

PLANT/EQUIPMENT RISK CONTROL (Hierarchy of Controls)

Risk controls are to be implemented using the “Hierarchy of Controls” below. In most cases, risk is controlled by a combination of several levels. Where a risk cannot be eliminated, then the risk is to be minimised by using level 2 – 4 control measures .

| Hierarchy of control | | Examples of control measures |
|----------------------|--|---|
| Level 1 | Elimination | Decommissioning/disposal of the plant/equipment |
| Level 2 | Substitution | Purchasing alternative plant/equipment which meets the legislative requirements |
| | Engineering/Isolation (Refer AS 4024 series , Safety of Machinery) | Installing: <ul style="list-style-type: none"> • Safeguarding (see below) • An interlocking device • A limiting device (i.e. prevents from exceeding design limits) • A mechanical restraining device (e.g. wedge, strut) • A protective structure • A switching device • An emergency stop (see below) |
| Level 3 | Administrative | <ul style="list-style-type: none"> • Use of Danger/Out of Service tags • Documenting Safe Operating Procedures (SOPs) • Provision of information, instruction, training and supervision • Obtaining licences and permits • Fatigue management (Refer Appendix F) |
| Level 4 | Personal Protective Equipment | Providing operators with appropriate safety equipment (e.g. eye and ear protection, safety boots, helmets, gloves, mask, vest as applicable). Also refer to Personal Protective Equipment Information Sheet . |

PLANT/EQUIPMENT – ADDITIONAL CONTROL MEASURES FOR GENERAL PLANT

Where any of the control measures or plant/equipment listed on the following tables, apply to your activities/area of work, please refer to the relevant section of the WHS Regulations/legislation for further requirements.

The examples provide an indication of the additional control measures required. The examples are not exhaustive. Controls will also need to take into consideration the specific item of equipment and the environment.

| | |
|---|--|
| Guarding WHS Regulations 2012 (SA) Section 208 | This includes ensuring that: <ul style="list-style-type: none"> <input type="checkbox"/> if access to the area where the plant/equipment is necessary during operation, maintenance or cleaning, the guarding is an interlocked physical barrier; or if it is not possible <input type="checkbox"/> the use of a physical barrier that can only be altered or removed by the use of tools; or if it is not possible <input type="checkbox"/> the guarding includes a presence-sensing safeguarding system that eliminates any risk arising when a person is in the area; <input type="checkbox"/> the guarding is properly maintained. |
| Guarding and insulation from heat or cold WHS Regulations 2012 (SA) Section 209 | This includes ensuring that: <ul style="list-style-type: none"> <input type="checkbox"/> where any pipe or other part of the plant/equipment associated with heat or cold is guarded or insulated. |
| Operational controls WHS Regulations 2012 (SA) section 210 | This includes ensuring that any operator controls are: <ul style="list-style-type: none"> <input type="checkbox"/> identified on the plant/equipment to indicate their nature and function and direction of operation; <input type="checkbox"/> located so they can be readily and conveniently operated by each person using the plant/equipment; <input type="checkbox"/> located or guarded to prevent unintentional activation; and <input type="checkbox"/> able to be locked into the “off” position to enable disconnection from energy sources. |

| | | | | |
|---------------|--|-----------------|--------------|-------------|
| HSW Handbook | Plant/Equipment Safety Management | Effective Date: | April 2021 | Version 4.0 |
| Authorised by | Chief Operating Officer (University Operations) | Review Date: | 1 April 2024 | Page 1 of 5 |
| Warning | This process is uncontrolled when printed. The current version of this document is available on the HSW Website. | | | |

PLANT/EQUIPMENT RISK CONTROL (Hierarchy of Controls)

PLANT/EQUIPMENT – ADDITIONAL CONTROL MEASURES FOR GENERAL PLANT (Continued)

