Procedure: Isolation and danger tagging

Purpose

The purpose of the University’s *Isolation and Danger Tagging procedure* is to ensure that any non-routine operation or corrective work undertaken on any Plant (equipment), electrical installation, maintenance or servicing of machinery, or equipment with hazardous moving parts or energy, is –

- Isolated from the energy source to make it safe, and
- Tagged to indicate the hazards, personnel responsible for the tag, and inadvertent re-energising of the system.

Definitions

**Caution–Out of Service Tag** is utilised to indicate that the equipment, plant or machinery is inoperable and must not to be used. It is recognisable as a yellow and black tag, with the wording ‘Caution Out of Service’. Only appropriate service personnel, technician or supervisor may remove the tag once the equipment is deemed safe after repair and testing.

Refer to Appendix A for example tag (Figures 2a & 2b)

**Competent Person** means a person who has acquired, through training, qualifications, experience, or combination of these, the knowledge and skill enabling the person to inspect, test or repair machinery/equipment or installation.

Where the person undertaking the repair, service or maintenance is not an employee of the University then they shall:

- be provided with induction information whereby specific University precautions and any special instructions are provided,
- be conversant with this procedure, and
- ensure that they adhere to isolation instruction requirements.

**Danger tags** are used to indicate that certain circuits, switches, equipment, etc must NOT be operated as operation creates a hazardous situation that may result in injury, death, or damage to the equipment. This tag is used when personnel are working on the equipment, plant, machinery or electrical installation.
A danger tag is recognizable as a red and white tag with the wording Danger Do Not Operate.

Personalised ‘Danger’ tags are attached to an appropriate type of isolation device. The tag is used to protect the individual and machinery, and may only be removed by the person who placed and signed the tag.

Where more than one person or a group is working on the same isolated energy source, multiple tags shall be used on a suitable multiple lockout device.

Refer to Appendix A for example tag (Figures 1a & 1b)

**Energy Sources** are a form of energy e.g. mechanical, chemical, electrical, hydraulic, radiation, thermal, gravitational, pneumatic, and kinetic energy systems, that has the potential for uncontrolled or catastrophic release, which can damage property, injure or kill. The energy source must be rendered safe using ‘isolation measures’ to avoid injury.

**Isolated** is a condition where a physical barrier prevents an energy source incapable of being made live (releasing its energy) unless it was an intentional/deliberate act to do so.

**Isolation measures** isolate plant, equipment, electrical installation etc. They include (but not limited to) safety lockout padlocks, safety lockout jaws/lockout hasp (for up to 6 padlocks), non conductive circuit breaker lockouts, metal spades for closing and blanking off pipelines, gate and ball valve lockout devices, electrical plug lockout case. Refer to Attachment A or commercial catalogues for examples.

**DO NOT OPERATE** Tag issued by the [Work Environment Group](#) staff to ensure a health or safety issue is addressed. It is recognizable as having the wording ‘danger do not operate, this equipment/plant/process has been deemed unsafe by the [Work Environment Group](#) and must not be disturbed or used until modified and authorised’. Refer to Appendix A for example tag Figure 4.

**NOTICE Tag** issued by the [Work Environment Group](#) staff is an advisory notice that an occupational health or safety issue should be addressed. It is recognizable with the wording NOTICE ‘this process/equipment/area requires Service/Repair/Calibration/Risk Assessment/Monitoring before further use.’

Refer to Appendix A for example tag Figure 3

**Plant** is defined in the Occupational Health and Safety (Safety Standard) Part 4 as including “any machinery/equipment or tool thereof”. Items of plant can be electrical or mechanical, with or without moving parts, fixed or moveable. Refer to [2] ANU Plant Policy and Procedure.
Padlocks or Safety locks provide an additional level of protection than just wiring or stringing a tag to an isolation point e.g. circuit breaker, handle of a water main. They prevent accidental removal. They should be used where removal of the isolation measure has the potential to cause injury or death.

Procedure

Scope

1. This hazard management procedure has been developed by the University to ensure safe, robust and consistent isolation and tagging procedures within the University.

