

# CRITICAL RISK STANDARD | MECHANICAL PLANT

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## INTRODUCTION

Use of mechanical plant is a common activity, which has a number of associated mechanical and non-mechanical hazards and therefore carries a potential risk of serious incidents and life changing harm.

This critical risk standard has been developed to provide information to our people about the way that the risk of using mechanical plant is managed at Massey University (MU). It applies to all our people (staff, students or others) who have any involvement using mechanical equipment for Massey University business purposes.

This standard should be read as the minimum standards that apply when operating mechanical plant at Massey University or on university business. It is acceptable to add controls at a local level, beyond what is prescribed here – however at no point may controls be removed or substituted without the express written permission of the relevant SLT member and the Director Health, Safety and Wellbeing.



## CRITICAL RISK SCENARIOS

The following scenarios have been identified for this critical risk:

- Loss of control of plant leading to fire
- Loss of control of plant causing acute harm
- Exposure to non-mechanical harm

## MINIMUM CONTROL REQUIREMENTS

### Selection of Mechanical Plant



Massey University shall ensure that all mechanical plant shall be soundly constructed and meet or exceed relevant New Zealand and International standards i.e. AS/NZ 4024 Safety of Machinery Series the principles of Health and Safety in Design (HSiD) and the duties in outlined in the Health and Safety at Work Act (HSWA) 2015.



Massey University shall ensure the procurement process in place includes an assessment of the health and safety risks for the mechanical plant considered. The selection of mechanical plant must take into consideration the physical dimensions, reach and cognitive capabilities of users along with compatibility with existing plant and equipment, available space and personal protective equipment (PPE). This assessment should include involvement of the health and safety representative (HSR) for the affected area.



This icon is used throughout this standard to identify any Critical Controls.

In addition, non-mechanical hazards such as noise and dust generation should have effective controls to eliminate or reduce potential for harm and comply with HSWA and HSWA/HSE Regulations.

## Working with Mechanical Equipment

Massey University must ensure there is a process in place to check mechanical plant is in a safe condition to use. The processes shall cover the management of any defective equipment, repair, replacement and disposal. Electrical plant connected to mains supply shall comply with the Electricity (Safety) Regulations 2010 and AS/NZS 3760:2010 and must be tested and tagged prior to first operation and thereafter as and when required. Portable hand held equipment that is powered by electric current must be connected an isolating transformer or Residual Current Device (RCD) system.



Massey University shall ensure that when unable to eliminate the hazard that minimisation controls will complete a risk assessment that will consider and select the most effective controls (i.e. engineering and isolation safeguards) to prevent contact of any body part with dangerous parts and exposure to harm affecting health.



- Where guards and barriers provide isolation, these shall be designed so that people cannot reach over, under, around or through them and come into contact with the dangerous parts of the machinery, guarding must perform to or exceed standards detailed in AS/NZ 4024 Safety of Machinery Series and not be easily removed.



- Where safety is reliant on an operator turning off equipment quickly to prevent harm, or where a person may become entangled or otherwise caught in mechanical equipment, a suitable e-stop device must be installed in a location near the controls or any place where a worker may become caught.



- Preference shall be given to ensuring that guarding is interlocked and prevents the operation of machinery with guards removed.



Massey University shall ensure that there are protective devices or apparatus for woodworking or abrasive grinding machinery for example:

- Push sticks
- Anti-kickback devices
- Jig or an automatic feeding device

Massey University must have policy in place to monitor non mechanical hazards (i.e. noise, dust and vibration). This includes a process and procedure to monitor the exposure levels in the work environment to ensure that no person is exposed to process inputs and outputs:

- Noise levels over 85 decibels (dB) averaged over 8 hours or a peak noise level over 140 dB.
- Toxic or hazardous substances that exceed Workplace Exposure Standards (WES) and/or Biological Exposure Indices (BEI).

When personal protective equipment is provided Massey University must have a process and procedure in place for health monitoring related to the risk profile of the work undertaken.

Workplace signs used to communication danger, warning or caution and inform of notices and safety instructions are set out in accordance to NZS/AS 1319:1994 Standard.



Anyone under the age of 15 years old is prohibited from working or helping with work with machinery.

## Operator Selection

A list of minimum skills, knowledge and competency standards an individual needs to possess to work safely with mechanical equipment is referenced when employing new staff. Pre-employment health checks relevant to the risk profile should also be considered when recruiting staff.

Any person who is aware of a medical condition or any other condition (i.e. fatigue) that may affect their health and safety while working with any mechanical plant or equipment must disclose the medical condition before starting work.

## **Operator Training and Supervision**

### *Training*

Massey University shall ensure that there is a system in place that identifies who has been trained to operate mechanical plant used for Massey University purposes and the individual competency levels attained.

Individuals operating mechanical equipment shall be inducted to the work area and tasks. Individuals shall receive training and supervision provided by a competent person with experience in the task being demonstrated. Training shall include a practical and 'hands on' component and ensure refresher training provided.

Training may include the following:

- information on the correct use of the plant and components attached
- how to install, adjust and basic operation and non-routine activities like maintenance, repair and cleaning
- the actual and potential hazards and precautions in relation to these
- safe manual handling
- housekeeping
- how to respond to an emergency
- incident reporting

### *Supervision*

Users shall be supervised by a competent person. Supervision should be provided during the course of all training stages and remain in place until person is deemed competent.

