



Low Voltage and Mechanical Isolation & Tagging Procedure

Power and Water Corporate Procedure

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1 Purpose

To ensure the elimination of hazardous energy and risks associated with work being performed on any plant or equipment owned and/or controlled by Power and Water Corporation.

2 Scope

2.1 The procedure applies to all Power and Water Corporation employee/s, contractor/s and visitor/s working on isolated Low Voltage circuits. This procedure is not required to be applied if the work is covered by a "Power station permit to work" or "Low Voltage permit".

3 References

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		File No: F2004/238	Version: 4

4 Roles and Responsibilities

Role / Title	Responsibility
Managing Director	<ul style="list-style-type: none"> • Authorises procedure
Business Unit General Manager	<ul style="list-style-type: none"> • As a member of EMC recommends approval by MD • Ensures this document meets PWC OHS standards and sufficient enrolment has occurred within the Business Unit
Branch/Section Manager	<ul style="list-style-type: none"> • Ensures that this procedure is accessible and complied with. <ul style="list-style-type: none"> • Identifies locations where personnel shall comply with this procedure in their area of responsibility.
Coordinator/ Team Leader	<ul style="list-style-type: none"> • Ensures all employees or contractors have a copy of these procedures. • Ensures all employees comply with the instructions contained therein. • Ensures all work parties have the appropriate Personal Protective Equipment and equipment to safely accomplish the assigned tasks.
Employees	<ul style="list-style-type: none"> • Comply with the instructions contained within these procedures. • Shall wear and use all personal protective equipment, equipment or devices as appropriate to the situation, in such a way as to achieve the purpose for which they were provided.

5 Definitions

Word	Definition
Control Isolation	The use of a lockable emergency stop button to isolate control circuits
Energy	Electricity, gas, oil, water, hydraulic oil and other fluids, air, oxygen, or any other source, the level of intensity of which could pose a threat to a person's safety
Energy Isolator	A device such as a switch, valve, lever etc that directly and positively blocks the source of potentially damaging energy, and which cannot be activated from a position remote from itself
Isolated { Energy off}	The condition in which equipment or plant is placed when all sources of potentially damaging energy are prevented or

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	blocked by the operation of energy isolator/s.
Primary Isolation	<p>The point at which the source of energy, radiation or material hazard can be positively isolated. This would include but not be limited to:</p> <ul style="list-style-type: none">• Electrical breakers• Batteries• Valves• Main Switch• Spades• Power Leads• Blanks• Fuel Valves
Procedure	Specified way to carry out an activity or process.
Danger, Out of Service and Information Tags	Indicate that a piece of machinery, equipment or appliance shall not be used as it is in an unsafe condition.

6 Records

7 Attachments

Attachment 1: Isolation and Tagging Process Flow Chart

Attachment 2: Sample Tags

8 Guidelines

8.1 Requirements

Any work requiring the removal of equipment, breaking into lines and/or systems or any other task which may exposure personnel to material hazards or energy sources shall be covered by this procedure.

Only Primary Isolation points shall be used for the isolation of energy sources.

Only proven isolations will be accepted. In all cases, the method of isolation must be proven before it can be accepted as an isolation point. A valve will not be considered a proven isolation point unless it has positively stopped a flow. A closed valve on a line that is not pressurised is not a proven isolation. In such cases the isolation point may be further along the line or the line may need to be brought on to prove the isolation. A proven isolation remains valid only while the conditions affecting the isolation point, do not change, i.e. if the pressure to an isolation point reduces then increases, the integrity of the isolation point may be compromised.

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Consideration must always be given to the condition of the plant or equipment on which work is to be carried out. All hazards associated with the work should be considered as per the Hierarchy of Prevention and Control:

- Elimination
- Substitution
- Isolation
- Engineering control
- Administrative controls
- Personal Protective Equipment.

High Voltage electrical isolation can only be performed by an authorised person in accordance with Power and Water's Electrical Safety Manual, (Green Book).

