

Personal Protective Equipment (PPE)

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1. Purpose

This document provides guiding principles on the selection, use and maintenance of PPE commonly used across Sydney Trains.

2. Scope

This guide is scoped at PPE commonly and frequently used across Sydney Trains. Examples include (but not limited to) high visibility clothing, safety footwear, protective gloves, respiratory, hearing and eye protection.

The document does not address requirements for the use and maintenance of specialised PPE such as protective clothing for electrical workers. These requirements are to be determined through risk assessments and addressed in documented safe work instructions as per [SMS-06-SP-3026 Risk Management](#).

Please refer to [SWI D2013/80874 PPE for Electrical Work](#) and [PR-D-78101 General Requirements for Electrical Work](#).

3. General Requirements

3.1 Management of PPE

To be effective as a risk control, the use of PPE requires systematic and active management at the workplace. Line Managers should ensure that the following aspects are managed in accordance with this guide:

- hazard identification and risk assessments;
- selection, purchase, registration and distribution;
- use, storage, inspection, review and maintenance; and
- training and instruction.

3.2 Determining PPE requirements through risk assessment

Line Managers are to perform risk assessments in consultation with workers in accordance with [SMS-06-SP-3026 Risk Management](#). This allows for the appropriate and correct PPE is identified.

Effective risk management requires a combination of strategies and PPE may be an adjunct to higher level controls in order to reduce risk i.e. fume extraction systems or adherence to Network Rules and Procedures for work on or about the track.

As a minimum, the risk assessment(s) should include the:

- tasks for which the PPE should be required;
- locations at the workplace where the PPE should be required; and
- factors which should influence the selection of PPE.

3.3 Selection and purchase

3.3.1 Selection

Once hazards are identified, risks assessed and controls identified in accordance with the *hierarchy of control*, PPE is to be selected to control remaining (residual) risks.



Note: The risk assessment should consider the limitations of the type of PPE. For example, no one type of glove should provide protection against all chemicals and respiratory protection selection should be in accordance with the type and concentration of the airborne contaminate.

Line Managers should consult with workers to make sure that PPE is appropriate to the work tasks performed, fits the individual and complies with relevant legislation, Australian Standards, and Codes of Practice.

Trials of PPE may be necessary to determine the most suitable type to match the hazard and user requirements such as comfort and effectiveness of fit.

3.3.2 Purchase

The majority of PPE required for use within Sydney Trains is available via a catalogue order using *Transport Equip*. If the risk assessment or trial has identified a requirement for other PPE, the line manager is to contact the procurement help desk to obtain advice and confirm that the required items are not on an existing catalogue.

For non-catalogue procurement, Line Managers should:

- develop specifications for the PPE by conducting a pre-procurement safety assessment (in consultation with workgroup safety committee/representative and safety workers) in accordance with [SMS-13-OP-3119 Manage Safety in Procurement - Goods](#); and
- purchase PPE in accordance with procurement procedures.

3.4 Registration and distribution

When being distributed to workers, items of PPE are to be logged in a PPE Register or equivalent record. Line Managers are to make sure Sydney Trains workers including Contractors are provided with the necessary PPE before commencing work.



Note: It is not necessary to record issue of items of disposable or consumable PPE which are available in the workplace for use on an "as required by task" basis. For example, disposable respirators, earplugs and sunscreen from a dispenser.

Where practicable, PPE issued to visitors is to be disposable. Where this is not practicable, non-disposable PPE may be issued for the duration of the visit and re-used after cleaning in accordance with the recommendation of the manufacturer/supplier. Items which cannot be cleaned to an unsoiled state are to be discarded.

PPE items which have inspection or maintenance requirements are to be included in Inspection, testing, Calibration and Monitoring Programs in accordance with [SMS-16-SP-3076 Inspection, Testing, Calibration and Monitoring](#). See **Section: 7.0 Specific Requirements** of this document for more information on inspection and maintenance requirements for specific items.

3.5 Use and maintenance of PPE

3.5.1 Workers

Workers are to use and care for equipment according to manufacturer's instructions (usually printed on tags on clothing, footwear, belts, harnesses, gloves and helmets). For other PPE such as eyewear, sunscreen, refer to the information on or inside the packaging.

Line Managers are to observe work activities (including visitors to work areas) to make sure correct PPE is being used and it is fit for purpose. They are to consult with Workers to discuss and resolve any issues with protective equipment.

PPE should be maintained correctly and not intentionally misused or damaged. This ensure they remain in good condition and do not compromise the health and safety of workers e.g. contaminated respiratory protection equipment can introduce a risk of infection; a damaged safety helmet might not provide the designed level of head protection.

3.5.2 Communicating PPE requirements to Contractors

Procurers should ensure that PPE requirements are communicated to contractors during the contractor procurement process. PPE requirements are to be stated in safety documentation (including SWMS/SWIs) related to the contract.

3.5.3 Visitors

PPE is to be made available for visitors to the workplace. Line Managers are to make sure that visitors are provided with PPE appropriate to the risks to which they should be exposed during their visit. Visitors are to be instructed in the need for, and correct use of, the required PPE. Workers who are escorting visitors are to make sure that visitors wear the provided PPE where required.

3.6 Modifications and repairs

Modification and repair of PPE is to be in accordance with the requirements of the manufacturer/supplier and should not be altered from its original specification e.g. long sleeved shirts cannot be altered to be short sleeved or sleeveless.

3.7 Inspection and review

Users are to ensure that the PPE is within its expiry date and inspect PPE for signs of deterioration, missing components cracks or distortion. In addition, any PPE identified with modifications or alternations that are not within manufacturer specifications should not be used under any circumstances.

Some types of PPE require scheduled inspections and maintenance. Refer to the **Section: 7.0 Specific Requirements** and the manufacturer's instructions for details.

PPE is to be fit for purpose and in serviceable condition. Faulty, damaged or excessively worn PPE is to be withdrawn from use immediately and replaced accordingly.

