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Guide for the destruction of stockpiled anti-personnel mines

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Foreword

International standards for humanitarian demining programmes were first proposed by working groups at an international technical conference in Denmark, in July 1996. Criteria were prescribed for all aspects of demining, 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) with the first edition produced in October 2001.

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

Article 4 of the Anti-Personnel Mine Ban Convention (APMBC) (MBT) requires that signatories undertake to destroy or ensure the destruction of all stockpiled anti-personnel mines it owns or possesses, or that are under its jurisdiction or control, as soon as possible but not later than four years after the entry into force of the MBT for that State Party. The existing APM stockpiles tend to be large in quantity, but relatively small in terms of weight and Net Explosive Content (NEC); however, the destruction of these stockpiles can be a complex logistic operation.

The physical destruction techniques available range from the relatively simple Open Burning and Open Detonation (OBOD) techniques to highly sophisticated industrial processes. This IMAS seeks to inform national authorities only of the technical and logistic issues involved in Ant-Personnel Mine (APM) stockpile destruction. There are so many inter-relational factors involved in APM stockpile destruction that it is not possible to provide 'template solutions'.

The selection of the most suitable technique or technology by a national authority will depend primarily on the resources available, the physical condition and quantity of the stockpile, the national capacity and the applicable environmental and explosives legislation. The most influential factor is likely to be economies of scale, in that the more APM that are requiring destruction, the larger the economies of scale, and therefore the wider range of available technology. Consequently, national authorities may wish to consider APM destruction on a regional basis in order to achieve the large economies of scale.

This IMAS is complementary to that of IATG 10.10 Demilitarization and destruction, which should now be used as the primary guidance when considering the destruction of APM. IATG 10.10 provides comprehensive information for the destruction of all ammunition natures, including APM and cluster munitions. This IMAS now only covers the more specific APM related aspects of ammunition destruction or demilitarization.

Guide for the destruction of stockpiled anti-personnel mines

1. Scope

The purpose of this IMAS is to explain the background to the stockpile destruction of Anti-Personnel Mines (APM), explain UN policy, and complement the contents of IATG 10.10 Demilitarization and destruction, which should now be used as the primary standard for the destruction of APM and cluster munition stockpiles.

Although this IMAS provides guidance, in addition to IATG 10.10, for the destruction of national stockpiles of APM, it does not cover the destruction of field stocks of APM that have arisen as a direct result of demining operations; these should be destroyed in accordance with the principles contained in IMAS 09.30.

This IMAS should be read in conjunction with IMAS 04.10, 09.30, 10.10, 10.50, 10.70 and 11.20:

- a) IMAS 04.10 provides a complete glossary of all the terms, definitions and abbreviations used in the IMAS series of standards;
- b) IMAS 09.30 provides specifications and guidance for Explosive Ordnance Disposal (EOD);
- c) IMAS 10.10 covers the general requirements of Safety and Occupational Health (S&OH). These apply as equally to demilitarization operations as they do to demining operations;
- d) IMAS 10.50 provides specifications and guidance for the storage, transportation and handling of explosives;
- e) IMAS 10.70 provides guidelines on the protection of the environment during mine action operations; and
- f) IMAS 11.20 covers the principles and procedures to be adopted for Open Burning and Open Detonation (OBOD) stockpile destruction operations.

2. References

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

3. Terms, definitions and abbreviations

The subject of stockpile destruction can be technically complex and it is important to understand the terminology in current use. Often terms are used interchangeably, which leads to confusion.

Note: As an extreme example, but to make the point, the logistic disposal of APM does not necessarily mean that they have been destroyed; they could have been gifted from one non-signatory nation to another. The donor nation has then disposed of the ammunition, whilst not destroying it.

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 'demilitarization' refers to *the complete range of processes that render weapons, ammunition and explosives unfit for their originally intended purpose.*¹

The term 'destruction' refers to *the process of final conversion of weapons, ammunition and explosives into an inert state so that it can no longer function as designed.*

The term 'disposal' refers to *the removal of ammunition and explosives from a stockpile by the utilisation of a variety of methods that may not necessarily involve destruction*¹.

In the IMAS series of standards, the words 'shall', 'should' and 'may' are used to indicate the intended degree of compliance. This use is consistent with the language used in ISO standards and guidelines:

- a) 'shall' is used to indicate requirements, methods or specifications that are to be applied in order to conform to the standard;
- b) 'should' is used to indicate the preferred requirements, methods or specifications; and
- c) 'may' is used to indicate a possible method or course of action.

