PPE Safe System of Work

1 Summary

The company has a duty under the Management of the Health and Safety at Work Regulations to carry out risk assessments for all significant risks. Where this risk assessment determines that personal protective equipment is required the company has a duty to provide that equipment free of charge, to maintain and replace that equipment, to train employees in its use and to provide storage if required.

2 Use of PPE

There are many uses of PPE which include:

- to provide protection in the event of something going wrong, eg something falling onto an employee's head or toes
- as back-up to other control systems
- first-line protection to enable a job to be done that could not be done otherwise, or at least with difficulty to protect the product, eg contaminants in the food industry.

3 Provision of PPE

However, PPE should be used only as a "last resort", and then employers must provide appropriate PPE and training in its correct use (see Training). The Management of Health, Safety and Welfare Regulations 1992 (MHSWR) require all employers to identify and assess risks to their employees' health and safety at work so that appropriate action can be taken to eliminate or control those risks to an acceptable level. Elimination, engineering controls and use of safe systems of work should always be considered and implemented before PPE is used to protect against residual risks.

Where the risks are considered to be low and do not need further control, the provision of PPE is unnecessary. The adequate control of risks is the standard that has to be achieved. The duty on the employer is to do this "so far as is practicable" and it should be noted that this is a stricter duty than "so far as is reasonably practicable". This duty entails ensuring that the fullest extent of what is technically possible has been achieved: the cost of this is not relevant to the duty, even thought PPE can be expensive.

There are cases where PPE cannot provide complete protection and the duty on the employer is to provide the PPE which offers the best protection to the user which is practicable when all factors (eg of risk and of the individual) have been considered. Clothing provided to protect against radiant heat and flames in the steel industry, or for fire-fighters, cannot provide total protection and so other measures to ensure the wearer's health and safety must be taken. PPE should not be used if the risk caused by using it is greater than the risk against which it is meant to protect.

4 Suitability of PPE

In order for PPE to be suitable, certain ergonomic factors must be considered. PPE should, therefore, be selected bearing in mind the sort of work that is being done and the demands

this may place on the employee wearing the PPE. This would include considering the following points:

(a) the physical effort necessary for the task
(b) any additional effort imposed by wearing the PPE
(c) the method of work
(d) how long the PPE has to be worn
(e) requirements for visual ability of the wearer
(f) ease of communication whilst wearing the PPE.

It is essential to consult with the potential wearers to ensure the most appropriate selection of these and other factors such as fit and comfort.

Other factors (this is not an exhaustive list) should also be considered if PPE is to be suitable:

- mobility
- detexerity
- manual handling
- hearing
- wind pressure if worn out of doors
- entry into restricted spaces
- thermal aspects
- decontamination.

5 Compatibility

Each individual item of PPE must be designed so that it can be used with other items of PPE, where applicable. A common problem is the need for employees to wear eye protection and respiratory protection at the same time and, unless care is taken in the selection of both items, one may interfere with the correct fit and, therefore, protection of the other. Acceptability of the combination will influence whether the PPE is used hence employees should be involved in the selection. Where PPE is already in use, the desired characteristics should be compared with the specification of those already in use to ensure the required protection can be achieved.

6 Assessment

As discussed in the above section, Provision of PPE, the MHSWR require all employers and the self-employed to carry out an assessment of risks to health and safety at work. The purpose of the assessment is to ensure that any PPE chosen as a means of controlling the risk or risks identified is suitable for the particular risks involved and the circumstances in which it is to be used. The level of risks which needs to be protected against must be assessed. An assessment should also consider the characteristics the PPE will need to have to protect against those risks.

For the simplest examples there is no need to record the assessment for the selection of PPE but it is still wise to keep a simple record of the hazard to be protected against and the type of PPE chosen. For more complex assessments, details should be recorded and kept readily available.

The risks at the workplace and the parts of the body affected are important aspects of the assessment.
Some of the tasks that could be considered for risk assessment include:

- using lasers
- spray painting
- use of adhesives and solvents
- steam cleaning
- welding
- working with power tools.

