000]

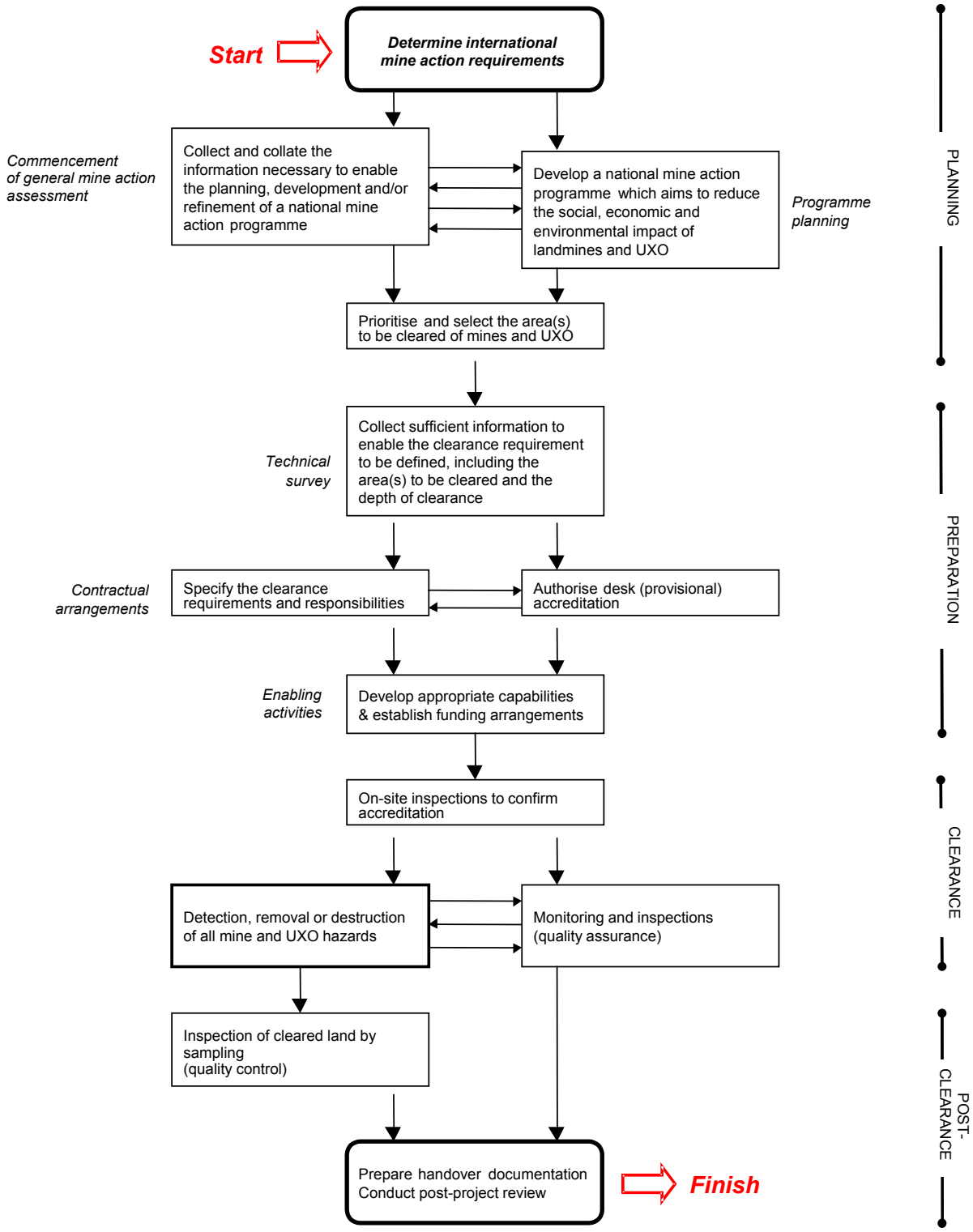
Note: QC relates to the *inspection* of a finished product. In the case of mine and UXO clearance, the 'product' is safe cleared land.

B.7.
quality management
coordinated activities to direct and control an organisation with regard to quality. [ISO 9000:2000]

B.8.
Standard Operating Procedures (SOPs)
Standing Operating Procedures (SOPs)
instructions that define the preferred or currently established method of conducting an operational task or activity.