| | |
|--|--|
| <p>Emergency stops WHS Regulations 2012 (SA) section 211</p> | <p>This includes ensuring that:</p> <ul style="list-style-type: none"> <input type="checkbox"/> the stop control is prominent, clearly and durably marked and immediately accessible to each operator; <input type="checkbox"/> any handle, bar or push button associated with the stop control is coloured red; <input type="checkbox"/> the stop control cannot be adversely affected by electrical or electronic circuit malfunction; <input type="checkbox"/> where the plant/equipment is designed to be operated or attended by more than one person and there is more than one emergency stop, that the the multiple controls are of the “stop and lock-off” type. |
| <p>Emergency warning devices WHS Regulations 2012 (SA) section 212</p> | <p>This includes ensuring that:</p> <ul style="list-style-type: none"> <input type="checkbox"/> the device is positioned on the plant/equipment to ensure that the device will work to best effect; <input type="checkbox"/> where there is a possibility of the plant/equipment colliding with pedestrians or other powered mobile plant/equipment, that there is a warning device to alert the operator and others in the workplace (e.g. automatic audible alarms, motion sensors, lights, flashing lights). |
| <p>Powered mobile plant WHS Regulations 2012 (SA) section 214 and 215</p> | <p>This includes ensuring that:</p> <ul style="list-style-type: none"> <input type="checkbox"/> the plant cannot overturn (e.g. if operating on an uneven or unstable surface); <input type="checkbox"/> things cannot fall onto the operator of the plant; <input type="checkbox"/> the operator cannot be ejected from the plant; <input type="checkbox"/> the plant does not collide with any person or thing; <input type="checkbox"/> plant reach has been taken into consideration <input type="checkbox"/> the mechanical failure of pressurised elements of the plant does not release fluids that pose a risk to health and safety <input type="checkbox"/> any traffic hazards are identified and traffic management plans implemented to control areas of interaction between people and mobile plant (e.g. exclusion zones, spotters and traffic controllers) in accordance with the requirements of the Managing HSW in the work environment HSW Handbook chapter. <input type="checkbox"/> mobile plant movement plans are communicated regularly <input type="checkbox"/> alarms for moving plant are operational and appropriate for the site conditions <input type="checkbox"/> traffic speeds are clearly identified <input type="checkbox"/> loads are adequately secured <input type="checkbox"/> plant operators are competent and have the relevant licences <p>(Where the plant is a vehicle, the Vehicle Safety Management information sheet provides further guidance on the safe operation of vehicles at work)</p> |
| <p>Roll-over protection on tractors WHS Regulations 2012 (SA) section 216</p> | <p>This includes ensuring that:</p> <ul style="list-style-type: none"> <input type="checkbox"/> The tractor is not used unless it is securely fitted with a roll-over protective structure unless the specific requirements of the legislation have been implemented. |
| <p>Quad bikes</p> | <p>Refer to the SafeWork SA for guidance Note the requirements of Aust Government Quad Bike Safety Standards (October 2019).</p> |
| <p>Agricultural plant/equipment</p> | <p>Ensure that:</p> <ul style="list-style-type: none"> <input type="checkbox"/> agricultural plant/equipment during harvest is used in accordance with Grain harvesting Code of Practice. <input type="checkbox"/> plant/equipment (especially Agricultural equipment and vehicles) that are used in an external environment which has the potential to cause bush/grass fires are managed in accordance with the CFS Codes of Practice. |

| | | | | |
|---------------|--|-----------------|--------------|-------------|
| HSW Handbook | Plant/Equipment Safety Management | Effective Date: | April 2021 | Version 4.0 |
| Authorised by | Chief Operating Officer (University Operations) | Review Date: | 1 April 2024 | Page 2 of 5 |
| Warning | This process is uncontrolled when printed. The current version of this document is available on the HSW Website. | | | |

PLANT/EQUIPMENT RISK CONTROL (Hierarchy of Controls)

PLANT/EQUIPMENT – ADDITIONAL CONTROL MEASURES FOR GENERAL PLANT (Continued)

