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## *Guide*

# Personal Protective Equipment

This guideline although documented as stand-alone is an element of the Petrofac E&C HSE Manual,  
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## Approval Authority:

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## Summary

The Personal Protective Equipment Guideline defines the types of personal protective equipment to be adopted on all Petrofac E&C Projects depending on the task/activities being undertaken. The PPE work instruction assists in ensuring that personnel are aware of the protective clothing and equipment provided for their use, its maintenance and when and how to use it. The present standard must be applied to all construction sites and must be considered as a minimum requirement.

**CONTENTS**

1.0 PURPOSE ..... 4

2.0 SCOPE OF WORK ..... 4

3.0 RESPONSIBLE PERSONS ..... 4

    3.1 All persons on site ..... 4

    3.2 HSSE Department ..... 4

    3.3 Supervisors ..... 4

4.0 INSTRUCTIONS ..... 5

    4.1 General ..... 5

    4.2 Use of Standard and Specialized PPE ..... 5

5.0 BIBLIOGRAPHY - UK STANDARDS ..... 9



## 1.0 PURPOSE

To assist in ensuring that personnel are aware of the protective clothing and equipment provided for their use, its maintenance and when and how to use it.

## 2.0 SCOPE OF WORK

The present standard must be applied to all construction sites and must be considered as a minimum requirement.

## 3.0 RESPONSIBLE PERSONS

### 3.1 All persons on site

All persons on site are responsible for:

- Wearing the appropriate protective clothing and using the correct equipment for the work in hand.
- Ensuring that protective clothing is maintained in a clean and serviceable condition.
- Reporting any defects to their Supervisor.
- Obtaining the advice of the Safety Representative / Authority or their Supervisor should the clothing / requirement be considered inadequate for the job in hand.

### 3.2 HSSE Department

The HSSE Department are responsible for:

- Monitoring that protective clothing is being worn as appropriate.
- Providing advice on the use of all types of protective clothing and equipment.
- Ensuring that safe working practices are being enforced at all times.
- Ensuring that defective equipment is withdrawn from service and repaired.

### 3.3 Supervisors

Supervisors are responsible for:

- Ensuring that personnel are aware of the dangers of their work.
- Ensuring that personnel possess and use the required approved protective equipment and that it is in good order.
- Ensuring that personnel know how to use the protective equipment.
- Authorizing the exchange of defective items of equipment.

## 4.0 INSTRUCTIONS

### 4.1 General

In general, all personnel when working or visiting any operating site outside office and accommodation areas shall wear protective clothing. The minimum requirement shall be as follows:

- To be worn at all times
  - Safety Footwear
  - Coveralls
  - Safety helmet
- To be carried at all times for use when required:
  - Gloves
  - Eye Protection
- To be worn as appropriate depending upon the specific environment, the weather and working conditions:
  - Safety goggles
  - Ear defenders / plugs
  - Lifejackets
  - Waterproof clothing
  - Safety Wellington Boots
  - Special protective clothing / equipment
  - H<sub>2</sub>S escape mask and H<sub>2</sub>S personal monitor
- The following points should be noted:
  - Loose clothing can get caught in moving machinery.
  - All clothing should be correctly fastened, cuffs secured or sleeves rolled up.
  - Contaminated clothing should be washed or discarded.
  - Jewelry, particularly chains and other loose items, should not be worn for work on site.
  - Overalls (working clothes) and working boots are not allowed to be worn in living quarters, site restaurants, etc.

NOTE: ALL PERSONAL PROTECTIVE EQUIPMENT SHALL COMPLY WITH A WELL KNOWN AND ACCEPTED INTERNATIONAL STANDARD.

## 4.2 Use of Standard and Specialized PPE

### 4.2.1 Safety Harnesses and Lifelines

Where a work site is such that a worker might be falling into the water or more than 2 metres and that it is not practicable to provide handrails, guards, safety nets, etc. a suitable safety harness together with its line, fittings and anchorage's should be permanently used. Safety belts are prohibited to use on operating sites.

