

ISOLATION AND LOCKOUT TAGOUT PROCEDURE

Section	University Services
Contact	Director Occupational Health & Safety, Wellbeing
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Approval	Director Occupational Health & Safety, Wellbeing

Purpose:

The purpose of this procedure is to provide a safe system for isolating plant or processes from sources of energy, to remove the possibility of anyone accidentally starting up or activating any moving parts of the plant or process or the accidental release of energy that could cause harm.

Scope:

This procedure applies to all operations, sites, and workers operating on Massey University sites, and will apply to contractors where a specific arrangement has not been agreed for an alternative system to be used.

Definitions:

Energy: Any source of energy, which if accidentally released or energised could cause injury from exposure to that energy. Sources of energy include, but are not limited to, electricity, gravity, chemical, mechanical, heat, pressure, and steam.

Isolation: The disconnection, or closing off, of sources of energy at a point to prevent energy from being present in the plant or process being worked on.

Licensed Electrical Worker: A person who has the requisite training and competency in installing, maintaining, and repairing electrical systems and equipment, and who has a current practicing licence from the Electrical Workers Registration Board.

General Isolation Overview

Shut down the relevant plant or equipment.	Plant must be shut down using the standard operating controls. E-Stops are not to be used as a substitute for a controlled stop and shutdown.
Identify ALL energy sources and other hazards.	Energy sources may be electrical, pneumatic, spring-loaded, gravitational, chemical, hydraulic, or mechanical.
Identify ALL isolation points.	Each energy source must have a method of “turning it off”, fixing it in place, or disconnecting it.
Isolate ALL energy sources.	Isolate each energy source at the isolation point. This should always involve a “whole current” isolation where possible, rather than “control isolations”.
Release or dissipate ALL stored energy.	If there is potential energy stored (such air pressure in a line) then this energy must be released or otherwise controlled to create a safe environment for work.
Lock out all isolation points.	Each isolation point must be locked using a padlock. It may be necessary to use devices such as hasps, chains, or covers to effectively lock the isolation point.
Tag Out all isolation points.	Each locked isolation point must have Danger Tag applied that indicates that the isolation has been applied and the plant is not safe to operate.
Test and Verify that the isolation has been effective.	Once the isolation has been applied, verify that the isolation has been effective by testing it.

Electrical Isolation

Complete Electrical Isolation

In the case of electrical isolation, “Whole Current Isolation” such as the main circuit breaker must be used instead of “Control Isolations” such as E-Stops, interlocking devices or control systems.

Whole Current Isolation removes electricity completely from the plant, and must be used wherever possible, and in all cases where plant is disassembled for maintenance or production, or where persons are to be exposed to energy sources within the plant.

Where isolation is to be applied by removing electricity in the Switchboard, or Motor Control Centre, this must be applied by a licensed electrical worker. It is necessary to verify this isolation by testing it in the presence of the person responsible for the isolation.

Emergency Stops, Interlocked Guards, Gates or Doors

These types of devices interrupt the power supply to the machine's control circuit only, which prevents operation of the plant. Mains power is still connected to the machine; therefore it could easily start if these devices or the supporting systems fail. These devices shall not be relied on as a means of isolation or immobilisation.

Where Cat III or Cat IV interlock devices are installed, these devices may be used to allow safe access to the mechanics of the machine for minor adjustments or maintenance activities only where there is no risk of harm in the event of inadvertent start-up, and no Lock or Tag is required.

Isolation Locks:

Isolation locks are utilised in conjunction with Danger Tags to isolate the equipment prior to work being performed on it.

Isolation Lock Requirements

It is mandatory that every person working on the equipment must apply a personal lock and tag to either the isolation point, or to the Lockbox in accordance with the Group Isolation requirements of this procedure.

Personal locks shall be individually keyed, with no duplicates. Each person working on the plant is responsible for their Personal Lock, and the locking and unlocking of the lockout device.

Danger Tags:

A Danger Tag is used to communicate the danger of operating the plant or process the tag is attached to and must be accompanied by a personal lock. No equipment is to be operated when a danger tag is attached.

Use of Danger Tags

- You must attach a Danger Tag with your personal lock before starting work on any equipment or machine where you could be injured if the machine inadvertently started up. Attach it to the current isolating device after it has been set in the correct position.
- You must never operate equipment which has had a danger tag or locked isolation device attached.
- You may only remove your own Danger Tag.
- When you have finished working on the equipment, you must remove your own danger tag.

Warning Tags:

A Warning Tag is used to communicate that the equipment is unserviceable and should not be used. It can be attached to a non-powered item of plant, such as ladders, jacks, and trolleys, as well as powered plant. If used on powered plant, the tag should be attached to the main controls if possible.