| | |
|--|--|
| <p>Industrial lift trucks (see definitions) WHS Regulations 2012 (SA) section 218</p> | <p>This includes ensuring that:</p> <ul style="list-style-type: none"> <input type="checkbox"/> the truck is equipped with lifting attachments that are suitable for the load to be lifted or moved by the truck; and <input type="checkbox"/> that the truck is not used to carry a passenger unless the truck is designed to carry a seated passenger and/or the requirements of the legislation have been implemented. <p>(Note – Industrial lift trucks include forklifts)</p> |
| <p>Plant that lifts or suspends loads WHS Regulations 2012 (SA) section 219</p> | <p>This includes ensuring that:</p> <ul style="list-style-type: none"> <input type="checkbox"/> the plant used has been specifically designed to lift or suspend the load or otherwise meets the requirements of the legislation; <input type="checkbox"/> when lifting and suspending a load, the lifting attachments are suitable and within the safe working limits of the plant/equipment; <input type="checkbox"/> the loads are not suspended or travel over a person unless the plant/equipment is specifically designed for that purpose. |
| <p>Exception – Plant not specifically designed to lift or suspend a person WHS Regulations 2012 (SA) section 220</p> | <p>This includes ensuring that:</p> <ul style="list-style-type: none"> <input type="checkbox"/> the person(s) are lifted or suspended in a work box that is securely attached to the plant/equipment; <input type="checkbox"/> the person(s) in the work box remain within the work box while they are being lifted or suspended; <input type="checkbox"/> if there is a risk of a person falling from a height, a safety harness is provided and worn by the person in order to prevent an injury as a result of the fall; and <input type="checkbox"/> there is a way in which the person(s) being lifted or suspended can safely exit from the plant/equipment in the event of a failure in its normal operation. |
| <p>Plant used in connection with tree lopping WHS Regulations 2012 (SA) section 221</p> | <p>Note WHS Regulation 220 1 (a) and (b) do not apply if:</p> <ul style="list-style-type: none"> <input type="checkbox"/> a risk assessment shows that lifting or suspending a person in a harness with a crane to place the person in a tree to carry out tree lopping does not create a greater risk to health or safety than using plant specifically designed to lift a person or climbing a tree; and <input type="checkbox"/> the tree lopping is carried out by a person who is a competent person in the use of the harness referred to above; and <input type="checkbox"/> a crane is used to put the competent person in the tree to lop it; and <input type="checkbox"/> the crane has safety mechanisms that would prevent the competent person from inadvertently falling; and <input type="checkbox"/> while attached to the crane, the competent person is in visual, audio or radio communication with the crane operator <p>In this regulation harness means a work positioning harness that is designed and certified, in accordance with AS/NZS 1891.1:2007 (Industrial fall-arrest systems – Harnesses and ancillary equipment), for the purpose of lifting and suspending a person.</p> |
| <p>Industrial robots Or other remotely or automatically energised plant/equipment WHS Regulations 2012 (SA) section 222</p> | <p>This includes ensuring that:</p> <ul style="list-style-type: none"> <input type="checkbox"/> no person works in the immediate vicinity of the plant if it could start without warning and cause a hazard, unless suitable control measures are in place (e.g. by isolating the area or by providing interlocked guards, or presence-sensing devices or a permit to work system.) |

| | | | | |
|---------------|--|-----------------|--------------|-------------|
| HSW Handbook | Plant/Equipment Safety Management | Effective Date: | April 2021 | Version 4.0 |
| Authorised by | Chief Operating Officer (University Operations) | Review Date: | 1 April 2024 | Page 3 of 5 |
| Warning | This process is uncontrolled when printed. The current version of this document is available on the HSW Website. | | | |

PLANT/EQUIPMENT RISK CONTROL (Hierarchy of Controls)

PLANT/EQUIPMENT – ADDITIONAL CONTROL MEASURES FOR GENERAL PLANT (Continued)

| | |
|--|--|
| <p>Lasers WHS Regulations 2012 (SA) section 223</p> | <p>This includes ensuring that:</p> <ul style="list-style-type: none"> <input type="checkbox"/> laser equipment intended for use on plant is designed, constructed and installed so as to prevent accidental irradiation of any person; <input type="checkbox"/> laser equipment on plant is protected so that any operator of the plant or any other person is not exposed to direct radiation, radiation produced by construction reflection/diffusion/secondary radiation; <input type="checkbox"/> any visual equipment used for the observation or adjustment of laser equipment on plant does not create a risk from laser rays; <input type="checkbox"/> workers operating the laser equipment are provided with the relevant level of information, instruction and training in the proper operation of the equipment in accordance with the Manufacturers instructions, AS/NZS IEC 60825.14:2011 Part 14: A user's guide and the Risk Assessment. (This will ensure users are aware of any hazards to which they may be exposed during the use of laser equipment and the procedures necessary to ensure protection); <input type="checkbox"/> Class 3B and Class 4 lasers (within the meaning of AS 2397:2015 "Safe use of lasers in the building and construction industry" are not used in construction work. Refer to AS/NZS IEC 60825.14:2011 "Safety of laser products Part 14: A user's guide" for more specific information, including laser radiation hazards, control measures, maintenance, requirements for a Laser Safety Officer, medical surveillance etc. <input type="checkbox"/> there is a locking interlock system in place to physically prevent unauthorised access into a laser area. (Note – manual locking of a laboratory door is not acceptable.) The locking system must be fail-safe, shutting down the laser and allowing access to the room in the event of power failure or when emergency access is required. Refer to AS/NZS IEC 60825.14:2011 "Safety of laser products Part 14: A user's guide" for more specific information <input type="checkbox"/> adequate warnings are displayed. These warnings should include the laser hazard symbol. The warning signs should be clearly displayed on the outside of all laser controlled areas. Refer to AS/NZS IEC 60825.14:2011 "Safety of laser products Part 14: A user's guide" for more specific information |
| <p>Pressure equipment WHS Regulations 2012 (SA) section 224</p> | <p>This includes ensuring that:</p> <ul style="list-style-type: none"> <input type="checkbox"/> the equipment is inspected on a regular basis by a competent person; and <input type="checkbox"/> any gas cylinder that is inspected is marked with a current inspection mark showing the date of the most recent inspection. <p>Refer to AS/NZS 1200 (2015) "Pressure equipment", AS 2971 (2007) "Serially produced pressure vessels" and AS 3788 (2006) "Pressure equipment – in-service inspection" for more specific information. The requirements include autoclaves.</p> |
| <p>Scaffolds WHS Regulations 2012 (SA) section 225</p> | <p>This includes ensuring that:</p> <ul style="list-style-type: none"> <input type="checkbox"/> the scaffold is not used unless the person receives written confirmation from a competent person that the inspection has been completed; <input type="checkbox"/> the scaffold and its supporting structure are inspected by a competent person at least every 30 days; <input type="checkbox"/> the scaffold and its supporting structure are repaired, altered if an inspection identifies a risk to health or safety and again inspected by a competent person before use of the scaffold is resumed; <input type="checkbox"/> unauthorised access to the scaffold is prevented while the scaffold is incomplete or unattended. |

