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DDAS Suggested Training Uses: Deminer Training

HD-AID

Humanitarian DeminingAccident and Incident Database

Deminer training

The database provides real-world examples that can be used as training aids. This will often reinforce what is considered to be common sense. Be aware that the database records prove (beyond reasonable doubt) that some common-sense wisdom is incorrect.

For example, it is a myth that the most dangerous time for deminers is shortly after their initial training. On the contrary, there is some evidence to suggest that deminers actually become more likely to have an accident the longer they work as a deminer.

The links below take you to a few examples of accidents that fit a few training topics. There are examples to fit every training need among the database records. Those given here cover:

NEED FOR EYE PROTECTION DURING EXCAVATION

The most frequent activity at the time of an accident is the excavation of the ground - either to investigate a metal-detector (or dog-signal) or when removing the entire ground surface manually. Accidents occur during excavation almost as often as when engaged in all other activities put together, and so the minimum requirement for PPE in the IMAS was designed to protect during "excavation".

Regardless of the requirements of the International Standards, the eye protection that is used in the field varies quite widely. Full-face 5mm polycarbonate visors are widely used, but also goggles and half-visors, masks, safety spectacles and helmets are used. The interface between the frontal body armour and the face/eye protection is often ignored.

Polycarbonate that has been formed using an oven with uneven heat distribution (or has been forced into shape using moulds) can lose its flexibility and become prone to catastrophic failure (shattering). The same is true of polycarbonate that has been subjected to prolonged exposure to sunlight (UVL). Polycarbonate that

has been treated for scratch resistance has been deliberately heat-treated to reduce its softness (and also its flexibility) so should be avoided.

Visors are regularly penetrated by fragments from metal-cased mines and very occasionally by fragments from stones. None of the polycarbonate products sold for eye or face protection are very effective against a hot or ballistic projectile. Their ability to flex very rapidly means that they do provide very good protection against the blast associated with anti-personnel mines and the light and small fragments of soil and plastic mine-casing that result. For this reason, they should be called "Blast-visors" or "Blast goggles". The thinner the material, the lower the protection. 5mm untreated polycarbonate has been proven to work in most anti-personnel blast mines incidents, except when the visor is old and UVL hardened.

Even when full-face visors are issued to deminers, they are very frequently raised when a blast occurs.

This deminer was wearing his visor raised. Severe face injury like this does occur, but is rare. This deminer's face was rebuilt but nothing could be done about the loss of his eyes. Severe eye injury and eye loss is very common even when very little facial damage occurs.

To reinforce the need to wear appropriate eye protection at all times when excavating, the following examples of accidents may be useful.

DDASaccident566.pdf DDASaccident564.pdf DDIV482record.pdf DDIV550record.pdf

DDIV500record.pdf DDASaccident498.pdf DDIV497record.pdf DDASaccident530.pdf

NEED FOR APPROPRIATE HAND-TOOLS

The most frequent activity at the time of an accident is the excavation of the ground - either to investigate a metal-detector (or dog-signal) or when removing the entire ground surface manually. Accidents occur during excavation almost as often as when engaged in all other activities put together, and so the minimum requirement for PPE in the IMAS was designed to protect during "excavation". The IMAS recommend the use of appropriate hand-tools.

Severe hand/arm-injury, covering the amputation of fingers, hands and occasionally upper and lower arms, is the most common severely disabling injury in Humanitarian Demining. It is more common than eye injury or the loss of a foot or lower leg. When the tool being used is short, the deminer's hand is so close to the blast that even small mine-blasts can destroy the user's hand.

When the tool breaks into parts during the blast it can add to the deminer's injury significantly. Parts of brittle plastic handles have penetrated deeply into the deminer's chest. Fragments of metal from the tool have injured the deminer's upper body and face. The blade of the tool has struck the visor hard enough to cut it in two in a few cases.

An appropriate handtool is one that keeps the deminer's hand at least 30cm from any blast, that stays in one piece during a blast, and that encourages the deminer to work at a low angle to the ground. See "Handtools" for further explanation of the design requirements.

To reinforce the need to use appropriate tools at all times when excavating, the following examples of accidents may be useful.

