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Personal protective equipment

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Warning

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Introduction

The needs to reduce risk and to provide a safe working environment are fundamental principles of mine action management. Risk reduction involves a combination of safe working practices and operating procedures, effective supervision and control, appropriate education and training, equipment of inherently safe design, and the provision and wearing of effective personal protective equipment (PPE) and clothing.

As a minimum, all employees involved in demining 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 risk 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 demining 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.

While the risk to deminers comes from all types of explosive ordnance including Anti Personnel (AP) blast mines, AP fragmentation mines, Anti Tank (AT) mines and ERW, including unexploded sub-munitions, the AP blast mine occurs in the greatest numbers and features in the most accidents. PPE, therefore, is principally designed to defeat the injuries caused by AP blast mines. At close quarters, AP fragmentation mines and AT mines overmatch PPE currently available, however, due to the area effect of such mines, they also have the potential to cause 'secondary victims' and PPE is intended to provide some protection to these.

In general, when unexploded munitions are encountered in humanitarian demining, they have already malfunctioned, they are usually high in metal content, on or near the surface, and constitute less of a hazard than mines. The varied nature of UXO, however, means that the hazard is best dealt with procedurally rather than by relying on PPE designed primarily for humanitarian demining.

Personal protective equipment

1. Scope

The SLNMAS provides specifications and guidance to the NMAO and demining organisations on the minimum requirements of personal protective equipment (PPE), including protective clothing, for use in Sri Lanka during demining operations.

2. PPE Requirements

2.1 General

The primary means of preventing explosive injury in the workplace is by the supervised use of demining tools and processes that reduce the likelihood of an unintended detonation. This is generally effective and unintended detonations are rare events. PPE is provided as a secondary safeguard to protect against the small risk remaining. It is important that the PPE provided should not restrict the application of demining tools and processes in any manner that increases the risk that an unplanned detonation will occur.

The Sri Lankan mine action programme requires that all personnel directly involved in demining and BAC operations shall wear PPE as specified in the relevant operation's standards that conforms fully with the specifications defined in this standard.

Demining organizations shall ensure that PPE are worn in conformance with their approved SOP.

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

The NMAC is the national authority for all mine action activities in Sri Lanka. All equipment being used and procured shall be approved through the accreditation process as described in SLNMAS 2.0. Any organisation planning to conduct demining activities in Sri Lanka shall submit proof that the PPE they are using and/or going to use in Sri Lanka conforms to the requirements in this standard.

2.2 Suitability and appropriateness

PPE provided shall fit the employee, male or female, and be designed to provide reasonable comfort and protection against the predictable risks present at 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. If the predictable risk is from AP blast mines, and ERW containing greater than 240 gm of TNT, and there is a high risk that the mine(s) or ERW may be initiated during the procedures that will be used, the use of other procedures or enhanced protection shall be considered.

2.3 Minimum PPE requirements

PPE shall be capable of protecting the parts of the body that are covered against the blast effects of 240 gm of TNT at distances appropriate to the wearer's activity. The amount of PPE provided shall be determined as a result of a field risk assessment and management decision. The minimum PPE inside the safety distance of a suspected hazardous area or when engaged in any activity that involves being close to mines and ERW, shall be:

- a. Body armour capable of satisfying the ballistic test outlined in STANAG 2920, achieving a V50 rating (dry) of 450m/s for 1.102g fragments. It shall also be

capable of protecting the chest, abdomen and groin area against the blast effects of 240 gm of TNT at 60 cm from the closest part of the body; and

- b. 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 gm of TNT at 60 cm and shall provide protection equivalent to not less than 5 mm of untreated polycarbonate. However, it is recommended that eye protection should be a part of frontal head protection capable of protecting against the blast effects of 240 gm of TNT at 60 cm and providing full frontal coverage of face and throat.

2.4 Fragmentation protection

The fragmentation danger from most fragmentation mines and unexploded sub-munitions cannot be protected against with lightweight and practical PPE. This emphasises the need to minimise risk through the use of inherently safe procedures. Although the level of protection may not be sufficient, PPE provided to reduce the risk from fragmentation mines shall be at least that used as protection against blast hazards described under Clause 2.3 above.

2.5 Hand tools

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. 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. The use of gloves can provide protection against non explosive injury and should be considered.

2.6 Daily working clothes

Demining organisations shall provide proper working clothes to their demining staff that are durable, suitable for the climate they are working in and that provide protection against the harsh vegetation and the ground conditions.

Proper footwear shall also be provided to deminers and immediate supervisors. The footwear shall be a lightweight military style boot. The boot shall not contain a metal cap in the front and the rest of the boot shall also contain as little metal as possible. The sole of the boot shall be rubber with a minimum thickness of 15mm directly under the toe and ball of the foot and the heel of the boot 25mm.

Demining organization should also provide their staff with the necessary protective clothing during bad weather conditions.

3. Responsibilities

3.1 NMAC

The NMAC shall:

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

3.2 Demining Organisations

Demining organisations shall:

- a. apply the documented NMAA standards for PPE;
- b. 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 should be provided to employees which is serviceable and appropriate to the risk, local operational procedures, culture and environmental conditions;
- c. provide training and supervision in the selection of appropriate PPE and 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, carriage, cleaning and maintenance of PPE; and
- f. establish and maintain documented SOPs to undertake periodic reviews of PPE.

3.3 Employees

Employees of demining 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. clean and maintain the PPE in accordance with the demining 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.