| | | | | |
|---------------|--|-----------------|--------------|-------------|
| HSW Handbook | Plant/Equipment Safety Management | Effective Date: | April 2021 | Version 4.0 |
| Authorised by | Chief Operating Officer (University Operations) | Review Date: | 1 April 2024 | Page 4 of 5 |
| Warning | This process is uncontrolled when printed. The current version of this document is available on the HSW Website. | | | |

PLANT/EQUIPMENT RISK CONTROL (Hierarchy of Controls)

PLANT/EQUIPMENT – ADDITIONAL CONTROL MEASURES FOR GENERAL PLANT (Continued)

| | |
|---|--|
| <p>Plant with presence-sensing safeguarding system – records WHS Regulations 2012 (SA) section 226</p> | <p>This includes ensuring that:</p> <ul style="list-style-type: none"> <input type="checkbox"/> a record of safety integrity tests, inspections, maintenance, commissioning, decommissioning, dismantling and alterations of the plant are kept for 5 years; or for the life of the plant; or until control of the plant is relinquished (if the plant is registered or has been altered). <input type="checkbox"/> the record is available for inspection under the Act; <input type="checkbox"/> the record is available to any person to whom the plant is relinquished. |
| <p>Control measures for registered plant Major inspection of registered mobile cranes and tower cranes WHS Regulations 2012 (SA) section 235</p> | <p>This includes ensuring that:</p> <ul style="list-style-type: none"> <input type="checkbox"/> major inspections of the crane are carried out by, or under the supervision of a competent person (see definitions): <ul style="list-style-type: none"> <input type="checkbox"/> at the end of the design life recommended by the manufacturer for the crane; or <input type="checkbox"/> if there are no manufacturer’s recommendations, in accordance with the recommendations of a competent person; or <input type="checkbox"/> every 10 years from the date that the crane was first commissioned or first registered, whichever occurred first. |
| <p>Lifts WHS Regulations 2012 (SA) section 236</p> | <p>This includes ensuring that:</p> <ul style="list-style-type: none"> <input type="checkbox"/> during the maintenance of the lift, secure barriers are provided to prevent access to openings in the lift well by someone other than a person who is performing the work, if there is a risk of a person falling down a lift well; and <input type="checkbox"/> secure working platforms or equivalent arrangements are provided for a person who is working in the lift well to prevent a fall from height; and <input type="checkbox"/> if there is a risk from objects falling onto that person, a secure barrier is provided to prevent falling objects from striking the person or causing a risk; <input type="checkbox"/> there is a safe means of entry to and exit from the base of the lift well; <input type="checkbox"/> in the lift, a fixed sign stating the safe working load is displayed in a prominent place (as specified in the design of the lift). |

| | | | | |
|---------------|--|-----------------|--------------|-------------|
| HSW Handbook | Plant/Equipment Safety Management | Effective Date: | April 2021 | Version 4.0 |
| Authorised by | Chief Operating Officer (University Operations) | Review Date: | 1 April 2024 | Page 5 of 5 |
| Warning | This process is uncontrolled when printed. The current version of this document is available on the HSW Website. | | | |