Laser Safety Compliance Australia: A practical framework to help businesses meet laser safety obligations

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Laser Safety Compliance Australia

About this framework

This framework sets out, in plain English, what a person conducting a business or undertaking (PCBU) that uses lasers needs to do to protect workers, clients and members of the public from laser radiation. It is organised around the hierarchy of controls, drawing from evidence-based resources including federal and state regulators, legislation and Australian Standards. Given workplace health and safety is primarily governed by state and territory law, PCBUs still need to comply with jurisdiction specific legislation.

Background

Laser safety obligations in Australia are set out across several sources including work health and safety legislation, state and territory radiation legislation, Australian Standards and regulator guidance. For some settings and jurisdictions, guidance on applying these obligations in practice is limited.

Australian Standards set out detailed requirements based on international standards, but they are gated behind a paywall. The standards and the legislation are written in technical and legal language respectively, which can make it difficult for PCBUs to turn requirements into everyday workplace practice.

The use of lasers is increasing particularly in cosmetic and therapeutic settings alongside the incidence of laser-related injuries (Biswas & Kaliyadan, 2026; Mousavi & Bagheri, 2025). Laser devices and laser safety eyewear are also widely available from online and overseas suppliers, and this has led to a situation where some of these products do not meet relevant standards or are poorly maintained (Victorian Department of Health, 2024).

This framework aims to help PCBUs fulfil risk management obligations to protect workers, clients and the public from laser radiation. The framework is designed as a reference guide to help PCBUs understand Laser Safety Compliance Australia's Practical Laser Risk Management Self-Audit.

Who it is for

This framework is written mainly for PCBUs (employers) that use lasers in health care and cosmetic settings, where most Australian laser regulation is focused. Its risk management principles apply to any workplace that uses lasers. However other industries such as construction and entertainment settings may face additional hazards and requirements not covered in detail here.

Contents and overview

- **Section 1** covers duties, laser hazards, classification and risk assessment.

- **Sections 2 to 7** follow the hierarchy of controls: elimination, substitution, isolation, engineering controls, administrative controls and personal protective equipment.
- **Section 8** covers incidents, review and how to demonstrate compliance.
- **Section 9** covers the laser safety management plan and emergency response, and Section 10 covers safety culture.
- **Section 11** covers cosmetic and health care settings, and **Section 12** points to state and territory requirements.

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Conflict of interest declaration

Laser Safety Compliance Australia supplies laser safety eyewear and laser safety awareness training. To manage this conflict, the framework is evidence-based and describes products and services by the requirements they must meet, not by brand or supplier.

Disclaimer

This framework is general information, not legal advice. It supplements, but does not replace, legislation, Australian Standards and regulator guidance. See Important information at the end of this framework.

Section 1 – Introductory matters

The following section introduces foundational concepts integral to establishing a risk management protocol for laser safety. The section will provide an overview of legal duties, the hazards that lasers present, laser classification, and other important concepts.

1.1 Key terms

Hazard. Anything with the potential to cause injury, illness or death.

Risk. The likelihood that a hazard will cause harm, combined with how severe that harm could be. Risk extends beyond workers to visitors, volunteers and members of the public (Standards Australia, 2022b).

Control measure. Anything put in place to eliminate a risk, or to reduce it where elimination is not reasonably practicable (Safe Work Australia, 2025a).

Reasonably practicable. What can reasonably be done to ensure health and safety, weighing up the likelihood and severity of harm, what the person concerned knows, and the availability and suitability of ways to reduce risk; cost of reducing risk is a final consideration in the concept of reasonably practicable (Safe Work Australia, 2025b; Victorian Government, 2004).

1.2 Duties

This framework uses the model WHS terms ‘PCBU’ and "worker". In Victoria, the equivalent is employers and employees respectively.

The PCBU has the primary duty to ensure, so far as is reasonably practicable, that the workplace is safe (Safe Work Australia, 2025a; Victorian Government, 2004). In line with the model WHS laws, this includes:

- following a risk management process
- identifying all foreseeable hazards that could arise during installation, operation, maintenance, servicing and failure of laser systems
- acting promptly to eliminate risks, or reduce them so far as is reasonably practicable
- providing training and supervision
- maintaining equipment, including lasers, so it remains safe to operate
- providing personal protective equipment that is suitable and fits the wearer
- regularly reviewing whether controls are working, and documenting the findings

Consultation. The PCBU must consult their workers during the risk management process (Safe Work Australia, 2025b; Victorian Government, 2004). This includes when identifying hazards, assessing risks, choosing controls and reviewing them. Workers are well positioned to identify hazards given they are directly involved in operational processes (Macdonald & Oakman, 2015). Including workers also helps build a sense of involvement which may help develop a strong safety culture (Macdonald & Oakman, 2015).

Officers. Under WHS law, directors and senior managers must exercise due diligence to ensure the PCBU complies with its duties (Macdonald & Oakman, 2015; Safe Work Australia, 2025a). In practice, this means understanding the laser hazards in the business, and making sure resources such as engineering controls, training and a laser safety officer are provided.

Where a PCBU cannot effectively implement a risk management plan on its own, they should seek advice from a competent person, such as an external laser safety adviser (Standards Australia, 2022b).

Workers. Under the model Work Health and Safety Act and Regulations (Safe Work Australia, 2025a), workers must:

- take reasonable care for their own health and safety, and that of others
- follow reasonable policies and procedures, including standard operating procedures
- wear the personal protective equipment provided
- report hazards to a supervisor or laser safety officer immediately, including faulty equipment and missing or damaged labels and signs

Manufacturers and suppliers are generally responsible for classifying and labelling laser products and providing information on their safe use (Standards Australia, 2022a).

