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Preface

This Standard was prepared by the Australian Rail Personal Protective Equipment – Minimum Requirements Development Group, overseen by the ARISO Safety Standing Committee.

Objective

The objective of this Standard is to outline the minimum requirements for personal protective equipment when accessing a railway operating environment. This document aims to establish a standard approach to personal protective equipment within the Australian rail industry.

Changes from previous editions of this Standard include the following:

(a) The inclusion of a PPE risk matrix.

(b) PPE requirements to apply within an overall railway operating environment and not confined to the rail corridor.

(c) Inclusion of head protection equipment and gloves as part of the minimum PPE requirements.

Compliance

There are four types of provisions contained within Australian Standards developed by ARISO:

(d) Requirements.

(e) Recommendations.

(f) Permissions.

(g) Constraints.

Requirements – it is mandatory to follow all requirements to claim full compliance with the Standard. Requirements are identified within the text by the term ‘shall’.

Recommendations – do not mention or exclude other possibilities but do offer the one that is preferred. Recommendations are identified within the text by the term ‘should’.

Recommendations recognize that there could be limitations to the universal application of the control, i.e. the identified control is not able to be applied or other controls are more appropriate or better.

For compliance purposes, where a recommended control is not applied as written in the standard it could be incumbent on the adopter of the standard to demonstrate their actual method of controlling the risk as part of their WHS or Rail Safety National Law obligations. Similarly, it could also be incumbent on an adopter of the standard to demonstrate their method of controlling the risk to contracting entities or interfacing organisations where the risk may be shared.

Permissions – conveys consent by providing an allowable option. Permissions are identified within the text by the term ‘may’.

Constraints – provided by an external source such as legislation. Constraints are identified within the text by the term ‘must’.

ARISO Standards address known hazards within the railway industry. Hazards, and clauses within this Standard that address those hazards, are listed in Appendix A.

Appendices in ARISO Standards may be designated either “normative” or “informative”. A "normative" appendix is an integral part of a Standard and compliance with it is a requirement, whereas an "informative" appendix is only for information and guidance.

Commentary

Commentary *C Preface*

This Standard includes a commentary on some of the clauses. The commentary directly follows the relevant clause, is designated by 'C' preceding the clause number and is printed in italics in a box. The commentary is for information and guidance and does not form part of the Standard.

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Section 1 Scope and general

1.1 Scope

Personal protective equipment (PPE) consists of any personal clothing or equipment that is worn to protect people against injury or illness. PPE acts as a physical barrier between a person and a hazard and is designed to minimize the risk of a worker coming into contact with dangerous conditions that has the potential to cause injury and illness.

This document specifies the minimum requirements for the following classes/types of PPE:

(a) High-visibility outer clothing
(b) protective gloves
(c) protective footwear
(d) protective eyewear
(e) head protection
(f) sun protection

This document applies to personnel at risk of being exposed to hazards and danger when performing work within a railway operating environment. It does not apply to those personnel whose role do not normally require access to a railway operating environment.

This document is applicable to RTOs and contractors that conduct work within heavy and light rail operating environments.

This document does not detail requirements for specialized PPE.

1.2 Normative references

The following documents are referred to in the text in such a way that *some* or all of their content constitutes requirements of this document:

- AS 1067:2016 (all parts), *Sunglasses and fashion spectacles*
- AS/NZS 1337.1:2010, *Personal eye protection, Part 1: Eye and face protectors for occupational applications*
- AS/NZS 1337.6:2012, *Personal eye protection, Part 6: Prescription eye protectors against low and medium impact*
- AS/NZS 1800:1998, *Occupational protective helmets - Selection, care and use*
- AS/NZS 2161.1:2016, *Occupational protective gloves Part 1: selection, use and maintenance*
- AS/NZS 2210.1:2025, *Safety, protective and occupational footwear, Part 1: Guide to selection, care and use*
- AS/NZS 2604:2021, *Sunscreen products – Evaluation and classification*
- AS/NZS 4399:2020, *Sun protective clothing – Evaluation and classification*

NOTE:

Documents for informative purposes are listed in a Bibliography at the back of the Standard.

1.3 Defined terms and abbreviations

For the purposes of this document, the following terms and definitions apply:

1.3.1
railway operating environment
railway operations as defined in Rail Safety National Law

1.3.2
rail transport operator (RTO)
As defined in Rail Safety National Law.

