Procedure 6.05.12  Isolation, Lock-out and Tag-out

Directorate  Business & Governance

Responsible Officer  Executive Manager | People & Governance

Contents

Isolation, Lock-out and Tag-out 1
Introduction 3
Scope 3
Duties and Responsibilities 3
Managers 3
  Co-ordinators, Supervisors and Team Leaders 3
  Employees 3
Isolation, Lock-out and Tag-out Procedure 3
  Isolation process 4
  De-isolation Process 5
  Emergency Stop Controls 5
  Failure to remove Personal Safety Lock or Danger Tag (Missing man routine) 6
Description of Locks and Tags 6
  Personal Safety Locks 6
  Physical Restraint Devices 7
  Isolation Multiple Locks 7
  Out of Service Tags 7
  Personal Danger Tags 7
  Using multiple tags 7
  Destruction and Accidental Removal of Tags 7
General Compliance Requirements 8
  Extended Isolation - Impacting Service 8
  Working Live: - Additional Control Measures and Emergency Arrangements 8
  Non-compliant Equipment 8
  Personal Protective Equipment and other Safety Equipment 8
  Contractors and isolations 8
  Council Employees 9
  Isolation Register 9
Procedure 6.05.12 Isolation, Lock-out and Tag-out
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Creating an Isolation Record

Competency, Supervision and Training

References
Introduction

There are a number of occasions where Bega Valley Shire Council employees are required to isolate a service or supply in order to safely conduct work. There are also times when these services or supplies may remain isolated for extended periods awaiting effective repairs. This procedure provides guidance to employees on the safe method of isolating and de-isolating services or supplies and the appropriate method to be used for extended isolations.

Scope

This procedure applies to all Council workers and contractors (as appropriate) who are required to isolate energy sources (e.g., electricity, fluids, mechanical movement and stored energy etc.) in order to undertake safe maintenance on Council equipment and facilities. This document is supplementary to and does not replace in any way the accepted Codes of Practice or relevant industry standards for the applicable work to be undertaken during the isolation.

Duties and Responsibilities

Managers

Managers are responsible for implementing this procedure within their areas of responsibility and providing appropriate funding to ensure this system of isolating sources of energy within their sections can be maintained.

Co-ordinators, Supervisors and Team Leaders

Coordinators, supervisors and team leaders are to ensure all staff that may be required to isolate a service or supply are inducted into this procedure, issued with locks and provided with appropriate on the job training on local isolations. Co-ordinators, supervisors and team leaders are responsible (as appropriate) for ensuring that:

- All persons under their control comply with this procedure and report any non-compliance to the Manager.
- Where detailed isolation instructions relating to specific equipment is required (e.g. a safe working/operating procedure or a safe work method statement) coordinators, supervisors and team leaders are to ensure that these are developed in consultation with all relevant workers and once finalised all staff are provided with on the job instruction using them as a guide.
- Ensure that only personnel deemed competent are permitted to isolate equipment/facilities.
- Any item deemed unserviceable by a competent person is safely isolated, tagged “Out of Service” and is made safe by the fastest possible means by either being repaired or replaced.

Employees

Employees have a responsibility to:

- Not place themselves or others at risk of injury.
- Conform to the requirements of this procedure.
- Consult with Managers, Supervisors and other workers in relation to hazard identification and risk control associated with energy isolations and out of service requirements.
- Advising their supervisors if further specific instruction is required in relation to isolating sources of energy within their workplace.

Isolation, Lock-out and Tag-out Procedure

Isolation, Lock-out and Tag-out is required when employees or contractors are exposed to hazardous energy sources. The affixation of a lock or tag is designed to protect employees and contractors from the unexpected start-up of the system, equipment or plant. This process may apply during the following activities:
Normal operations are not covered except under the following conditions, during these conductions, the equipment must be de-energised through Lock-out/ Tag-out.

- A safety guard is opened or removed.
- A safety device is missing or bypassed.
- An employee must enter the area where the equipment performs its operation.
- An employee must enter an area of associated operations.
- Any other time where failure to isolate equipment will result in injury to a worker.

Activities that do not require Lockout and Tag out - provided they are performed using alternative protection measures e.g. machine guarding include:

- Minor tool changes and adjustments.
- Routine, repetitive service that is integral to normal production operations.
- Cord and plug-connected equipment if the equipment is unplugged and under sole control of servicing employee.

