8 PERSONAL PROTECTIVE EQUIPMENT

8.1 Introduction

8.1.1 Risks to the health and safety of seafarers must be identified and assessed. It will often not be possible to remove all risks, but attention should be given to control measures that will make the working environment and working methods as safe as reasonably practicable.

S.I. 1999/2205, MSN 1870(M+F), Reg. 5

8.1.2 Personal protective equipment (PPE) must be used only when risks cannot be avoided or reduced to an acceptable level by safe working practices. This is because PPE does nothing to reduce the hazard and can only protect the person wearing it, leaving others vulnerable.

8.1.3 Controls should be chosen taking into account various factors. In order of effectiveness these are:

- elimination;
- substitution by something less hazardous and risky;
- enclosure (enclose the hazard in a way that eliminates or controls the risk);
- guarding/segregation of people;
- safe system of work that reduces the risk to an acceptable level;
- written procedures that are known and understood by those affected;
- reviewing the blend of technical and procedural control;
- adequate supervision;
- identification of training needs;
- information/instruction (signs, hand-outs); and
- PPE (last resort) – cannot be controlled by any other means.

8.1.4 It should be noted that the use of PPE may in itself cause a hazard, e.g. through reduced field of vision, loss of dexterity or agility.

8.2 General requirements

8.2.1 The Company must ensure that seafarers are provided with suitable PPE where it is needed.

Reg. 6(1)

8.2.2 As a general rule, PPE should be supplied at no cost to the seafarer. The exception to this is where it is not exclusive to the workplace, and so seafarers may be required to contribute to the cost, or when seafarers wish to have equipment that exceeds the minimum standards required by legislation (e.g. a more attractive design).

Reg. 6(3)

8.2.3 The Company should assess the equipment required to ensure that it is suitable and effective for the task in question, and meets the appropriate standards of design and manufacture.

8.2.4 Suitable equipment should:

- be appropriate for the risks involved, and the task being performed, without itself leading to any significant increased risk;
- fit the seafarer correctly after any necessary adjustment;
- take account of ergonomic requirements and the seafarer's state of health; and
- be compatible with any other equipment that the seafarer has to use at the same time, so that it continues to be effective against the risk.

MSN 1870(M+F), Reg. 6(2)

8.2.5 Details of PPE are listed in a merchant shipping notice (MSN), including the full title of each relevant standard. The appropriate PPE of the required standard must be supplied for seafarers doing the tasks listed in the M notice. However, this should not be considered an exhaustive list and PPE must be supplied wherever risk assessment indicates that there is a risk to health and safety from a work process that cannot be adequately controlled by other means, but which can be alleviated by the provision of such clothing or equipment.

8.2.6 The Company must also ensure that PPE is regularly checked and maintained or serviced. Records should be maintained of servicing and any repair required and carried out.

Reg. 8

8.2.7 All seafarers required to use protective equipment must be properly instructed and trained in its use. This should include being advised of its limitations and why it is needed. A record should be kept of who has received training.

Reg. 9

8.2.8 Defective or ineffective protective equipment provides no defence. It is therefore essential that the correct items of equipment are selected and that they are properly maintained at all times. The manufacturer's instructions should be kept safe with the relevant apparatus and, if necessary, referred to before use and when maintenance is carried out. PPE should be kept clean and should be disinfected as and when necessary for health reasons.

Reg. 8(4)

8.2.9 A competent person should inspect each item of protective equipment at regular intervals and in all cases before and after use. All inspections should be recorded. Equipment should always be properly stowed in a safe place after use.

Reg. 8(4)

8.3 Seafarer duties

Reg. 10

8.3.1 Seafarers must wear the protective equipment or clothing supplied when they are carrying out a task for which it is provided, and follow appropriate instructions for use.

8.3.2 PPE should always be checked by the wearer each time before use. Seafarers should comply with the training they have received in the use of protective items, and follow the manufacturer's instructions for use.