1.3.3
personal protective equipment
clothing or equipment used by a worker or individual to minimize health and safety risks from hazards

1.3.4
specialized PPE
PPE designed specifically for roles, tasks, and/ or specific environmental circumstances. Specialized PPE is identified through a risk assessment process

1.3.5
SPF
rating for sunscreen that indicates how well it protects skin from sunburn

1.3.6
UPF
rating for sun-protective clothing that measures how much UV radiation a fabric blocks

1.3.7
UVR
ultraviolet radiation forms part of the electromagnetic spectrum between 100 nm and 400 nm

General rail industry terms and definitions are maintained in the ARISO Glossary. Refer to:
https://www.ariso.org.au/glossary/

Section 2 PPE requirements within a railway operating environment

2.1 General

This document must be used in conjunction with model WHS Laws and Regulations to identify the PPE requirements necessary to ensure the health and safety of people.

RTOs should adopt a risk based approach to identify any PPE that is required within a railway operating environment. A risk assessment should be conducted to understand the role, task, working and environmental conditions within which the PPE is to be used as a risk control.
Upon completion of a risk assessment, the selected PPE shall be assessed for suitability to the task. See Appendix C for more information.

When assessing PPE requirements, RTOs should:

(a) determine the scope and nature of the railway operations taking into account and documenting the hazards that have the potential to impact on the health and safety of personnel;

(b) analyze work tasks to understand the specific hazards that are present such as physical, chemical and biological;

(c) assess environment factors such as temperature, noise levels, and weather conditions;

(d) identify and assess work tasks which are carried out in a railway operating environment;

(e) identify any hazardous substances that are used in the working environment; and

(f) evaluate the potential products and items that influence PPE selection.

Commentary *C2.1*

Risk management is a critical activity that supports the management and control of risks and hazards to ensure that they are identified, assessed, eliminated and managed SFAIRP. The application of risk management processes will enable RTOs to demonstrate an awareness of the risks and hazards within their operating environment and allow them to determine the types of PPE required to ensure that people are protected from identified health and safety hazards.

When selecting PPE, RTOs should;

(g) procure equipment that fits properly and is comfortable for the user;

(h) ensure that PPE is compatible where multiple PPE items are worn;

(i) provide training to workers on the correct use of PPE;

(j) implement procedures to ensure that all PPE is maintained, cleaned and stored correctly to maintain effectiveness; and

(k) maintain records of workplace risk assessments associated with the use of PPE.

RTOs should ensure that the selected PPE meets or exceeds the requirement of the work task and the demands of the end users.

When assessing controls to manage risks, the use of PPE is lowest on the list of control priorities within the hierarchy of control framework. These controls should not be relied on as the primary means of risk control until the options higher in the list of control priorities have been exhausted.

PPE should only be used:

(l) as a last resort where there are no other practical control measures available;

(m) as a short-term measure until a more effective way of controlling the risk can be used; and

(n) together with other control measures where practicable.

See Appendix D for more information.

2.2 High-visibility outer clothing

RTOs shall ensure that all personnel that enter a railway operating environment wear high-visibility outer clothing.

High-visibility clothing can include the following items:

(a) high-visibility vests worn over other clothing;

(b) shirts;

(c) jackets;

(d) pants and/or trousers;

(e) coveralls; and

(f) waterproof jackets and pants.

High-visibility outer clothing shall meet the requirements of AS 4602. See Appendix B for more information.

High-visibility outer clothing that is worn in a railway operating environment should:

(g) feature a high-visibility fluorescent orange which complies with chromaticity coordinates that lie within the colour spaces specified in AS/NZS 1906.4;

(h) have a minimum luminance factor in accordance with AS/NZS 1906.4;

(i) feature colourfastness after UV exposure compliant with AS/NZS 1906.4 tested to AS 2001.5.4:2005;

(j) be compliant with AS/NZS 4602.1; and

(k) be of a suitable size for the individual to cover the entire torso, and, if a vest, extend at least 100 mm.

If a compliant luminance factor cannot be met for high-visibility outer clothing, the RTO can conduct a risk assessment to determine whether the high-visibility clothing item is visible from the same distance, in various conditions, as an item of high-visibility clothing in accordance with AS/NZS 1906.4.

All high-visibility outer clothing shall be fitted with retro-reflective strips which:

(l) meet the requirements of Class R material in AS/NZS 1906.4;

(m) is positioned on the garment in accordance with AS/NZS 4602.1;

(n) is at least 50 mm wide; and

(o) is silver in colour.

Where the colour requirement of retro-reflective strips cannot be met due to extreme heat reasons, operators can substitute high-visibility clothing as long as any such substitution is visible from the same distance, in various conditions. Decision to substitute high-visibility outer clothing can be supported by a completed risk assessment, documented and retained by the RTO.