8.2 Types of Tags

8.2.1 Personal Danger Tag

The personal danger tag is mainly red in colour with large black print stating personal danger with a space in white for the name of the person placing the tag, their contact number, date, and equipment description. (Refer Attachment 2)

8.2.2 Out of Service Tag

The out of service tag is mainly yellow in colour with Out of Service in bold black writing displayed on the tag. As this tag may spend longer in the field, the construction of the tag should be more robust. (Refer Attachment 2)

8.2.3 Information Tag

The information tag is blue in colour with areas of white to record information on the tag for other personnel to read. As this tag may spend longer in the field, the construction of the tag should be more robust. (Refer Attachment 2)

8.3 Isolation Procedure

8.3.1 This procedure is designed for your personal protection. The appropriate energy isolator shall be placed in the correct non-dangerous position. Each person, who enters the worksite, shall attach his or her completed personal Danger Tag to the appropriate energy isolator before commencing work.

8.3.2 An energy isolator shall not be changed to any other operating position by any person whilst a Danger Tag is attached.

8.3.3 Each personal Danger Tag shall be securely attached to the energy isolator in a prominent position.

8.3.4 Any person other than the person whose name is printed on the tag shall not remove a personal Danger Tag.

8.3.5 No person shall erase the name of another person from a personal Danger Tag in order to print his or her own name on the personal Danger Tag.

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- 8.3.6 Any person contravening the instructions set out in this paragraph is liable to disciplinary action.
- 8.3.7 Any breach of this procedure shall be investigated immediately by the coordinator of the employee who placed the personal Danger Tag and the coordinator in charge of the equipment.

8.4 Placing of Danger Tags

- 8.4.1 Each person who may be endangered in the event of an energy isolator being operated is responsible for attaching a completed personal Danger Tag to the energy isolator. Where a Job Safety and Environmental Analysis, (JSEA), is used then details of isolation points and a record of personal danger tag use shall be recorded on the JSEA.
- 8.4.2 No person shall depend on a personal Danger Tag placed by another person.
- 8.4.3 When a person who is required to isolate and tag equipment has insufficient information to identify the energy isolator/s they must ascertain from the person in charge of the equipment, which energy isolator/s shall be isolated and tagged.
- 8.4.4 Whenever the operation of associated equipment would establish a situation dangerous to personnel, the associated equipment shall be isolated. Each person in danger shall attach his or her personal Danger Tag to the isolator of the associated equipment, in addition to isolating and tagging the equipment for the work/task being performed.
- 8.4.5 When a person is required to carry out work in a business unit or section other than his/her normal section, s/he shall not commence isolating and tagging until the person in charge of the business unit or section has been notified of his/her intentions.
- 8.4.6 Where energy isolators are not available at the equipment, the relevant energy isolators shall be identified and isolated. Only an electrician may change the operating position of an isolator in a switch yard.
- 8.4.7 In such work as construction, re-construction, and major overhaul expected to last more than one shift, Out of Service Tags shall be used in conjunction with Danger Tags. Refer to section 11, "Jobs extending over a shift".

8.5 Removal of Danger Tags

- 8.5.1 Each person is responsible for the removal of their own personal Danger Tag when s/he:
 - a) Is no longer in a position of danger.
 - b) Has completed his/her job.
 - c) Has completed the shift.

If conditions still exist in which the operation of the power isolator would (or could) set up a dangerous condition or expose the equipment to possible damage, the person concerned shall attach an Out of Service Tag to the energy isolator before removing their personal Danger Tag. The placement of the Out of Service tag shall be reported to person's coordinator/supervisor.

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- 8.5.2 No person shall remove or interfere with another person's personal Danger Tag except under the following circumstances. Where a person who placed the Danger Tag on a energy isolator is prevented from removing the Danger Tag, the Branch/Section Manager of that business unit or his/her nominated deputy may remove the Danger Tag provided the following requirements have been followed:
- a) All possible efforts have been made to contact the person who placed the personal Danger Tag, and it has been established that the person has completed the shift.
 - b) No person would/could be endangered by the operation of the energy isolator.
 - c) Efforts are continued to locate the person and inform him/her that the Danger Tag has been removed from the energy isolator.
- 8.5.3 After removal, personal Danger Tags shall be destroyed.

9 Out of Service Tag Procedure

The Out of Service Tag procedure is designed to place faulty or unsafe equipment or machinery out of service and prevent further damage to the plant. Equipment or machinery, or components of the equipment or machinery, for which an Out of Service Tag has been completed and attached shall not be used or operated.