## **Safe Systems of Work**

Massey University shall ensure there is an effective system for identifying hazards, assessing risk and resolving machinery faults. In addition, Massey University shall ensure safe systems of work procedures are established and followed. Key factors that should be considered when developing a safe system of work include:

- Correct use of tools and plant
- Manufacturers specifications and recommendations
- Conducting pre use checks/inspection
- Working environment (i.e. lighting, ventilation and temperature).
- People management
- Training and supervision requirements
- Emergency management procedures
- Signage
- Human factors
- Administrative controls like in house SOP/JSA/SWMS/PTW/LOTO
- Regulations, Code of Practice and Industry Standards
- Non routine activities like maintenance and cleaning
- Handling of hazardous substances and chemicals
- Health monitoring requirements that are relevant to the risk

A Job Safety Analysis (JSA) should be completed when normal safeguards cannot be used or where new hazards are introduced by the work, during maintenance activities.

Isolating plant or processes from sources of energy must follow the Massey University Isolation and Lock Out Tag Out (LOTO) procedure.

## Cleaning, Maintenance, or Repair of Machinery



Prior to undertaking cleaning, maintenance or repair work, every part of the machinery, including any extensions or attachment must be secured against movement, including inadvertent movement and every control device has been secured as inoperable in accordance to the Massey University Isolation Lock Out Tag Out (LOTO) Procedure.

- A procedure should be established for carrying out of the cleaning, maintenance, or repair in a safe manner; and
- Only individuals who are competent or who are under the direct supervision of a competent person shall carry out the cleaning, maintenance, or repair work.
- Where it is essential that a part of the machinery remains moving, only that part shall be set in motion; The procedure is followed on every occasion to which it applies.

Mechanical equipment must be maintained according to manufacturer's instructions.

Mechanical equipment is located in spaces that supports safe operation, cleaning, maintenance, inspection and emergency response/evacuation.

An inventory record listing mechanical equipment and tracks planned maintenance, breakdowns and repairs should be in place.

## Access Control, Lone worker and After Hours Work



Restricted areas must be easily identified with unauthorised access controlled at all times.

- A risk assessment must be undertaken, signed off and appropriate controls put in place before after-hours or in lone worker situations involving use of mechanical plant.
- Personnel and contractors must be authorised to access the mechanical workshop unsupervised, by the Head of School or equivalent.

## Incident Management Procedures

Campus security shall be notified if emergency services are called so they can meet at an entrance and guide them to the scene. Massey University shall ensure that access ways are kept clear for emergency vehicles using signage and have processes in place to monitor.

Massey University shall ensure there are processes to manage incidents on campus and for the rehabilitation of staff and a sufficient number of trained first aiders present at all campuses. This includes appropriate support to those involved in and/or witnessing an incident that may have a psychological impact.

## Emergency Response

Massey University will ensure that there is an effective emergency response plan and that the processes and procedures are tested.

Massey University shall ensure that it has adequate fire detection and suppressions mechanisms in place and that these are regularly tested.

Massey University shall ensure there is a business continuity plan that covers disruption to utilities such as electricity supply (i.e. back up equipment like generators) and operation of mechanical plant.

Massey University shall have in place communications processes and procedures in the event of an emergency.

## Emergency Equipment

Emergency equipment must be available at strategic locations around campus so that trained users can prevent further harm or environmental damage for e.g.

- First aid and spill kits
- AED located in key locations
- Suitable fire suppression and control equipment

Emergency equipment must be fit for purpose, up-to-date and maintained, and checked at intervals recommended by the equipment manufacturers.

## Reporting

All incidents involving plant must be reported using the University's online safety reporting system, regardless of severity.

Incidents may require reporting to the Regulators (i.e. WorkSafe New Zealand) in these situations Massey University will ensure there are processes and procedures in place to manage the regulatory requirements.

Property and infrastructure damage must also be reported.

## Insurance and Legal

Massey University shall ensure that there is appropriate insurance to cover property and infrastructure damage.

Massey University shall ensure that there is a process in place should legal advice be required.

### DEFINITIONS

**Critical Risk:** Any risk that carries the potential for a fatal or serious, life-altering injury.

**Critical Control:** A control that is crucial to preventing the event or mitigating the consequences of the event.

**Lock-Out-Tag-out (LOTO):** an administrative prevention control.

**Plant:** is referring to any machinery, equipment appliance, container, implement or tool and any component of those things and anything fitted or connected to those things.

**Safe Systems of Work (SSOW):** A formal procedure which results from a systematic examination of a task in order to identify the hazards. It defines safe methods and assigns controls to ensure hazards are eliminated and risk reduced.

## RELEVANT LEGISLATION OR POLICY

- Health and Safety at Work Act 2015
- Health and Safety at Work (General Risk and Workplace Management) Regulations 2016
- Health and Safety in Employment Regulations 1995
- Health and Safety in Employment (PECPR) Regulations 1999
- Health and Safety at Work (General Risk and Workplace Management) Regulations 2016
- Electricity (Safety) Regulations 2010
- Massey University Health, Safety and Wellbeing Policy.
- Massey University Procurement Policy
- Massey University Health and Safety Procurement Procedures
- Massey University Contract Management Policy
- Massey University Contractors (Academic and General Staff Duties) Procedure.
- Massey University Isolation and Lock-Out Tag-Out (LOTO) Procedure

## OTHER REFERENCES

- WorkSafe New Zealand. Good Practice Guidelines: Safe Use of Machinery.
- WorkSafe New Zealand. Special Guide – Workplace Exposure Standards and Biological Exposure Indices
- AS/NZS 4024.1:2014 Safety of Machinery Series
- AS/NZS 1319:1994 Safety Signs for the Occupational Environment.
- AS/NZS 3760:2010 In-Service Inspection and Testing of Electrical Equipment
- MBIE: Ergonomics of Machine Guarding Guide.