4. Background

4.1. General

Stockpiled APM will rarely pose an immediate risk to human life, but they do provide the capability for the deployment of new minefields. The removal of this capability is therefore an important factor for the continuing success of the Anti-Personnel Mine Ban Convention (APMBC), and the reduction of the potential risk posed by landmines world-wide.

Note: Only in those circumstances where there is significant chemical instability of the explosive filling or a major fault in the fuzing mechanism will stockpiled APM pose an immediate risk to human life. Notwithstanding, they of course remain a hazard and must be stored and transported in accordance with international safety standards in order to reduce the risk of an undesired explosive event.

4.2. Core component of mine action

It was agreed at a meeting of the UN Inter-agency Co-ordination Group for Mine Action on 17 August 2000 that stockpile destruction be formerly incorporated as the fifth core component of mine action.

5. International conventions

5.1. Anti-Personnel Mine Ban Convention (APMBC) (MBT)

Within the APMBC there are specific requirements applicable to the State Parties for the destruction of stockpiled APM. The specific articles are reproduced below for ease of reference:

Note: Also referred to as the Ottawa Treaty, Ottawa Convention etc. The full treaty title to which these refer is the 'Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-Personnel Landmines and their Destruction, Ottawa Convention, 03 December 1997'.

¹ Demilitarization not only involves the final destruction process but also includes all of the other transport, storage, accounting and pre-processing operations that are equally as critical to achieving the final result.

5.1.1. Article 4 – Destruction of stockpiled Anti-Personnel Mines (APM)

Except as provided for in Article 3, each State Party undertakes to destroy or ensure the destruction of all stockpiled anti-personnel mines it owns or possesses, or that are under its jurisdiction or control, as soon as possible but not later than four years after the entry into force of this convention for that State Party.

Note: Article 3 relates to the retention of APM for training in, and the development of, mine clearance techniques.

5.1.2. Article 6 – International cooperation and assistance

- i. In fulfilling its obligation under this convention, each State Party has the right to seek and receive assistance, where feasible, from other States Parties to the extent possible.*
- ii. Each State Party undertakes to facilitate and shall have the right to participate in the fullest possible exchange of equipment, material and scientific and technological information concerning the implementation of this Convention. The States Parties shall not impose undue restrictions on the provision of mine clearance equipment and related technological information for humanitarian purposes.*
- iii. Each State Party in a position to do so shall provide assistance for the destruction of stockpiled anti-personnel landmines.*

5.1.3. Non-signatory nations

Notwithstanding the provisions of the APMBC, there may be cases where non-signatory countries seek assistance from the UN with stockpile destruction, and it is appropriate for this to occur. There are already examples of non-signatory nations receiving bi-lateral assistance in this area.

5.2. Convention on Cluster Munitions

Article 3(2) of this convention, which entered into force on 01 August 2010, requires that State Parties shall destroy or ensure the destruction of all cluster munitions referred to in paragraph 1 of this Article as soon as possible but not later than eight years after the entry into force of this Convention for that State Party. Each State Party undertakes to ensure that destruction methods comply with applicable international standards for protecting public health and the environment.

6. General considerations

In terms of stockpile destruction, APM are no different to other types of munitions. They all contain fuze systems and high explosives, so the inherent dangers present during transport, storage, processing and destruction are the same. For this reason, it is recommended that the stockpile destruction of APMs should not be looked at in isolation. The technical factors are the same for the destruction of all types of ammunition, therefore, where appropriate, consideration should be given for the destruction of these different types in parallel to APM; it may prove to be beneficial in some cases. The supporting logistic and support services will remain similar for all ammunition types.

Note: For example, the destruction of APM could be done in conjunction with the disposal of large calibre artillery shells. These can then act as donor charges for the APM, thereby reducing the costs of serviceable explosives during Open Detonation (OD) disposal operations.