7 Maintenance and Storage of PPE

7.1 Maintenance

Once selected, a system of maintenance of PPE is necessary to ensure that PPE can continue to provide the designated level of protection. Maintenance will include cleaning, disinfection, examination for defects, replacement or repair and testing. Some or all of this may be done by the wearers after they have been properly instructed and trained.

A written system should be introduced which lays down the responsibilities for maintenance. The procedures to be followed, methods of examination, ways of cleaning and the frequency should be specified. Where appropriate, examination and testing should be recorded.
In most cases, PPE should be examined to ensure it is in good working order before being issued to a wearer. It should also be examined before actually being used and should not be used if found to be defective. This examination before use should be carried out by properly trained employees following manufacturers' information.

Where PPE is not issued for the sole use of an individual, arrangements for cleaning and disinfecting before re-issue will be required.

7.2 Storage

Arrangements need to be made to keep PPE safe when not in use. This may range from hooks for outdoor coats or safety helmets to lockers for larger items. The accommodation may consist of a wallet or case for safety spectacles, which can be carried by the individual user. Where workers are mobile, suitable containers may need to be provided for storage in vehicles. The storage should provide adequate physical protection and prevent contamination from harmful substances. It should also keep PPE clean and prevent exposure to sunlight if necessary (eg plastic helmets can be adversely affected).

If the PPE becomes contaminated in use it may be necessary to have separate accommodation from that provided to individuals for their other work clothing or ordinary clothing. If particularly dirty activities are involved, the ease of cleaning the storage facilities

should be taken into account when planning and installing them. The Workplace (Health, Safety and Welfare) Regulations 1992 deal with the requirement to provide accommodation for ordinary work clothing.

8 Reporting lost or defective PPE

In addition, there must be arrangements for reporting lost or defective PPE, so that it can be returned to good working order before an employee needs it again. Employers must ensure that employees are informed of their responsibility to report any loss or obvious defect as soon as possible to their employer. The employer must also ensure that employees take reasonable care of any PPE issued to them and that they consult with their employer if they have any concerns about its serviceability.

9 Standards of PPE

PPE has often been required to comply with established standards, for example eye protection has to be made to British Standard (BS) 2092, and this principle is now being extended within the European Community. The Personal Protective Equipment Directive (89/686/EEC) has led to the drawing up of Regulations to ensure appropriate standards for PPE used at work. The Personal Protective Equipment (EC Directive) Regulations 1992 (as amended) came into effect on 1.1.93. Under these Regulations, most PPE made or sold in the UK, including imports, must satisfy wide-ranging safety requirements based on various levels and classes of protection.
For PPE of "simple design", it must be subject to a manufacturer's declaration of conformity. For PPE of "non-simple design" affording protection against minimal risks, it must be subject to type-examination by an Approved Body (an EC type-examination is a procedure carried out by a body approved by a Member State, to establish and certify that prototype PPE satisfies the relevant provisions of the PPE Directive (89/686/EEC)).

For PPE of "complex design" it must be subject to type-examination by an Approved Body and be subject to ongoing production surveillance by an Approved Body (or satisfy other approved methods of manufacture). It must carry the CE marking and necessary information (CE marking indicates that the PPE has been satisfactorily type-examined by an Approved Body or in the case of PPE of "simple design" the manufacturer has made a declaration of conformity). It must also be accompanied by instructions in the official language of the country of use. In addition, the manufacturer must draw up and keep available a technical file relating to the PPE.
However, the requirements do not apply to PPE supplied in the EC before 1.1.93 or to PPE covered by other Directives designed to achieve the same objectives as this Directive, or to second-hand PPE, or to retailers of PPE.

10 Purchasing PPE

From 30.6.95 virtually all PPE should carry a CE mark. After this date only CE marked PPE should be sold or purchased. PPE in use before the above date may continue in use for as long as it remains suitable for the use to which it is being put.