Workers are to report any expired, faulty or sub-standard equipment to their Line Manager to allow for a replacement to be provided. Users are also to report any problems they encounter when using the PPE.

Where issues with PPE have been identified, Line Managers are require to:

- reorder and replace worn, expired or faulty equipment as necessary;
- make sure that scheduled inspections/maintenance is carried out on PPE where required; and
- brief workers in the correct use of PPE and make sure they are using it for the intended purpose.

3.8 Storage

3.8.1 General

When not in use, PPE is to be stored in a suitable manner and location to avoid damage or contamination through exposure to elements such as moisture, inclement weather, direct sunlight, contaminated and corrosive atmospheres.

Some types of PPE have specific storage requirements. Refer to the **Section: 7.0 Specific Requirements** of this document and/or the manufacturer's instructions for details.

Storage requirements are to be communicated to users via appropriate means such as team briefs and toolbox talks and included in Safe Work Instructions/Safe Work Method Statements where used.

3.8.2 Storage for emergencies

Where necessary, PPE is to be stored in quantities appropriate to emergency situations at the workplace.

In addition, PPE stored for emergency situations is subject to an expiry period or shelf life it is to be included in workplace inspection activities and replaced as necessary.

4. Training and Instruction

4.1 General instruction

Where applicable, PPE requirements are to be incorporated into inductions (for workers including contractors and visitors).

Workers performing work that requires PPE are to be competent in the selection, fitting, use and maintenance of the required PPE. They are also to understand any additional risks the PPE may introduce and the compensating controls in place at the workplace e.g. the use of hearing protection may limit the person's ability to hear audible warning signals so visual signals are also provided.

4.2 Task based Instruction

Instruction in the use of PPE for workplace tasks is to be included in workers briefings and pre-work briefs. Types of PPE to be used when performing tasks are to be included in documented work procedures. Instructions are to follow the recommendations of the manufacturer/supplier and cover the following topics:

- why the PPE is required, the nature of the hazard and effects of exposure;
- user inspections;
- correct use, fitting and adjustment; and
- cleaning and storage requirements.

5. Introducing new PPE

The introduction of new PPE is to be carried out in consultation with the workers who are required to wear it. To aid the correct selection of PPE consideration should be given to the different hazards in the workplace. This should enable an assessment to be carried out on which types of PPE are suitable to protect against the hazards. It may be necessary to obtain advice from specialist sources such as the PPE manufacturer, occupational hygienist or safety professional. The following should be considered when introducing new PPE:

- can the risks be controlled by other means e.g. substitution or engineering?
- is it appropriate for needs of the job, demands on the wearer, etc.?
- does it prevent or adequately control risks without increasing the overall risk or introducing new risks?
- can it be adjusted to fit the wearer correctly?
- is it compatible with other items of PPE that are required to be worn?

6. Specific Requirements

6.1 Safety Footwear

Safety footwear is to be selected, used and maintained in accordance with *AS 2210.1 Safety protective and occupational footwear – Guide to selection, care and use*. Selection of types and styles to be used at workplaces is to be determined by risk assessment. A range of types and styles is available from supply agreements to match the nature of the hazard and to allow wearers to obtain the most comfortable fit.

6.2 High visibility clothing

6.2.1 Rail Corridor

High visibility clothing or vests increase visibility of the wearer to train crew, track vehicle drivers and plant operators.

High visibility clothing which is worn in the rail corridor and maintenance centres is to feature a high visibility colour of orange in accordance with *AS/NZS 1906.4 Retro-reflective materials and devices for road traffic control purposes - High visibility materials for safety garments* and comply with the requirements of *AS/NZS 4602.1 High visibility safety garments – garments for high risk applications*.

Where used at night or at times of reduced visibility such as fog, low light or whilst in tunnels or underground locations, high visibility clothing should be fitted with retro-reflective strips in accordance with *AS/NZS 4602.1 High visibility safety garments* and *AS/NZS 1906.4 Retro-reflective materials and devices for road traffic control purposes*. The pattern of the strips is to be vertical front with crossed strips back as set out in *AS/NZS 4602.1*.

High visibility vests for use in the rail corridor and maintenance centres are to comply with the requirements defined in **section 8 - Specifications for high visibility vests for use in the rail corridor** of this document and are to be worn as the outermost garment whenever clothing other than high visibility clothing is worn. High visibility vests fitted with retro-reflective strips are also to be worn over non-reflective high visibility clothing at times of reduced visibility such as fog, low light or whilst in tunnels or underground locations.

Selection of an appropriate vest design for use in the workplace is to be based on a risk assessment which is to consider, but not be limited to, the following factors:

- entanglement or snagging hazards;
- temperature and humidity;
- type of work being undertaken; and
- opportunity for the vest to present entanglement or snagging hazards and/or reduced visibility.

The supply agreement offers a range of designs, as follows:

- poncho style, open on the sides only and joined by fabric hook and loop fastening (such as Velcro®) at the sides and shoulders;
- front opening, fastened by fabric hook and loop fastening (such as Velcro®); and
- front opening, fastened by a non-metallic zipper.

Other designs may also be used subject to risk assessment and compliance with Australian Standards, as above.

6.2.2 Shunters

Shunters within nominated maintenance centres and yards wear high visibility vests or clothing coloured yellow (also known as lime-yellow) in accordance with *AS/NZS 1906.4 Retro reflective materials and devices for road traffic control purposes - High -visibility materials for safety garments*. This aids train crew in identification of the shunter when in the company of other persons wearing orange vests. **Section 8 -Specifications for high visibility vests for use in the rail corridor** of this document lists the requirements and colour specifications for high visibility vests for use by shunters within nominated maintenance centres and yards.

6.2.3 Rail Commander

The *Incident Rail Commander* (IRC) responding to an incident acts as the *Rail Commander* (RC) as per Incident Management Framework (IMF). The RC takes charge of an incident site unless the Police or an Emergency Services assumes control. The RC is in charge of the site and all rail workers on the site.

