



## LOCK-OUT / TAG-OUT GUIDELINE

### PURPOSE

These guidelines support the *Health and Safety Policy* and *Health and Safety Management Standards* and apply to all workplaces within the University where plant and equipment is used. Fire equipment isolation procedures can be found on the Properties website [http://properties.curtin.edu.au/contractors/work\\_permits.cfm](http://properties.curtin.edu.au/contractors/work_permits.cfm)

### DEFINITIONS

**Authorised person** A person authorised by the Area Manager/Supervisor, who is sufficiently competent to lock out, tag out and isolate installations, plant or equipment for the purposes of cleaning, servicing, repairing or alteration.

**Competent person** Having acquired through training, qualification, experience, or a combination of these, the knowledge and skills to carry out a particular task.

**Danger Tag** White tag with Black and red oval containing 'Danger' indicating a person may be harmed if the tag is removed. It is attached to the power source to prevent inadvertent or unauthorised operation of equipment during repairs, installation or maintenance. Where a personal danger tag is not issued the tag should be written on with indelible ink. Or you could say where a disposable danger tag is issued.



**Energy Sources** An energy source is any form of energy that has the potential to damage property or injure personnel.

**Hierarchy of controls** A range of control measures used to control risk to the lowest reasonably practicable level. In most cases a combination of elimination (most effective), substitution, engineering controls, administrative controls and Personal Protective Equipment (least effective) are chosen to control risks.



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**Isolation of Plant** This is the removal of the source of energy of a plant/equipment, in such a way as to prevent the possibility of accidental or unplanned energisation of the whole, or a specific section of the plant.

**Isolation Procedures** An isolation procedure is a set of predetermined steps that must be followed to ensure that plant and related hazards cannot jeopardise the safety of those working on the plant. This must be completed for each item of plant and is required to include the application of isolation devices, locks and tags. These procedures should be written in consultation with relevant plant operators, people maintaining the plant and if possible with the plant manufacturers, suppliers and people who designed and installed the plant.

**Lockout device and personal locks** Personal locks are keyed alike to allow multiple placement of locks. A group lockout device may hold many personal locks. Lockout devices are available for valves (gate valve pictured), cabinets, handles, switches, electrical cords etc.



**Out of Service Tag** A yellow tag with black writing clearly stating “Out of Service’ or ‘Do not Operate’. It is used to indicate the installation, plant or equipment is faulty and is currently out of service. The defect of the equipment is written on the tag with indelible ink.



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**Plant** Is the general name for machinery, tools, appliances and equipment.

**Tagging** This is the secure attachment of a 'Danger' or 'Out of Service' tag to the item of plant and/or equipment, which displays a prominent warning, and includes the name of the person who is authorised to attach/remove the tag and the date the tag was attached (e.g. tagging of portable fan due to frayed electrical lead)

### 1. Lock-out and Tag-out

Employees are required to reduce the risk of exposure to dangerous parts of plant and exposure to possible sources of stored energy during operation/maintenance/servicing. This can be achieved by identifying energy sources by inspection and reading the instruction manual, locking or tagging energy sources, such as by placing a lock and/or tag on a switch, valve, breaker etc. to prevent reactivation of the equipment or to warn that maintenance activities are in progress.

Safety tags and lockout procedures are required where plant/equipment:

- Is in a dangerous condition;
- Is being maintained;
- Has not been completely installed/commissioned;
- Is out of service for repair or alteration.

Examples of energy sources that might need to be isolated include but are not limited to; electricity (mains, solar and generator), mechanical, hydraulic, pneumatic, chemical, thermal, gravitational, radiation, and other forms of potential or kinetic energy. Where energy sources are present, instructions for the isolation and re-activation of machinery/equipment are required to be developed. Isolation of plant/equipment must also prevent the introduction of contaminants or conditions through equipment such as piping, ducts, vents, drains, conveyors, service pipes and fire protection equipment.



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### 1.1. Out of Service Tags

- 1.1.1. Plant/equipment that is deemed to be unsafe to operate or connected to a power source can be taken Out-of-Service by the placement of Out-of-Service Tags.
- 1.1.2. These tags are fixed at common isolation points of the equipment that is unsafe or not to be operated.
- 1.1.3. The tags should be marked clearly with the person's name, contact number (preferably mobile), school area/company, date of placement, details of defect and signature.
- 1.1.4. These tags should be left attached to the equipment/plant until the defect listed on it is remedied. A competent person, such as the person who has performed the repair or maintenance, is to remove the out of service tag when recommissioning the plant or equipment. It is important that they are both familiar with the equipment and fully aware of the reason that the tag was placed, except in an emergency situation.

