



IMPLEMENTATION

Aim

To prescribe the responsibilities and actions required for the management and safe use of lasers to ensure the University meets the requirements of the [Health, Safety and Wellbeing \(HSW\) Policy](#) and the relevant sections of the [Work Health and Safety Act 2012 \(SA\)](#) and [Work Health and Safety Regulations 2012 \(SA\)](#).

This procedure should be read in conjunction with the [Plant/Equipment Safety Management procedure](#).

1 Objectives

- 1.1 To ensure levels of human exposure to laser radiation does not exceed maximum permissible exposure (MPE) values as set out in set out in Australian and International standards, such as the [AS/NZS IEC 60825 series](#).
- 1.2 To provide a framework that ensures:
 - individuals can only use high-powered laser equipment once deemed competent;
 - risks to health and safety posed by high-powered lasers are minimised so far as is reasonably practicable using the hierarchy of controls prior to the activity commencing;
 - high-risk laser activities are reviewed and approved by a person proficient in laser safety matters; and
 - laser-related incidents and safety concerns are investigated, and controls effectively addressed.

2 Scope and application

2.1 Inclusions

This process applies to all persons who undertake University of Adelaide related activities and/or are employed or engaged by the University or affiliated with the University in any capacity as a worker as defined under the [WHS Act 2012 \(SA\)](#). This includes but is not limited to employees, title holders, volunteers, students, visitors or third parties engaged by the University under a contract of service or contract for service (e.g. contractors, sub-contractors and employees of a labour hire company placed in the University) or all parties seeking to conduct laser operations on University campuses.

2.2 Exclusions

This chapter does not apply to class 1, 1M, 2, or 2M laser products when used as per the manufacturer's instructions, risk assessment, and any documented safe operating procedures – in which instance following the manufacturer's warnings and guidance is sufficient for safe use.

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Note: An individual may serve in one, a combination of, or all of the following roles: laser safety officer, supervisor of a laser laboratory, and laser user. In cases where an individual serves in multiple roles, that person must fulfil all the responsibilities outlined in the respective sections.

3 Process: Authorising personnel responsible for management of laser operations

Person Responsible	Actions
<p>3.1 Head of School (or delegate)</p>	<p>Heads of schools whose activities involve the use or operation of lasers within the scope of this procedure must:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Identify and appoint a laser safety officer/s who meets or exceeds the standard of competence in Appendix A. <input type="checkbox"/> Ensure laser safety officer/s are sufficiently resourced to perform their responsibilities.

4 Process: Management of laser operations

Person Responsible	Actions
<p>4.1 Director, HSW (or delegate)</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Maintain a register (to be known as the university laser register) of all class 3B and 4 lasers (see definitions) in use at the University. <input type="checkbox"/> Ensure ongoing availability of the basic operator laser safety course for supervisors of laser laboratories and laser users, ensuring it conveys necessary and up-to-date information in relation to safe operating practices, hazard identification, and compliance with relevant safety standards.
<p>4.2 Laser Protection Advisor (See definitions)</p>	<p>Upon request:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Offer pre-purchase advice to ensure that all lasers acquired meet safety standards and are suitable for the intended use. <input type="checkbox"/> Offer guidance, and support on the development and review of laser-related documentation including laser safety plans, risk assessments and safe operating procedures. <input type="checkbox"/> Conduct on-site reviews of the University's laser safety management to evaluate alignment with current best practices and the principles outlined in the AS/NZS IEC 60825 series, and provide recommendations for improvement where necessary. <input type="checkbox"/> Review laser facilities and controls, including where there is a need to modify the facility to accommodate new tasks or activities. <input type="checkbox"/> Verify hazard calculations and assess the suitability of selected control measures and safety equipment (including eyewear).
<p>4.3 Laser Safety Officer (See definitions)</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Upon request, authorise activities involving high-powered lasers by reviewing the adequacy of controls in risk assessments submitted by supervisors of laser laboratories, ensuring exposure does not exceed maximum permissible exposure levels. <input type="checkbox"/> Upon request, provide pre-purchase advice for laser equipment, ensuring equipment meets safety standards. <input type="checkbox"/> Take all reasonable measures to prevent the procurement, use or possession of laser pointers with an output power greater than 1 milliwatt. <input type="checkbox"/> Ensure supervisors of laser laboratories are trained to the appropriate level of competence set out in Appendix A. <input type="checkbox"/> Ensure that warnings displayed in laser work areas comply with AS/NZS IEC 60825.14:2011 "Safety of laser products Part 14: A user's guide".