The RC wears a two tone yellow/orange vest and a white protective helmet. This colour is consistent with *AS 3745 Planning for Emergencies in facilities* and allows the Rail Commander to be more easily identified by other workers including Emergency Services attending the incident site.

6.2.4 Sleeve for worksite lookouts

Nominated lookouts for a team working in the danger zone may wear a yellow (also known as lime-yellow) high visibility sleeve to increase visibility of the lookout to train crew and work team members. The colour of the sleeve is to match the requirements for yellow high visibility vests for shunters set out in **section 8 -Specifications for high visibility vests for use in the rail corridor** of this document.

6.2.5 Crowd control and emergency situations

Workers engaged in crowd control and emergency situations wear vests to aid identification and define roles. Unless worn in the danger zone, the colour of these vests may differ from Orange and need not be of a fluorescent nature. Emergency response procedures may specify particular requirements for vests worn by workers and emergency services personnel.

6.2.6 Use and Maintenance

High visibility clothing is not flame retardant unless compliant with *International Standard EN 533 Protective clothing – Protection against heat and flame* or *ISO 14116 Protective clothing – Protection against heat and flame*. The risks of high visibility clothing compromising safety via burning or melting should be assessed when tasks involving ignition sources, such as welding, are to be performed. Where wearing high visibility clothing would present such a risk, Line Managers should make sure that work methods are implemented that:

- provide protection from hot or burning materials; and
- ensure that if there is a reduction in the person's visibility, their safety (or the safety of others) is not compromised.

Users are to wear high visibility clothing in a manner, which should provide maximum visibility i.e. by fastening the garment, ensuring they are not torn, and the material is not soiled or faded to a point where high visibility properties are degraded. To prolong the high visibility properties, high visibility clothing is to be stored out of direct sunlight and laundered in accordance with the recommendations of the manufacturer.

6.3 PPE and clothing for sun protection

As part of the conducting the risk assessment (section 3.2 of this document) the use of personal protective equipment and clothing (PPE) is one of the measure that reduce exposure to UV radiation by providing a personal barrier between individual workers and the hazard. These measures include:

- **provision of sun protective work clothing:** the overall protection provided by clothing depends both on the material from which it is made and the garment’s design. Fabrics may carry a swing tag with a UPF rating. These fabrics have been tested to determine how effective they are at blocking UVR. The higher the UPF rating, the more protection provided. UPF 50+ provides the best protection. Approved long pants and shirts with a collar and long sleeves provide the best sun protection.
- **provision and use of sun protective hats:** a sun protective hat is one that shades the face, head, ears and neck. As with clothing, the overall protection provided depends on the material from which the hat is made together with the design.
- **provision and use of sunglasses :** when selecting sunglasses for your workers, keep in mind that all sunglasses sold in Australia must comply with the sunglass standard *AS/NZS 1067: Sunglasses and Fashion Spectacles*. Look for the words ‘good UV protection’ on the label or swing tag and be aware that category 0 and 1 are fashion spectacles – not sunglasses.
- **provision and use of sunscreen :** sunscreen listed on the supply agreement provides broad spectrum protection and is rated at SPF 30+. Users should be briefed on the manufacturer’s requirements for use and be made aware of the factors which vary the level of protection afforded by the sunscreen. The effectiveness of sunscreen products declines over time and users are to make sure that sunscreen issued to them personally is within date prior to use. Line Managers are to make sure sunscreen dispensers and/or stocks of product for personal issue are within date and that storage complies with manufacturer’s recommendations.

The UPF rating indicates how well the material blocks ultraviolet radiation from the sun, also known as solar ultraviolet radiation (UVR). The higher the UPF rating, the more solar UVR gets blocked by the material and the less exposure to solar UVR you will receive. The Australian/New Zealand standard for sun protective clothing has three protection classifications depending on the amount of solar UVR blocked. Each classification has corresponding UPF ratings:

Classification	Ultraviolet protection factor (UPF) rating
Minimum	15
Good	30
Excellent	50, 50+

Source: www.arpansa.gov.au

6.4 Hearing Protection

6.4.1 Types and use

Workers in noise hazard areas are to be supplied with, and wear, appropriate hearing protection where engineering and administrative controls do not reduce noise level exposure at a workplace to a level at or below an 8 Hour noise equivalent of 85 dB(A) or there is a peak noise level more than 140 dB(C).

Line Managers are to make sure that hearing protectors should provide wearers with adequate protection and are suitable for use in the work environment as per *AS/NZS 1269.3 Occupational Noise Management – Hearing Protector Program*.

Earmuffs - comprise cups that fit over the ears and are sealed to the head with soft cushions usually filled with plastic foam or liquid.

Earplugs – are hearing protectors that are inserted into the ear canal and include:

- *Pre-moulded earplugs* –inserted into the ear canal without the need for prior shaping and are available in a range of sizes;
- *User formable earplugs* –generally made from compressible material that is moulded by the user prior to insertion in the ear canal. After insertion the plug expands to form a seal on the walls of the ear canal;
- *Custom moulded earplugs* – these ear plugs are custom made to fit an individual’s ear canal; and
- *Banded earplugs* – banded earplugs are usually made of soft silicone, rubber or plastic and are suspended on a headband.
- *Ear canal caps* - seal the entrance to the ear canal without entering it and are held in place by a spring headband.
- *Acoustic helmets* - cover a *large* part of the head as well as the ear. As well as providing direct hearing protection they may also reduce bone conduction of the sound to the ear.

Special types – these types of hearing protector use electronic circuitry, microphones, mechanical techniques and loudspeakers in various ways to achieve noise reduction or noise cancellation. Some are specifically designed to provide voice/signal communication and hearing protection. Examples include

- *Level-dependent protectors* –*designed* to provide increased protection as the noise level increases;
- *Active noise reduction protectors* –duplicates the noise pattern and inverts it which results in dynamic noise cancellation inside the protector; and
- *Communication hearing protectors* – these provide hearing protection and earphones that allow messages, signal and alarms to be heard by the user and may be fitted with a microphone connected to a two way radio to facilitate person to person conversation. They can be either wireless or of the plug in type.