**Isolation process**

To prevent the potential release of stored energy and to protect the safety of persons during plant inspection, repair and maintenance or cleaning activities, the minimum steps shall be followed by the person carrying out the isolation:

1. Identify the task or activity where isolations are required.
2. Identify all sources of energy that will have influence on the work area. This may include but is not limited to the following:
   - Electricity
   - Fluids
   - Potential energy (stored or kinetic)
   - Mechanical
   - Mechanical movement
   - Gravitational
   - Hydraulic
   - Radiation
3. Place the system/work area in a safe state. e.g. electricity turned off, valves closed, system drained, machinery shut down etc. Where isolations are required for work on circuits, any associated control circuits must also be isolated. All equipment, plant, facilities etc. must be treated as live/unsafe until proven to be ‘de-energised’ or in a ‘safe state’.
4. Identify all isolation points.
5. Confirm all isolations are effective (e.g. using a voltmeter to confirm a piece of equipment is electrically isolated).
6. Fit the isolator (breaker switch, valve etc.) with a lockout device that when in position will prevent the isolator from being switched or turned to the operating position e.g. breaker lockout device, valve lockout device.
7. A keyed lock and danger tag must be placed on the locking device with the key held by the person who would be at risk. Where more than operator will be working on the system a multi locking device is to be used and each person is to fit a keyed lock.
8. When isolations are required for extended periods:
Prior to commencing the restoration process, relevant personnel must ensure that restoration of any related equipment is planned in the correct order to prevent injury or damage. The following is an overview of a general restoration process:

1. When all work is complete, the system or equipment is to be checked by a competent person to ensure it is ready for service. Ensure that all works are completed and that non-essential items, tools and equipment from around the work area have been removed.
2. Ensure all personnel are clear and have removed their personal safety lock and danger tag from all points of isolation and recorded in the register.

3. For extended periods of isolation where a risk assessment determines that the inadvertent removal of the out of service tag and the locking device may cause damage to major machinery or environmental damage a long term isolation lock is to be placed on the locking device and remain there until the system/equipment is set to work.
4. Return long term isolation locks and tags to storage cabinet and complete isolations register noting that the service remains isolated with either an out of service tag remaining or an operators lock.
5. Check again that personnel are clear and restore the energy source.
6. Test the operation of the equipment and return the equipment back to service.

Emergency Stop Controls

Under no circumstances are emergency stop controls to be used as a sole method of isolation for the purpose of working on the equipment.

WARNING:
Under NO circumstance is the locking device to be removed from the isolator until the service or supply is ready to be set to work.
Failure to remove Personal Safety Lock or Danger Tag (Missing man routine)

Where a personal safety lock and/or personal 'Danger Tag' or 'Caution Tag' has been left in place at the end of shift or on completion of the work, the worker noting the possible breach must report the incident to their supervisor or Council contact. Where a person has left the job and failed to remove a lock, the Supervisor responsible for the equipment must:

- Make all practical efforts to contact the individual at work and have them remove their lock.
- Make all practical efforts to contact the person off the work site and have them return to work to remove their lock.
- Inform the area co-ordinator or his representative of the situation.

**WARNING:**
Where this occurs without a valid reason disciplinary action will be taken.

Where a recall may cause excessive delays or interrupt other essential works, a delegated responsible person should make contact with the owner of the Personal Safety Lock or danger tag and confirm the following before removing the tag:

- That they are not working on the plant or equipment.
- The operational status of the plant or equipment.
- Why these devices weren’t removed; and
- That there is no immediate danger to personnel.

If the owner of the Personal Safety Lock or danger tag cannot be contacted a delegated responsible person should:

- Ensure that a competent person has checked the equipment / system and it is safe to operate
- Ensure the person who attached the lock has been positively identified as NOT working on the equipment and can NOT be located.
- Sought and gained approval from the area manager for the lock to be removed. This approval to be followed by a completed non-conformance report noting all avenues made to contact the missing person.
- The spare key is then and **ONLY** then used to remove the lock and noted in the lockout register.

Description of Locks and Tags

The application of a lock to lockout a system is the preferred method of isolation opposed to placing a warning tag on the system (tagging out). Locks are hard to bypass and they take great deal of effort to compromise a lock e.g. bolt cutters, whereas Tags can be pretty easily removed by being cut, pulled or torn off. Tags are only communication devices which serve as a warning device; tags are not a “safety device”. Tags may be easily lost or damaged by environmental or physical hazards like chemicals or abrasives.