There are many differing techniques and technologies available for APM destruction. The selection of the most suitable technique/technology will depend primarily on available finance, the condition of the stockpile, the in-country capacity and the extant environmental legislation of the State concerned. In Europe, many nations have banned OBOD of all munitions, unless there is no alternative and that can only be justified on safety grounds. This has necessitated the construction of expensive demilitarization facilities, hence the requirement for the disposal of ammunition types other than APM and the necessity for economies of scale if pursuing this option. The argument as to the environmental effect of OBOD is still ongoing, and sound scientific evidence has been developed to support a case that OBOD of certain APM types may not be all that damaging to the environment. This means that OBOD still remains a viable destruction option for APM, and may well be the most suitable option for those areas of the world, such as Africa and Asia, with virtually no industrialised demilitarization capacities.

Note: There is often spare demilitarization capacity with commercial companies in Europe and the USA. The NATO Maintenance and Supply Agency (NAMSA) can advise on this disposal option. The costs of demilitarization of APM range from US\$2 to US\$4 each, dependent on the type.

6.1. Advantages and disadvantages of industrial demilitarization

Industrial scale demilitarization has many advantages; mechanical disassembly, incineration in environmentally controlled systems and the ability to operate 24 hours a day, 365 days a year. Their major disadvantage is the high capital set up costs of design, project management, construction and commissioning. Their operating costs are generally lower than OBOD (once amortisation of the development capital is discounted); but it should not be forgotten that the high labour costs in developed countries accounts for a large percentage of the OBOD costs. Notwithstanding this, OBOD can be a cheaper option dependent on the economy of scale. In the US, for example, average OBOD costs are \$US850 per tonne, whilst industrial demilitarization is \$US1180 per tonne; but it must be recognised that these costs are for all ammunition types, not just APM.

In many cases the development of such purpose built demilitarization facilities to enable State Parties to fulfil their obligation for stockpile destruction will be well beyond available resources and therefore may not be a practical option. Factors such as cost, location and safety may mean that OBOD is the only pragmatic and feasible option. The advantages, disadvantages and environmental implications of OBOD are discussed in IATG 10.10.

6.2. Traditional disposal options for ammunition

There were traditionally five options for the logistic disposal of ammunition and explosives, however, in the case of APM four of these options are banned by international treaty. The MBT itself precludes sale, gift or increased use of APM at training whilst the Oslo Convention now bans deep sea dumping. Therefore, the international community is now left with destruction as the only available option for the disposal of APM.

7. Destruction methodology and techniques

All logistic destruction of APM should be in accordance with IATG 10.10 destruction and demilitarization.

8. World demilitarization capability

Industrial demilitarization activity for the full range of ammunition natures is taking place in many countries throughout the world, whilst some examples of OBOD operations exist in developing countries.

It would not be appropriate to include contact details of these, mainly commercial organisations, in this IMAS, however contact details and a indication of the capabilities of known enterprises are included in the UN Stockpile Destruction website at <http://www.mineaction.org/>. It must be emphasised that the inclusion of a specific company's details in this website is not an endorsement of their capability by the UN. Details are included in the website to enable State Parties to have access to the widest possible range of advice and options for stockpile destruction during the preparation of their destruction plan.

Note: The authors of the UN Stockpile Destruction website do not claim that this is necessarily an exhaustive list of all demilitarization companies. It has been compiled from consultation and an extensive literature search. The details will be continually updated and other demilitarization organisations should contact the Webmaster to ensure that they are included

The website covers four main groups of demilitarization expertise that can be consulted by national authorities for advice:

- a) international organisations;
- b) demilitarization advice and consultancy;
- c) demilitarization equipment manufacturers; and
- d) operational demilitarization facilities.

9. Policy and responsibilities

9.1. UN organisations

9.1.1. UNMAS responsibilities

The UNMAS is the focal point within the UN system for all mine-related activities. In this capacity, it is responsible for ensuring an effective, proactive and co-ordinated UN response to stockpile destruction. UNMAS, in consultation with other partners, can provide the following assistance in this area:

- a) establish priorities for assessment missions;
- b) facilitate a coherent and constructive dialogue with the donor and international communities on the issue;
- c) co-ordinate the mobilisation of resources;
- d) the development, maintenance and promotion of technical and safety standards;
- e) technical advice;
- f) training; and
- g) the maintenance of a demilitarization technology database (see <http://www.mineaction.org/>).

9.1.2. UNDP responsibilities

The UNDP Mine Action Policy Statement (dated 18 December 1998) requires *'the development of integrated, sustainable national/local mine action programmes'*. The main principles of the policy statement relate as equally to stockpile destruction as they do to all other aspects of mine action. UNDP could assist in the development of national capacities and capabilities for stockpile destruction. Such assistance could take the form of:

- a) the development of national capacities for stockpile destruction;

- b) provision of support to sustainable stockpile destruction initiatives or programmes;
and
- c) resource mobilisation and donor co-ordination for UNDP initiatives under sub-clauses a) and b) above.