6.4.2 Selection

Provided that adequate protection is given, the user of hearing protection should be allowed reasonable choice from a selection of hearing protectors. Factors to consider include:

- the degree of protection required. Selection of hearing protection with unnecessarily high attenuation should be avoided;
- suitability for use in the work environment and the fit to the wearer;
- compatibility of the hearing protection with other PPE that may be required; and
- the comfort, weight and clamping force of the hearing protection.

6.4.3 Storage

Hearing protectors are to be stored in an area outside the designated noise hazard area and kept clean and dry and away from oil, dust and exposure to corrosive chemicals and atmospheres.

6.4.4 Service Life

Re-usable earplug and ear canal caps are to be replaced when they show signs of cracking, distortion or the headband (where fitted) becomes damaged or slack. In addition:

- single use earplugs are to be discarded after use;
- earmuffs are to be replaced if the cups become damaged, the headband becomes damaged, slack or replacement parts are unavailable;
- hearing protection is not to be used in a degraded condition as any loss of protection performance may not be noticeable to the wearer.

6.4.5 Cleaning, inspection and maintenance

Hearing protectors are to be kept in a clean and hygienic condition and cleaned in accordance with manufacturers’ instructions. Where instructions are not available, re-usable earplugs and ear canal caps should be washed in soap and water, rinsed and allowed to dry.

Earmuffs are to be wiped clean removing dirt and perspiration from the cups and sealing cushions. Foam inserts, headband and the insides of the cups are to be cleaned as required to maintain them in a hygienic condition. If in continual and regular use, the sealing cushions should be washed in soap and water weekly.

Re-usable hearing protectors are to be inspected before and after each use, during cleaning and at regular intervals as part of a hearing protector program. When carrying out inspections on hearing protectors some primary defects to look for include (but are not limited to) cracks, distortion, grease, hardening of seals and physical damage.

6.5 Protective Helmets

6.5.1 Types and Use

Protective Helmets are designed to reduce the risk or severity of injuries caused by objects falling onto a worker's head or the head striking against a fixed object. Protective helmets should comply with the requirements of *AS/NZS 1801 Occupational Protective Helmets*.

Bump caps are worn only to protect against scalp lacerations and minimise possible lateral impact when the workers head bumps into an object. They are not required to comply with *AS/NZS 1801* and are not to be worn where protection from falling objects is required.

Protective Helmets and bump caps are not to be modified or altered unless done in accordance with the recommendations of the manufacturer/supplier.

6.5.2 Storage

Helmets are to be stored in a clean dry location out of direct sunlight, away from heat sources. Stored helmets are to be protected from mechanical damage and exposure to chemicals, particularly when being transported.

6.5.3 Service Life

Protective helmets are to have the date of issue marked inside the helmet, in addition to the entry made in the PPE Register. Shells of helmets in regular use have a service life of at least three years and harnesses a service life of at least two years. Accordingly Line Managers should make sure that helmets in regular use are replaced at maximum intervals of two years.

Helmets which are used infrequently and stored as per above requirements need not be replaced at two yearly intervals – the user should examine the helmet regularly with replacement based on condition.

6.5.4 Accessories

Any accessories fitted to a protective helmet (such as chinstrap, earmuffs) should be fitted and used in accordance with the requirements of the manufacturer/supplier of the helmet and accessory. Unless specified by the manufacturer/supplier, modifications are not to be made to enable fitting of accessories.

6.5.5 Cleaning, inspection, & maintenance

Helmets and harnesses may be cleaned with warm water and soap or as per the requirements of the manufacturer/supplier.

Protective helmets are to be inspected at weekly intervals by the user. This inspection is to check the:

- shell for damage such as dents, deformation, cracks, excessive discolouration or weathering; and
- harness for damage such as deformation, stretching, tearing or missing components.

Worn or excessively dirty sweat bands should be replaced as required; helmets with damaged shells/harness components or heavily soiled harness components that cannot be cleaned using methods recommended by the manufacturer/supplier should be withdrawn from service and a replacement issued.

6.6 Protective Gloves

6.6.1 Types and use

The following table contains a guide to the most common hazards and examples of gloves that may be used to protect against them.

Hazard	Typical work	Example of suitable glove materials
Radiant Heat	Welding, braising	Leather, pigskin, aramid blends
Abrasion	Brick/block handling, steel fabrication, construction, demolition, quarry work	Leather, pigskin, aramid blends, terrycord, cotton blends
Cut/slice	Sheet metal, salvage work, scrap metal	Aramid blends, neoprene, loopile cotton blends, leather
Puncture	Swarf, wire handling, demolition work, reinforced steel mesh handling	Leather, pigskin, neoprene, nitrile, PVC
Chemical	Cleaning, degreasing, acid/solvent handling, painting, graffiti removal	PVC, PVA, nitrile, neoprene, rubber, vinyl
Electrical shock	Electrical work	In accordance with <i>AS/NZS 2225</i> Insulating gloves for Electrical Purposes and documented rules and procedures
Needle penetration	Cleaning, garbage collection	Whilst no glove material is puncture proof, heavy duty neoprene can provide a degree of protection from penetration
Biological	Cleaning, first aid, rescue work, biological waste handling	Nitrile, rubber, neoprene, vinyl, PVC

6.6.2 Selection

The following provide examples of elements to consider when selecting gloves:

- requirements or recommendations in Safety Data Sheets;
- sizing and style of glove, which may be influenced by the level of manual dexterity required;
- consultation with employees;
- most suitable material to give the required protection e.g. does the glove need to be liquid proof?;
- could the task for which the glove is being used cause mechanical damage (e.g. punctured, torn, cut); and
- whether wearing protective gloves will potentially introduce new risks.

6.6.3 Storage

Gloves should be cleaned of all contaminants before storage. They are to be stored away from direct sunlight and extremes of temperature and in accordance with the manufacturers' recommendations. Moisture and artificial lighting may also have a detrimental effect on some gloves.