Shared duties and contractors. More than one PCBU often has duties for the same laser work. For example, a clinic and a visiting service technician may share duties. Each PCBU must, so far as is reasonably practicable, consult, cooperate and coordinate with the other PCBUs who share the duty (Safe Work Australia, 2025b). A duty cannot be transferred to someone else by contract. In practice, each PCBU should:

- agree in writing who is responsible for which controls
- share risk assessments, procedures and laser details

- check a contractor's competence before work starts, including their qualifications, manufacturer training and safety procedures
- induct contractors and visitors to the site's laser controls
- supervise and monitor contractors' work

1.3 The risk management process

Risk management follows four steps:

1. **Identify hazards.** This includes every stage of the laser's life: installation, normal operation, alignment, maintenance, servicing and failure.
2. **Assess the risks.** This involves considering who could be exposed, including operators, other workers, contractors, clients, visitors and the public. It also involves the likelihood and severity of harm occurring.
3. **Control the risks.** Controls are selected by working down the hierarchy in Sections 2 to 7, starting with elimination.
4. **Review the controls.** Controls are checked to confirm they are working, and revised when something changes or an incident occurs (Section 8).

Deciding what is reasonably practicable. In practice:

1. Controls should start at the top of the hierarchy, moving down only when a higher control is not reasonably practicable (Sections 2 to 7).
2. What others in the industry do, and what regulators require elsewhere, is a good guide to what is available and suitable. A control that one state requires by law is clearly achievable.
3. Most risks need a combination of controls, not a single one.
4. The reasons higher-order controls were not chosen should be recorded. This shows the decision was reasoned.

1.4 Risk of laser radiation

Eyes. Laser radiation is focused by the eye onto the retina, which can cause retinal burns and permanent vision loss (Biswas & Kaliyadan, 2026; Mousavi & Bagheri, 2025). Laser radiation may also damage the cornea, iris and lens. Invisible beams give no visible warning, so a person may be injured without realising they have been exposed.

Skin. Intentional or unintentional exposure can cause burns, scarring and permanent pigmentary changes (Nguyen et al., 2026).

Dazzle and distraction. Even lower-powered beams can cause dazzle, distraction and after-images, which can be hazards in themselves, for example when driving or working at height (Standards Australia, 2022b).

How exposure happens. When identifying hazards, all four pathways should be considered, not just the direct beam:

- **direct beam:** looking into, or being struck by, the beam itself
- **specular reflection:** mirror-like reflections from instruments, jewellery, watches, windows and other shiny surfaces

- **diffuse reflection:** scattered light from rough surfaces, which is hazardous with Class 4 lasers
- **secondary radiation:** radiation that may be produced when the beam interacts with a target. This may be particularly relevant in laboratory settings where different materials and targets are used.

Optical fibres. Where a beam is delivered through an optical fibre, a disconnected, broken or damaged fibre can release the beam. Precautions need to be taken on a case-by-case basis depending on whether a break could reasonably foreseeably occur. The hazard level applies to the particular location that a break could occur, rather than the maximum output of the system as a whole (Standards Australia, 2022b).

1.5 Non-beam hazards

Some of the most serious laser hazards have nothing to do with the beam striking the eye or skin.

- **Laser-generated airborne contaminants (plume).** Cutting, engraving and many medical and cosmetic procedures produce fumes that can be hazardous to breathe (Barat, 2022). Plume from medical procedures may also carry biological material.
- **Electrical hazards.** Some laser systems use high voltage, which is particularly hazardous during servicing or if the equipment is damaged.
- **Fire.** High voltage and the heat the beam generates can be ignition sources, especially with Class 4 lasers. Flammable materials, solvents and drapes are at risk.
- **Other.** PCBUs must consider all other foreseeable hazards in a workplace that uses lasers - this extends beyond lasers and includes both physical and psychosocial hazards (Safe Work Australia, 2025a; Victorian Government, 2017).

1.6 Laser classification

In most cases, lasers should be classified under AS/NZS IEC 60825.1, or an equivalent international standard. The class reflects the laser's ability to cause injury and guides the controls that are needed (Barat, 2022). This framework uses the IEC 60825-1 classification because it is what typically appears on equipment labels. Australian Standard AS/NZS IEC 60825.1 is a direct adoption of the IEC standard, so the classes are the same.

Class	What it means	What to watch for
1	Not hazardous under normal operation, either because the emission is low or because the beam is fully enclosed within a machine (Worksafe WA, 2024).	A Class 1 product may contain a Class 3B or Class 4 laser inside its housing. If the housing is opened or modified, the risk increases significantly. The label should not create a false sense of security.
1M	Generally safe to the naked eye, but hazardous if viewed through magnifying optics (ARPANSA).	Divergent beams become hazardous through magnifiers. Wide, parallel beams become hazardous through binoculars or telescopes.
1C	Used in medical and cosmetic settings. The laser is designed to fire only when the	The output may exceed Class 1 levels. Safety depends on the contact-sensing engineering

Class	What it means	What to watch for
	applicator is in contact with the skin (Standards Australia, 2014).	control. If it fails or is bypassed this can pose a serious risk.
2	Visible light only, and low power. Usually not hazardous because people blink or look away from bright light (Worksafe WA, 2024).	Hazardous if a person stares into the beam. Drugs and alcohol can suppress the aversion response (Standards Australia, 2022b). Dazzle and after-images are possible.
2M	Visible light only. Hazardous if viewed through magnifying optics (ARPANSA).	Also hazardous with intentional staring (Standards Australia, 2022b).
3R	Hazardous when the beam is viewed directly, and possibly from specular reflections (Worksafe WA, 2024).	Low risk of eye injury from brief exposure. Skin injury is unlikely (ARPANSA).
3B	Can damage the eye with any direct exposure, faster than a person can blink or look away. Specular reflections are also hazardous, and skin burns are possible (Standards Australia, 2022b).	A laser safety officer should be appointed (Section 6.1). Specular reflections may cause harm.
4	Hazardous to eyes and skin from the direct beam and from specular and diffuse reflections. Also a fire hazard (Standards Australia, 2022b; Worksafe WA, 2024).	A laser safety officer should be appointed (Section 6.1). Plume and electrical hazards should also be considered. Specular and diffuse reflections may cause harm.

Invisible beams. Lasers that emit radiation outside of the visible spectrum give no visible warning and trigger no blink or aversion response.