**Personal Safety Locks**

All persons working on the equipment being isolated must apply their own Personal Safety and these locks are to be only unlockable by their owner. The Personal Safety Lock should be affixed with a fully completed and signed ‘Personal Danger’ tag of each individual who is working on the isolated system. Only the individual identified by the personal tag may unlock, replace, or remove their personal Safety Lock and personal ‘Danger Tag’. If the servicing or maintenance on a piece of equipment extends beyond a shift or a day, then the equipment is to be placed in a safe state (e.g. long term isolation) and all persons must remove their Personal Safety Locks and complete an entry in the site specific Isolation Register.
Physical Restraint Devices

Physical Restraint Devices are used to reduce the likelihood of misuse of machinery/equipment or accidental energising. These are used in conjunction with clasps, locks, and tags.

Isolation Multiple Locks

Isolation Multiple Locks are used so that multiple locks can be affixed to control point multiple locks and tags e.g. Hasps or clasps. Each lock on a clasp represents each person working on the system or equipment. The first lock and tag attached to the system shall be the Out of Service Lock and Tag. Under no circumstances must locks be “interlocked”. Where a multiple lockout is required and a single facility is available, a multiple lockout device such as lockout scissors or lockout box, etc. must be used.

Out of Service Tags

An ‘Out of Service Tag’ is a notice that distinguishes appliances or equipment ‘out of operation’ for repairs and alteration, or plant that is still being installed. While an Out of Service Tag is attached to the appliance or equipment, it should not be operated. Out of Service Tags should not be relied upon to provide personal protection.

Personal Danger Tags

A Personal Danger Tag (Red, White and Black) is a warning that the equipment is in an unsafe condition and that operation of that equipment may endanger the person who attached the tag.

- Must Contain clear Information – Printed Name, Company name and Contact Number, Printed text and legends should be coloured black
- Tags must display a recognised DANGER symbol on each side, should be durable and not less than 60 x 120 mm in size.
- Every isolation point must have a personal danger tag attached.
- Personal Danger tags should be removed by the responsible person when they are required to leave site and should destroyed after use.

Using multiple tags

Some tasks require Danger and Out of Service tags to be used together. When this occurs, an Out of Service tag is placed on the switch or main control to indicate that the unit has been taken out of service and no one is to attempt to operate it. Each person working on the equipment places their own Danger tag on top of the Out of Service tag. This indicates that if anyone touches the item they will be placing those persons working on the job in danger. As each person finishes their task they remove their own Personal Danger tag from the isolation point.

- Out of Service tags protect machinery.
- Personal Danger tags protect people

Destruction and Accidental Removal of Tags

Tags are generally manufactured from paper and plastic and are to be regarded as disposable. The tags must be destroyed immediately after use to prevent any possibility of reuse. Any person who finds an un-destroyed tag should assume that it has become unintentionally detached from an isolation point and should, place a substitute tag at the isolation point, and immediately refer the matter to the person named on the tag or the Group Property Services Call Centre. The same procedure applies if a person accidentally removes another person’s tag from an isolation point. System of work must provide for:

- Disposable tags to be destroyed immediately after use; and
- Safe procedures in the event of a tag being accidentally removed or becoming unintentionally detached.
General Compliance Requirements

Failure by an employee to comply with this procedure may result in disciplinary action in accordance with Council’s current discipline procedure. The following general compliance requirements also apply.

Extended Isolation - Impacting Service

Where programmed works or reactive maintenance/repairs could result in systems, equipment or processes being out of service for an extended period; the relevant manager/supervisor will need to be notified.

Working Live: - Additional Control Measures and Emergency Arrangements

Personnel should never undertake live work unless testing live when troubleshooting and in certain maintenance situations e.g. fault finding where energisation is required. Where it is necessary to work with a live energy source the task shall be performed using a risk-based approach and documented using an appropriate risk assessment template (e.g. Drafting a task specific job safety analysis ‘JSA’). Additional control measures and emergency arrangements should be included in the risk assessment and safe work method statements. The following as a minimum should be undertaken:

- A documented site specific risk assessment by competent personnel to cover all tasks;
- Consultation with all persons proposing to do the work;
- A pre-site inspection to review environmental safety impacts

Non-compliant Equipment

Where in-service inspection or testing identifies equipment which fails to comply with relevant standards and criteria, the equipment shall be appropriately labelled with an ‘Out of Service’ tag to warn against further use and be withdrawn from service. The remedial action i.e. disposal or other corrective action shall be determined by the relevant Manager. Any repairs to faulty electrical equipment must be undertaken by competent personnel.  

