

# **IMAS 10.30**

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## **Safety and occupational health – Personal protective equipment**

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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 organizations. The latest version of each standard, together with information on the work of the technical committees, can be found at [www.mineactionstandards.org](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

Fundamental responsibilities of mine action management include the need to reduce risk and to provide a safe working environment for deminers and mine action staff. IMAS 10.10 provides guidance for the development and implementation of safety and occupational health systems for use in mine action. Risk reduction involves a combination of:

- safe working practices and operating procedures;
- effective supervision and control;
- appropriate education and training;
- tools and equipment of inherently safe design;
- the provision of effective personal protective equipment (PPE) and clothing.

PPE need to be regarded as a last resort to protect against the hazards associated with mine and explosive remnants of war (ERW) clearance. It is the final protective measure after all planning, training and procedural efforts have been taken to reduce risk. There are 3 main reasons for this approach.

- 1) PPE protects only the person wearing it, whereas measures controlling the risk at source can protect everyone at the demining worksite.
- 2) The theoretical maximum levels of protection are rarely achieved with PPE, and the actual level of protection provided is difficult to assess. To obtain the maximum protection from any PPE, it must be correctly fitted and properly maintained and used.
- 3) The PPE may restrict the wearer to some extent by limiting mobility, visibility and comfort. The requirements for protection needs to be balanced against the possibility that wearing too much PPE may impair movement and concentration.

The risk to deminers comes from all types of explosive ordnance (EO), including:

- anti-personnel (AP) blast mines;
- AP fragmentation mines;
- anti-vehicle (AV) mines;
- ERW, including unexploded sub-munitions;
- improvised explosive devices (IEDs).

Statistical data shows that AP blast mines appear in the greatest numbers and feature in most accidents. Therefore, PPE is principally designed to prevent the injuries caused by AP blast mines. At close quarters, AP fragmentation mines and AV mines will almost certainly overmatch the PPE currently available.

Although this standard provides distances at which the PPE is effective, this does not imply that the wearer will be safe at such distances. Distance reduces the severity of blast effects and secondary fragmentation, so the further away the wearer is, the safer the wearer is likely to be.

In the absence of any other internationally recognized standard, NATO's STANAG 2920 is used to define the minimum level of protection for PPE. However, it does not specify the requirement to provide facial protection against the blast effects of 240 g of TNT at 60 cm. Thus, the minimum requirement for PPE is a combination of these two elements.

# **Safety and occupational health – Personal protective equipment**

## **1 Scope**

This standard provides specifications and guidance to national mine action authorities and demining organizations on the minimum requirements for PPE used in mine action against the effects of unintended explosion of explosive ordnance (EO).

It does not provide guidance on the design characteristics of PPE garments, or on test and evaluation procedures.

## **2 Normative 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 standard.

## **3 Terms and definitions**

A complete glossary of all the terms, definitions and abbreviations used in the International Mine Action Standards (IMAS) series is given in IMAS 04.10.

In the IMAS series, the words “shall”, “should” and “may” are used to indicate the intended degree of compliance:

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

### **3.1**

#### **national mine action authority**

##### **NMAA**

government entity, often an inter-ministerial committee, in an EO-affected country charged with the responsibility for broad strategic, policy and regulatory decisions related to mine action

Note 1 to entry: In the absence of an NMAA, it may be necessary and appropriate for the UN, or some other body, to assume some or all of the responsibilities of an NMAA.

### **3.2**

#### **employer**

any organization (government, NGO or commercial entity) responsible for implementing demining projects or tasks

Note 1 to entry: The responsibilities conveyed on the employer also include those acting as a prime contractor, subcontractor, consultant or agent.

### **3.3**

#### **employee**

person that works for an employer

Note 1 to entry: Employees include people involved in management, operational or support activities.

### **3.4**

#### **personal protective equipment**

##### **PPE**

all equipment and clothing designed to provide a reasonable degree of protection, which is intended to be worn, or held by an employee when conducting specific activities, and which protects them against one or more risks to their safety or health

## **4 Personal protective equipment (PPE) requirements**

### **4.1 General**

The primary means of preventing explosive injury in the mine action worksite is by:

- safe working practices and operating procedures, as described in IMAS 10.20;
- effective supervision and control;
- appropriate education and training;
- tools and equipment of inherently safe design.