6.6.4 Service Life

There are many factors that can affect the service life of protective gloves e.g. gloves taken off and put on frequently can result in internal contamination. Gloves used for handling chemicals are only to be re-used where it is within the manufacturers' guidelines to do so. Re-usable gloves are to be inspected prior to each use. Where single use gloves are used they are to be discarded immediately after use.

6.6.5 Cleaning, Inspection & Maintenance

Cleaning of gloves should be undertaken in accordance with the manufacturers' recommendations. Gloves used for handling chemicals or cleaning should be rinsed in warm water prior to being taken off to remove any contaminants and dried prior to storage.

Gloves are to be inspected before and after use for signs of defects or wear. Some signs of disrepair include rips or tears, seam failure, cracking and wear between fingers.

Gloves showing signs of defects are to be withdrawn from use and discarded.

6.7 Respiratory Protection

6.7.1 Assessment of the hazard

Selection of suitable Respiratory Protection Equipment (RPE) should be based on knowledge of the airborne contaminant which creates the hazard using measurements undertaken in the workplace. Each hazard has particular characteristics (refer to the following table), and the nature, toxicity, physical form and concentration of each contaminant should be included in the assessment.

Hazard	Key points
Gases	Substances present in workplace air which exist as a gas at normal temperature. Gases may be toxic in their own right, such as Hydrogen Sulphide, or displace oxygen to create a risk of asphyxiation
Vapours	Vapours are the gaseous form of a solid or liquid substance formed when evaporation occurs.
Particulates	Tiny particles generated by such processes as grinding, crushing and mixing of compounds, either solid or liquid.
	Dusts – Solid particles produced by grinding, crushing and mixing powder or solids. Airborne fibres, such as asbestos, are a type of dust
	Mists – Tiny liquid droplets caused when a liquid is sprayed, atomised or vigorously mixed or agitated.
	Fumes – Extremely fine solid condensed particles from a thermal process such as welding, brazing or molten metal
	Smoke – Carbon or soot particles or tarry droplets suspended in air which result from the combustion of carbon based material such as paper, wood, coal or oil

6.7.2 Types of RPE

RPE can be divided into two broad categories – those which purify the air the person breathes (*air purifying* - the most commonly used), and those which supply air from a separate source (*supplied air*). Air Purifying RPE may be powered or non-powered and be used for routine tasks or as self rescue devices for escape purposes.

Types available for routine use are set out on the next page (refer to **Figure 1**).

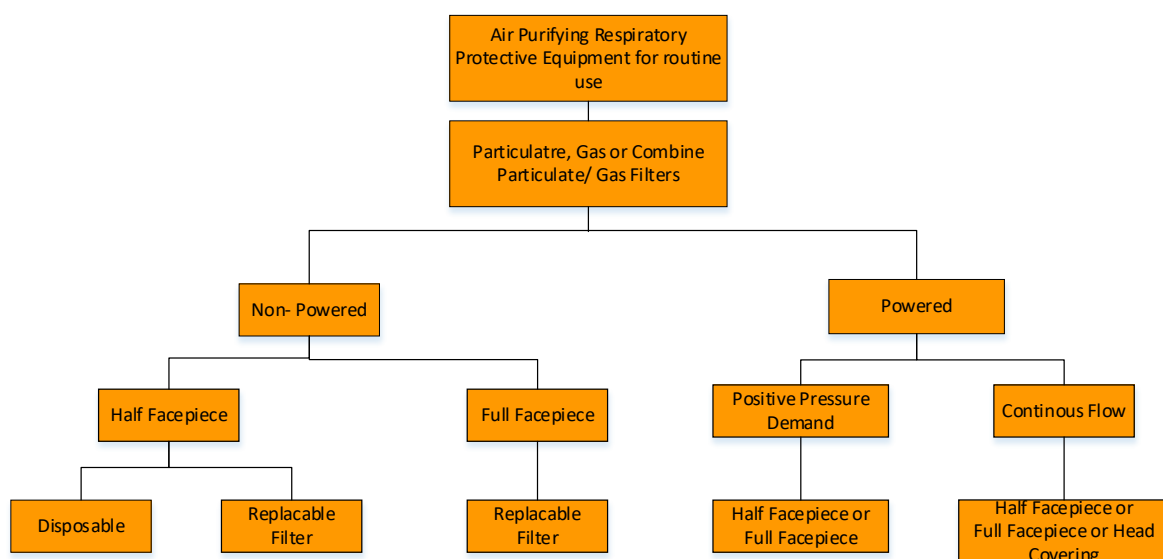


Figure 1: Air Purifying RPE for routine use

Supplied Air RPE provides breathing air from an uncontaminated source and supplies this air to a mask or hood worn by the user. At its most basic form, the air can be moved from the uncontaminated source to the user via natural breathing using a large diameter hose. This type has several limitations, and more practical types supply air via a hose from a blower, compressor or from compressed air bottles. Types of supplied air RPE suitable for routine use are set out in **Figure 2**.

When the bottles are carried by the wearer the RPE is known as *Self Contained Breathing Apparatus (SCBA)*. SCBA is classified by duration of the air supply as suitable for either escape purposes or routine work.



Note: Air purifying equipment for self rescue, Self Contained Breathing Apparatus and Compressed Gas RPE are specialist items for use in specific circumstances and are not covered by this guide. Expert advice on selection, use and maintenance is required.

