Plant Isolation Procedure

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1 Purpose

The Plant Isolation procedure establishes the mandatory requirements for isolating plant and applying Lock-Out and Tag-Out (LOTO) controls to prevent accidental energization or movement during servicing, maintenance, or other work activities. Its purpose is to ensure a consistent, robust, and safe approach across all PBPL-operated sites and vessels, minimizing risks to health and safety from hazardous energy sources.

This procedure applies to all employees, suppliers, and contractors working on PBPL plant. It outlines the principles of isolation, energy dissipation, and restraint, and provides guidance on selecting the appropriate isolation method based on the complexity of the task. By following this procedure, personnel can maintain control over hazardous energies and comply with legislative requirements, ensuring that plant remains in a safe state until work is complete and the equipment is fit for service.

2 Scope

This procedure applies to all PBPL employees and work activities across the organisation.

3 Definitions

Term	Definition
Competent Person	A person who has been trained, acquired qualifications, experience, and the knowledge and skills to perform the specified isolation task.
Isolation	A process that ensures each person involved with plant-related work personally verifies that hazard and energy sources are isolated, dissipated, or restrained until work stops. This process must be achieved via one of the following methods: ▪ Single Person – Direct Shutdown ▪ Basic Isolation – Limited Steps & Energies ▪ Complex Isolation – Documented Steps ▪ High Voltage – Documented Switching Steps
Isolation Lock	A lock secured to an isolation point by an Isolation Person.
Isolation Person	A competent person authorised to perform an isolation process for a specific item of plant. Authorisation may involve induction, familiarisation, licensing, or HVIA training.
Isolation Point	A mechanical device that physically blocks or prevents the release of gases, liquids, solids, or transmission/accumulation of hazardous energy.
Isolation Tag	A tag attached to an isolation lock by an Isolation Person to provide specific isolation information.
Lock-Out	A process of securing an isolation point in a safe position to prevent inadvertent operation or energy release, involving isolation locks and possibly personal locks.
Out of Service Tag	A tag providing a visual warning that plant is unfit for use or may pose unacceptable risk if operated.
Permit to Work Form	A PBPL document tracking authorisation and close-out of high-risk work activities, including sign-on/off of the work party.
Personal Lock	A lock secured to an isolation point by a work party member for personal control of plant and its energies.
Personal Isolation Tag	A tag attached to a personal lock by a work party member to provide specific information about the lock.

4 Hazards and Energy Sources

When working on plant, protection is required from hazards including:

- Movement or operation of the plant itself
- Movement of materials handled or conveyed by the plant
- Contact with energy used to operate the plant
- Contact with energy used in processes within the plant
- Contact with energy produced or carried by the plant
- Contact with energy stored within the plant

Examples of energy forms include:

- **Electrical energy** – power supply, batteries, capacitors, static charges
- **Mechanical energy** – drives, moving, and rotating parts
- **Pressure energy** – compressed air, hydraulics, vacuums, water pressure
- **Gravitational energy** – counterweights, suspended parts, hung-up materials
- **Potential energy** – springs, parts under strain or compression
- **Thermal energy** – hot/cold surfaces, substances, heat radiation
- **Hazardous substances** – corrosives, poisons, asphyxiants, flammable, explosive, or reactive chemicals

The isolation process must ensure that **each person involved personally verifies that all hazardous energy sources are isolated, dissipated, or restrained** and remain so until work is complete.

5 Working without an Isolation

5.1 Minor Inspection or Servicing Tasks

Certain routine tasks—such as minor tool changes, inspections, adjustments—may be performed without isolation if all of the following apply:

- The task is routine, repetitive, and integral to plant operation
- Alternative protective measures are in place (e.g., reduced speed, safe operating mode, PPE, safe distance)
- Workers are competent to perform the task
- The task complies with manufacturer's instructions or minimum requirements

5.2 Live Work Tasks

In some cases, work may need to be performed while the plant remains energized (e.g., adjustment, monitoring, fault finding, or maintenance where shutdown is impractical)

Live work must only be performed by competent persons under:

- **Documented procedures**
- **Task-specific risk assessments**
- **Compliance with legislative requirements** such as the *Work Health and Safety Act 2011 (Qld)*, *Model*

WHS Regulations, and relevant Codes of Practice.