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4 Process: Management of laser operations (Continued)

Person Responsible	Actions
<p>4.3 Laser Safety Officer (Continued)</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Ensure there is a system for retaining formal risk assessments in accordance with the State Records of SA, General disposal Schedule No 30 issued under the State Records Act 1997. (Contact the University's Records Management Office for further assistance/information if required). <input type="checkbox"/> Ensure the testing of incident response plans is added to the school/branch schedule of programmable events (safety calendar) and maintain appropriate testing records. <input type="checkbox"/> Ensure supervisors of laser laboratories and laser users complete the basic operator awareness course prior to undertaking work involving high-powered lasers. <input type="checkbox"/> Take an active role in promoting best practices for the safe operation of laser laboratories. <input type="checkbox"/> Ensure that all laser equipment purchased complies with relevant Australian standards. <input type="checkbox"/> Consult a laser protection advisor if further information or additional expertise is required, or to seek a second opinion on safety calculations or risk assessments. Refer to the internal knowledge article for guidance on how to seek advice from the laser protection advisor.
<p>4.4 Supervisor of a Laser Laboratory (See definitions)</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Ensure laser users are inducted to local area including local laser safety rules prior to conducting work involving class 3R, 3B and 4 lasers. <input type="checkbox"/> Supervise all laser activities within your area of responsibility, ensuring that all laser users are operating in a safe manner. <input type="checkbox"/> Ensure the University laser register contains complete and up to date information on all class 3B and 4 lasers in use in the lab you supervise by filling out the laser register update form as required. <input type="checkbox"/> Ensure laser hazards are risk assessed and controls are implemented in accordance with the Hazard Management Procedure. <input type="checkbox"/> Ensure incident response plans are in place where high-powered lasers are used. <input type="checkbox"/> Ensure that response plans clearly outline procedures for addressing traumatic or serious eye injuries, skin injuries, or non-traumatic (minor) eye injuries resulting from exposure exceeding the maximum permissible exposure level. <input type="checkbox"/> Ensure all lasers are inspected and maintained in accordance with the manufacturer's instructions and the Plant and Equipment Procedure. <input type="checkbox"/> Ensure that lab access restrictions are strictly enforced and remain effective, preventing entry by individuals who have not been deemed competent. <input type="checkbox"/> Where required, seek advice from the laser safety officer prior to the purchase or manufacture of any high-powered laser equipment. <input type="checkbox"/> Where the output power of a laser is not known (e.g. laser components, experimental or prototype systems), measure and record its output for listing on the University Laser Register. <input type="checkbox"/> Ensure there is a system for retaining formal risk assessments in accordance with the General Disposal Schedule No 30 issued under the State Records Act 1997 (contact the University's Records Management Office for further assistance/information if required). <input type="checkbox"/> Complete the online basic operator awareness course (request access). Note: You are exempt from having to complete the course if a laser safety officer has confirmed that you possess the required level of knowledge as outlined in Appendix A and has provided written acknowledgement of your competency.

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4 Process: Management of laser operations (Continued)

Person Responsible	Actions
<p>4.4 Supervisor of a Laser Laboratory (Continued)</p>	<p>Review risk assessment and controls used for laser activities when:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Alterations to the environment or modifications, relocations, or replacements of laser equipment are made that affect or have the potential to affect the effectiveness of existing controls; or <input type="checkbox"/> Changes are made which impact or may impact who has access to the laser equipment or who could potentially be exposed to laser hazards; or <input type="checkbox"/> There is a recurring pattern or trend of non-compliance with the established controls.
<p>4.5 Laser Users (see definitions)</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Ensure a risk assessment authorised by the laser safety officer is in place prior to conducting an activity involving a high-powered laser. <input type="checkbox"/> Only carry out high-powered laser activities that have been authorised by a laser safety officer. <input type="checkbox"/> Do not engage in tasks involving high-powered lasers without direct supervision from the laser laboratory supervisor or a laser safety officer, unless you have received comprehensive task-specific guidance and formal approval from the area supervisor to proceed independently. <input type="checkbox"/> Abide by the activity risk assessment, SOP, and incident response plan. <input type="checkbox"/> Do not conduct or perform any laser activities until authorised to do so by the supervisor of the laser laboratory. <input type="checkbox"/> Ensure records (such as risk assessments, SOPs and training records) are stored using the faculty process. <input type="checkbox"/> Complete the basic operator awareness course (request access). <input type="checkbox"/> Do not procure or remain in possession of a laser pointer with an output power greater than 1 milliwatt <input type="checkbox"/> Report incidents and near misses in line with section 5.2.