Exposure limits and hazard distances. The maximum permissible exposure is the highest level of laser radiation the eye or skin can be exposed to without expected harm. It depends on the wavelength, the exposure time and, for pulsed lasers, the pulse characteristics. It is used to work out:

- the optical density laser safety eyewear needs (Section 7.1)
- the nominal hazard zone, which sets the boundary of the controlled area (Section 4.4)
- the screening needed on windows and openings (Section 4.2)

These calculations are technical, and errors can lead to inadequate protection. They should only be carried out by a suitably qualified person.

Is it necessary to calculate maximum permissible exposure?

Legislation does not generally require PCBUs to calculate the maximum permissible exposure (Queensland Government, 2025; Western Australia Government, 1983). It requires that people are not exposed above safe limits, and that risks are minimised so far as is reasonably practicable. PCBUs may achieve this without calculations, by:

- using compliant equipment, and the hazard distance and eyewear protection specified by the manufacturer
- using certified eyewear rated for the laser
- treating the whole laser room as the controlled area, and screening windows and openings (Section 4)

Calculations by a suitably qualified person are generally needed only where people could be exposed above the maximum permissible exposure and:

- manufacturer or supplier data is unavailable or unclear
- the system has been modified
- the beam is not in a controlled room

Hazard distances. The nominal hazard distance is the distance from a laser within which exposure could exceed safe limits. It is used to set the boundary of the controlled area. Where the whole room is treated as the controlled area, with opaque, non-reflective walls, screened windows and openings, controlled entry, and suitable eyewear for everyone inside, a calculated hazard distance may not be necessary because the room boundary contains the hazard. Further to this, the manufacturer of a laser system may provide the hazard distance and the optical density required for eyewear.

A suitably qualified person should determine the hazard distance where the controlled area is smaller than the room (for example, open-plan areas or curtained treatment bays), where doors or windows cannot be controlled or screened, or where lasers are used outdoors or across large areas. Whatever the hazard distance, eyewear should still be selected for the worst realistic case of exposure.

1.7 Reading laser labels

In Australia, lasers must carry labels identifying their class, maximum output and wavelength (ARPANSA). Labels tell a worker how dangerous the device in front of them is, and they help prevent complacency (Mok et al., 2025). Labelling requirements are set out in AS/NZS IEC 60825.1 (Standards Australia, 2022b).

Most laser products sold in Australia are made overseas, so labels commonly cite IEC 60825-1 or the European EN 60825-1 rather than the Australian designation. The classes, label formats and symbols are the same.

Warning label. The laser hazard symbol: a triangle containing a starburst representing a laser beam. It shows a laser radiation hazard exists, and to look for the explanatory label beside it.

Explanatory label. A text panel giving the laser's maximum output power, wavelength, pulse duration where relevant, and class. It may be written text or pictorial. A pictorial label typically has three panels: the hazard triangle, the class number, and a prohibition symbol meaning do not stare into the beam or view it with optical instruments. For Class 1 and Class 1M products, this information may appear in the user manual instead of on a label.

Aperture label. Identifies the opening the beam comes out of. Aperture labels are required on Class 3R, 3B and 4 products. A marked aperture should be treated as live whenever the system is powered.

Panel and housing markings. Where opening a panel would expose a person to laser radiation, the panel is marked with the class of laser accessible once it is open. This is often much higher than the class on the outside. A device that is Class 1 in normal use can be Class 4 with the cover off.

1.8 Common causes of laser incidents

The causes below are common across laser incidents (Barat, 2022). They can be used as a checklist when identifying hazards.

Cause	What goes wrong	Controlled in
Equipment malfunction	Faulty equipment emits unexpectedly or fails to shut down.	Sections 5 and 8
Eyewear not worn	Eyewear is uncomfortable or inconvenient and is taken off.	Sections 6 and 7
Procedures not followed	Steps designed to limit risk are skipped.	Section 6
Exposure during alignment	Protective covers are removed, greatly increasing the risk.	Sections 5 and 6
Inhaling plume	Fumes from cutting or procedures are breathed in.	Sections 5, 7 and 11
Wrong eyewear	Eyewear does not match the wavelength, output or type of laser.	Section 7
Unfamiliar operators	Untrained or unsupervised workers operate the laser.	Section 6
Poor restoration after servicing	Guards, interlocks or enclosures are not restored and tested.	Section 5
Unsafe high-voltage handling	Electrical hazards during servicing or after damage.	Sections 5 and 6
Beams at eye level or directed upward	Beams cross eye level or are aimed into the sky, endangering people and aircraft.	Sections 4 and 6
Intentional exposure of others	A laser is deliberately pointed at a person.	Section 6
Fire	The beam ignites flammable materials, solvents or drapes.	Sections 5, 6 and 11

1.9 Other legal requirements

Some laws affecting lasers sit outside work health and safety legislation. Thresholds, definitions and permit processes vary between jurisdictions. However, in Australia laser pointers available for sale to the public must have a radiant power of less than 1 milliwatt (ARPANSA). In certain jurisdictions, it is an offence to possess a handheld laser pointer with an output above 1 milliwatt without a permit or exemption (Northern Territory Government, 2001; NSW Government, 1998; NSW Police Force, 2021; South Australia Police, 2026; Tasmania Police; Victoria Police; Western Australian Government, 1999).

Aircraft. Beams directed into the sky can be a hazard to aircraft.

Laser displays and demonstrations. Some states and territories have specific notification or approval requirements (Section 12).

Radiation licensing. Queensland, Tasmania and Western Australia have licensing requirements for owning and using higher class lasers. The licensing details are beyond the scope of this framework and readers are encouraged to visit the website of the relevant state regulator for a primary source of information pertaining to licensing requirements. Laser Safety Compliance Australia also has information on licensing on the state regulation pages.

Section 2 – Elimination

The most effective control is to remove the hazard (Safe Work Australia, 2025a). A PCBU must eliminate risks, including laser risks, where reasonably practicable, and only reduce them when elimination is not possible (Safe Work Australia, 2025a; Victorian Government, 2004).