11 Disadvantages of Using PPE

It should be remembered that use of PPE is expensive and may not provide the level of protection desired. PPE is seldom 100% effective, and its effectiveness is not easily measured. PPE may impede access, limit visibility or mobility and impose extra strain on the user, eg heat stress when wearing chemical protection suits. Additionally, use of PPE is very dependent on good discipline but some users are careless, foolhardy or indifferent and hence the level of protection is not as good as it could be. PPE only protects the wearer or user. Measures controlling the risk at source protect everyone within range of the risk and are clearly more effective and desirable.

12 Situations Where the PPE Regulations do not Apply

The PPE Regulations do not apply where, in any of the following sets of Regulations, there is a more comprehensive requirement for the provision and use of PPE:

– Control of Lead at Work Regulations 1980
– Ionising Radiations Regulations 1985
– Control of Asbestos at Work Regulations 1987
– Construction (Head Protection) Regulations 1989
– Noise at Work Regulations 1989 (NAWR)
– Control of Substances Hazardous to Health Regulations 1994 (COSHH).

13 Charging for PPE

An employer cannot charge employees for anything done or provided in order to comply with a specific requirement of a relevant statutory provision. The PPE Regulations impose such a specific requirement where a risk assessment has been made under the MHSWR and a residual risk or risks exist after other control measures have been applied. Provision of PPE would, therefore, be a specific requirement. In these circumstances, no charge can be made by the employer for PPE which is used only at work.

14 Duty of the Self-employed

Self-employed persons are also required to carry out assessments of risk to their own health and safety under MHSWR and have a duty to provide themselves with appropriate PPE where there are residual risks which cannot be controlled by any other means.

15 Types of PPE

15.1 Head protection

Head protection may be required in the following work processes:

- construction and building, particularly in the vicinity of scaffolding
- underground work including working in pits, trenches and tunnels.

Industrial safety helmets can protect against falling objects or impact with fixed objects and are the most commonly thought of type of head protection and the one normally found on building sites. On building sites there will be designated "hard hat" areas and it is mandatory to wear safety helmets in them. The only exception to this rule is turban-wearing Sikhs, who are exempt and so they should be considered in the risk assessment.

Most safety helmets are plastic and can be seriously weakened if paint is applied, if solvents are used for cleaning or if stickers are affixed. All these can chemically weaken the shell, causing deterioration. Storing helmets in the back window of a car, where they could be in direct sunlight or in heat, will quickly weaken the plastic. The employer must ensure that safety helmets are never modified by drilling holes or being cut, and the internal harness or headband must never be modified. Also employers must ensure that hard hats are never worn the wrong way round which is often seen as fashionable and trendy.

In all cases comfort is important and may be influenced by:

- the flexibility of the headband, its width, contour and adjustability
- a replaceable or easily cleanable absorbent sweat band
- textile cradle straps
- chin straps, if fitted, that do not cross the ears, are made from non-irritant materials, have smooth adjustment buckles and are compatible with other PPE.

15.1.1 Issue and maintenance

The need for head protection has long been recognised and was made a legal requirement through the Construction (Head Protection) Regulations 1989. These Regulations do not require blanket usage of head protection, only where there is a risk of head injury. Once provided, the employees have a duty to wear the head protection properly.

Some activities and types of head protection may not come within the scope of the PPE Regulations.
Hairnets used for purposes of hygiene control would not be included but such hairnets used to contain hair where there was a risk of entanglement with moving machinery would be.

Motorcycle crash helmets used by employees on the public road would not be included, as road traffic legislation is more relevant, but s.2 of the Health and Safety at Work, etc Act 1974 (HSW Act) still applies. There may be times when such helmets are required at work, for instance when employees drive all-terrain vehicles or motorcycles on farmland; in these cases the Regulations would apply.

It is important for all forms of head protection to fit correctly and manufacturers' guidance on this should be followed. All forms of head protection must be compatible with the work being done.

Head protection used in the food industries must be easy to clean, whilst that for use on building sites must be robust. A chin strap is essential if much stooping or leaning forward is necessary. For hardened forms of protection, the shell must be the correct size, and harnesses, nape band and chin strap of safety helmets easily adjustable for the individual wearer. The size should be capable of incorporating thermal liners if these are to be used during the winter. If other hazards are likely to be present in the workplace, this could

require other PPE which may interfere with the safety helmet. If high noise levels are likely to require the use of hearing protection, for example, then a safety helmet design incorporating ear defender attachments may be most appropriate.