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

Annex C
(Informative)
Demining process



Annex D
(Informative)
ISO 9000

This Annex is an extract from a UN paper on the application of quality management systems which was prepared by UNMAS and delivered to the International Workshop on the Management of Mine Action, Ottawa, March 1998. It has been updated to reflect the changes as a result of the revision of ISO 9000, and the subsequent issue of the ISO 9000:2000 series on 15 December 2000.

INTRODUCTION

A framework of international standards for humanitarian mine clearance and demining was developed and agreed at the International Conference on Mine Clearance Technology, Denmark in July 1996. Criteria were prescribed for all aspects of mine clearance, standards were recommended, and a new universal definition of clearance levels was proposed.

The conference also recommended that a coordinated approach to quality assurance and quality control be adopted; in particular, the relevance of quality management systems (including the application of ISO 9000) to mine action was to be examined. In his 1996 report to the General Assembly, the Secretary-General acknowledged the UN's responsibilities in taking this work forward. [A/51/540 dated 23 October 1996.] In the Fifty First session, the General Assembly encouraged Member States, intergovernmental organisations, NGOs and foundations to support this developing work on mine action standards and quality management. [A/RES/51/149 dated 4 February 1997.]

AIM AND SCOPE OF PAPER

This paper examines the relevance of quality management systems (QMS) and the application of ISO 9000 to mine clearance, and makes recommendations.

This paper focuses on the application of QMS to demining tasks and processes, although the recommendations are applicable to other facets of mine action.

QUALITY - DEFINITIONS

The word *quality* has many meanings: a degree of excellence, consistency, conformance with requirement and freedom from defects, imperfections or contamination. The official ISO definition is " .... degree to which a set of inherent characteristics fulfils requirements."

The concept of *total quality management* (TQM*)* and the development of *quality management systems* (QMS) evolved in the 1980s, and was used by management to achieve levels of excellence in manufacturing. Those companies which embraced the philosophy to change their organisations and empower their staff achieved remarkable levels of performance and a clear competitive edge. During the 1990s this approach has been applied to the public sector and 'non-profit' organisations with similar improvements in performance.

QUALITY MANAGEMENT

The elements of QMS

QMS comprises three components: (1) standards and common procedures that define the rules, norms and required performance of an organisation; (2) an internal management system (such as ISO 9001:2000) that encourages an organisation to achieve these standards; and (3) institutional arrangements, such as national and international professional bodies, that establish the rules, norms and required performance, and monitor the performance of its member organisations. This section of the paper will address these three components and will discuss their relevance to mine action.

ISO 9000

ISO 9000 provides a management discipline that encourages an organisation to deliver products or services to agreed requirements. These requirements may represent the specific needs and expectations of customers for a particular product, or they may be the standards of service deemed appropriate by a professional body (such as solicitors or physicians). ISO 9000 is not a product or service standard *per se.* There are no product acceptance criteria. ISO 9000 does, however, require organisations to have the management procedures, processes and practices in place that will consistently deliver products and services to the standards required.

Three levels of ISO 9000 accreditation were available in the original 1994 system: ISO 9001 was seen as the most comprehensive quality system, ISO 9002 was more appropriate for organisations delivering a product or service where no conceptual design work is required, whilst ISO 9003 provided a model quality system for use when conformance to special requirements could be assured only by final inspection and test. On 15 December 2000 these three standards were replaced by a single standard, ISO 9001:2000.

Organisations which seek ISO 9001:2000 accreditation are required to comply with an agreed set of criteria: the 5 major standard clause “areas “that define the agreed criteria are listed at Appendix 1 of this paper. The interpretation of the criteria depends on the role of the organisation and whether it delivers a product or service. Many professional bodies have produced guidelines that relate to their own business sectors and professions. Currently no agreed international criteria or guidelines exist for mine action.

Application of ISO 9001:2000 to mine action

The 5 major standard clause “areas” of ISO 9001:2000 need to be modified to reflect the role of organisations engaged in mine action.