Ask whether a laser is needed at all. Before buying or using a laser, the PCBU should consider whether the same result can be achieved without one.

Remove lasers that are no longer needed. Lasers that are surplus, broken or no longer used remain hazards while they are on site. They should be disposed of safely or removed from the workplace. Keys and power supplies should be removed from equipment that is not in use.

Eliminate tasks that create exposure. Some exposures come from tasks rather than the laser itself. Examples are manual alignment with the beam on, and working with covers removed. Where a task can be redesigned so no person is near the beam, the exposure is eliminated.

Eliminate specular reflection hazards. Reflective objects such as jewellery and phones should be eliminated from the controlled area when higher powered lasers are used.

Eliminate hazards at the design stage. When planning a new laser installation, the room, the beam path and the work process should be designed to minimise the risk of laser irradiation.

Section 3 – Substitution

Choose the lowest class that works.

Where a laser is needed, the lowest class, lowest power and least hazardous wavelength that will do the job should be used.

Use visible wavelengths where the task allows. A visible beam can be seen, which helps serve as a visual reminder of the hazard.

Use lower power settings when full power is not needed. Reduced power should be used where the equipment allows.

Construction work. Under the model WHS Regulations, Class 3B and Class 4 lasers, within the meaning of AS 2397:2015, must not be used in construction work.

Section 4 – Isolation

Isolation separates people from the beam using distance or physical barriers. Laser equipment must be protected so that operators and others are not exposed to direct radiation, reflected or scattered radiation, or secondary radiation (Safe Work Australia, 2025a).

4.1 Enclose the beam

The most effective form of isolation is a complete enclosure, so the beam cannot reach anyone in normal operation. A fully enclosed system can sometimes be treated as Class 1, even if a much more powerful laser is inside.

4.2 Keep laser radiation inside the room

No hazardous laser radiation should leave the room where the laser is used.

- Every window, doorway and opening should be protected or screened so that any radiation passing through is below the accessible emission limits for Class 1.
- Where applicable, laser barriers and curtains should be rated for the laser's wavelength and power.

4.3 Control the beam path

- Beam paths should ideally be kept well above or below eye level, whether people are sitting or standing.
- Beams should not be directed upward or into the sky unless this is controlled and approved (Section 1.9).
- Every beam should end at a beam stop that is rated for the laser's power and will not reflect or introduce a risk of fire (Section 5).
- Reflective surfaces should not be in proximity to the beam

4.4 Controlled areas

A controlled area is the space around a Class 3B or Class 4 laser where exposure above safe limits is possible. Its physical boundaries are a form of isolation. Walls, doors, barriers and curtains keep people out of the hazard zone while the laser operates. The rules for entering and working in a controlled area are administrative controls (Section 6.3).

The door to a laser room may be linked to the laser through a remote interlock, so the laser stops or drops to a safe level when the door opens (Section 5.2).

Temporary controlled areas. When an enclosed laser system is opened for servicing, maintenance, repair or testing, the enclosure no longer isolates the beam. A temporary controlled area may be set up around the work until the covers are restored (Section 5.5).

Section 5 – Engineering controls

Engineering controls build safety into the equipment and the workplace, so protection does not depend on people remembering to act. Laser equipment should be designed, constructed and installed to prevent accidental irradiation of any person (Safe Work Australia, 2025a).

5.1 Buying compliant equipment

Not every device sold online meets standards. Cheap units bought from overseas suppliers may not comply with IEC 60825, and a missing or poorly designed interlock may increase the risk of accidental irradiation.

Verify compliance, do not assume it. Before buying, the PCBU should ask for a certificate of compliance confirming the device meets IEC 60825 requirements, and check that:

- the certificate was issued by an independent, accredited testing laboratory, not just the manufacturer
- the model and serial range on the certificate match the device being bought
- the labels on the device (class, wavelength, output and warning symbol) agree with the certificate

If a supplier cannot provide a certificate, this should be treated as a red flag. The same principle applies to laser safety eyewear (Section 7.1).

Acceptance check before first use. Before a new device is used on anyone, the PCBU should confirm that the protective housing is intact, the safety features in Sections 5.2 to 5.4 work, the labels match the certificate, and it may be necessary to verify that the output at several settings matches the selected settings (Section 8.3). A record of the check should be kept (Section 8).

5.2 Interlocks and key control

Access panels. Any panel that can be removed or opened to give access to laser radiation should be interlocked or secured (Standards Australia, 2022b). An interlocked panel stops the laser, or reduces it below Class 1 levels, when the panel is opened.

Override mechanisms. If an interlock can be deliberately overridden, the equipment should show clearly that it is in override, or the panel should not be able to close while overridden (Queensland Government, 2021a). The panel should be labelled to warn of laser radiation when it is open and the interlocks are defeated (Standards Australia, 2014).

Remote interlock connector. A remote interlock should be considered for Class 4 lasers. This may involve wiring to a door or other safety device. When the circuit is broken, such as when the door opens, the laser stops (Section 4.4).

Key control. A Class 4 laser should only operate when a key is engaged (Queensland Government, 2021a).

Emergency stop. Where fitted, the emergency stop must work and be easy to reach.

5.3 Warning devices and indicators

- **Emission warning.** The laser should give a visible or audible warning while it is emitting. Everyone near the controls or the aperture should be able to see or hear it.
- **Entrance warning light.** An illuminated warning at each entrance shows when the laser is on. An effective system may include having it linked to the laser so that it switches on automatically.

5.4 Viewing optics

Viewing optics and adjustment equipment, such as viewports, eyepieces, microscopes and cameras, should not create a risk to health or safety. Optics can concentrate laser light into the eye, so:

- Every viewport and eyepiece used while the laser operates should reduce radiation reaching the eye below Class 1 levels (Queensland Government, 2021a).
- where practical, camera viewing should be used instead of direct viewing, particularly for alignment
- particular attention should be paid to Class 1M and Class 2M lasers which become significantly more hazardous when viewed through magnifying systems

5.5 Servicing and return to service

Servicing and maintenance may pose a risk of irradiation particularly when it results in the temporary removal of controls. A device that is Class 1 in normal use can be Class 4 with the cover off.