2. It is a requirement that University management, staff, students, visitors and contractors shall follow this hazard management procedure. Local area management must ensure that the risk assessment process is carried out and where and when appropriate, isolation risk control measures are implemented.

3. The requirements of the Isolation and Danger Tagging procedure is applicable at all University facilities, including (but not limited to) workshops, plant rooms, laboratories; work associated with electricity, hot work, and confined space operations.

4. The Isolation and Danger Tagging procedure still requires a thorough risk assessment and analysis of any proposed work to be undertaken.

Isolation and tagging are both required.

5. For routine operational work, (eg. changing the drill bit on a portable electric drill) tagging may not be required, however, equipment should be isolated from the energy source (eg. unplugged from the electrical circuit).

6. This procedure has been established to assist management implement safe isolation practices (using appropriate isolating devices) for the prevention of personnel injury and accidental damage to plant, equipment and/or electrical installation.

7. Interference to isolation devices or danger tags constitutes a very serious offence that will lead to disciplinary action under the University’s Code of Conduct.

Risk Reduction and Controls

8. The Budget Area must take all reasonably practicable steps to ensure that risks relating to dangerous parts on plant (during operation, examination,
lubrication, maintenance, and adjustment) are assessed and eliminated. If it is not reasonably practicable to eliminate, then appropriate controls to further minimize the risks must be implemented.

9. The hierarchy of control describes a systematic way of minimising risks. Isolation and tagging practices are part of the hierarchy. However, additional control measures should not be forgotten. Other types and variations of signage, lockouts and mechanical interlocking devices may also be utilised.

10. In the management of risks associated with plant and equipment, isolation and tagging contributes to protecting personnel and equipment from harm. The formal risk assessment, which identifies a requirement for isolation practice/s, should also include the means by which the hazard has or will be isolated. Procedures incorporating isolation devices, and tags should be used when energy sources are:

- Out of service awaiting repair or alteration,
- In an unsafe/dangerous condition,
- Commissioning is incomplete,
- Faulty and must not to be operated,
- Isolated from the electrical power supply,
- Locked by brake or locking mechanism to prevent movement, or
- Currently under repair or being serviced.

11. Where plant is isolated but not disconnected from the power/energy supply, all possible precautions must be employed to prevent inadvertent energising or release of energy.

12. The equipment’s manufacturer’s recommendations for isolation shall be considered, (when available).

**Guards**

13. Where a guard (a risk control device to prevent or reduce access to a dangerous part or area) is used on plant, the Budget Area must ensure that all reasonably practicable steps are taken to ensure that the guarding provided is:

a. Permanently fixed during normal operation.

b. If accessible during normal operation, an interlocked physical barrier is required

c. Where (a) and (b) are not practicable, a physical barrier which eliminates any fitted guard from being removed or altered unless by a special tool or key,
is used.

d. Where all of the above is not practicable, the use of presence sensing safeguards shall be used.

14. When a guard is required to be removed (eg for maintenance), appropriate isolation and danger tagging shall be followed.

Testing

15. The effectiveness of any isolation method must be tested prior to commencing work to ensure/confirm a safe system.

16. An examination by instruments, gauges and indicator panels should be considered to determine the energy of the system. Where possible the energy in system should be released.

Notification of Isolation

17. All areas and personnel that maybe inconvenienced by an isolation shutdown process should be informed in advance (when possible).

Isolation Procedure

18. The system of work shall provide for the availability and appropriate type/s of device needed for isolation.

19. It is essential that an effective isolating control device be selected that is suitable for the type of isolation identified in the risk analysis. e.g. locking of operational switches, blanking off pipes utilising capping or spade method, locking pins, locking access hatchways, electrical isolation switches, and other innovative combinations found in lockout kits.

20. The prevention mechanism of choice for multiple operators is a physical device whereby individual locks/hasps can be used to guard against the accidental release of hazardous energy. All persons working on the equipment/installation shall only attach and remove their own tags.