The relevance of these clauses to demining can be established by mapping them onto the IMAS standards and guides, as shown in Appendix 2 of this paper. The resulting matrix provides a deeper and more comprehensive understanding of the total quality requirements of mine clearance. For example, a demining organisation seeking ISO 9001:2000 accreditation would be expected to demonstrate (as clause 8.3 in the ISO) how its internal quality assurance and quality control procedures would be used to identify critical non-conformities, an action that is currently required in many contracts. In the case of IMAS standards, a critical non-conformity is defined as a unit of land (usually 1 square meter) containing one or more mine or UXO hazards. The demining organisation's SOPs would be expected to be consistent with the monitoring and post-clearance inspection requirements cited in IMAS 07.40 and 09.20.

Such an approach would provide a common framework to assess and evaluate the suitability and preparedness of contractors and sub-contractors as part of accreditation procedures. It would generate transparency and this, in turn, would improve confidence in the product.

Professional bodies and institutes

Organisations and individuals who aspire to meet agreed professional standards usually share common values and beliefs. Professional bodies and institutes represent the interests and articulate the views of their members. They ensure conformance to the agreed standards, and encourage commitment to the shared values and beliefs. Many institutes issue detailed professional guidelines for ISO 9001:2000 accreditation, as well as general advice on routine QMS matters.

The formation of such bodies and institutes within the mine action community would be advantageous, and should be encouraged. They would provide a particularly useful mechanism for generating a professional ethos, and for developing common mine action policy and practices. They would complement the role of UNHQ.

Initially it will be easier to create such bodies and institutes nationally and regionally, although international affiliations and partnerships should be encouraged. Currently, only one such body is known to exist: the Institute of Munition Clearance Engineers (IMCE) which formed in 1998.

RECOMMENDATIONS

GA Resolution 51/540 of 23 October 1996 provided the UN with an obligation and the mandate to develop effective international mine action standards and to provide guidance on the application of quality management. In order to effect this mandate the following recommendations are proposed:

- Organisations involved in mine action should be encouraged to develop strategies, establish management systems, and demonstrate procedures and practices that are consistent with the principles of total quality management.

- There is a need to establish a set of international guidelines on the application of ISO 9000 to mine action.

- The formation of professional bodies within the mine action community is to be encouraged, although their legal status, constitution and composition will need to be closely monitored.

Appendix 1 to Annex D
(Informative)
Procedures required by ISO 9001:2000

The following 5 subject areas represent the major standard 'clauses' of ISO 9001:2000. These clauses contain numerous sub-clauses, which must be satisfied in order to achieve ISO 9001:2000 accreditation. Each sub-clause has more specific requirements; in total there are 184 subjects that require evidence of some form of documentation or process - either policy or practice or both. Guidance on the relevance of each subject is provided by professional bodies and institutions. Guidance for demining is given in Appendix 2.

4. Quality Management System

4.1. General requirements

4.2. Documentation requirements

5. Management Responsibility

5.1. Management commitment

5.2. Customer focus

5.3. Quality policy

5.4. Planning

5.5. Responsibility, authority and communication

5.6. Management review

6. Resource Output

6.1. Provision of resources

6.2. Human resources

6.3. Infrastructure

6.4. Work environment

7. Product Realization

7.1. Planning of product realization

7.2. Customer-related processes

7.3. Design and development

7.4. Purchasing

7.5. Production and service provision

7.6. Control of monitoring and measuring devices

8. Measurement, analysis and improvement

8.1. General

8.2. Monitoring and measurement

8.3. Control of non-conforming product

8.4. Analysis of data

8.5. Improvement

Appendix 2 to Annex D
(Informative)
ISO 9001:2000 - Guidelines for demining operations

ISO 9001:2000 and IMAS standards
(Informative)