Analysis of accident data shows that this approach has proven highly effective, and unintended explosions are rare events. PPE is provided as a secondary safeguard to protect against the relatively small risk that remains. Any PPE provided shall not restrict the application of demining tools and processes, nor EOD processes, in any manner that increases the risk of an unplanned explosion.

The levels of PPE provided for use in hazardous areas or for EOD tasks shall be decided after considering:

- the risk(s) specific to the task;
- the operational procedures and tools used for the task;
- the local environmental conditions that may affect the task.

These three main factors shall be collected and analysed in a formalized risk assessment. From this process, different levels of PPE are likely to be appropriate for use during different activities at different parts of a worksite. Guidelines on conducting field risk assessment are given in TNMA 10.20-02/2009. Furthermore, requirements and guidelines to determine the appropriate working distances for a demining worksite are given in IMAS 10.20.

The employer shall provide training on the proper use, maintenance and storage of all PPE provided and in use in the demining organization. The employer shall provide facilities for the proper storage, carriage, cleaning and maintenance of PPE. Equipment shall be examined on a regular basis to ensure that it is suitable for use. The employer shall develop procedures for the general management of PPE.

### **4.2 Suitability and appropriateness**

PPE provided shall fit the employee regardless of gender, and be designed to provide reasonable comfort and protection against the predictable risks of a demining worksite. Other clothing provided shall be suitable for the prevailing weather conditions, and include footwear with suitably slip-resistant soles. Cultural practices should also be taken into consideration for the provision of PPE.

Enhanced protection and risk mitigation procedures shall be considered if the predictable risk of an unintended explosion results from an item of EO that contains more than 240 g of TNT. This does not mean that enhanced protection is required or even appropriate. It is the process of deliberation that is important to ensuring the PPE is both suitable and appropriate.

While staff are within the safety distance for the identified hazards or within a hazardous area, the minimum requirements in 4.3 shall apply. The minimum PPE requirement in 4.3 shall be increased when the worksite risk assessment determines that the risk warrants greater protection.

### **4.3 Minimum PPE requirement**

PPE shall protect the parts of the body that are covered against the blast effects of 240 g of TNT at distances appropriate to the wearer's activity.

The amount of PPE provided shall be determined as a result of a formalized risk assessment and management decision. The minimum PPE within the safety distance of a hazardous area, or when engaged in any activity that involves being close to EO, shall be:

- body armour capable of satisfying the ballistic test outlined in STANAG 2920, achieving a V50 rating (dry) of 450 m/s for 1.102 g fragments. It shall also be capable of protecting the chest, abdomen and groin area against the blast effects of 240 g of TNT at 60 cm from the closest part of the body;
- eye protection that is held over the eyes in a frame that prevents blast ingress from beneath. The eye protection shall be capable of retaining integrity against the blast effects of 240 g of TNT at 60 cm. It is recommended that eye protection be a part of frontal head protection capable of protecting against the blast effects of 240 g of TNT at 60 cm and of providing full frontal coverage of face and throat.

Safety glasses that do meet STANAG 2920 are available and may be used. However, commonly available industrial safety spectacles that do not meet the minimum requirement of this standard, shall not be used as demining PPE.

#### **4.4 Fragmentation protection**

Lightweight and practical PPE complying with the minimum PPE requirements (see 4.3) does not guarantee ballistic protection against fragments. However, such PPE increases protection from fragments as the distance from the explosion increases. The relative protection against fragments offered by such PPE shall be considered when determining the demining working distances (see IMAS 10.20) to minimize the risks to employees.

#### **4.5 Hand tools**

Hand tools should be constructed in such a way that their separation or fragmentation resulting from the functioning of an AP blast-mine is reduced to a minimum. Hand tools should be designed to be used at a low angle to the ground and should provide adequate stand-off from an anticipated point of explosion. The use of gloves can provide protection against non-explosive injury and should be considered.

#### **4.6 Protecting hearing**

When conducting demolitions at minimum safety distances, the use of protection for the eardrums shall be provided by the employer.

When using machinery and tools, including strimmers and chainsaws, the use of protection for the eardrums shall be provided by the employer.

#### **4.7 Explosive ordnance disposal (EOD) clearance sites**

When engaged in the clearance of EO, including IEDs, an enhanced level of protection may be necessary. This shall be defined in standard operating procedures (SOPs) and may include ballistic protection or other specialist PPE ensembles.