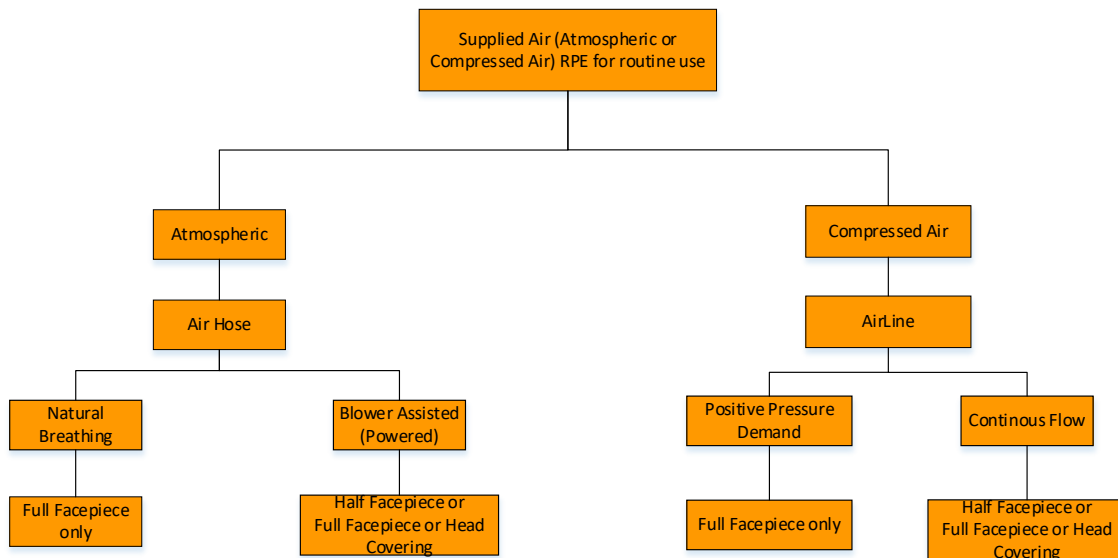


Figure 2 Supplied Air RPE for routine use

Selection of suitable RPE should be determined by risk assessment in accordance with this guide, [SMS-06-SP-3026 WHS Risk Management](#)- and *AS/NZS 1715 Selection, use and maintenance of respiratory protective equipment*.



Note: A Safety Professional should be included in the assessment of any airborne contaminants or where RPE is being considered as a risk control measure.

Selection should firstly consider the hazard category, which should set some basic RPE requirements as set out in the following table:

Hazard	Key points
Gases and Vapours	<p>Gas filter cartridges in air purifying respirators can only provide protection against a limited range of gases and vapours at low concentrations, and cannot be used for protection against asphyxiants. Filter cartridges are coded to indicate the gas, gas type or vapour for which protection is provided. Unless stated, gas cartridges do not provide protection against particulates.</p> <p>Supplied air respirators should be used for high concentrations of toxic gas, gases which cannot be filtered by a cartridge, where the gas concentration is unknown or where asphyxiants are present.</p>
Particulates	<p>Particulate filters or cartridges are class rated according to their efficiency.</p> <p>RPE with Class P1 Filters provide protection against mechanically generated particles such as silica and asbestos. P1 filter RPE may be replaceable cartridge type (half facepiece or full facepiece), disposable type or powered type.</p> <p>RPE with Class P2 Filters provide protection against mechanically or thermally generated particles such as metal fumes. P2 filter RPE may be replaceable cartridge type (half facepiece or full facepiece), disposable type or powered type.</p> <p>RPE with Class P3 filters provide protection against highly toxic or highly irritant particles such as beryllium. P3 filter RPE may be full facepiece replaceable cartridge type or powered type (head covering or full facepiece). A half facepiece respirator cannot provide protection to Class P3 - even if fitted with P3 filters.</p>

6.7.4 Selection of RPE – Determining the minimum required protection factor

The protection factor offered by a respirator is the ratio between the concentration of a contaminant outside the respirator to the concentration inside the respirator (the air breathed by the wearer). Air purifying respirators provide the lowest levels of protection factor and supplied air respirators provide the highest. Generally the higher the protection factor the more cumbersome, uncomfortable and complex the equipment becomes and the less likely it should be worn, or worn correctly. This emphasises the importance of applying higher risk control measures (such as forced ventilation) to reduce the contaminant to a concentration such that RPE is (preferably) not required, or needs to provide only a low protection factor.

6.7.5 Selection of RPE - Nature of Tasks and wearer

Once the details of the contaminants are known, the nature of the task being undertaken should then be examined. Aspects to consider include (but are not limited to):

- whether the device is for regular, emergency or rescue purposes;
- the length of time the wearer should be in the contaminated atmosphere;
- the expected level of activity and mobility required of the wearer;
- the nature of the working environment and its location to a source of air suitable for breathing;
- the need for clear vision and communication;
- whether failure of RPE can result in a situation which is immediately dangerous to life or health;
- the need to wear other PPE, such as eye or skin protection;
- the possibility of the contaminated atmosphere being flammable or explosive;
- physiological considerations matched to the type of RPE;
- facial fit; and
- user acceptance.

A facial fit test which is appropriate to the type of respirator to be used is to be conducted in accordance with *AS/NZS 1715 Selection, use and maintenance of respiratory protective equipment*. These tests should be conducted by a person with knowledge and expertise in selecting and applying a suitable test method.



Note: The supplier of the RPE is to be consulted to determine a suitable method of testing facial fit.

6.7.6 Selection of RPE – Consideration of Limitations

All RPE has limitations on its ability to effectively protect the wearer from the contaminant and provide the theoretical protection factor. The main limitations of air purifying RPE that need to be factored in the selection process include:

For disposable and half facepiece respirators

- a satisfactory seal can be difficult to obtain and maintain due to the variation in face shapes, particularly the nose and chin area. Facial hair, in particular, can compromise the facial seal. Wearers may find difficulty in wearing safety or prescription eyewear and the mask can make understanding speech difficult

Full facepiece respirators

- facial hair can affect the facial seal as can the side arms of spectacles. These respirators can also become very hot and uncomfortable, particularly if worn while undertaking hard work or in a hot environment.

Line Managers should make sure that only the selected RPE, and cartridge type matched to the hazard, is available for users. Where a range of RPE is required at a workplace Line Managers should make sure that the use applicable for each type is clearly marked.

6.7.7 Workplace Exposure Standard

When a contaminant is present in the atmosphere at a level below the Workplace Exposure Standard (WES), RPE may be used as a control measure to minimise exposure to the lowest practicable level and/or remove unpleasant odours. Irrespective of the contaminant concentration, all respirators used within Sydney Trains should comply with AS/NZS 1715 and be managed in accordance with this guide.