8.4 Types of equipment

8.4.1 Overalls, gloves and suitable footwear are the proper working dress for most work about ship but these may not give adequate protection against particular hazards in particular jobs. Specific recommendations for the use of special PPE will be found in relevant chapters of this Code, but there will be other occasions when the need for such special protection will be identified by the risk assessment carried out by the officer in charge at that particular time.

8.4.2 PPE must always be selected according to the hazard being faced and the kind of work being undertaken, in accordance with the findings of the risk assessment.

8.4.3 PPE can be classified as follows:

Type	**Examples**
Head protection	Safety helmets, bump caps, hair protection
Hearing protection	Earmuffs, earplugs
Face and eye protection	Goggles and spectacles, facial shields
Respiratory protective equipment	Dust masks, respirators, breathing apparatus
Hand and foot protection	Gloves, safety boots and shoes
Body protection	Safety suits, safety belts, harnesses, aprons, high-visibility clothing
Protection against drowning	Lifejackets, buoyancy aids and lifebuoys
Protection against hypothermia	Immersion suits and anti-exposure suits

8.5 Head protection

Safety helmets

8.5.1 Safety helmets are most commonly provided as protection against falling objects. They can also protect against crushing or a sideways blow, and chemical splashes.

8.5.2 Since the hazards may vary, it will be appreciated that no one type of helmet would be ideal as protection in every case. Design details are normally decided by the manufacturer

whose primary consideration will be compliance with an appropriate standard (see section 8.2.5). The standard selected should reflect the findings of the risk assessment.

8.5.3 The shell of a helmet should be of one-piece seamless construction designed to resist impact. The harness or suspension, when properly adjusted, forms a cradle for supporting the protector on the wearer's head. The crown straps help absorb the force of impact. They are designed to permit a clearance of approximately 25 mm between the shell and the skull of the wearer. The harness or suspension should be properly adjusted before a helmet is worn. Safety equipment should be used in accordance with manufacturer's instructions.

Bump caps

8.5.4 A bump cap is an ordinary cap with a hard penetration-resistant shell. They are useful as protection against bruising and abrasion when working in confined spaces such as a main engine crankcase or a double bottom tank. They do not, however, afford the same protection as safety helmets and are intended only to protect against minor knocks.

Hairnets and safety caps

8.5.5 Seafarers working on or near to moving machinery should always be aware of the possibility of their hair becoming entangled in the machinery. Long hair should always be covered by a hairnet or safety cap when working with or near moving machinery.

8.6 Hearing protection

8.6.1 All seafarers exposed to high levels of noise (e.g. in machinery spaces) should wear ear protection of a type recommended as suitable for the particular circumstances. Protectors are of three types: earplugs, disposable or permanent, and earmuffs. For further information see the *Code of Practice for Controlling Risks due to Noise on Ships* and Merchant Shipping and Fishing Vessels (Noise at Work) Regulations 2007.

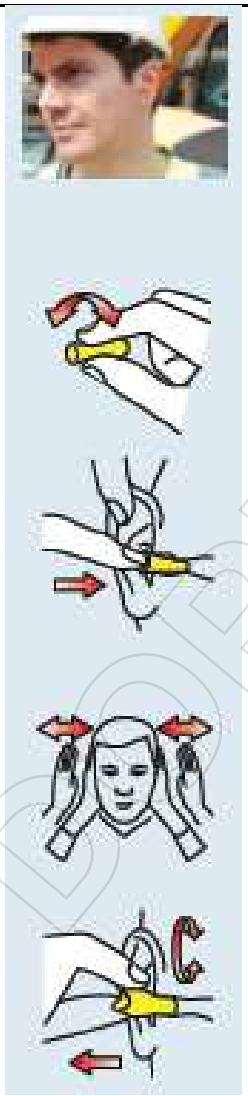
S.I. 2007/3075
MGN 352(M+F)

Earplugs

8.6.2 The simplest form of ear protection is the earplug. This type, however, has the disadvantage of limited capability of noise level reduction.