DDASaccident569.pdf DDASaccident564.pdf DDASaccident503.pdf DDASaccident489.pdf

DDASaccident484.pdf DDASaccident453.pdf DDASaccident449.pdf DDASaccident448.pdf

DDASaccident795.pdf

NEED FOR APPROPRIATE METAL DETECTOR (AND PROCEDURES)

There is very little difference between the performance of the top five metal-detectors that are used in demining today. The purchaser's choice may well depend on ergonomic features, static or dynamic modes, ease of training and supervision, durability and battery consumption.

Appropriate training is essential. Metal-detectors are sophisticated tools and many of their users do not have a sophisticated educational background. Training of trainers must cover *WHY* the machine must be used in a particular way in order to reduce the trainer's temptation to simplify the instruction and allow variations in the drills to be adopted. In my experience, very few of the senior staff who select detectors and train in their use have any real understanding of how they work. For example, most do not understand the way that the area beneath the search-head varies according to the ground and the target and so they allow search-head advance to be too rapid to ensure covering the ground to the required depth. See "Metal-detector setup" for details about the use of metal-detectors. Some "specialists" allow detectors designed only to find ferrous material (iron) to search for aluminium targets (the detonators in plastic-cased mines).

The person most likely to step on a missed mine is the deminer who missed it.

When mines are not detected, their metal-content is likely to be beneath 8cm in the ground. Depending on the design of the fuzing system and the hardness of the ground, this can mean that the mine is not detonated if the deminer steps on the ground above it. When that happens it is left behind and may detonate when the ground is soft, when it is dug over for agriculture, or when erosion exposes it. If a mine is left within the agreed clearance depth for that country (usually 10 or 13cm) the demining group have broken their contract with the National Authority and with the end-users of the land because the purpose of demining (as stated in the IMAS) is the removal all *ALL* mines and ERW to an agreed depth.

To reinforce the need to use detectors that can find the targets in the correct manner, the following examples of accidents may be useful.

DDASaccident496.pdf DDASaccident547.pdf DDASaccident508.pdf DDASaccident234.pdf

DDASaccident499.pdf DDASaccident456.pdf DDASaccident427.pdf DDASaccident168.pdf

NEED FOR ADEQUATE SITE MARKING

Marking inside a demining worksite usually involves using painted pickets, plastic or woven tape, painted rocks or flags. Marking the dividing line between the area cleared and the area that is still to be worked on is obviously essential, but it is not always done. Many of the accidents involving a deminer stepping on a mine

occur when he/she steps outside the cleared area without knowing it.

Marking the dividing line between searched and unsearched land has to be advanced as work progresses so requires constant attention. Markers may also be removed or damaged by weather, livestock or local people during break periods and must be replaced as soon as the deminers return. Failure to maintain clear marking of the extent of the cleared area is probably responsible for one in five of all demining accidents.

To reinforce the need to introduce and maintain a clear marking system that everyone understands at all times, the following examples of accidents may be useful.

DDASaccident468.pdf DDASaccident570.pdf DDASaccident392.pdf DDASaccident373.pdf

DDASaccident567.pdf DDASaccident399.pdf DDASaccident328.pdf DDASaccident078.pdf

NEED NOT TO HANDLE DEVICES UNNECESSARILY

An unexpected number of disabling or fatal accidents are suffered when handling devices. Surprisingly, many of these involve highly trained or experienced specialists (frequently internationals) handling devices out of curiosity or without "good" reason. They are frequently breaking their employer's SOPs, often wearing no protection at all, and apparently taking risks without good reason. It is worth stressing to ERW specialists (EOD Techs, etc) that the accident record shows that they are not invulnerable. A few examples below also occurred when international demining groups had implemented inadequate or patently unsafe procedures.

To reinforce the lesson that experience and training do not licence anyone to break safety rules, the examples below may be useful. Higher numbers refer to later accidents. There are many others scattered throughout the database.

DDASaccident028.pdf DDASaccident049.pdf DDASaccident 338.pdf DDASaccident467.pdf

DDASaccident542.pdf DDASaccident591.pdf DDASaccident726.pdf DDASaccident743.pdf

DDASaccident747.pdf DDASaccident786.pdf DDASaccident795.pdf DDASaccident796.pdf

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