Commentary *C2.2*

In extreme heat situations, retro-reflective strips can heat up at a higher rate than other materials and become uncomfortable or hot to touch. For colour and chromaticity coordinates for routine high-visibility requirements, refer AS/NZS 1906.4

2.3 Protective gloves

Protective gloves shall be worn if the RTOs determine that risk-to-skin exposure is unavoidable.

Protective gloves shall comply with AS/NZS 2161.1:2016

When selecting protective gloves, RTOS should assess the following:

(a) potential hand exposure hazards;
(b) the type of material(s) that provides protection;
(c) how much manual dexterity is needed;
(d) the style of glove that would be suitable;
(e) the range of glove sizes available;
(f) whether the gloves are acceptable to the wearer;
(g) the cleaning and maintenance requirements; and
(h) the frequency of glove replacement.

2.4 Protective footwear

RTOs shall ensure that workers within a railway operating environment wear protective footwear.

Protective footwear shall be selected, used and maintained in accordance with AS/NZS 2210.1:2025

A risk based approach should be used to identify any specific footwear requirements beyond the basic safety footwear (e.g., puncture protection/top of foot/welding, in the rail corridor).

Protective footwear shall:

(a) have toe protection such as steel caps;
(b) be of ankle length and high sided;
(c) be lace up, have a zip side or a combination of both;
(d) be acid and oil resistant;
(e) have puncture resistant soles;
(f) have a protective, slip-resistant sole; and
(g) conform to the requirements of AS/NZS 2210.1:2025

2.5 Protective eyewear

Protective eyewear can include safety glasses, safety goggles and face shields.

A risk based approach should be used to identify the requirements for appropriate eyewear.

Safety eyewear or over-glasses shall be worn when conducting work that has the potential to harm the eyes.

Safety glasses or over-glasses shall:

(a) conform to the requirements of AS/NZS 1337.1;
(b) include a suitable set of safety frames; and
(c) have wraparound side protection.

Prescription glasses shall be worn with safety glasses or over-glasses.

Prescription safety glasses shall conform to the requirements of AS/NZS 1337.6

2.6 Head protection

A risk based approach should be used to identify the requirements for appropriate head protection.

Hard hats shall be worn where there is the risk of falling objects, low hanging structures or electrical hazards within the work environment.

Hard hats shall:

(a) comply with AS/NZS 1800:1998 for impact, penetration and electrical insulation;

(b) be inspected before use for dents, cracks, dullness and frayed strapping;

(c) be fitted for comfort to ensure maximum protection;

(d) be vented for airflow in hot conditions;

(e) be replaced after any hard impact and within the manufacturer's expiry date; and

(f) be stored away from direct sunlight, extreme temperatures and chemicals.

Bump caps can offer protection from minor bumps, scrapes and bruises when working in low clearance areas that contain fixed objects.

Bump caps should be worn in low-risk environments that contain hazards that have the potential to cause minor or incidental bumps from static objects.

Bump caps shall not be used as an alternative to hard hats if there is the risk of a severe impact to the head within the working environment.

2.7 Protection from the sun

Sun protection equipment shall include clothing, hats, gloves, sunscreen and sunglasses.

Sun-protection equipment shall be worn in accordance with advice from the World Health Organization (WHO) and the Cancer Council of Australia. More information can be found at:

https://www.who.int/initiatives/intersun-programme

2.8 Sun-protective clothing

Sun-protective clothing shall be rated at UPF 50+ and comply with AS/NZS 4399:2020

Sun-protective clothing can include long sleeved shirts and long pants.

A risk based approach should be adopted to determine fit for purpose sun protection clothing suitable to the conditions at the specific location.

Hazards that have the potential to lead to heat stroke when wearing excessive clothing in a railway operating environment should be subject to a risk assessment and appropriate controls applied.

2.9 Head protection from the sun

Sun-protective headwear should be worn where there is a risk of exposure to harmful ultraviolet rays (UVR).

Sun-protective headwear should be of a design which provides maximum shade for the face, head, ears and neck. The ultraviolet protection factor (UPF) rating of the fabric should be checked to ensure that the material is provides protection from the sun in accordance with AS/NZS 4399

Hard hats should be fitted with a wide brim and neck flap.

Commentary *C2.9*

The effectiveness of sun protection will depend on the material from which a hat or helmet brim and neck flap are made. UVR will penetrate material that has transparent or loose weave material; hence a

close weave is important. Hats will carry a swing tag if the material has been tested to determine how effectively it blocks solar UVR.

2.10 Sunscreen and sunglasses

Sunscreen shall provide broad-spectrum protection rated at a minimum of SPF 30+ and comply with AS/NZS 2604:2021

Sunscreen should be applied as per the manufacturer's instructions.