8.6.3 Earplugs made from rubber or plastic also have only a limited effect, in that extremes of high or low frequency make the plug vibrate in the ear canal causing a consequential loss in

protection. It may be difficult to keep re-usable earplugs clean on a ship and disposable earplugs are recommended. Earplugs should never be used by anyone with ear trouble, without medical advice.



General fitting instructions for disposable earplugs

Earplugs offer excellent protection against noise, but only if they are fitted correctly.

Make sure that your hands are clean before fitting any earplugs.

Hold the earplug between your thumb and index finger. Roll and compress the whole earplug, use your other hand to reach over your head and pull up and back on your outer ear. This straightens the ear canal and makes way for a tight and snug fit.

Insert an earplug in each ear canal and hold for 20–30 seconds. This enables the earplug to expand and fill your ear canal.

Test the fit of your earplugs

In a noisy environment, and with your earplugs inserted, cup both your hands over your ears and release. You should not notice any significant difference in the noise level. If the noise level appears to reduce when your hands are cupped over your ears, your earplugs are probably not correctly fitted. Remove and refit your earplugs.

Always remove your earplugs slowly. Twist them to break the seal. Removing your earplugs too quickly could damage your eardrum.

Always read the manufacturer's instructions and get guidance on how to wear earplugs correctly.

Do not reuse disposable earplugs.

Do not share your earplugs.

Protect it or lose it

Earmuffs

8.6.4 In general, earmuffs provide a more effective form of hearing protection. They consist of a pair of rigid cups designed to completely envelope the ears, fitted with soft sealing rings to fit closely against the head around the ears. The ear cups are connected by a spring-loaded headband (or neck band), which ensures that the sound seals around the ears are maintained. Different types are available, and provision should be made according to the circumstances of use and expert advice.

General fitting instructions for earmuff ear protection

Earmuffs offer excellent protection against noise but only if the cups are fitted and adjusted correctly.

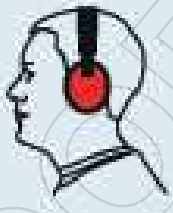
Your ears must be completely enclosed within the ear cups.

Adjust the cups up or down to ensure that the headband fits securely on the crown of your head. The best performance is obtained when the cup cushions make a tight seal against your head.

Test the fit of your earmuffs

In a noisy environment, place the palms of your hands on both cups, push the cup cushions towards your head then release the cups. You should not notice any significant difference in the noise level. If the noise level appears to reduce when you press the cups, your earmuffs are probably not correctly fitted.

Check the cup cushion regularly for wear and tear. Clean them regularly with a damp hygienic cloth or wipe. If the cup cushions become hard, damaged or deteriorate they must be replaced immediately.



Always read the manufacturer's instructions and get guidance on how to wear earmuffs correctly.

Do not share your earmuffs.

Protect it or lose it

8.7 Face and eye protection

8.7.1 The main causes of eye injury are:

- infra-red rays (gas welding);
- ultra-violet rays (electric welding);
- exposure to chemicals; or
- exposure to flying particles and foreign bodies.

Face and eye protectors are available in a wide variety, designed to international standard specifications, to protect against these different types of hazard (see section 8.2.5).

8.7.2 Ordinary prescription (corrective) spectacles, unless manufactured to a safety standard, do not afford protection. Certain box-type goggles are designed so that they can be worn over ordinary spectacles.

8.8 Respiratory protective equipment

8.8.1 Respiratory protective equipment is essential for protection when work has to be done in conditions of irritating, dangerous or poisonous dust, fumes or gases. There are two main types of equipment, which perform different functions:

- A respirator filters the air before it is inhaled.
- Breathing apparatus supplies air or oxygen from an uncontaminated source.

8.8.2 Advice on selection, use and maintenance of the equipment is contained in the relevant standard. This should be available to all those concerned with the use of respiratory protective equipment on board ship (see section 8.2.5).

8.8.3 It is most important that the face piece of respirators and breathing apparatus is fitted correctly to avoid leakage. The wearing of spectacles, unless adequately designed for that purpose, or having a beard is likely to adversely affect the face seal. This is a particularly important consideration in emergency situations.