Use of Warning Tags

A warning tag is used to give safety advice and protect equipment, or it may be used to give an indication of the status of the equipment after maintenance repairs.

The reason for applying the tag must be written in the appropriate area on the tag.

If a piece of equipment is made safe for use, or the fault is being investigated, the Warning Tag may be removed by:

- The person who attached the Warning Tag.
- The person who is responsible for the repair or maintenance of the equipment, or
- The supervisor responsible for the equipment.

Verification of Isolation:

After plant has been shut down, locked out, and tagged; all isolated power sources should be tested prior to any person starting work on the plant. This testing should be done through attempting to activate the plant, or by testing with appropriate instruments. This testing should be undertaken by a person who has understanding of the plant and its operation, including any control stations (local and remote) or devices (such as sensors) which may start or operate the plant. Where electricity is to be tested with instruments, a licenced electrical worker shall be required to undertake these tests.

It is not safe to assume that an isolator has locked out an electricity source simply due to it being in an open position. While normally this should open an air gap between contact points, it is possible for contact points to become welded together by the passage of electricity and remain so even when the isolator appears to be open/off.

Work on the plant must not begin until tests have confirmed that it is safe to do so. The operation of any instruments required to test isolations should be checked before use.

Lockout Stations:

All campuses must have at least one Lockout Station where locks and tags are located for use by workers.

The Lockout Station should contain, as a minimum:

- Locks, including Personal Locks, and any other lock necessary as per these procedures.
- Danger Tags.
- Warning Tags.
- Isolation Devices as appropriate, such as valve covers, chains etc.
- Isolation registers; and
- Multi-lock hasps

Every department and school with a requirement for a Lockout Station shall be responsible for ensuring that the Lockout Stations have adequate equipment for the isolations that it undertakes. During periods of high usage, such as maintenance shutdowns, it will be necessary to have sufficient isolation equipment

to allow for the higher levels of use.

Group Lockout:

Where multiple workers need to work on, or gain access to, the same piece of equipment, machinery or electrical system for repairs or maintenance a “group” isolation procedure may be used.

There are two methods available for Massey University workers to use.

Individual Isolation Option

In this option, each worker must attach a Personal Lock to every isolation device using a multi-lock hasp. This allows up to 6 workers to isolate a single isolation device using a Personal Lock. The Hasp passes through the isolation device, and locks are fitted to the hasp.

Lockbox Option

In this option, which is appropriate for larger groups or more complex isolations, a “group” isolation lock (individually keyed) is applied to the isolation and the key put into a “lockbox”. Each worker then reviews the isolation and locks the box with a Personal Lock so the Group Lock key cannot be removed.

Removal of Locks and Tags

Only the person who applied the lock and tag may remove them. Locks and tags are to be removed by the person who applied them in the following circumstances:

- Work has finished, and the machine is to be re-energised.
- Any time where there is a handover between workers, as per this procedure.

Anyone who fails to remove their lock at the end of work, will be expected to return to campus and remove their isolation, at their own expense.

Where locks and tags were to be removed, and the responsible person has left, then the following actions must be taken:

- Attempt to contact the person who applied the lock and request them to return to the job and remove the lock.
- If the person who placed the lock cannot be contacted, or is unable to return and remove it, a group of three people can authorise the removal of the lock if a careful examination of the lock scenario has been undertaken and it is safe to do so.
- This group must include the Facilities Services Manager (or designated person within a school), and at least 2 other people familiar with both the plant/equipment and these procedures. If the lock is for work being undertaken on electrical equipment, then a licenced electrical worker must be involved and must confirm that it is safe to remove the lock.

Any event involving the removal of locks and tags using this procedure must be documented in writing by a member of the group.

Handover

Individuals must remove their own Personal Lock (and Danger Tag) if the isolated plant is to be handed over to other workers. Following handover, and before commencing work on the plant, the relieving person must install their own personal lock and tag if the isolation is to be maintained.

Where a physical handover is not possible due to operational hours or staffing, the person responsible for managing the work must develop a procedure that determines how Lockout is maintained, and the exchange of keys is managed. This must address the application or removal of locks, the location of the keys, and the exchange of safety information relating to the isolation. Any registers used with the isolation must be updated with the names of the new party.

Related documents:

Relevant Legislation

- Health and Safety at Work Act 2015
- Electricity Act 1992
- Electricity (Safety) Regulations 2010

Procedures

- Health, Safety & Wellbeing Policy
- Contractor Management Procedures/Guidelines
- Hazard and Risk Management Procedures