Head protection is often seen lying around when not in use but, as with any other equipment, correct storage to maintain its performance, and to minimise replacement costs, is essential. It should be visually inspected regularly by the users to identify any damage or to see if there is a need to replace sweat bands or chin straps. If it is to be reissued to another person, it must be thoroughly cleaned, inspected and serviced as necessary.

Plastic shells can be damaged through striking or being hit by falling or thrown objects. They should be replaced if a severe impact has occurred and if there are deep scratches or any visible cracks. Further reduction of protection can result from exposure to chemicals, exposure to heat or sunlight, ageing due to heat, sunlight, humidity or rain.

Head protection should never be stored in that commonly seen position on the rear parcel shelf of the car, or on radiators or window sills.

15.2 Eye protection

Eye protection may be required in the following:

- handling chemical substances such as acids, alkalis and other corrosive or irritant substances
- working with molten metals
- working with abrasive wheels or any machine likely to eject particles
- during welding operations where intense light may otherwise cause damage to the eye.

Types of protectors available include safety spectacles, eyeshields, goggles, visors or faceshields.

15.2.1 Safety spectacles.

These appear similar to prescription spectacles but usually incorporate sideshields to give limited lateral protection to the eyes. They provide protection against lesser impacts, the lenses being made from toughened glass or tough optical quality plastic such as polycarbonate. Most manufacturers are able to supply a range of safety spectacles fitted with prescription lenses.

15.2.2 Eyeshields. Eyeshields are like safety spectacles but usually designed with a frameless, one-piece moulded lens. Vision cannot be corrected as with safety spectacles but certain designs of eyeshield may be worn over prescription spectacles.

15.2.3 Faceshields. Faceshields protect the face but as they do not fully enclose the eyes, and they do not provide protection against dusts, gases, mists or vapours. With appropriately designed brow guards and shield, they may give a high level of protection against direct splashing of liquids and may give a high level of impact protection.

15.2.4 Goggles. Goggles usually consist of a flexible plastic frame into which is fitted a one-piece lens and they usually have an elastic headband. They give a greater degree of protection than spectacles or eyeshields as the tough plastic frame should be in contact with the face around its whole periphery. Lenses may be of plastic or toughened glass and are usually replaceable. Goggles are prone to misting and over the years many designs have been developed to reduce this. Some may be double glazed and/or treated with an anti-mist coating. Vents may be fitted and consist of perforations around the frame to give "direct ventilation" but these reduce the level of protection against dusts, gases or splashes.

15.2.5 Issue and maintenance

If assessing the risk of eye injury and the need for protection, employers should identify the type of hazard present such as liquid splashes or projectiles. The likely size and speed of projectiles will influence the type of eye protection most suitable. Eye protection can then be selected from CE marked eye protectors available for protection against different risks such as liquid splashes, molten metal splash, dusts, gases, chemical splash or impact. Eye protection should usually be issued on a personal basis and then used only by that person. If eye protection is reissued to another person it should first be thoroughly cleaned and sanitised. A suitable record of issue should be kept. Eye protectors should be protected by being kept in suitable cases when not in use. Larger items, such as visors, may need to be kept in small lockers.

The following should be remedied immediately:

– damage to side frames of spectacles
– loose sideshields
– elastic bands losing their elasticity
– damage to visor support headbands

15.3 Hand and arm protection

Hand protection may be required for the following work practices:

- handling chemical substances where there is a risk of dermatitis or of damage to skin tissue
- during construction and outdoor work
- where there is a risk of cuts or abrasions
- where articles may be hot, cold or slippery
- where there is a risk of electrical shock when using vibratory tools.

The range of gloves and other protection is vast with different materials having different properties.

Gloves can be made up of anything from PVC which are resistant to oil, grease, acids and solvents to latex which has excellent strength and temperature resistance.