10 Use of Out of Service Tags

- 10.1.1 When it is foreseen that the use, operation or movement of any equipment or machinery could cause damage or extend the fault or malfunction already located, or expose any personnel to a risk of injury, a completed Out of Service Tag shall be attached to the equipment or machinery.

Under no circumstances shall any equipment or machinery, which is unsafe to operate, be left without an Out of Service Tag attached.

The person attaching the Out of Service Tag shall report the placement of an Out of Service Tag to their Coordinator/Supervisor as soon as possible, and before leaving the worksite.

- 10.1.2 Where malfunction, fault or damage is found to exist in equipment interconnected with other equipment, and it appears that the operation of the whole unit could cause injury to personnel, or damage to any interconnected equipment or machinery, an Out of Service Tag shall be placed on the energy isolator/s controlling the operation or series of operations.
- 10.1.3 All Out of Service Tags shall be securely attached to the energy isolator in a prominent position.
- 10.1.4 No person shall erase the name of another person from an Out of Service Tag in order to print his or her own name on the tag.
- 10.1.5 Any breach of this procedure shall be investigated immediately and this responsibility shall rest with the coordinator/supervisor of the person who placed

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the Out of Service Tag, and the coordinator/supervisor in charge of the equipment tagged.

- 10.1.6 A coordinator/supervisor is responsible for ensuring that all personnel under his/her control have been instructed in the purposes and uses of Out of Service Tags.

11 Job extending over a shift

- 11.1 When it is evident that a job cannot be completed by the end of a shift, the person in charge of the job shall place an Out of Service Tag/s on the energy isolator/s before personal Danger tag/s are removed. The person in charge of the job shall notify his/her coordinator/supervisor of the actions taken.
- 11.2 When the job is restarted, each person working on the job shall place his or her own complete personal Danger Tag as instructed in this procedure.
When the job is finally completed, and the equipment is safe to operate, an authorised person shall remove the Out of Service Tag after each person has removed their personal Danger Tag and is safely clear.

12 Removal of Out of Service Tags

- 12.1 An authorised person shall only remove an Out of Service Tag. An authorised person may be the person who placed the Out of Service Tag, a coordinator/supervisor, or a person delegated by a coordinator/supervisor to ensure that any dangerous condition is eliminated and no longer exists.
- 12.2 Before the removal of any Out of Service Tag, the person removing the tag shall ensure that the equipment is in proper working order and its operation will not cause injury to personnel, or damage to any plant or equipment.
- 12.3 After removal, Out of Service Tags shall be destroyed.

13 General

- 13.1 An Out of Service Tag does not provide specific personal protection because it may be removed by other authorised person/s, and the equipment operated while being worked on.
- 13.2 Always use a personal Danger Tag, if there is a risk the equipment could be operated while being worked on. Place the personal Danger Tag on the energy isolator, even if an Out of Service Tag is already in place.

14 Information Tags

- 14.1 Information Tags are used to indicate that Equipment may start or stop or that Equipment is being worked on and parts of it may be operating. It is used only for the purpose of supplying information about that equipment and to notify others to keep clear, and not to isolate that equipment. An Information Tag indicates that the Isolation Points and Controls of that Equipment must not be changed or operated unless it is by the person who placed the Tag. Only one task or job can be carried out under an Information Tag. A JSEA must be carried out on the job prior to work being carried out under an Information Tag.
- 14.2 The information Tag does not replace the Out of Service Tag or Personal Danger Tag when actual work has to be carried out. It may be attached to any part of any equipment, not just the Isolation Point. It is used only for the purpose of supplying information about that equipment.
- 14.3 An Information Tag will be used when testing or calibration can not be carried out with the Equipment isolated. An Information Tag indicates that the isolation points and controls of the Equipment must not be changed or operated unless it is by the person who placed the Tag.

15 Exclusion

For the Generation Business Unit, any work carried out under a Power Station "permit to work" system will be excluded from the requirements of this procedure. However, this procedure will still apply to all other work carried out in the Business Unit.

16. Attachment 1: Power & Water Isolation and Tagging Process