Personal Protective Equipment and other Safety Equipment

The following points regarding PPE should be considered in addition to other Council PPE requirements:

- Personal protective equipment such as insulated gloves, (rated at 650 volts or greater [working load]) and non-conductive footwear shall be considered as part of the risk assessment process when dealing with electrical isolations).
- Electrical rescue kits are compulsory for high voltage live work and should be considered for low voltage work. (As per Group Property Services High Risk Works Procedure), Where appropriate and feasible the use of insulated mats should be considered,
- Long sleeve 100% cotton shirts and clothing should be worn when undertaking any live work (compulsory in substations).
- Isolation barriers are to be used to isolate all workers from exposed conductive parts that could become live, in trafficable areas; Safety barriers are placed to prevent other persons entering the vicinity of the exposed live parts, and
- When using voltage testers, ensure that they are tested for correct operation; immediately before use and gain after use to confirm that the instrument is working correctly.

Contractors and isolations

Contractors that have systems that provide a lower standard to what is detailed in this procedure must use Council systems when undertaking works involving isolations. Any contractors using Council’s systems that fail to comply with this procedure shall be stood down until such time as the contract manager or other authorised person is satisfied that the contractor shall not commit any further breaches. Any serious or continued non-compliance shall be considered a breach of the contract and may be sufficient grounds for termination of the contract.
Council Employees

Failure by an employee to comply with this procedure may result in disciplinary action in accordance with Council’s current discipline procedure.

Isolation Register

Where plant, equipment or a process is isolated for more than one shift or a day, then the details should be entered onto the site specific Isolation Register.

Creating an Isolation Record

The relevant supervisor/asset manager shall ensure that there is an Isolation Register for their section (see annex 4 for an example). Individual sections are free to develop an isolations register that suits their specific needs and includes the following information:

- The installation, plant or equipment that is isolated;
- The reason the installation, plant or equipment is isolated;
- The name of the authorised person who conducted the isolation; and
- The date of the isolation.

All isolations of equipment, plant or processes must be updated into the site specific Isolation Register by the relevant personnel undertaking the work. Once the plant, equipment or process is operational and the isolation has been finalised the entry for the isolation must be completed by the relevant site supervisor with the isolation final date being completed and signed off. Further information regarding Isolation Registers can be obtained through Councils WHS Officer.

Competency, Supervision and Training

Isolations and testing must be carried out by competent personnel e.g. licensed electrician or someone who has extensive knowledge on the operation of the system / machine.