15.3.1 Issue and maintenance

As well as the types of gloves there are also many variation within that length and thickness, lining, grip, cuff style and of course size. The glove is often seen as a simple, easily used form of protection. It is not. Care in selection must be followed by proper training of the wearer in their use. This must include training in inspection for holes, cuts, distortion or wear before use. The training must explain the hazards being protected against, and any limitations of the protection being issued. It must also be properly recorded.

Cleaning of gloves is very frequently overlooked yet can significantly improve their life expectancy and reduce the risk of cross-contamination and development of skin irritation or dermatitis. Repeated washing may remove fungal or bacterial inhibitors from linings which will need to be replaced.

Methods of donning and removing gloves should be explained as this can seriously influence the risk of skin contamination. Gloves contaminated on the inside can be a frequent problem. Washing before removal is one aid to reducing this risk. During use, good discipline by the wearer is needed to prevent touching other parts of the body, especially eyes and mouth.

15.4 Foot and lower leg protection

Foot protection may be required in the following:

- where there is a risk from molten metal splashes
- to prevent injury from falling objects
- where special slip-resistance is required
- in flammable atmospheres, where the build-up of static electrical charges creates a risk of explosion.

Foot protection encompasses the use of:

– safety boots and shoes
– wellingtons, often including protective toecaps
– clogs
– footwear to control anti-static or electric hazards
– specialised boots or footwear relevant to industry hazards.

In the foundry industry, protection may include gaiters used in conjunction with boots to provide protection to the leg and foot from splashes of molten metal.

15.4.1 Issue and maintenance

Boots and shoes should have treaded soles to give slip resistance. They may need to be resistant to oil, heat, chemicals, be anti-static or electrically conductive and provide impact shock protection.

Soles which are stitched or glued to uppers may leak or separate exposing the foot to the hazard.

Footwear with steel midsole protection may be needed where there is a risk of penetration injuries from nails or similar objects.

Footwear for use in very wet activities must be impervious to water. Rubber and PVC may be suitable but as they are not "breathable" materials there may be a build-up of heat and condensation within the footwear. There are some "breathable" materials now in use that can be more comfortable in some circumstances. Also it must be taken into consideration that water or other fluids may spill over the top of the boots.

Leather or other heat-resistant materials may be needed to protect against molten metal, radiant heat or sparks from welding or gas/plasma cutting activities. Wooden clogs can provide excellent heat insulation where work is carried out on high temperature plant.

Anti-static footwear helps to protect against static electricity. The soles have a low resistance that allows a static charge to leak away but which is high enough to give some protection from electric shock. This type of footwear may be used as part of a system to reduce risks of static ignition of flammable atmospheres.

Conductive footwear has a very low resistance and allows static to flow through rapidly. It is used when handling electronic components which are very sensitive to static. It gives no protection whatsoever from electric shock.

15.5 Body protection

Body protection may be required for the following:

- as warm clothing when working outdoors in low temperatures, or in cold-stores
- protection against intense heat and/or flame-retardant clothing when working at a foundry, or with welding equipment
- high-visibility clothing when working in the vicinity of moving traffic such as, airports, etc cut-resistant clothing when using chain saws or butcher's knives
- lifejackets when working near deep water.

For general body protection, aprons, coats or boiler suits give protection very much dependent on the material of construction. "Breathable" waterproof fabrics will keep out water whilst allowing a certain amount of water vapour from perspiration to escape. Specialised clothing for work in harsh environments includes insulated suits, waterproofs and cooling garments for use in very hot conditions. Suits are also available to provide protection in very cold environments.

15.5.1 Issue and maintenance

Some of the PPE described above is very specialised and will require considerable training of the users. It should only be used for the purpose for which it is intended and be regularly checked for damage, wear and tear that indicate a need for repair or replacement.

16 Training

Employees must be given adequate and comprehensible instructions, information and training in:

- the purpose for which PPE has been provided
- the risks that it will protect against
- the correct method of use
- the employee's part in ensuring that PPE remains in an efficient state, properly working and in good repair.

For the simpler items training will be short and easily organised using employees as trainers, who have themselves become "competent" by training using manufacturers' literature and guidance. With more complex PPE it may be necessary to have trainers trained by manufacturers or suppliers, or in some cases have the actual training carried out by them.