IMAS standards →

ISO 9001:2000's clauses ↓

		Guide for the application of IMAS	Establishment of mine action programmes 02.10	Guide to equipment procurement 03.10	The procurement process 03.20	Test and evaluation 03.30	Guide to research 03.40	Glossary of mine action terms definitions 04.10	Information systems and communications 05.10	Development and management training 06.10	Training of senior level national managers 06.20	Training of middle level national managers 06.30	Training of technical managers 06.40	Management (SERIES) 07.10	Guide for drafting demining contracts 07.20	Accreditation of demining organisations 07.30	Monitoring (SERIES) 07.40	General mine action assessment 08.10	Technical survey 08.20	Post clearance documentation 08.30	Marking of hazards 08.40	Clearance requirements 09.10	Post-clearance inspections & sampling 09.20	EOD 09.30	Mine Detection Dogs (SERIES) 09.40	Mechanically-assisted clearance 09.50	S&OH general principles 10.10	Demining worksite safety 10.20	PPE 10.30	Medical requirements 10.40	Explosive storage, tpt & handling 10.50	Incident reporting & investigation 10.60
4	**Quality Management System**																														
4.1	General requirements	■												■																		
4.2	Documentation requirements	■	■		■	■		■	■					■	■	■	■			■		■	■									■
5	**Management Responsibility**																															
5.1	Management commitment	■												■																		
5.2	Customer focus	■																■	■			■										
5.3	Quality policy													■		■	■			■			■									
5.4	Planning	■												■																		
5.5	Responsibility, authority and communication	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
5.6	Management review	■																														
6	**Resource Management**	■																														
6.1	Provision of resources																															
6.2	Human resources									■	■	■	■											■	■							
6.3	Infrastructure			■	■	■	■																		■	■			■			
6.4	Work environment	■												■													■	■	■	■	■	
7	**Product Realization**	■																														

ISO 9001:2000 and IMAS standards
(Informative)

IMAS standards →

ISO 9001:2000's clauses ↓

		01.10 Guide for the application of IMAS	02.10 Establishment of mine action programmes	03.10 Guide to equipment procurement	03.20 The procurement process	03.30 Test and evaluation	03.40 Guide to research	04.10 Glossary of mine action terms definitions	05.10 Information systems and communications	06.10 Development and management training	06.20 Training of senior level national managers	06.30 Training of middle level national managers	06.40 Training of technical managers	07.10 Management (SERIES)	07.20 Guide for drafting demining contracts	07.30 Accreditation of demining organisations	07.40 Monitoring (SERIES)	08.10 General mine action assessment	08.20 Technical survey	08.30 Post clearance documentation	08.40 Marking of hazards	09.10 Clearance requirements	09.20 Post-clearance inspections & sampling	09.30 EOD	09.40 Mine Detection Dogs (SERIES)	09.50 Mechanically-assisted clearance	10.10 S&OH general principles	10.20 Demining worksite safety	10.30 PPE	10.40 Medical requirements	10.50 Explosive storage, tpt & handling	10.60 Incident reporting & investigation
7.1	Planning of product realization	■												■		■	■			■			■									
7.2	Customer-related processes	■						■						■	■							■										
7.3	Design and development			■	■	■								■																		
7.4	Purchasing			■	■										■																	
7.5	Production and service provision	■												■		■	■															
7.6	Control of monitoring and measuring devices																															
8	**Measurement, analysis and improvement**																															
8.1	General															■	■						■									
8.2	Monitoring and measurement															■	■						■									
8.3	Control of non-conforming product																			■			■									
8.4	Analysis of data							■												■			■									
8.5	Improvement	■																														

Amendment record

Management of IMAS amendments

The IMAS series of standards are subject to formal review on a three-yearly basis, however this does not preclude amendments being made within these three-year periods for reasons of operational safety and efficiency or for editorial purposes.

As amendments are made to this IMAS they will be given a number, and the date and general details of the amendment shown in the table below. The amendment will also be shown on the cover page of the IMAS by the inclusion under the edition date of the phrase *'incorporating amendment number(s) 1 etc.'*

As the formal reviews of each IMAS are completed new editions may be issued. Amendments up to the date of the new edition will be incorporated into the new edition and the amendment record table cleared. Recording of amendments will then start again until a further review is carried out.

The most recently amended IMAS will be the versions that are posted on the IMAS website at www.mineactionstandards.org.

Number	Date	Amendment Details
1	1 Dec 2004	1. Formatting changes. 2. Minor text editing changes. 3. Changes to terms, definitions and abbreviations where necessary to ensure that this IMAS is consistent with IMAS 04.10. 4. Substantive changes: a) Clause 4.1, complete revision.
2	23 Jul 2005	1. Clause 4.4, third paragraph, second sentence, the inclusion of a clause concerning accident/incident reports being appended to Post Project Reviews. 2. Annex B, change to the definition of 'Quality Assurance (QA)' to be consistent with IMAS 04.10.