21. After selection and installation, an effective means of testing to confirm the effectiveness of the isolation technique should be carried out, prior to the commencement of any work on the energy source. If working on equipment or the electrical installation creates a hazard, it shall first be taken out of service and Danger tag/s attached.

22. Special care needs to be taken with automated systems. These may restart or reset without warning. A physical isolation device must be used to prevent the automatic energising of the system.
23. Isolation devices and tags should never be interfered with.

**Electrical Isolation Not Possible**

24. If the equipment or installation must be worked on with electrical power applied, the precautions listed in the Electrical safety management procedure or Australian Standards shall be observed and the risk assessment completed prior to commencing the work.

25. If the electrical installation is to be taken out of service for a significant time, then physical disconnection and circuit identification by tagging must be carried out.

**Tagging Procedure**

26. The risk assessment should identify hazards and locations where a person may be injured. Tagging the isolation point (e.g. power supply circuit), operation controls (e.g. on/off switch) or other relevant point, indicates the problem, personnel involved and precautions. The following steps are likely to be performed:

   a. a *Competent Person* isolates the electrically powered machinery/equipment or installation,

   b. an appropriate type of isolation measure shall be used to prevent inadvertent switching causing the release of the energy source,

   c. the machinery/equipment or installation is then tested to confirm the power/energy is isolated and safe to work on by a *Competent Person*,

   d. a means of attachment onto the locking device for personnel Danger Tags is provided,

   e. all persons working on the machinery/equipment or installation attaches their own personal *Danger Tag* during work,

   f. as each person completes their task/s they are to remove only the *Danger Tag*/s they are responsible for installing,

   g. only when all Danger Tags are removed and the competent person confirms that the machinery/equipment or installation is safe, can power be restored coinciding with the removal of the locking device,

   h. where the energy source cannot be returned back to normal operational conditions following the removal of the last *Danger Tag*, an *Out of Service tag* plus remarks detailing the reason for the out of service condition remaining shall be left on both the lockout device and the
Procedure:

Isolation and danger tagging procedure

machinery/equipment or installation. e.g. removal of the electrical equipment from the installation and an out of service tag and isolating device applied to the plug and a tag placed in a prominent part of the machinery/equipment or installation, to alert users to the status of the equipment.

Removing DANGER Tags

27. The person whose name is written on the tag should only remove their Danger tag/s and associated isolation measure/s. At the completion of the work e.g. change in shift, the removal of each personal Danger tag/s shall be undertaken by each individual person.

28. Where the situation requires the associated isolation device to remain in place and the equipment/circuit in an inoperative state, the Danger tag should be replaced with an *Out of Service tag* and in as safe a condition (as possible) if not already done so. The *Out of Service tag/s* should replace the danger tags at each isolating point and as well as a prominent location on the item of machinery/equipment or installation before the removal of all personnel DANGER tag/s.

Removal process for isolation device and danger tag

29. Where an employee/contractor has failed to remove a Danger tag, the work Supervisor may request that the person return to the worksite and remove/address the associated isolation device and return the machinery/equipment or installation to normal operation.

Removal after failing to remove an isolation device and danger tag

30. Where failure to contact the owner of the potentially redundant Danger tag, through contact details provided on the tag, has occurred, the Supervisor and another Competent Person shall document the removal process:

   a. document who the owner of the Danger tag and type of accompanying lockout device/s which were used,

   b. identify and document the method of isolation, necessary to gain an understanding and reason/s for the isolation practice,

   c. assess all the risks that may result by the removal of the isolation device/s to reactivate the machinery/equipment or installation,

   d. re-energise the machinery/equipment or installation according to any reactivation procedure,
e. a period of time to test, monitor and review the performance, reliability and integrity in terms of the operational safety aspects of the machinery/equipment or installation, shall be undertaken, and document the findings as part of the analysis.

31. **Note:** further authorisation may need to be sought through the *Work Environment Group* (Human Resources Division) eg. the isolation practice may be as a result of regulatory or Work Environment Group conditions.