Where personnel require the use of eye protection from UV, the use of safety eyewear shall meet the requirements of AS 1067:2016 (all parts).

Commentary *C2.10*

The sun protection factor (SPF) rating is based on how long it takes for intense ultraviolet radiation to burn skin with the sunscreen liberally applied compared to bare skin. A higher SPF rating indicates that less ultraviolet radiation reaches the skin if the sunscreen is applied according to the directions.

Although the Cancer Council of Australia recommends using SPF50 or SPF50+ sunscreen, it is safe to continue to use SPF30/SPF30+ sunscreen, as it also provides a high level of protection.

Section 3 Maintenance and care of PPE

PPE maintenance shall include provisions for the appropriate storage, cleaning and servicing of PPE.

PPE shall be inspected as per manufacturers instruction prior to use.

Defective or unsuitable PPE shall be disposed of in accordance with the manufacturer's guidelines and replaced.

PPE shall be replaced when:

(a) it is life expired as specified by the equipment manufacturer;

(b) it is worn or faded to a point that its function is impaired; and/or

(c) if it is damaged or defective in a way that its function is impaired, such as footwear soles worn out or split, eye wear lenses scratched or cracked.

PPE shall be allocated as personal issue and cleaned and stored after each use.

If shared, PPE shall not involve direct skin contact that has the potential to pose a risk of cross infection.

Appendix A Hazard Register (Informative)

Hazard number	Hazard
5.41	Radiation
5.41.1.19	Sunburn
6.5	Harm to Persons
6.5.1.3	Persons being crushed
6.5.1.25	Eye Injury
6.18	Falls
6.18.1.24	Inappropriate or slippery footwear
8.4	Injury or Death of an Employee
8.4.1.1	Being struck by rail traffic

Appendix B Classes of High-visibility Outer Clothing (Informative)

The following classes of high-visibility safety garments are specified in AS 4602:

(a) **Class D** – Day time use ONLY. These garments are intended to ensure that the wearer is highly visible under daylight viewing conditions in outdoor situations. Class D garments are designed for outdoor daytime use only, comprising fluorescent (class F) or non-fluorescent (class NF) high-visibility material. Class D high-visibility materials encircle the upper torso and have a visible area of not less than 0.2 m^2 on both the front and back of the garment.

(b) **Class N** – Nighttime use ONLY. These garments are intended to ensure that the wearer is highly visible at night when viewed under retro-reflected light, such as by drivers of rolling stock or operators of other plant and machinery. Class N garments are manufactured with retro-reflective strips at least 50 mm wide on an unspecified colour background in specific tape configurations and are designed to make the wearer visible from all angles. These garments rely on light reflected from their surface to be directed back along the path of the incoming light beam. An observer will not gain the benefit of a retroreflective article unless he/she is observing it from a position closely aligned with the light source, usually just behind.

(c) **Class D/N** – Suitable for day and night use. These garments are designed for both day and night use, comprising fluorescent (class F) or non-fluorescent (class NF) high-visibility background material and retro-reflective strips at least 50 mm wide on an unspecified colour background in specific tape configurations. Class D/N garments are intended to ensure that the wearer is highly visible under normal daylight and nighttime (under retro-reflected light) viewing. These garments combine the requirements of both Class D and Class N.

Appendix C PPE Risk Matrix (Informative)

PPE Item	PPE types	Hazard types	Usage
High-visibility clothing	• Fluorescent, special purpose coloured – vests – shirts – overalls – rainwear	• Strike by train • Strike by other vehicle	• For increased visibility when accessing a railway operating environment. • To be fitted with retro-reflective strips.
General outer clothing/Sun protective clothing	• Long sleeve shirt with a collar • Long pants / trousers. • Hat – wide brim/legionnaire which protects the ears and neck from the sun.	• Exposure to the sun; cold and wet conditions • Insect bites/stings • Snake bites • Abrasions and cuts • Chemical and biological agents.	• For protection against harmful UV rays. • For protection against adverse weather conditions. • For protection against bites and stings. • For protection against general workplace hazards.
Protective footwear	• High ankle boots – Steel or composite toe – Slip resistant – Waterproof – Puncture proof	• Crushing • Slips/trips/falls • Punctures • Falling objects • Chemical exposure	• For foot and ankle protection when accessing a railway operating environment.
Protective eyewear	• Safety glasses • Safety goggles • Face shields • Prescription safety glasses	• Flying debris / insects • Chemical splashes • Dust exposure • Vapours	• For use in railway operating environments that require eye protection.
Head protection	• Hard hats – Type II – top of head impact protection. – Type II – side of head impact protection • Bump caps	• Falling objects • Head bumping • Exposure to sun • Chemical drips/splashes	• For head protection against falling objects, low hanging structures or electrical hazards when accessing a railway operating environment.