References

- AS/NZS 3760:2010, In-Service Safety Inspection & Testing of Electrical Equipment
- NSW WorkCover Guide to Electrical Work near Live Electrical Equipment.
- NSW WorkCover Guide to Low Voltage Electrical Work.
- NSW WorkCover Plant Guide.
- Work Health & Safety Regulation 2011.
Annex 1: Glossary of terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competent Person</td>
<td>A person who has, through a combination of training, education and experience, acquired knowledge and skills enabling that person to perform specified tasks</td>
</tr>
<tr>
<td>Danger Tag</td>
<td>Must be installed at the isolation point with the isolation lock where there is the potential for injury to a person if system restored. Can only be removed by the person named on the Danger tag, after the system / equipment is clear of danger</td>
</tr>
<tr>
<td>De-Isolate</td>
<td>The removal of all isolators tags and locks to place a service or supply into service. Only to be conducted by authorized personnel once all work / repairs have been completed</td>
</tr>
<tr>
<td>Energy source</td>
<td>A source of power including: electrical, mechanical, hydraulic, pneumatic, chemical, thermal, gas and other. Note: energy sources may include stored energy that may be released as kinetic energy, such as an object suspended above the work area.</td>
</tr>
<tr>
<td>Isolate</td>
<td>The removal of an energy source from any item of equipment in such a way as to prevent the possibility of accidental or inadvertent energisation of the whole or a specified section of that equipment. Also the control measures taken to prevent unauthorised removal of an energy block used to prevent any injury or damage to personnel or equipment</td>
</tr>
<tr>
<td>Isolator</td>
<td>The actual device that is turned off or closed to prevent the energy source influencing the affected area.</td>
</tr>
<tr>
<td>Isolation register</td>
<td>Isolation register is used to record the details of any tags that are active for more than one shift of the person affixing the tag.</td>
</tr>
<tr>
<td>Lockout</td>
<td>The process which involves physically locking a service or supply in an isolated position with a locking device to prevent injury or major damage through inadvertent or accidental de-isolation</td>
</tr>
<tr>
<td>Long Term Isolation Lock</td>
<td>A keyed padlock type device used by the area supervisor to lockout a service or supply for extended isolations where a system or service is determined via a risk assessment that the inadvertent removal of the out of service tag and the locking device may cause injury to a person or major machinery or environmental damage</td>
</tr>
<tr>
<td>Out of Service Tag</td>
<td>A tag used to indicate that a service or supply is not in service. A full system / equipment inspection is required prior to removing the tag and setting to work</td>
</tr>
<tr>
<td>Personal Lock</td>
<td>A keyed padlock type device used by maintainers and operators to lockout a service or supply during maintenance or routine work to protect themselves against energy sources.</td>
</tr>
<tr>
<td>Danger Tag</td>
<td>Must be installed at the isolation point with the isolation lock where there is the potential for injury to a person if system restored. Can only be removed by the person named on the Danger tag, after the system / equipment is clear of danger</td>
</tr>
</tbody>
</table>
Annex 2: Isolation flow chart for energised appliances

Are energy sources present?

- No: No Isolations Required
- Yes:
  - Draw Locks & Tags from storage
  - Identify isolation points
  - Is more than one trade required?
    - No: Single locking devices required
    - Yes: Multi locking devices required
      - Place locking devices and keyed locks on isolation points
      - Test isolation, drain energy
      - Conduct work. Isolation Key to be held by worker or workers at risk

An energy source can be:
- Electricity
- Fluids under pressure
- Fluids not under pressure
- Moving machinery or
- Machinery parts
Annex 3 – Completion of works flowchart where isolations is required

NOTE:
For extended periods of isolation where a risk assessment determines that the inadvertent removal of the out of service tag and the locking device may cause damage to major machinery or environmental damage a long term isolation lock is to be placed on the locking device and remain there until the system / equipment is set to work. For all other circumstances the lock would be substituted by a completed out of service tag. The lockout register is to be filled in to show all items that remain isolated for any length of time greater than one shift. The register is to be monitored by the area co-ordinators to ensure that systems are returned to normal as soon as possible.
Annex 4 Isolation Register (Example)

Isolation Register

<table>
<thead>
<tr>
<th>No.</th>
<th>Equipment Being Isolated (name or #)</th>
<th>Description of Isolation Method Used</th>
<th>Person(s) Performing Isolation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
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<td></td>
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<td>3</td>
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<td>4</td>
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</tbody>
</table>

Approval Signatures

<p>| | | | |</p>
<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Electrical Isolation</td>
<td>Where high voltage or high-energy low voltage is involved, the signature of the authorized electrical person or supervisor is required.</td>
<td>Electrical Professional Signature:</td>
<td>Date/Time:</td>
</tr>
<tr>
<td>Lockout/Tagout Implemented</td>
<td>The isolations on this form have been fully implemented.</td>
<td>Performing Authority Signature:</td>
<td>Date/Time:</td>
</tr>
<tr>
<td>Lockout/Tagout Closed</td>
<td>All isolations on this form have been removed.</td>
<td>Performing Authority Signature:</td>
<td>Date/Time:</td>
</tr>
<tr>
<td>System Checked</td>
<td>All valves, switches and controls have been checked for correct positions and settings before restarting.</td>
<td>Performing Authority Signature:</td>
<td>Date/Time:</td>
</tr>
<tr>
<td>Long-Term Isolations</td>
<td>Long-term isolations marked above shall remain in effect after all other isolations are removed and the permit closed</td>
<td>Issuing Authority Signature:</td>
<td>Date/Time:</td>
</tr>
<tr>
<td>Final Closure</td>
<td>All non-long term isolations have been removed and the equipment has been returned to service.</td>
<td>Issuing Authority Signature:</td>
<td>Date/Time:</td>
</tr>
</tbody>
</table>