Know who can do what. Operational maintenance is the routine maintenance an owner is expected to carry out, as described in the operator manual. Technical servicing is everything else and should be carried out only by a qualified technician.

Contractors. When an external technician services a laser, their competence should be checked first, and the parties should agree who sets up the temporary controlled area and who signs off the return-to-service check (Section 1.2).

During servicing, the PCBU should:

- set up a temporary controlled area around the work (Section 4.4)
- follow the manufacturer's procedures for alignment, and only with appropriate training
- manage electrical hazards from high-voltage components
- record any interlock or safety feature that is bypassed, so it is restored before use

Before returning to service: a trained person should confirm that guards, interlocks and enclosures have been restored.

5.6 Plume and fire

Plume. Where a procedure can produce laser-generated airborne contaminants, extraction such as local exhaust ventilation or a smoke evacuator should be used.

Fire. Beam stops should be made of non-flammable, non-reflective material rated for the laser's power. Flammable materials, solvents and drapes should be kept clear of the beam path, and fire extinguishers should be kept nearby.

Section 6 – Administrative controls

Administrative controls are the rules, procedures, signs and training that govern how people work with lasers. They support the higher-order controls in Sections 2 to 5 but cannot replace them, because their effectiveness depends on people following them every time.

6.1 Laser safety officer

Workplaces using Class 3B or Class 4 lasers should appoint a laser safety officer (Queensland Government, 1999; Standards Australia, 2022b). A laser safety officer may also be recommended where Class 1M or Class 2M lasers produce beams that could be hazardous through binoculars or telescopes at a distance, and where equipment containing embedded higher-class lasers is installed or serviced (Standards Australia, 2022b). In Queensland, licensed radiation practices must appoint a radiation safety officer with defined functions (Queensland Government, 1999). Those functions are a useful benchmark for the role in any jurisdiction.

What the laser safety officer does. The laser safety officer should:

- identify ways to minimise exposure to laser radiation, consistent with the laser safety management plan
- provide, or arrange, training on laser hazards and safe work practices for operators and for other workers who may be exposed
- make sure training covers the precautions needed to keep exposures below exposure limits and as low as practicable
- check that the laser safety management plan is being followed
- review the plan regularly to make sure it remains effective
- check whether the laws and standards that apply to the lasers and the premises are being complied with
- If applicable, make sure exposure limit and hazard distance calculations are carried out by a suitably qualified person
- Oversee controlled areas, eyewear selection and incident investigation

Competence. The laser safety officer should understand the hazards of the lasers in use, the controls in this framework, and the legal requirements that apply to the workplace. This may involve completing a recognised laser safety officer course, in addition to training on the specific laser systems in use. In states with radiation licensing, the regulator may set specific training or qualification requirements. Exact competency requirements may vary based on the setting and circumstances of the individual workplace.

Reporting to the PCBU. Where the laser safety officer is not the PCBU, they should:

- advise the PCBU on ways to minimise exposure
- report any breach of the plan, laws or standards, and the action needed to fix it
- report the results of each review, with recommended changes to the plan

Authority and resources. The PCBU should give the laser safety officer the authority to stop unsafe laser work, and the time, training and resources the role needs. Workers should know who the laser safety officer is and report laser hazards to them.

Smaller workplaces. Where no suitably competent person is available internally, the PCBU may engage an external or shared laser safety officer.

6.2 Procedures and information

The PCBU should have clearly defined standard operating procedures, and give workers information on how to carry out laser work safely (Standards Australia, 2022b). Procedures may cover:

- normal operation, including start-up and shut-down
- alignment where applicable, carried out according to the manufacturer's instructions and only by trained workers
- operational maintenance, and when to call a qualified technician (Section 5.5)
- emergency protocols, including suspected exposure, fire and equipment failure (Section 9.4)

6.3 Controlled areas, access and signage

Access. Only authorised, trained people should enter a controlled area while the laser is operating (Section 4.4).

Entrance signage. Entrance signage should be placed around eye level and easily identifiable. Where higher-class lasers are in use, Queensland Government (2021b) recommends that each entrance to the laser room or controlled area have:

- an illuminated warning that shows when the laser is on (Section 5.3)
- a sign showing the laser hazard symbol, with words similar to "Warning – laser on – do not enter when light is illuminated" and "Eye protection must be worn"

PPE signage. Signs should show the personal protective equipment required in each area. Where a facility uses several wavelengths, a placard at the entrance can list each laser and its identifying colour, matched to colour-coded eyewear (McEwen et al., 2024) (Section 7.4).

Reporting. Workers must follow any reasonable controls that safety signs set out (Safe Work Australia, 2025a; Victorian Government, 2017). They may report signage that is faulty, missing or obscured, and report anyone entering a controlled area without authorisation or without the required protection (Barat, 2022).

6.4 Keeping labels in place

The PCBU should keep equipment labels present and readable (Mok et al., 2025). A compliant label is durable, permanently fixed, legible while the equipment is running, and readable without exposure to the beam (Mok et al., 2025). A worn, missing, damaged or obscured label is a hazard, because the next user cannot tell what they are dealing with. Labels should be checked during routine inspections. If a worker finds a compromised label, the device should not be used until its class and specifications are confirmed.

6.5 Training and supervision

A lack of adequate training is a contributing factor to many laser incidents (Biswas & Kaliyadan, 2026). Workers must be provided with information and training that allows them to work without risks to health and safety (Safe Work Australia, 2025b; Victorian Government, 2004). By extension, this includes information and training for the safe use of lasers where applicable. This may include general laser safety training and system-specific training.