### **5 Responsibilities**

#### **5.1 General requirements**

NMAA and employers (governments, NGOs and commercial entities) shall establish and maintain policy, standards and guidelines on the minimum requirements of PPE for use in different situations in national mine action programmes. These should distinguish between the obligations and responsibilities at the national level, and those of the employer and employee as set out in 5.2 to 5.4.

#### **5.2 National responsibilities**

The NMAA, or the organization acting on its behalf, shall:



- establish and maintain national standards to be applied for PPE;
- monitor the application of standards;
- undertake periodic reviews of the national standards for PPE and the technologies available to reduce risks.

### **5.3 Employers' responsibilities**

Demining organizations shall:

- apply the documented NMAA standards for PPE as a minimum;
- provide PPE for each activity undertaken that meets, or exceeds, the minimum requirements and is appropriate for the wearer, male or female. In this regard, PPE shall be provided to employees, which is serviceable and appropriate to the risk, local operational procedures, culture and environmental conditions;
- provide training and supervision in the selection of appropriate PPE and its correct use and maintenance;
- establish and maintain SOPs that specify control, care and maintenance requirements;
- provide suitable facilities for the storage, carriage, cleaning and maintenance of PPE;
- establish and maintain documented SOPs to undertake periodic reviews of PPE.

In the absence of a NMAA or authorities, the demining organization shall assume additional responsibilities. These include, but are not restricted to:

- issue, maintain and update their own standards to be applied for PPE;
- cooperate with other demining organizations in the same country to ensure consistency of standards for the use and maintenance of PPE;
- assist the host nation during the establishment of a NMAA in framing national standards for PPE.

### **5.4 Employees' obligations**

Employees of demining organizations shall:

- use PPE in accordance with the requirements specified by their employers and with the manufacturer's specification for the PPE, including the use of facilities provided for storage and carriage of PPE;
- clean and maintain the PPE in accordance with the demining organization's SOPs and/or the manufacturer's specifications or guidelines;
- report problems with the equipment or suggested improvements to SOPs to the employer, which may reduce the requirement for PPE, or improvements in the design or application of PPE.

## **Annex A (normative)**

### **References**

The following normative documents contain provisions which, through reference in this text, constitute provisions of this standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not automatically apply. However, parties to agreements based on this 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.

- [1] ISO Guide 51, *Safety aspects – Guidelines for their inclusion in standards*
- [2] IMAS 10.10, *Safety and occupational health – General requirements*
- [3] IMAS 10.20, *Demining worksite safety*
- [4] NATO STANAG 2920
- [5] Database of Demining Accidents, Humanitarian Demining Accident and Incident Database (AID), James Madison University (jmu.edu)
- [6] TNMA 10.20-02/2009, *Field risk assessment*

The latest version/edition of these references shall be used. GICHD hold copies of all normative 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](http://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 are given a number. The date and general details of the amendment shown in the table below. The amendment is also shown on the cover page of the IMAS by the inclusion under the edition date of the phrase “*incorporating amendment #.*”

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

The most recently amended IMAS are posted on the IMAS website at [www.mineactionstandards.org](http://www.mineactionstandards.org).

Number	Date	Amendment details
1	1 March 2010	<ol style="list-style-type: none"> <li>1. Definition of NMAA updated.</li> <li>2. UNMAS Address updated.</li> <li>3. Minor changes throughout to ensure gender and cluster munitions issues.</li> <li>4. Inclusion of a normative reference to TNMA–FRA in the body and Annex A.</li> <li>5. Removal of Annex B (definitions) from the IMAS series and its reference in Clause 3.</li> </ol>
2	1 January 2011	<ol style="list-style-type: none"> <li>1. References to CWA for T&amp;E of PPE were removed from Clause 1 and Annex A.</li> </ol>
3	1 August 2012	<ol style="list-style-type: none"> <li>1. Reviewed for impact of IATG development.</li> <li>2. Minor typographical amendments.</li> </ol>
4	1 June 2013	<ol style="list-style-type: none"> <li>1. Reviewed for the impact of new land release IMAS.</li> <li>2. Amendment No and date included in the title and header.</li> </ol>
5	17 January 2023	<ol style="list-style-type: none"> <li>1. Minor typographical amendments.</li> <li>2. Confirmation that NATO’s STANAG 2920 remains the baseline standard of protection.</li> <li>3. Removal of the requirement for ballistic boots.</li> </ol>