Provision of information and training is only of benefit when the employee fully understands all of the content. English may not be the first language of some employees, so allowance may have to be made for this in the way the material is presented. It may be necessary to provide the training in the employee's mother tongue.

Even when English is the first language, some people may have difficulty understanding technical information and sufficient explanation must accompany provision of written materials. A full understanding of all the training aspects listed below must be achieved and in some cases the practical training can be slightly adapted to form part or all of a practical assessment, of knowledge and skill.

16.1 Theoretical training

Theoretical training should generally include:

– an explanation of the risks
– why PPE is required
– the limitations of the PPE
– how it works and its performance
– instructions in the selection use and storage of PPE
– any written procedures, permits to work or systems of work that require PPE should be explained
– factors that can reduce the performance of the PPE, eg wearing other PPE that interferes with it
– recognising defects in PPE and the arrangements for reporting defects and any loss
– the duties of the employee under the relevant legislation

16.2 Practical training

This should include:

– practice in putting on, wearing and taking off the PPE
– instruction and practice in carrying out inspections and if appropriate the testing of PPE before use
– instruction and practice in the maintenance which may be done by the user and replacement of components.

With some PPE there will be limits placed on what the wearer is allowed to clean or repair and this must be clearly explained instruction in the safe storage of the PPE. In addition to initial training, users of PPE will require refresher training from time to time. Records of both initial and refresher training should be kept along with details of the content of the training programme.

16.3 Training in the use of specific PPE

The following gives advice on how to train employees to use specific types of PPE. The general advice given above should be taken into consideration at the same time.

16.4 Training in use of head protection

Training should include the correct fitting of head protection to the individual user, and information about what it is capable of protecting against and what its limits for protection are. The following must be adequately covered:

- correct adjustment
- the need to wear protection correctly
- how to clean and inspect for damage
- how to obtain replacements
- correct storage, eg not in car rear windows.

16.5 Training in use of eye protection

Training should take account of the types of eye protectors in use, the hazards they are protecting against and the likely exposure to dirt and contamination. It should include:

- limitations of protection
- the hazards the wearer may be exposed to
- how to adjust side frames of spectacles, retaining straps or headbands
- how to use specialised equipment such as flip-up welding goggles
- recognising wear and tear and defects
- correct cleaning
- storage
- the need for prompt reporting of loss or damage to allow speedy replacement.

16.6 Training in use of hand protection

The glove is often seen as a simple, easily used form of protection. It is not. Care in selection must be followed by proper training of the wearer in their use. This must include training in inspection for holes, cuts, distortion or wear before use. The training must explain the hazards being protected against, and any limitations of the protection being issued. It must also be properly recorded.

Cleaning of gloves is very frequently overlooked yet can significantly improve their life expectancy and reduce the risk of cross-contamination and development of skin irritation or dermatitis. Repeated washing may remove fungal or bacterial inhibitors from linings which will need to be replaced.

Methods of donning and removing gloves should be explained as this can seriously influence the risk of skin contamination. Gloves contaminated on the inside can be a frequent problem. Washing before removal is one aid to reducing this risk.
During use, good discipline by the wearer is needed to prevent touching other parts of the body, especially eyes and mouth.

16.7 Training in the use of footwear protection

The hazards to which the employee is exposed and the protection afforded by the footwear should be explained including any limitations in the protection. Where the footwear has to be worn in a particular way (ie foundry boots and gaiters) there must be clear instruction and practical demonstration given. Records of both issue and of training and instruction should be kept.

16.8 Training in the use of body protection

Some of the PPE used to protect the body is very specialised and will require considerable training of the users. It should only be used for the purpose for which it is intended and be regularly checked for damage, wear and tear that indicate a need for repair or replacement. As with other training a record should be kept.

17 Employees whose first language is not English

Provision of information and training is only of benefit when the employee fully understands all of the content. English may not be the first language of some employees, so allowance may have to be made for this in the way the material is presented. It may be necessary to provide the training in the employee's mother tongue. Even when English is the first language, some people may have difficulty understanding technical information and sufficient explanation must accompany provision of written materials.