General laser safety training is for every worker likely to be exposed to a laser risk. It should cover:

- how laser hazards are identified and risks controlled
- the laser safety procedures used in the workplace
- the responsibilities of workers in risk management
- the use, fit, testing and storage of personal protective equipment

System-specific training is for every worker who operates a particular laser. It should cover:

- the proper operation of that equipment
- its parameters, including wavelength and output, so the worker can check that their eyewear gives the right protection (Glover & Richer, 2023)
- its alignment, maintenance and emergency procedures

Workers should not carry out any laser activity until they are trained in it. Comprehensive training and close supervision are essential for workers who are new to a laser system. Training records should be kept (Section 8).

Section 7 – Personal protective equipment

Personal protective equipment is the last line of defence. It is essential where a laser hazard remains, but it protects only one person, only against the wavelengths it was selected for, and only when it is worn, in good condition and correct for the laser in use.

7.1 Selecting laser safety eyewear

There is no one-size-fits-all approach. No single pair of eyewear protects against all lasers whilst maintaining adequate visibility. Eyewear should be selected based on the wavelengths emitted, whether the laser is continuous or pulsed, and the expected exposure in both normal and unexpected circumstances (Standards Australia, 2022b). It should also fit the wearer's face (Section 7.3). The PCBU should work with the laser manufacturer, the eyewear supplier and someone with subject-matter knowledge to ensure the right eyewear is used.

Who is responsible. The PCBU must provide PPE that gives appropriate protection for the work task and this includes laser safety eyewear that suits the parameters of the laser used (Safe Work Australia, 2025a; Victorian Government, 2017). In workplaces using Class 3B or Class 4 lasers, the laser safety officer should oversee selection (Standards Australia, 2022b). As an extra layer of protection, workers may be trained and familiar with the parameters of the lasers they use, so they can check their eyewear gives the right protection (Glover & Richer, 2023).

Verify certification. Eyewear should not be assumed to comply with appropriate standards because a supplier says so. The PCBU should ask for evidence of certification, preferably from an independent third party. If a supplier cannot provide a certificate of compliance, this is a red flag and another supplier should be considered.

Eyewear standards. Laser safety eyewear standards are complex. Several Australian, European and international standards apply, and some have recently been revised. For an explanation of which standards apply and how to read eyewear markings readers may refer to the following article Selecting Laser Safety Lenses | Laser Safety Compliance Australia.

7.2 Lasers with multiple wavelengths

Matching eyewear becomes harder when an operator uses several wavelengths in one session (Daggett et al., 2020). Either the eyewear must be rated for every wavelength used, or the worker must change eyewear during the session. Eyewear should be changed outside the controlled area so there is no gap in protection. Strict systems are needed to keep each pair easy to identify and prevent mix-ups (Section 7.4).

7.3 Fit

Not wearing eyewear contributes to many avoidable laser eye injuries, but poorly fitting eyewear has also been implicated (Barat, 2022; Biswas & Kaliyadan, 2026; Jbara et al., 2023).

- **Comfort affects use.** Uncomfortable frames make workers less likely to keep their eyewear on (Barat, 2022).
- **Gaps let radiation in.** A beam can reach the eye through gaps around the frame (Jbara et al., 2023).
- **Back-surface reflections.** Light entering from behind can reflect off the back of the lens into the eye.

A good fit may be hard to achieve when eyewear is bought online in a single size. Many organisations fit-test workers for respiratory protection, but the fit of laser eyewear may often be overlooked. Regardless of the practical difficulties, the PCBU is obliged to ensure personal protective equipment is appropriate and fits the wearer (Safe Work Australia, 2025a; Victorian Government, 2017).

Achieving a sound fit. Frames should conform to the face, typically wrapping around the forehead and temples, to remove or minimise gaps (Sutter & Schirmacher, 2001). Side shields reduce the risk of radiation reaching the eye from the side. When fit is checked, particular attention should be paid to the nose and cheeks, where gaps often appear (Sutter & Schirmacher, 2001). Adjustable temples can help fit the frame to the individual. Spectacle wearers, and how the eyewear works with other PPE such as hearing protection, should also be considered.

Goggles or glasses. Goggles may be preferable to glasses, particularly with higher-class lasers. Goggles may fit more closely with no gaps, and their strap stops them loosening or falling off (Sutter & Schirmacher, 2001). Goggles can fog, although some models have built-in ventilation to prevent this (Sutter & Schirmacher, 2001).

7.4 Maintenance, storage and identification

Cleaning and inspection. Laser safety eyewear should be cleaned and inspected regularly (Wamsley et al., 2021). Eyewear should be cleaned according to the manufacturer's instructions, because harsh cleaning agents can damage some lens coatings (Wamsley et al., 2021). Where eyewear is shared between workers or clients, it also needs disinfecting, using only products the manufacturer approves. Inspections should check for:

- scratches or discolouration on the lenses
- cracks or discolouration on the frame
- damage to the straps that could affect the fit

Any eyewear that is compromised should be discarded.

Storage. Eyewear should be stored in an accessible place outside the controlled area, so it can be put on before entering the hazard zone. It can be kept in storage pockets or with the lenses facing up to avoid scratches. Goggles should not be hung by their straps, as this can stretch the strap over time and affect the fit (Barat, 2022). Likewise, glasses should not be hung by their arms.

Identification. Where eyewear is shared, a clear system should mark each pair by size, wavelength and optical density. Operators should be able to identify quickly which wavelength their eyewear protects against, especially where different wavelengths are used for different procedures. McEwen et al. (2024) describe colour-coded stickers for rapid identification, with a placard at the room entrance listing each laser and its colour (Section 6.3).

7.5 Other protective equipment

Eye protection for clients and others in the room. Everyone who could be exposed during a procedure needs eyewear with an optical density suited to the laser. This includes the operator, the client and anyone else in the room (ARPANSA). When treating around the face, occlusive eye shields give clients additional protection (ARPANSA). See also Section 11.

Respiratory protection. Where plume cannot be fully controlled by extraction (Section 5.6), workers may need respiratory protection suited to the contaminants, with fit testing.

Skin protection. Where there is a risk of skin exposure from Class 3B or Class 4 lasers, protective clothing and gloves made from suitable, flame-resistant materials should be considered.