### 1.2. Personal Danger Tags

- 1.2.1. A Personal Danger Tag is NOT in itself an effective isolation device. A tag acts only as a means of providing information to others at the workplace. When practicable, a lock must be used in preference to a tag as an isolation device.
- 1.2.2. These tags should be marked with the worker's name, contact number (preferably mobile), school area/company, the time and date that this occurred and signature. This is a minimum requirement on the tag.
- 1.2.3. These tags should only be applied by suitably skilled, experienced and/or competent personnel.
- 1.2.4. These tags are not to be left on after that person completes their work, or finishes their shift. Each employee should remove his or her Danger Tag and the Out-of-Service tag should be left attached, unless the plant or equipment is safe to return to service.
- 1.2.5. Danger tags are to be removed by the person who placed them or in exceptional circumstances, such as an emergency by other authorised personnel. The authorised person must ensure the person listed on the danger tag and any other people will not be endangered by the removal of the tag and recommissioning of the equipment.
- 1.2.6. All disposable personal danger tags should be destroyed after use.



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### 1.3. Personal Locks

- 1.3.1. Plant/equipment should be locked out whenever staff must work near dangerous parts that have not been guarded due to the location, and whenever guards are removed for maintenance or repair.
- 1.3.2. The locking device is to be attached at the point of isolation of the energy sources and must effectively prevent the isolation point from being operated in any way.
- 1.3.3. The authorised person who locks out the plant or equipment retains the key to the safety lock or ignition.
- 1.3.4. Any stored energy in the locked-out plant or equipment must be discharged before any work can commence.
- 1.3.5. Where multiple points of isolation are required, or multiple workgroups are in an area, approved group lockout procedures may be employed to enhance control of isolation. That is, if two or more people are working on plant that is isolated through several lockout points, each person must attach a lock and tag to each lockout point. To avoid the need for people to carry several keys, it is advisable that each person's locks respond to a single key. Each worker must still be able to effect control over sources of energy likely to affect them.
- 1.3.6. If at the end of the work period the job is not completed the Out-of-Service Tag is to be left on the plant or equipment.

### 1.4. Maintenance work with no danger tags/locks

- 1.4.1. There are times when application of danger tags might not be needed, however an out-of-service tag must still be attached to the main isolation point. Such situations include;
  - a. When minor servicing activities are taking place during normal working hours where;
    - The plant is under the control of an authorised person;
    - The authorised person has a line of sight at all times to all access points of the plant/equipment which could place a person at risk if the plant commenced operation; and
    - There is no risk of contact with electricity/energy sources when undertaking the task
  - b. Situations where unexpected start-up can be controlled by unplugging the plant/equipment from the electrical point. The plug must also be under the exclusive control of the staff performing the servicing, maintenance or cleaning of the plant/equipment.



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### 1.5. Isolation Procedure

- 1.5.1. The lock-out process is the most effective isolation procedure. The steps in this process are:
- a. The authorised person should notify all affected employees regarding the need to isolate plant/equipment. Appropriate warning signage and barriers should be erected to restrict entry into the area;
  - b. Identify all energy sources and other hazards;
  - c. Shut down the plant/equipment;
  - d. De-energise and isolate all energy sources;
    - Both kinetic (motion energy) and potential (stored energy) sources are to be isolated/de-energised;
    - Emergency stop buttons or similar stop devices on their own will not achieve full isolation. It is dangerous to rely on emergency stopping devices, as an isolation source as they cannot always be locked out and therefore may allow energy to be inadvertently re-activated. Emergency stop buttons may also allow control circuits to remain live within the plant or equipment.
    - The hierarchy of controls should be taken into consideration when isolating or removing machinery/equipment from service. For instance, engineering controls must be used in preference to administrative controls due to their increased effectiveness.
    - Energy sources such as electricity can be isolated by switching connections to the off position and locking it in place.
    - Capacitors must be discharged in the lockout process in order to protect workers from electrical shock.
    - Except in the case of equipment connected via a plug and socket, a person authorised by the Manager, Electrical Engineering is to isolate and disconnect the electricity supply to an item of plant.
    - In order to isolate and de-energise plant with hydraulic and pneumatic energy, valves should be set to closed position and locked into place.
    - Parts that could move from loss of pressure should be blocked and residual energies bled off by opening pressure relief valves and then closing airlines.
    - If there is a chance that a part of the plant could fall/move (gravitational energy), a safety pin/block could be used to prevent this from occurring during maintenance. If feasible, lower the part to a height where falling is impossible.