Respirators

8.8.4 The respirator selected must be of a type designed to protect against the hazards being met.

8.8.5 The dust respirator gives protection against dusts and aerosol sprays but not against gases. There are many types of dust respirator available but they are generally of the ori-nasal type, i.e. half-masks covering the nose and mouth.

8.8.6 Many types of light, simple face masks are also available and are extremely useful for protecting against dust nuisance and non-toxic sprays, but should never be used in place of proper protection against harmful dusts or sprays. Types of respirator include the following:

- The positive pressure-powered dust respirator incorporates a battery-powered blower unit, connected by a tube to the face mask to create a positive pressure in the face piece. This makes breathing easier and reduces face-seal leakage.
- The cartridge-type of respirator consists of a full face-piece or half-mask connected to a replaceable cartridge containing absorbent or adsorbent material and a particulate filter. It is designed to provide protection against low concentrations of certain relatively non-toxic gases and vapours.

- The canister-type of respirator incorporates a full face-piece connected to an absorbent or adsorbent material contained in a replaceable canister carried in a sling on the back or side of the wearer. This type gives considerably more protection than the cartridge type.

8.8.7 The filters, canisters and cartridges incorporated in respirators are designed to provide protection against certain specified dusts or gases. Different types are available to provide protection against different hazards and it is therefore important that the appropriate type is selected for the particular circumstances or conditions being encountered. It must be remembered, however, that they have a limited effective life and must be replaced or renewed at intervals in accordance with manufacturers' instructions.

8.8.8 **Respirators provide no protection against an oxygen-deficient atmosphere**. They are designed to purify the air of specific contaminants and they do not supply any further air. They should never be used to provide protection in dangerous (enclosed) spaces such as tanks, cofferdams, double bottoms or other similar spaces against dangerous fumes, gases or vapours. Only breathing apparatus (self-contained or airline) is capable of giving protection in such circumstances.

Personal gas monitors

8.8.9 Personal gas monitors should be carried when working in dangerous spaces. The type of monitor should be determined by a competent person within a safe system of work, and will depend on the circumstances and knowledge of possible contaminants.

8.8.10 Where there is a potential risk of flammable or explosive atmospheres, monitors specifically designed to measure for these will be required. All such monitors should be specifically suited for use in potentially flammable or explosive atmospheres.

8.8.11 Monitors should be in good working order, and calibrated and tested either in accordance with the manufacturer's recommendations, or in line with another schedule identified from the findings of the risk assessment.

8.8.12 Personal gas monitors must only be used in conjunction with the procedures set out in Chapter 15 when entering a dangerous space.

Breathing apparatus

8.8.13 The type of breathing apparatus to be used when entering a space that is known to be, or suspected of being deficient in oxygen, or containing toxic gas or vapours, is given in section 15.13.

8.8.14 Breathing apparatus should not be used underwater unless the equipment is suitable for the purpose, and then only in an emergency.

Resuscitators

8.8.15 It is recommended that resuscitators of an appropriate kind should be provided when any person may be required to enter a dangerous space (see Chapter 15, Entering dangerous (enclosed) spaces).

8.9 Hand and foot protection

Gloves

8.9.1 The exact type of glove selected will depend on the kind of work being undertaken or the particular substance being handled and, in these cases, expert advice should be followed. The following are general rules:

- Leather gloves should generally be used when handling rough or sharp objects.
- Heat-resistant gloves should be used when handling hot objects.
- Rubber, synthetic or PVC gloves are generally best for handling acids, alkalis, various types of oils, solvents and chemicals in general.

Footwear

8.9.2 Foot injuries most often result from the wearing of unsuitable footwear (e.g. sandals, plimsolls and flip-flops) rather than from failure to wear safety shoes and boots. It is nevertheless strongly advisable that all personnel whilst at work on board ship wear appropriate safety footwear.