Section 8 – Review, incidents and demonstrating compliance

Controls only work if they are checked. The PCBU must review controls and revise them where needed, learn from incidents and near-misses, and keep records (Safe Work Australia, 2025b; Victorian Government, 2004). This extends to PCBUs who use lasers.

8.1 Incidents and near-misses

When a laser injury or a near-miss occurs, the PCBU should identify the cause so further controls can be put in place to prevent reoccurrence. Workplaces should have an incident reporting system that allows a thorough investigation (Standards Australia, 2022b). Workers may contribute to risk management by reporting malfunctioning or faulty equipment, as well as injuries and near-misses. PCBUs should

establish a culture where workers feel safe to report hazards, incidents and near-misses (Brown et al., 2026; Khatri et al., 2009).

8.2 Reviewing controls

The PCBU should periodically review its control measures and, if necessary, revise them (Safe Work Australia, 2025a; Victorian Government, 2004). Controls may also be reviewed

- after an incident or near-miss
- when equipment, processes or premises change
- when new information about a hazard becomes available
- when workers raise a concern
- when a review shows a control is not working

8.3 Periodic equipment checks

Each laser should be checked to confirm it continues to work as intended, including interlocks, key controls, emergency stops and emission warnings. For lasers used on people, the delivered output, wavelength and pulse duration may need to be periodically verified against the selected settings.

How often controls, equipment and eyewear are checked depends on the level of risk and how often the laser is used. The PCBU should set these intervals and record them in the laser safety management plan (Section 9).

8.4 Records to keep

Record	Why it matters	See
Risk assessments and reviews	Shows hazards were identified and controls chosen and reviewed	Sections 1.3 and 8.2
Certificates of compliance	Shows equipment and eyewear meet recognised standards	Sections 5.1 and 7.1
Acceptance checks	Shows safety features worked before first use	Section 5.1
Maintenance, servicing and return-to-service checks	Shows equipment was kept safe and restored correctly	Section 5.5
Extraction equipment maintenance	Shows plume controls were maintained to specification	Section 5.6
Eyewear inspections	Shows eyewear was checked and compromised pairs removed	Section 7.4
Training and supervision	Shows workers were trained in general laser safety and on each	Section 6.5

Record	Why it matters	See
	system they use	
Incident and near-miss reports	Shows incidents were investigated and acted on	Section 8.1
Laser safety officer appointment	Shows who oversees the program	Section 6.1

8.5 Demonstrating compliance

A PCBU can show it is meeting its laser safety obligations by:

- following a risk management framework, such as the guidance in AS/NZS IEC 60825.14
- having clearly defined and documented procedures (Section 6.2)
- buying lasers and laser safety equipment from suppliers who can provide verifiable certification to recognised standards, and keeping the certificates (Sections 5.1 and 7.1)
- training workers in both general laser safety awareness and the specific laser systems they use (Section 6.5)
- documenting its risk management and training (Section 8.4)
- engaging a competent, independent assessor for risk assessments and audits

Section 9 – Laser safety management plan

A laser safety management plan records how a PCBU manages laser risk. Tailored for the individual workplace, industry and state legislation, it brings elements of this framework together in one place, so workers, managers, auditors and regulators can see what controls are in place and who is responsible for them.

9.1 Who needs a plan

Any PCBU using Class 3B or Class 4 lasers should consider a laser safety management plan. Where only lower-class lasers are used, the same information may be recorded within the PCBU's general WHS management system.

9.2 What the plan may contain

Element	What to include	See
Scope	The lasers, locations and activities the plan covers	Section 1
Laser register	Each laser's class, wavelength, output, location and responsible person	Section 1.6
Roles and responsibilities	PCBU, officers, laser safety officer, supervisors, operators and contractors	Sections 1.2 and 6.1
Risk assessments	An assessment for each laser and task,	Section 1.3

Element	What to include	See
	including servicing and failure	
Controls	The controls for each laser, in hierarchy order	Sections 2 to 7
Controlled areas	Boundaries, access rules and signage	Sections 4.4 and 6.3
Procedures	Operation, alignment, servicing and return to service	Sections 5.5 and 6.2
Personal protective equipment	Eyewear for each laser, fit checks and inspection schedule	Section 7
Training	Training required for each role, refresher intervals and records	Section 6.5
Emergency response	The laser injury and emergency response policy	Section 9.4
Incidents and review	Reporting, investigation, review triggers and audits	Section 8
Records	What is kept, where and for how long	Section 8.4

9.3 Keeping the plan current

A plan only works if it reflects what actually happens in the workplace.

- The plan should have an owner, usually the laser safety officer.
- It should be developed and reviewed in consultation with workers, on a regular schedule and whenever a review trigger occurs (Sections 1.2 and 8.2).
- It should be easy for workers to find and read.

9.4 Emergency response policy

PCBUs should have an emergency plan for their workplace (Safe Work Australia, 2025a). Where lasers are used, the PCBU may also have a written policy for responding to laser injuries to both workers and clients. This policy forms part of the laser safety management plan.

The emergency response policy will depend on the lasers in use and the workplace. It may cover:

- **Stopping and making safe.** How the laser or treatment is stopped immediately and the equipment shut down.
- **First aid.** Who provides initial assistance, such as a designated first aid officer, and what first aid equipment is available. What the referral process is.
- **Recording laser details.** The laser's class, wavelength, output and settings, and the circumstances of the exposure, so the treating practitioner has the information they need.

- **Reporting and investigation.** Recording and investigating the injury (Section 8.1), and notifying the WHS regulator, or the radiation regulator where licensing conditions require it.
- **Fire and electrical incidents.** Isolating the power supply, using suitable extinguishers, and evacuating according to the emergency plan.

Section 10 – Safety culture

A strong safety culture is one where people follow procedures even when no one is watching, report hazards, and feel safe to report injuries and near-misses (Khatri et al., 2009; Savage et al., 2024).