Any person entering a confined space where there is potential for deficiency of oxygen or which contains toxic or noxious gases, must be fitted with a suitable safety harness and lifeline, in addition to a breathing apparatus (SCBA).

The free end of the safety line should be under the control of a second person, safely positioned outside the confined space, which must keep the wearer under constant surveillance and be ready to withdraw him immediately, should the necessity arise.

When the safety belt and lifeline are used, pre-arranged signals shall be used.

These are as follows:

SIGNAL	BY WEARER	BY ATTENDANT
1 pull	I am OK	Are you OK ?
2 pulls	Pay out more line	I am paying out more line
2 pulls - pause - 2 pulls	Stop lowering, or paying out	I am stopping lowering, or paying out
3 pulls	Heave in slack line, or haul up	I am heaving in slack line or hauling up.
Repeated, sharp pulls	Danger, help me out	Danger, come out at once

When signals are employed, they must be acknowledged by repeating the signal to show that it has been understood or is being acted upon.

#### 4.2.2 Life jacket / Work vest

Where any person in getting to or from the place at which he is to work could fall into the water, and it is not practicable to ensure his safety by the means described above, that person must wear a suitable life jacket or work vest.

#### 4.2.3 Emergency Showers and Bath

In all places where acids or corrosive fluids are used or handled, emergency water showers and / or eye baths are to be provided.

Additional or specialized PPE shall include in particular:

- Ear defenders/ear plugs (for any area where the noise is over 85 dB)
- Safety goggles or face shields (for grinding, chipping, paint spraying, high pressure jetting etc.)
- High visibility clothing as required (banks man, person working near or on roads, etc.)
- Welding/burning shield (for welding or burning)
- Specialized gloves and hand protection (for rigging, burning, welding, handling chemicals, etc.)
- Specialized clothing for chemicals, cold or foul weather
- Aprons (for welding, chemicals etc.)
- Suitable respiratory protective devices (H<sub>2</sub>S, other toxic gases, fumes, dust, etc.)
- Fire fighters equipment (boots, coveralls, helmets, face heat shields, gloves)
- Suitable safety harnesses and fall arrest equipment
- Safety "Wellington" boots for working with irritant or corrosive chemicals
- Sun block creams.

#### 4.2.4 Foot protection

Safety footwear as appropriate must be worn for all work on site. Safety footwear should be in good condition and free of grease / dirt. They should be constructed so as to prevent crushing and the soles must be non-slip, corrosion resistant, resistant to puncture, and be non-sparking. Footwear with exposed steel toe caps must be discarded due to the danger of sparking.

Safety Wellington's Boots should be worn for working with irritant or corrosive chemicals. They should not be worn on scaffolding or "slippery" surfaces.

#### 4.2.5 Head Protection

Safety helmets must be worn at all times out with the administration and office buildings or in designated areas.

For non-operational sites the requirement to wear safety helmets must be indicated by the appropriate sign.

The painting of helmets or the use of the stickers is not recommended as chemical reactions could weaken the helmet and render it less effective. Metal helmets are prohibited.

Safety helmets which are used daily have a realistic life of about 3 years & should be replaced even if showing no obvious signs of damage, etc.

#### 4.2.6 Coveralls

Coveralls must be worn if required by working conditions on the site.

Coveralls made of nylon material are prohibited. PVC coveralls may be worn when handling hazardous substances if appropriate. Apron protection is applicable to work in battery rooms.

Coveralls for personnel who have specific fire fighting duties etc. must be made of flame resistant materials.

#### 4.2.7 Hand Protection

Protective gloves of appropriate type must be worn for:

Lifting, carrying and handling objects with sharp edges, rough or slippery surfaces or with protrusions such as splinters or nails.

Work where the hands may come into contact with surfaces of extreme temperature, either hot or cold.

The following gives examples of the types and uses of protective gloves:

Riggers gloves	General use
PVC/rubberized gloves	Handling chemicals
Thermal gloves	Cold work (e.g. N <sub>2</sub> )
Rubber gloves	Electrical work (live systems)
Leather gloves	Work with hot surfaces

NOTE: Gloves should be dry, particularly when handling very cold surfaces such as for dew point testing and work with refrigeration equipment.