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- For plant/equipment that have mechanical energy, carefully release energy from springs that may still be compressed and if this is not possible, block the parts that may move if there is likelihood that the spring can transfer energy to it.
  - Chemical supply lines should be isolated by closing and locking out the valves. Where possible, bleed lines and/or cap ends to remove chemicals from the system. If a line must be blocked where there is no valve, use a blank flange.
  - Turning off the power supply and removing the plug from the supply socket (if safe to do so) can normally isolate simple portable type machinery/equipment. A tag or physical restraint device can then be applied as per this procedure.
- e. Lock out all energy sources.
- f. Tag plant/equipment controls, energy sources and other hazards.
- g. The authorised person should verify isolation by 'trying to reactivate the plant without exposing himself/herself or others to risk (failure to reactivate the plant means that the isolation procedure is effective and that all stored energies have dissipated).
- It is essential to verify that the plant/equipment is properly locked out prior to beginning work and this can be done in several ways.
  - Engage/activate the plant, equipment, or process controls (push buttons, switches, etc.) and note the result.
  - Carry out a visual inspection of;
    - All tags and locks
    - Electrical connections to ensure they are off
    - Suspended parts to ensure that they have been lowered to a resting position or blocked to prevent movement
    - Other devices that restrain plant or process movement
    - Valve positioning for double block – close two valves of a section of a line, and then bleed (or vent) the section of the line between the two closed valves
    - The presence of the solid plate used to absolutely close a line
    - Any other approved method of energy isolation
  - Testing of the equipment
    - Test electrical circuits to make sure power is off (should be done by an authorised electrician) – however, plant/equipment with capacitors needs to be cycled until all energy is drained



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- o Check pressure gauges to ensure hydraulic and pneumatic potential energy has been removed
  - o Check temperature gauges to ensure thermal energy has been discharged
  - Choose the method that will best ensure that the energy to the system has been isolated without creating other hazards during the verification.
- h. Perform maintenance or service activity
  - i. Remove lockout/tag out devices when maintenance/service etc is complete.

## 1.6. RESPONSIBILITIES

### 1.6.1. Authorised Person

The authorised person is responsible for:

- a. Notifying all personnel in the area of impending work
- b. Ensuring appropriate signage and barricading is in place
- c. Ensuring completion of Isolation Permit
- d. Ensuring the equipment has been made ready to isolate
- e. Ensuring personal lockout devices are in place

### 1.6.2. Manager/Supervisor

The Manager/Supervisor is responsible for:

- a. Identifying processes and situations where this procedure is applicable and implementing accordingly
- b. Consulting with staff on the implementation of this procedure
- c. Ensuring adequate provision of lockout devices and tags
- d. Ensuring staff training in isolation, lockout and tagging is completed
- e. Ensuring Safe Work Procedures for plant and equipment contain isolation requirements
- f. Ensuring faulty equipment is tagged 'Out of Service'.

### 1.6.3. Employee/Contractor/Student

The staff/contractor/student is responsible for:

- a. Complying with the Lockout and Tag out Procedure
- b. Taking reasonable care for their own and others health and safety in the workplace





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- c. Reporting hazards to the Area Supervisor and on the Online Incident/Hazard reporting system
- d. Applying out of service tags to faulty equipment
- e. Complete where appropriate, the isolation section on the permit-to-work form (e.g. confined space entry permit, electrical access permit)

#### 1.1. EXEMPTIONS

Nil

#### 1.2. RELEVANT DOCUMENTS/LINKS

[Health and Safety Policy](#)

[Health and Safety Management Standards](#)

[WorkSafe WA \(2010\) Guidance Note – Isolation of Plant](#)

[Occupational Safety and Health Regulations 1996 \(WA\)](#)

#### CONTACT DETAILS

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Approval Authority	Director, Health, Safety and Emergency Management

#### REVISION HISTORY

Revision #	Date	Amendment Description
1	30/08/2016	New Guideline
1.1	08/02/2017	Addition of H&S Management Standards to Purpose and Relevant Documents sections