**OUT OF SERVICE Tags**

32. An Out of Service tag can be placed onto machinery/equipment by anyone who considers the machinery or equipment to be unsafe or unserviceable. An Out of Service tag shall be fully completed to include:

- the person attaching the tag and their contact details supported by their signature and date,
- a clear indication of why the machinery/equipment has been taken out of service, or disconnected from an energy sources e.g. by key or any other starting device removed or installed to effect inoperability,
- the tag for electrical energised machinery/equipment should be placed onto the electrical cord adjacent to the electrical plug.

33. Immediately following this action they have a responsibility to advise their immediate supervisor, notify appropriate staff and arrange for appropriate maintenance or repair.

34. Where a log book exists, this should be updated with relevant information.

35. Only the person who originally attached the Out of Service tag OR a Competent Person is permitted to remove the Out of Service tag. For example, an A-Grade electrician repairing an electrical fault could remove the tag after repair and further inspection.

36. **Note:** An Out of Service tag indicates that the machinery/equipment is unsafe to operate. It does not mean that the machinery/equipment is safe to work on for maintenance or repair.

**Supplies of Danger and Out of Service tags**

<table>
<thead>
<tr>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RSPE (Store)</td>
<td>Tag, ‘Danger Do Not Operate’</td>
</tr>
<tr>
<td>Facilities and Services (Store)</td>
<td>Tag ‘Danger Do Not Operate’</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td></td>
<td>Tag ‘OUT of SERVICE’</td>
</tr>
</tbody>
</table>

**APPENDIX A**

Figure 1a Front

![Figure 1a Front](image1.png)

Figure 1b Back

![Figure 1b Back](image2.png)

Figure 2a Back

![Figure 2a Back](image3.png)

Figure 2b Front

![Figure 2b Front](image4.png)

Figure 3

![Figure 3](image5.png)

Figure 4

![Figure 4](image6.png)
ATTACHMENT A

Examples

37. The following are examples of isolation and tagging – Other methods and techniques are possible.

A.1 Electrical installation circuits

38. It is the responsibility of Facilities & Services to ensure the competent persons they approve have appropriate qualifications, licences and experience for the nominated tasks, undertake a risk assessment prior to undertaking a task, and use appropriate work practices to effectively control the assessed risk as per the University electrical safety procedure [3].

39. Where an individual risk assessment or operational work procedure requires the isolation of an electrical circuit prior to work, then the inclusion of an isolating
device shall be fixed to the identified circuit breaker within the main switchboard, similar to the examples shown in pictures A and B. The examples demonstrate the additional use of an individual padlock and identifying isolation tag, necessary in preventing accidental or uncontrolled re-energising of the individual circuit.

Picture A  Picture B

A.2  Electrical Appliances/Equipment

40. Electrical appliances and equipment, which are deemed un-serviceable or restricted from use should be isolated and tagged similar to that shown in pictures C, D and E. The isolating device is secured by padlock around the electrical plug, preventing its use and tagged accordingly.

Picture C  Picture D

A.3  Electrical Machinery and Industrial Equipment

41. Machinery/equipment are constantly being improved in design through the inclusion of built-in isolation mechanisms. However not all machinery/equipment in operation at the University has these improved design features. Therefore this machinery/equipment requires the complete isolation of all hazardous energy sources, usually required when undertaking inspection, maintenance or cleaning activities and sometimes during tool changes. Where the machinery/equipment has no built-in lockable isolation mechanism, then it will be necessary to isolate directly from the hazardous source e.g. from the lockable switches by individual padlock to control unauthorised usage see pictures E and F below.
Note

42. Any isolation technique administered for the control of a hazard/s, shall be tested to confirm the effectiveness of control of the hazard/s prior to work proceeding as referred to in sections 16 and 17.

43. Some machinery/equipment may involve one or more hazardous energy sources. The machinery/equipment operator’s manual, or service representative can provide further information regarding the safe isolation measure/s to undertake regarding specific machinery/equipment.

References

- Risk assessment prior to work on ANU low voltage electrical installation
- Plant (equipment) risk assessment
- Plant (equipment) hazard management procedure
- Electrical safety management