5 Process: Responding to incidents and managing issues

Person Responsible	Actions
<p>5.1 Laser Safety Officer</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Participate in any HSW investigation (coordinated by HSW) and review of controls where requested to do so by a relevant person. <input type="checkbox"/> Where an unsafe practice or safety issue is identified through an HSW inspection or other method: <ul style="list-style-type: none"> <input type="checkbox"/> advise the laser user to cease the activity, and; <input type="checkbox"/> discuss and enter corrective actions(s) for the supervisor of the laser laboratory in UniSafe.
<p>5.2 Supervisor of a Laser Laboratory</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Participate in any HSW-coordinated investigation and review of controls where requested to do so by a relevant person. <input type="checkbox"/> In the event of, or upon becoming aware of a safety issue relating to a high-powered laser in a laboratory you supervise: <ul style="list-style-type: none"> <input type="checkbox"/> advise a laser safety officer Note: if you are the supervisor of the laser laboratory and the laser safety officer, you do not need to advise another laser safety officer. <input type="checkbox"/> ensure that the laser activity does not recommence until a laser safety officer has approved the activity.

5 Process: Responding to incidents and managing issues (Continued)

Person Responsible	Actions
5.3 Laser Users	<ul style="list-style-type: none"> <input type="checkbox"/> Participate in any HSW investigation (coordinated by HSW) and review of controls where requested to do so by a relevant person. <input type="checkbox"/> In the event of an incident or safety issue relating to a high-powered laser: <ul style="list-style-type: none"> <input type="checkbox"/> advise the supervisor of the laboratory <input type="checkbox"/> follow the steps set out in the incident response plan <input type="checkbox"/> file a report in UniSafe <input type="checkbox"/> cease laser activity until a laser safety officer has approved the activity to recommence.

6 Process: Purchase of high-powered laser equipment

Person Responsible	Actions
6.1 Supervisor of a Laser Laboratory	<ul style="list-style-type: none"> <input type="checkbox"/> Ensure the proper design, manufacture, importation, supply, lease/hire, acquisition, installation and commissioning accordance with Appendix A of the Plant/Equipment Safety Management procedure. <input type="checkbox"/> Where required, consult a laser safety officer if further information or additional expertise is required, or to seek a second opinion on safety matters. Refer to the internal knowledge article for guidance on how to seek advice from a laser safety officer. <input type="checkbox"/> Notify the HSW team when a new 3B or 4 laser has been acquired by submitting a laser register update request through ServiceNow.
6.2 Laser User	<ul style="list-style-type: none"> <input type="checkbox"/> Before purchasing a laser, consult with the supervisor of the laboratory where the laser will be operated to ensure that the facilities are suitable and that the device you intend to purchase complies with the relevant Australian Standards, and that the facilities can be appropriately modified (if required) to meet all HSW requirements for the safe operation of the laser. <input type="checkbox"/> Notify the supervisor of the area in which you intend to operate the laser that you intend to purchase a laser.

7 Process: Disposal of high-powered laser equipment

Note: An individual may serve in one or both of the supervisor of a laser laboratory and laser user roles. If so, that individual must fulfil all the responsibilities outlined in the respective sections.

Person Responsible	Actions
7.1 Supervisor of a Laser Laboratory	<ul style="list-style-type: none"> <input type="checkbox"/> Ensure the proper storage, decommissioning, dismantling or disposal of the laser device in accordance with Appendix H of the Plant/Equipment Safety Management handbook chapter: 'Decommissioning, dismantling and disposing of plant/equipment'. <input type="checkbox"/> Consult a laser protection advisor if further information or additional expertise is required. Refer to the internal knowledge article for guidance on how to seek advice from a laser protection advisor. <input type="checkbox"/> If the laser is class 3B or 4: notify the HSW team that the laser has been disposed of by submitting a laser register update request through ServiceNow.
7.2 Laser User	<ul style="list-style-type: none"> <input type="checkbox"/> Notify the supervisor of the laboratory in which you intend to operate the laser that you intend to dispose of a laser

8 Performance Measures

The HSW Team will use performance measures to assist in identifying areas of success and/or where corrective action is required to meet the objectives and targets of this process.
The level of compliance with the chapter and effectiveness will be determined during the internal audit process.

9 Useful information and resources

9.1 University related documents and Policies

- [HSW Policy Statement](#)
- [Hazard Management Procedure](#)
- [Incident Reporting & Investigation Procedure](#)
- [Plant and Equipment Procedure](#)

9.2 Related Legislation

- [Work Health and Safety Act 2012 \(SA\)](#)
- [Work Health and Safety Regulations 2012 \(SA\)](#)

9.3 Useful Links

Australian Standards online (accessible when connected to a University of Adelaide network)

The [AS/NZS IEC 60825 series – Safety of laser products](#).
(Accessible through [Techstreet Enterprise](#)).

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10 Definitions

Classes of lasers

Refer to section 5.1.2 [AS/NZS IEC 60825.14 Safety of laser products, Part 14: A user's guide](#). The classification of a laser gives an indication of its potential hazard, with classes 1, 1C, 1M, 2, 2M and 3R considered low powered under normal use and classes 3B and 4 considered high powered.