Note: Disposable masks marked as providing protection against “nuisance dusts” or “nuisance odours” do not comply with AS 1716 *Respiratory Protective Devices*. These masks usually have a single strap, making them easily identifiable.

Line Managers should note that WES are not definitive indicators of levels below which no effect can occur. Rather, they represent levels below which the health and comfort of nearly all workers should not be impaired. A very small proportion of workers exposed to levels at or below the WES may exhibit discomfort and/or health effects.

In addition, as more information becomes available on the effects of substances, exposure standards are invariably lowered and standards are established for other substances not currently covered. These factors underpin the principle of ensuring that exposure levels in the workplace are as low as reasonably practicable, not just at or below the WES.

6.7.8 Instructions to wearers

Workers who are required to wear RPE are to be instructed in the following aspects:

- the hazards which are present in the work environment, how they are produced and the risks presented;
- steps which have been taken to minimise the risks by higher level controls;
- how the RPE used at the workplace provides protection against the airborne hazard;
- correct use of the RPE, how to wear it correctly and how to check for a good facial seal;
- limitations of the particular RPE;
- how to inspect the RPE for defects;
- how to clean the RPE, the interval for cleaning and the storage requirements;
- how to fit items which are user replaceable (straps, cartridges); and
- the interval for replacement of filter media.

These aspects should be delivered by way of a safety briefing. A Safety Professional or co-ordinator should verify the content of the briefing.

6.7.9 Storage

In addition to the general storage requirements in **Section 4.8**, the following particular requirements exist for the storage of RPE:

- cartridges and disposable respirators should be left in the original sealed packing until required for use. This is particularly important for gas and vapour cartridges as the absorbent material in the cartridge should start to absorb contaminants from the air as soon as they are unwrapped and shorten the useable life of the cartridge;
- for this reason, respirators fitted with cartridges, and filter cartridges which have been fitted to a respirator that are to be re-used, should be stored in an airtight container. The container should be a suitable size to prevent distortion of the facepiece.

6.7.10 Service Life

For disposable RPE the service life has expired if:

- the service life replacement interval has been reached or
- the filter media has become contaminated with foreign matter (water, dirt, oil etc.) or
- there is any physical damage to the filter, exhalation valve, straps or nose clip.

Disposable RPE is not to be repaired if any of the above conditions are present – it should be replaced.

For half facepiece or full facepiece air purifying or supplied air RPE the service life has expired if any damage has occurred to the facepiece, head straps, valves, filter elements, breathing tube or air supply system which cannot be rectified with replacement parts approved by the manufacturer/supplier. The service life of the air purifying cartridges has expired when the replacement interval is reached.

6.7.11 Determination of filter replacement schedule

The filter media of air purifying RPE has a finite life, after which efficiency is impaired and the device cannot provide protection. Factors affecting the replacement interval include:

- concentration and nature of the contaminant in the workplace atmosphere;
- type of filter media; and
- hours and conditions of RPE use.

For particulate filters on natural breathing (non-powered) respirators, breathing resistance does provide some indication that the service life of the respirator (if disposable) or cartridges (if replaceable cartridge type) has been reached. A perceived increase in breathing resistance is sufficient to indicate that replacement is required.

For gas filters no reliable indications are available to the wearer. Whilst detecting an odour of the contaminant certainly indicates that replacement is necessary, this is not to be used as the indicator for determining a replacement schedule as contaminant concentrations may be above the exposure standard before an odour is detected. In addition, some substances have no detectible odour and others do not exhibit a detectible odour at high concentrations.

Determination of filter replacement intervals therefore requires specialist knowledge, and should largely be based on the concentration of contaminant determined during workplace air monitoring

6.7.12 Cleaning, Inspection & Maintenance

Line Managers should make sure that an inspection and maintenance regime is developed and implemented for RPE in accordance with [SMS-16-SP-3076 Inspection, Testing, Calibration and Monitoring](#). For half or full facepiece RPE the person to whom the RPE is issued is to perform regular cleaning of the equipment in accordance with the recommendations of the manufacturer/supplier.

Users are to be instructed in how to clean and maintain the RPE in accordance with 8. Instructions to wearers section in Respiratory Protection.

For supplied air RPE Line Managers should make sure that the maintenance requirements set out by the manufacturer/supplier are fulfilled. The wearer is to be instructed in how to perform user cleaning and maintenance tasks as established by the manufacturer. Line Managers should make sure that cleaning, inspection and maintenance procedures which are not identified as user tasks are performed by the manufacturer or agent.

6.8 Eye Protection

6.8.1 Types and use

Safety glasses should comply with *AS/NZS 1337.1 Personal eye protection – Eye and face protectors for occupational applications*. For protection against hazards such as dust and small particles a range of safety glasses offering medium impact protection are available from Sydney Trains supply agreements. Various styles are available to match the nature of the hazard and to allow wearers to obtain the most comfortable fit. The glasses are suitable for general use in locations such as maintenance centres, workshops, depots and the rail corridor where use of eye protection is specified.

Both clear and tinted versions are available from supply agreements, the tinted versions provide protection against sun glare and solar ultraviolet radiation equivalent to that of general purpose sunglasses which conform to *AS/NZS 1067 Sunglasses and fashion spectacles*.

Where eye protection is required for specific hazards involving projectiles, such as welding, chipping, grinding or for light sources such as welding, lasers or gas welding/cutting the requirements of *AS/NZS 1336: Eye and face protection – Guidelines* should be followed. For protection against chemical hazards the recommendations of the safety data sheet and *AS/NZS 1336* are to be followed.

Requirements for eye protection for specific hazards are to be stated in written work procedures (SWMS/SWIs) where used. When pre-work briefs are used, the requirement to wear eye protection is to be included in the briefing.