PPE Item	PPE types	Hazard types	Usage
Protective gloves	• Gloves • Leather • Latex	• Cuts and abrasions • Thermal risks (Extreme heat/cold) • Exposure to chemicals • Exposure to the UV rays •	• For protection against harmful skin exposure to the hands and arms when working in a railway operating environment.
Sunscreen and sunglasses	• Sunscreen – Broad-spectrum factor – Sun protection • Sunglasses – UV protection – Polarized lenses	• Skin cancer • Sunburn • Long term skin damage • Excessive UV rays • Glare • Degraded eye health	• For protection against harmful UV rays when accessing a railway operating environment.

Appendix D Hierarchy of Controls (Informative)

The Hierarchy of Controls, as shown below, places PPE at the bottom (least effective), as it relies on worker compliance and does not remove the hazard. It is the last line of defence after elimination, substitution, engineering controls and administrative controls, which are more reliable steps to protect workers from risks. PPE is generally adopted as a control measure when other higher-level controls are unable to sufficiently eliminate or reduce hazards.

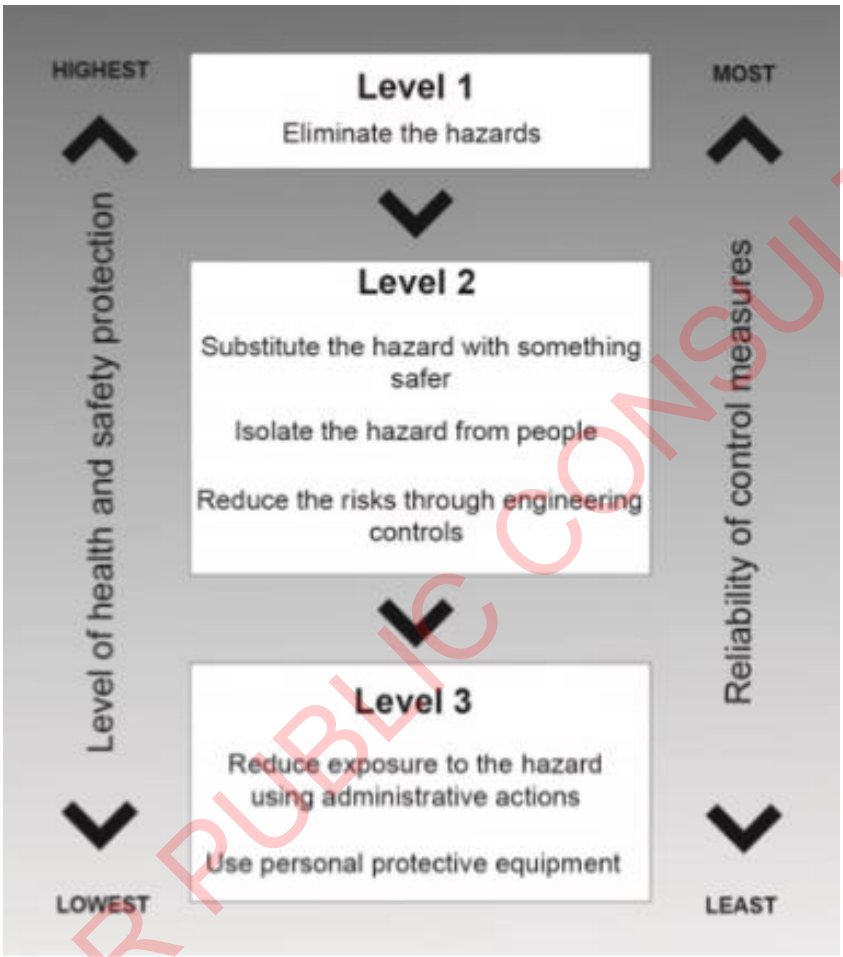

Figure 1 Hierarchy of Controls diagram

Bibliography (Informative)

The following referenced documents are used by this document for information only:

- AS 2001.5.4, *Methods of test for textiles, Method 5.4: Dimensional change - Domestic washing and drying procedures for textile testing (ISO 6330:2000, MOD)*
- AS/NZS 1906.4, *Retroreflective materials and devices for road traffic control purposes, Part 4: High-visibility materials for safety garments*
- AS/NZS 4602.1:2011 Amd 1:2016, *High visibility safety garments, Part 1: Garments for high risk applications*
- *Rail Safety National Law (South Australia) Act 2012*