Proficient person

A proficient person is a person with sufficient skill in, and knowledge of, matters relevant to laser safety, relating specifically to the technical area within which advice is being sought; and able to provide appropriate advice in hazard determination, risk assessment and protective control. Refer to [Appendix A](#) – Guidance on competencies and training.

Competent person

A person who possesses the skills and knowledge to safely and effectively manage and operate laser systems. This person has undergone the basic operator awareness course, enabling them to identify laser hazards, apply relevant safety measures, and comply with applicable standards and procedures in laser safety.

High-powered laser

Class 3R, 3B and 4 laser products.

Laser Protection Advisor

The University laser protection advisor is an external provider engaged by HSW, recognised as a proficient person who has sufficient skills, knowledge and experience to advise the university in the use of lasers and the implementation of procedures that meet compliance requirements (AS/NZS IEC 60825.14:2022, *Safety of laser products, Part 14: A user's guide*).

Laser Safety Officer

A laser safety officer is a competent person identified by a Head of School, who has sufficient skill, knowledge, and experience (in line with [Appendix A](#)) to facilitate the implementation of laser safety. A laser safety officer can be a staff member who is a recognised subject matter expert, or has completed appropriate recognised training

Laser User

A person who works with or is placed in control of high-powered laser equipment. A laser user is a competent person who has completed instruction or training as required by the laser safety officer. Refer to [Appendix A](#) – Guidance on competencies and training.

Supervisor of a Laser Laboratory

A supervisor of a laser laboratory is a university staff member (technical or academic) who is responsible for managing the day-to-day safe operation of a lab in which a laser that falls within the remit of this procedure is used.

Safety Issue

An unsafe condition and/or unsafe act is one that could cause harm or place someone at risk of injury or illness. Examples of unsafe conditions include exposure to visible wiring, broken equipment, hazardous materials, inadequate guarding of hazardous plant, and unsafe working environments. Examples of unsafe acts include not following control measures in a risk assessment, leaving spills on the floor, and failing to inform someone of a potentially hazardous situation.

University Laser Register

A register of all class 3B and 4 laser products at the University of Adelaide.

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LASER SAFETY MANAGEMENT ROLES

Minimum requirements

(in accordance with [AS/NZS IEC 60825.14 Safety of laser products, Part 14: A user's guide](#)).

Role	Expected Level of Knowledge
Laser Safety Officer	<p>Any person acting as a Laser Safety Officer must have sufficient knowledge, competence, and experience with high powered lasers, particularly regarding the following:</p> <ul style="list-style-type: none"> • laser safety standards and national regulations • understanding laser risk assessments and safe operating procedures • the proper use of warning signs and controlled areas • the nature and extent of other hazards that may arise from the use of the laser equipment, including: <ul style="list-style-type: none"> ○ mechanical hazards ○ electrical hazards ○ noise and vibration hazards ○ thermal hazards ○ fire and explosion hazards ○ chemical hazards ○ biological hazards including laser fume or plume ○ radiation hazards, in addition to those due to laser emission. <p>The Laser Safety Officer must also have a demonstrated understanding of the following technical aspects:</p> <ul style="list-style-type: none"> • the type(s) of laser equipment in use. • the use of high-powered lasers in a research environment. • the basic characteristics (spatial, spectral, and temporal) of laser emission • the appropriate quantities and units in which laser emission is specified • the concept of laser hazard classes and the meaning of laser warning labels • the waveband(s) and wavelength(s) of emission of the laser equipment in use • the tissue(s) at risk from laser beam exposure, and in the case of laser emission within the retinal hazard region (wavelengths between 400 nm and 1400 nm), the focusing effects of the eye • the severity of harm that can occur from laser beam exposure.
Supervisors of Laser Laboratories	<p>If directly involved with the laser work, the supervisor must have the same or greater level of knowledge and/or training as a laser user.</p> <p>If not directly involved with the laser work, training is not required as it will be expected that the laser user will be supervised by a laser safety officer.</p>
Laser User	<p>Those who work with high-power laser equipment should be sufficiently competent in the operation and use of equipment including, particularly with regard to:</p> <ul style="list-style-type: none"> • laser operation principles, radiation characteristics, associated hazards, and the implications of the laser classification system • the health hazards that can arise from the use of the laser equipment, the tissues of the body which are at risk, and the severity of harm which can result • the meaning of the warning labels appropriate to the class/classes of laser being used • the proper use of hazard control procedures, including where appropriate, the need for personal protection • the need for any addition precautions that may be necessary when undertaking non-routine activities, such as adjustment work • University and local procedures for laser use, including emergency action (incident response plans) and reporting of safety issues.

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