9.2. National authorities

The national authority is ultimately responsible for all aspects of the safety and security of the APM whilst in the national stockpile. They should ensure that effective management and physical security processes are in place to safeguard the APM stockpile.

They should ensure that the proposed demilitarization implementing agency comply with all appropriate national (and where applicable, international) legislation for the storage, transport and handling of explosives.

The national authority is responsible for all aspects of APM stockpile management, and therefore shall fulfil the management function of stockpile destruction planning. This shall include recognised procedures for the transfer of safety and security responsibility (but not APM ownership) to the destruction implementing agency.

The national authority should be content that the selected destruction technique is as environmentally benign as is reasonably practicable.

9.3. Donors

Donor agencies are part of the management process, and as such have some responsibility for ensuring that the projects they are funding are managed effectively, and in accordance with international standards. This may involve strict attention to the writing of contract documents, and ensuring that the demilitarization organisations chosen to carry out such contracts meet the accreditation criteria within their parent country. This responsibility and accountability is even greater when the national authority is inexperienced in demilitarization operations.

9.4. Implementing agencies

The implementing agency assumes responsibility for all aspects of the safety and security of the APM stockpile on arrival at the agency's storage location. They should demonstrate this to the national authority, and apply it throughout the destruction project.

Note: Safety and security on route from a national to an implementing agency storage location is a national responsibility.

The implementing agency should provide timely and accurate information to the national authority throughout the project as to the destruction rate being achieved.

The implementing agency is responsible for explosive safety during all phases of the demilitarization cycle, (less transport from the national base depot to their own storage location). They shall demonstrate that they have planned and subsequently practice safe systems of work in order to reduce the risk to the work force to as low as is reasonably practicable. In doing so, they should comply with all relevant national explosive safety and environmental legislation.

The implementing agency shall recruit, train and maintain the appropriate staff to conduct AP demilitarization and destruction operations.

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) IATG 03.10 Inventory management of ammunition;
- b) IATG 08.10 Transport of ammunition;
- c) IATG 09.10 Security systems and principles;
- d) IATG 10.10 Demilitarization and destruction;
- e) IMAS 04.10 Glossary of mine action terms, definitions and abbreviations;
- f) IMAS 09.30 Explosive ordnance disposal;
- g) IMAS 10.10 S&OH - General requirements;
- h) IMAS 10.50 S&OH - Storage, transportation and handling of explosives;
- i) IMAS 10.70 S&OH – Protection of the environment;
- j) IMAS 11.20 Principles and procedures for OBOD operations; and
- k) IMAS 11.30 National planning guidelines for stockpile destruction.

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: (See www.mineactionstandards.org). NMAA, employers and other interested bodies and organisations should obtain copies before commencing mine action programmes.

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	01 Dec 2004	<ol style="list-style-type: none"> 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.
2	23 Jul 2005	<ol style="list-style-type: none"> 1. Annex B, change to the definition of 'Explosive Ordnance Disposal (EOD)' to be consistent with IMAS 04.10.
3	01 Aug 2006	<ol style="list-style-type: none"> 1. Minor changes/additions to the first and second paragraph of the foreword. 2. Removal of the term 'threat' from throughout the IMAS.
4	01 Mar 2010	<ol style="list-style-type: none"> 1. UNMAS address updated. 2. Minor changes clause 6.9 to ensure gender issues. 3. Inclusion of reference to IMAS 10.70. 4. Removal of Annex B (definitions) and its reference in clause 3. 5. Re-naming Annex C to B, D to C etc., and updating their references in the body of the IMAS.
5	01 Aug 2012	<ol style="list-style-type: none"> 1. Inclusion of IATG 03.10, 08.10, 09.10 and 10.10 as normative references. 2. Inclusion of IATG 10.10 information in Introduction. 3. Removal of information that is covered in more detail in IATG 10.10. 4. Removal of Annexes B to F, as that information is contained within IATG 10.10. 5. Minor typographical amendments.
6	01 Jun 2013	<ol style="list-style-type: none"> 1. Reviewed for the impact of new land release IMAS. 2. Amendment No and date included in the title and header.