#### 4.2.8 Eye Protection

Eye protection must be worn whenever there is the appropriate sign.

Goggles or a face shield must be used for:

- Chipping, grinding, cutting or breaking of brittle material (concrete/stone/glass/metal or other hard materials) where particles may fly around. This requirement applies also to all personnel present in the vicinity.
- Paint spraying, air blowing, blast cleaning, high pressure water jetting.
- Handling chemicals, during maintenance of chemical pumps/equipment or certain routine tasks such as draining, venting, sampling of chemicals.
- Sampling products from pressurized systems.
- Welding or gas cutting or assisting in these activities; the proper lens shade must be used.

#### 4.2.9 Ear Protection

Ear protection must be worn in areas indicated by the appropriate sign.

Type of ear protection should be available:

- Ear defenders
- Ear plugs

Even if not shown by the sign, ear protection should be worn in all noisy areas. In this context "noisy" (a mean attenuation of 85 dBa) if it is necessary to raise ones voice in order to be heard when talking to someone from a distance of 1 metre.

#### 4.2.10 Respiratory protection

##### Definitions:

##### **Airlines ("Cascade System")**

Air lines with a full-face mask and air supplied via an airline from cylinders or a compressor. To be used to enable the wearer to work for long periods in a toxic or oxygen deficient atmosphere. The compressor's intake must be in an unpolluted atmosphere. **NORMAL PLANT SERVICE AIR MUST NEVER BE USED.** Suitable filters in compressors must be used.

##### **Self-Contained BA sets (SCBA)**

To be used to enable the wearer to work for short periods in a toxic or oxygen deficient atmosphere. Used in emergency situations for search and rescue operations.

##### **Canister Respirators**

The respirator consists of a canister of absorbent material specific for certain atmospheres. Hence its use is very limited & must only be used when the concentration of toxic gas is low & the time exposure is short. They must not be used when there is a lack of oxygen. The manufacturer's instructions must be strictly followed.

They must not be used in enclosed spaces, tanks or vessels. Approval must be sought from Safety Representative / authority before using this type of respirator.



**Dust Mask Respirator**

Only suitable for mechanical removal of dust, or sprays from the atmosphere. They must not be used in toxic/noxious atmosphere or where there may be a lack of oxygen.

Note: after use, all respirators etc. must be decontaminated for hygiene reasons.

**H<sub>2</sub>S escape mask**

Canister type escape mask should be used for evacuation only and not for rescue operation (SCBA), nor for working in H<sub>2</sub>S environment.

**Use**

It is the responsibility of the site representative and the HSE Department to define the geographical areas in which specific respiratory equipment must be worn.

Testing of protective breathing equipment shall be done at least once a week, with the exception of air filters, made of coal absorbent such as those used in escape masks, because they are degraded by ambient humidity.

Air compressor(s) used to fill SCBA's or the Cascade System capacities should be able to operate on a continuous basis, and in particular the suction line of air compressor should be situated in a SAFE ZONE so as to avoid entry of contaminated air.

**5.0 BIBLIOGRAPHY - UK STANDARDS**

As described in Section 4.1 all PPE must adhere to internationally recognised standards. The British standards below are given as examples.

BS 1397 Specification for safety belts, harnesses and safety lanyards.

BS 1542 Specification for equipment for eye, face and neck protection against welding radiation.

BS 1870 Safety footwear.

BS 2091 Specification for respirators.

BS 2092 Specification for eye protection.

BS 2653 Specification for protective clothing for welders.

BS 4275 Recommendation for the selection, use and maintenance of respiratory protective equipment.

BS 5240 Specification for safety helmets.

BS 6344 Industrial hearing protectors.

BS 7004 Self-contained compressed air breathing apparatus.

BS 7184 Recommendations for the selection, use and maintenance for chemical protective clothing.

HSE Guidance Notes EH 41 - respiratory protective equipment for use against asbestos.