6.8.2 Prescription eye protectors

Eye protectors fitted with prescription lenses can provide low or medium impact protection together with prescribed refractive correction of vision based on an individual's visual need. Prescription eye protectors are to comply with the requirements of *AS/NZS 1337.6 Personal Eye Protection - Prescription eye protectors against low and medium impact*.

Where high impact resistance or protection from hazards other than flying particles is required eye protectors which are appropriate to the hazard, comply with *AS/NZS 1337* and cover the prescription eyewear are to be worn.

6.8.3 Protective Eyewear for train crew

Train crew may use medium or low impact eye protection to provide added protection against ultraviolet radiation, wind and dust and antisocial behaviour such as thrown objects and spitting. Glasses cannot provide full protection against these hazards but may assist in minimising injury.

6.8.4 Protective Eyewear for welding/cutting

Welding and cutting operations using gas or arc methods present hazards to eyes by exposure to ultraviolet and infrared radiation, sparks and flying particles. Filters are to comply with the requirements of *AS/NZS 1338.1 Filters for eye protectors - Filters for protection against radiation generated in welding and allied operations*. Line Managers should make sure that the level of eye protection provided for these tasks is fit for the purpose and is specified in documented Safe Work Practices.

6.8.5 Storage

In addition to the general storage requirements set out at section Storage, individuals issued with safety spectacles are to be issued with a suitable storage case to protect the spectacles from scratches and damage.

6.8.6 Service Life

The service life of protective eye wear expires when:

- the lens/visor surface is scratched, abraded or etched such that vision is impaired or mechanical strength may be reduced;
- frames, fittings and straps are worn or broken; and
- for a glass lens, the inside surface is scratched (minute glass particles can be released from a scratch).

Replace protective eyewear used for general protection, which is in frequent use, when two years has elapsed from the date of issue.

6.8.7 Cleaning, Inspection and Maintenance

Cleaning and inspection of eye protection is to take place prior to issue and before and after use. Cleaning is to be carried out in accordance with the manufacturers' recommendations. In the absence of specific recommendations eye protectors should be washed thoroughly with non-abrasive soap or detergent and warm water using a soft cloth, rinsed and allowed to dry.

7. Specifications for high visibility vests for use in the rail corridor

7.1 Compliance with standards

a) Design

Materials used in the vest construction must be compliant with *AS/NZS 4602.1 High visibility safety garments – garments for high risk applications*. High visibility vests must be fitted with retro-reflective strips in accordance with *AS/NZS 1906.4 Retro reflective materials and devices for road traffic control purposes - High –visibility materials for safety garments*. They must also be day and night compliant to *AS/NZS 4602.1*.

All high visibility vests must cover the entire torso above the waist. The front of the garment must extend at least 100mm below waist level, and the back must cover the buttocks (to improve visibility when bending forward or in a stooped position).

In addition to corporate identification, vests may have lettering on the back and/or front to identify particular roles such as Investigator etc. For the "First Aid" version the words "First Aid" must be printed in reflective letters on the front of the vest and the 'First Aid Symbol' printed on the back (top, centre) in green.

b) Retro Reflective Strips

All high visibility vests must be fitted with retro reflective strips. The strips must be silver in colour (reflects white), not less than 50mm wide and retro reflective to meet the requirements of Class R material in accordance with *AS1906.4*.

The retro reflective strips must be applied to the vest such that they remain in place and will be serviceable for the life of the garment under normal use and laundering.

Positioning of the strips on garments must be in accordance with *AS4602.1*, as follows:

- i) One horizontal hoop of retro reflective material must encircle the waist;
- ii) A second horizontal strip must be at the back, below the waist, so as the strip is still visible when the wearer is bending forward or in a stooped position. The minimum gap between the horizontal strips should be 50mm;
- iii) Two vertical 50mm strips of retro reflective material must join the upper horizontal hoop, straight over each shoulder, and forming an "X" on the back.

c) Colour

i) Fluorescent Orange Red high visibility Vests

The colour Fluorescent Orange Red must have chromaticity coordinates that lie within the colour spaces specified for 'Fluorescent Orange Red' in *Table 2.1 of AS/NZS 1906.4*. The minimum luminance factor must be 0.40 in accordance with *Table 2.2 of AS/NZS 1906.4*.

ii) Yellow high visibility Vests for Shunters

The colour Yellow must have chromaticity coordinates that lie within the colour spaces specified for 'Yellow' in *Table 2.1 of AS/NZS 1906.4*. The minimum luminance factor must be 0.70 in accordance with *Table 2.2 of AS/NZS 1906.4*.

7.2 ID Pockets

Where required, high visibility vests may have a clear ID pocket provided on the breast pocket position. The clear pocket must:

- be approximately 100mm wide and 70mm high, without a flap, and fastened by fabric hook and loop fastening;
- have a clear flexible transparent front for easy viewing of the ID inside;
- have smooth edges all around so as not to cause injury to the wearer and
- be heat resistant to the recommended laundering processes for the garment.

8. Further information

- [PR-D-78101 General Requirements for Electrical Work](#)
- [SMS-16-SP-3076 Inspection, Testing, Calibration and Monitoring](#)
- [SMS-13-OP-3119 Managing Safety in Procurement - Goods](#)
- [SMS-18-SP-3078 Safety Action Management](#)
- [SMS-06-SP-3026 WHS Risk Management](#)
- [SWI - D2013/80874 PPE for Electrical Work](#)

9. Document control

Document custodian: Senior Safety Specialist Safety Systems
 Document approver: Director Safety and Standards
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10. Version history

Version	Effective Date	Change notes
1.4	24/03/2020	<ul style="list-style-type: none"> • Section 7.2.3 – Rail Commander - has been added to explain the PPE requirements of Rail Commander as per briefing note TRIM SYD2019/438720 • Changes made as a result of the audit recommendation (6.6.11) - reference to SWI and procedure for electrical work- SMS Legislative and Regulatory Compliance Phase 2- Element 6 June 2018. • New template has been used in this version • Added section 6.3 – PPE and clothing for sun protection as a result of the feedback from stakeholders

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