10.1 Why it matters

Many of the common causes of laser incidents are behavioural: eyewear not worn, procedures skipped, operators working beyond their training, and lasers pointed at people (Section 1.8). Complacency is a particular risk when laser work becomes routine. Engineering controls reduce reliance on behaviour, but no workplace can remove it entirely.

10.2 Leadership

Officers, managers and supervisors set the standard. They should:

- follow the same rules as everyone else, including wearing eyewear in controlled areas
- provide the resources that safety needs, such as equipment, training and time
- respond promptly and visibly when workers raise concerns

10.3 Reporting and involving workers

Workers are more likely to report near-misses when reporting leads to fixes rather than blame (Section 8.1). They are also more likely to follow controls when involved in the risk management process such as developing procedures and selecting equipment (Sections 1.2 and 7.3).

10.4 Countering complacency

The PCBU can counter complacency by:

- providing refresher training
- sharing the lessons from incidents and near-misses, including those from other workplaces
- supervising new and returning operators closely
- auditing how procedures are followed in practice, not just how they are written.

Section 11 – Client safety and clinical governance

In cosmetic and health care settings, the laser is deliberately applied to a person. Clients are "other persons" under model WHS law, so the PCBU's duty of care extends to them as well as to workers.

Laser treatments can cause client complications such as burns, scarring and pigment changes. The risk increases when an inappropriate device or mismatched settings are used, and with client-related factors such as photosensitising medications, skin type and existing infections (Nguyen et al., 2026).

Screening clients, identifying precautions and contraindications, and choosing treatment settings are clinical decisions. They sit within clinical governance rather than work health and safety, so this framework does not cover them in detail.

Examples of clinical governance initiatives the PCBU can implement may include ensuring that laser operators:

- hold qualifications appropriate to the treatments they provide
- practise within their scope
- have opportunities for professional development
- are trained in each device they use (Section 6.5)
- work within documented clinical procedures, including client screening

For guidance on clinical governance, PCBUs can refer to the Australian Commission on Safety and Quality in Health Care, which publishes the National Safety and Quality Primary and Community Healthcare Standards. This website includes frameworks, training modules and other information to facilitate effective clinical governance.

Section 12 – State and territory requirements

In addition to WHS laws, some states and territories have radiation laws that license laser users, register premises, restrict certain classes of laser, or set compliance tests for medical and cosmetic lasers. These requirements differ between jurisdictions and change over time, so they are not reproduced here.

PCBUs should check the requirements for their state or territory on our jurisdiction pages, and confirm them with the relevant regulator. Some state regulations refer to older editions of laser standards rather than the most recent Australian standards. Most state regulators have enquiry forms on their webpages where PCBUs can receive assistance and advice on WHS and radiation safety matters. Laser Safety Compliance Australia have published articles summarising jurisdiction specific regulations; these articles may be beneficial to refer to as supporting material but should not be relied on as a primary resource.

Laser regulations in Australia | Laser Safety Compliance Australia

Important information

General information only. This framework provides general information about laser safety. It is not legal, medical or professional advice, and it does not create a professional relationship between Laser Safety Compliance Australia and any reader.

Not a substitute for the law or standards. This framework summarises and interprets legislation, Australian Standards and guidance in plain English. It does not replace them. Where this framework differs from legislation, a regulator's requirements or an Australian Standard, those sources prevail. Following this framework does not guarantee compliance with work health and safety, radiation or any other laws.

Individual circumstances. Each workplace, industry and laser system is different. PCBUs remain responsible for identifying the hazards in their own workplace, assessing the risks and deciding which controls are reasonably practicable. Where needed, PCBUs should seek advice from a suitably qualified

laser safety professional, independent legal advice, and the relevant work health and safety or radiation regulator.

Currency and third-party material. This framework reflects the law and guidance available at the date of publication. Laws, standards and guidance change, and requirements differ between states and territories, so readers should check that they are using the current version and confirm current requirements with the relevant regulator. This framework refers to legislation, standards, research and websites published by others. Laser Safety Compliance Australia is not responsible for their content or availability. These works remain the property of their respective owners. Australian Standards are available from Standards Australia.

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Glossary

Term	Meaning
Accessible emission limit	The maximum laser radiation a product of a given class is permitted to emit.
Aperture	The opening a laser beam comes out of.
Aversion response	The natural reflex to blink or look away from bright light. It works only for visible light and should not be relied on.
Beam stop	A device that safely ends a laser beam, absorbing it without reflecting it or catching fire.
Continuous wave laser	A laser that emits a steady beam rather than pulses.
Controlled area	The area around a Class 3B or Class 4 laser where exposure above safe limits is possible. Access is restricted while the laser operates.
Diffuse reflection	Scattered reflection from a rough surface.
Interlock	A safety device that stops the laser, or reduces it to a safe level, when a door or panel is opened.
Laser class	The hazard category of a laser under IEC 60825-1 (Section 1.6).
Plume	Fumes, particles and biological material released when a laser interacts with a material or tissue.
Laser safety officer	The person appointed to oversee laser safety in a workplace (Section 6.1).

Term	Meaning
Maximum permissible exposure	The highest level of laser radiation the eye or skin can be exposed to without expected harm.
Nominal hazard zone	The space around a laser within which exposure may exceed the maximum permissible exposure. Its outer limit is the nominal hazard distance.
Optical density	A measure of how strongly laser eyewear blocks a given wavelength.
PCBU	Person conducting a business or undertaking: the main duty holder under the model WHS laws (Section 1.2).
Pulsed laser	A laser that emits in short bursts. Peak power can be very high even when average power is low.
Reasonably practicable	What can reasonably be done to ensure health and safety, weighing the factors in Section 1.1.
Specular reflection	A mirror-like reflection from a shiny surface, which can be as hazardous as the direct beam.
Wavelength	The property that determines a laser's colour or invisibility, which part of the eye it affects, and which eyewear protects against it. Measured in nanometres.
Worker	Anyone who carries out work for a PCBU, including employees, contractors, labour-hire workers, apprentices and volunteers.

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