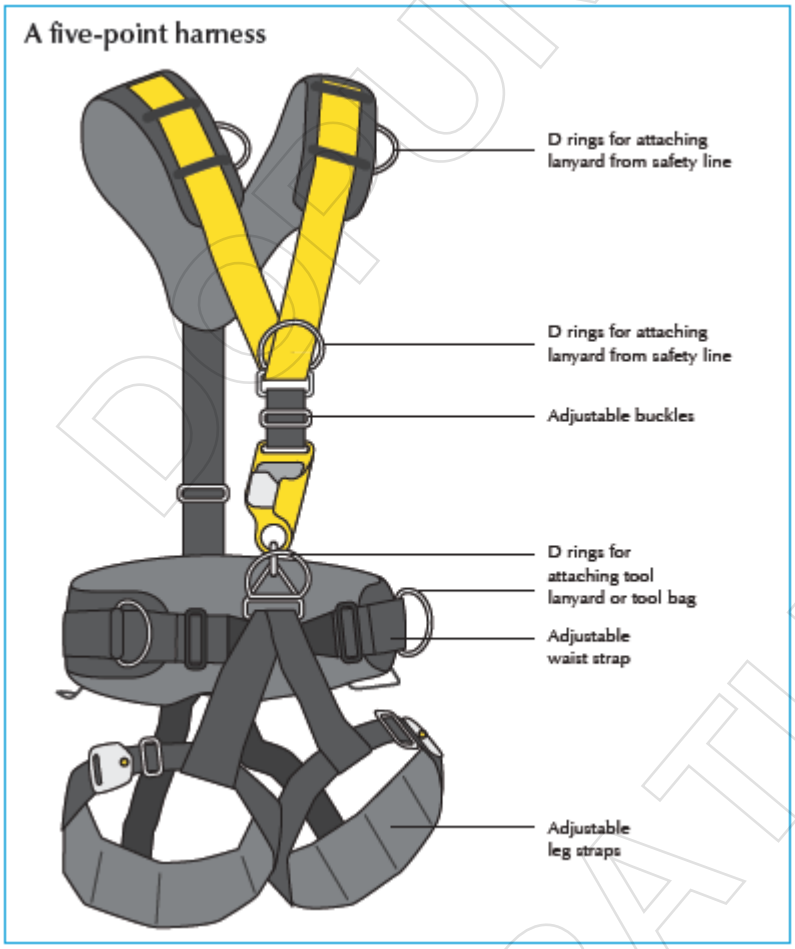
8.9.3 Injuries are commonly caused by impact, penetration through the sole, slipping, heat and crushing. Safety footwear is available that is designed to protect against these or other specific hazards identified in the risk assessment, manufactured to various standards appropriate to the particular danger involved (see section 8.2.5).

8.10 Protection from falls

8.10.1 All personnel who are working at height (i.e. in any position from which there is a risk of falling) should wear a safety harness (or belt with shock absorber) attached to a

lifeline. If a vessel is shipping frequent seas, nobody should be required to work on deck unless absolutely necessary. However, where this is unavoidable, persons on deck should wear a harness and, where practicable, should be secured by lifeline as a protection from falls, and from being washed overboard, or against the ship's structure. (see also Chapter 17, Work at height.)

8.10.2 Inertial clamp devices allow more freedom in movement.



8.11 Body protection

8.11.1 Special outer clothing may be needed for protection when personnel are exposed to particular contaminating or corrosive substances. This clothing should be kept for the particular purpose and dealt with as directed in the relevant sections of this Code.

8.11.2 High-visibility clothing should be worn when it is important to be seen to be safe, e.g. during loading and unloading operations.

8.12 Protection against drowning

8.12.1 Where work is being carried out overside or in an exposed position where there is a reasonably foreseeable risk of falling or being washed overboard, or where work is being carried out in or from a ship's boat, a lifebuoy with sufficient line should be provided. In addition and, as appropriate, a working lifejacket, a personal flotation device or a buoyancy aid should be worn. Where necessary, personnel should be provided with thermal protective clothing to reduce the risks of cold shock.