



Cambodian Mine Action Standards (CMAS)

Chapter 11

Personal Protective Equipment PPE

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## Introduction

The need to reduce as far as possible the risk to all personnel who work operationally on Mine Action and EOD tasks and to provide as safe a working environment as possible is fundamental principles of mine action management (see CMAS 10.10). Risk reduction involves a combination of safe working practices and safe operating procedures, effective supervision and control, appropriate education and training, equipment of inherently safe design, and the provision of effective personal protective equipment (PPE) and clothing.

As a minimum, all employees involved in mine and UXO clearance in Cambodia should be provided with comfortable and serviceable clothing and footwear appropriate to the task and local conditions

PPE should be regarded as a 'last resort' to protect against the effects of mine and UXO hazards. It should be the final protective measure after all planning; training and procedural efforts to reduce risks have been taken. There are a number of reasons for this approach. First, PPE protects only the person wearing it, whereas measures controlling the risk at source can protect everyone at the clearance workplace. Second, theoretical maximum levels of protection are seldom achieved with PPE in practice, and the actual level of protection is difficult to assess; effective protection is only achieved by suitable PPE, correctly fitted, and properly maintained and used. And third, PPE may restrict the wearer to some extent by limiting mobility or visibility, or by requiring additional weight to be carried.

The risk to deminers comes principally from anti personnel (AP) blast mines, AP fragmentation mines, anti tank (AT) mines and unexploded ordnance (UXO). AP blast mines are the most abundant mines encountered in humanitarian mine action and cause the greatest number of injuries. At very close distances, the low velocity penetrative power of AP fragmentation & AT mines exceeds the levels of protection of standard issue PPE. Due to the area effect of such mines they also have the potential to cause 'secondary victims'. In general, when UXO munitions are encountered in humanitarian mine action, they have already malfunctioned (sub-munitions being a possible exception). They are usually high in metal content, in most cases on or near the surface, and in some cases constitute less of an initiation hazard than mines. The varied nature of UXO means that the hazard is best dealt with procedurally rather than relying on PPE designed primarily for humanitarian mine clearance.

# Safety & Occupational Health

## Personal Protective Equipment

### 1. Scope

This Standard provides specifications and guidance to mine action organisations on the minimum requirements of personal protective equipment (PPE), including protective clothing, for use during clearance in Cambodia.

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

### 2. PPE Requirements

#### 2.1. General

The levels of PPE provided for use in hazardous areas shall be based on a number of factors including: the local risk(s), operational procedures and practices, and local environmental conditions.

Training shall be provided on the proper use, maintenance and storage of the PPE in use within the mine action organisation. Facilities should be provided for its proper storage and carriage. Equipment shall be examined on a regular basis to ensure that it is suitable for use.

All deminers conducting mine clearance and all visitors to demining worksites who enter away from the administration area and into the mine site during demining operations shall wear appropriate PPE.

#### 2.2. Blast protection

PPE should be capable of protecting against the blast effects of 240 gm of TNT at stand-off distances, for each item of PPE, appropriate to the activity performed in accordance with SOPs. Equipment provided to reduce the risk from such a hazard shall include, as a minimum:

- a) Frontal protection, appropriate to the activity, capable of protecting against the blast effects of 240 gm of TNT at 30 cm from the closest part of the body; and
- b) Eye protection capable of retaining integrity against the blast effects of 240 gm of TNT at 60 cm. The facial protection must provide full frontal coverage of the face and throat in conjunction with the specified frontal protection ensemble.

The frontal protection ensemble provided to employees, whether required to kneel, sit or squat shall be designed to cover the eyes, throat (frontal neck), chest, abdomen and genitals.

Hand tools should be constructed in such a way that their separation or fragmentation resulting from the detonation of an AP blast-mine incident is reduced to a minimum. They may be used with appropriate hand protection such as hand-shields or gloves. 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 detonation.

During the risk reduction process, mine action organisations may consider providing blast boots for the protection of feet and lower limbs, where there is a significant risk that cannot be reduced by SOPs alone, provided that the blast boots being considered are proven to be effective in reducing the effects.

In addition Mine Action Organisations may consider providing elbow and knee pads to add to the de-miners comfort in the field.

### **2.3. Fragmentation protection**

Fragmentation mines currently defeat all but specialist EOD ensembles, which emphasises the initial need to minimise risk procedurally via appropriate SOPs. Protection should nevertheless be provided against non-designed fragmentation from other mines, and to potential secondary victims where such a threat cannot be removed procedurally. PPE provided to reduce the risk from such a hazard should include, as a minimum:

- a) Ballistic body armour with a STANAG 2920 v50 rating (dry) of 450m/s for 1.102g fragments. (This standard will continue to be used until an accepted alternative is developed as an international standard);
- b) A full-face visor as described in clause 2.2(b) above. However, if an analysis of the threat using the criteria set out in these guidelines and CMAS 10.10 indicates that a full-face visor would provide inadequate protection then a helmet shall be worn. The helmet should have a ballistic rating similar to the ballistic body armour selected by the mine action organization

Note 1: Eye protection should no less than that offered by 5mm of untreated polycarbonate. It should provide full frontal coverage of face and throat in conjunction with the specified frontal protection ensemble. (If the body protection is fitted with an “overlap”, then the visor should be capable of fitting behind this “overlap” when in use).

### **2.4. EOD clearance sites**

When engaged in the clearance of UXO or other hazardous ordnance, an enhanced level of protection may be necessary. This should be defined in SOPs, and may include conventional body armour or other specialist PPE ensembles.

## **3. Responsibilities**

### **3.1. General requirements**

CMAA and Mine Action employers (government, NGOs and commercial entities) shall enforce the minimum requirements of PPE for use in Cambodian mine action programmes. The obligations and responsibilities at the national level, and those of the employer and employee are set out below.

### **3.2. National responsibilities**

The CMAA shall:

- a) Maintain the National Standards;
- b) Monitor the application of this standard; and
- c) Undertake periodic reviews of the national standards for PPE, monitor developments of revised international standards and the technologies available to reduce risks.

### **3.3. Employers' responsibilities**

Mine action organisations shall:

- a) Apply this, and any revised national standard, for PPE;
- b) Meet, or exceed, the minimum requirements for the provision of PPE. In this regard, provide PPE to all employees which is serviceable and appropriate to the risk, local operational procedures and environmental conditions;
- c) Provide training and supervision in the correct use and maintenance of PPE;
- d) Establish and maintain SOPs that specify care and maintenance requirements;

- e) Provide suitable facilities for the storage, maintenance and carriage of PPE; and
- f) Establish and maintain periodic reviews and inspection of PPE.

#### **3.4. Employees' obligations**

Employees of mine action organisations shall:

- a) Use PPE in accordance with the requirements specified by their employers and the manufacturer's specification for the PPE, including the use of facilities provided for storage and carriage of PPE;
- b) Maintain the PPE in accordance with the mine action organisation's SOPs and/or the manufacturer's specifications or guidelines; and
- c) Report to the employer, problems with the equipment or suggested improvements to SOPs, which may reduce the requirement for PPE, or improvements in the design or application of PPE.'