6 General Isolation Requirements

6.1 Isolation Process

To ensure plant safety during maintenance or servicing, the following steps must be followed in sequence:

1 Stop the plant

2 Isolate, dissipate, and restrain all energy sources

3 Apply lock-out and tag-out controls or otherwise ensure the plant cannot be re-energised or operated

4 Verify and test isolation effectiveness (positive isolation)

5 Carry out the work on the plant

6 Remove all locks, tags, and isolation/restraint measures once work is complete

7 Re-energise the plant only after confirming it is safe to return to service

6.2 Documentation Requirements

The isolation plan must document:

- The nature of the plant involved
- The hazards and energy sources (type, number, and potential harm)
- The complexity of the isolation (steps, actions, and isolation point locations)
- The number of people involved in the work
- The duration of the isolation
- The potential impact on others not involved in the work

6.3 Choosing the Required Isolation Method

To ensure the most suitable and safe isolation method is used, the Isolation Method Decision Flow Chart at Appendix 1 is to be used.

7 Specific Isolation Requirements

Because plant-related tasks vary in complexity, a single isolation method cannot cover all scenarios. PBPL applies four isolation methods, each tailored to different risk levels and identified using the Isolation Method Decision Flow Chart (Appendix 1).

7.1 Single Person – Direct Shutdown

This method is only permitted when deemed suitable by the decision flow chart.

Key requirements:

Must be performed by a **competent person** familiar with the plant and task.

Steps:

1 Identify all hazards and energy sources and isolate, dissipate, or restrain them (e.g., unplugging power leads, disconnecting air hoses, removing ignition keys).

2 Verify isolation effectiveness (e.g., visual checks, attempting to start the plant).

3 Tags and locks are not mandatory, but the person must maintain direct control of isolation points (e.g., keeping leads, hoses, keys under control).

4 After work, confirm the plant is safe, clear of tools and personnel, and fit for service before re-energising.

5 If work is incomplete or the plant remains unfit for use, apply the **Out of Service Tag-Out Process**.

7.2 Basic Isolation – Limited Steps and Energies

Used for tasks requiring more formal controls but not full complexity.

Pre-requisites:

- Written Risk Assessment
- Permit to Work Form
- Plant Isolation Control Form

Process:

1 Isolation Person consults OEM manuals before isolation.

2 Physically interrupt energy sources (not via control circuits or emergency stops). Examples:

- **Isolation:** Switch off isolators, remove fuses, close valves, disconnect batteries or hoses, blank pipelines.
- **Dissipation:** Drain pipelines, release pressure, open covers, earth circuits, release springs, drop counterweights.
- **Restraint:** Secure springs, apply brakes, insert chocks, lock rotation devices.

3 **Apply isolation locks and tags** to all devices. If multiple workers are involved, use lock-out devices for personal locks.

4 Verify isolation (visual checks, electrical tests, attempt to start plant).

5 Document isolation in Section 5 of the Plant Isolation Control Form.

6 Supervisor communicates isolation scope and shows isolation points so each worker can apply personal locks and tags.

7 Workers sign on/off the Permit to Work and maintain ongoing consultation.

Prohibited actions:

- Operating locked/tagged devices
- Re-energising plant while work is in progress
- Removing another person's lock or tag

After work:

- Clear tools and materials
- Replace guards
- Remove personal locks/tags and sign off
- Supervisor confirms plant is safe for service.

7.3 Complex Isolation – Documented Steps

This method should be applied when Single Person or Basic Isolation methods are not appropriate or sufficient.

Requirements:

- Written Risk Assessment
- Permit to Work Form
- Plant Isolation Control Form
- Plant Isolation Steps Sheet

Process:

1 Two competent persons involved in planning:

- Isolation Person prepares isolation steps and documents in the Plant Isolation Steps Sheet.
- Second Isolation Person verifies steps against OEM documentation.

2 Isolation Person isolates, dissipates, or restrains energy sources according to documented steps.

3 Each isolation step is initialled progressively on the Steps Sheet.

4 Supervisor communicates isolation scope and shows isolation points to work party members for personal lock/tag application.

5 Any isolation changes (e.g., for testing or commissioning) must be documented and communicated before work resumes.

6 After work, restoration steps are initialled, and plant restoration is acknowledged in Section 6 of the Plant Isolation Control Form.

7 One competent person authorised to perform the isolation (Isolation Person) is to determine and document the following:

Within the Plant Isolation Control Form:
Section 1: Description of the Work Activity to be undertaken
Section 2: Plant Isolation Scope details (including a description of the plant to be isolated, description of the boundary of the isolated area and any pre-isolation permissions that may be required prior to isolation)
Section 3: Plant Isolation Hazard & Controls (including an identification of the energies that will be controlled via isolation, isolating controls required to be adopted by the person during the isolation, and isolation resources required to perform the isolation inclusive of isolation tag and lock numbers)
Section 4: An indication that the isolation is not a Basic Isolation – Limited Steps & Energies type and will require a Plant Isolation Steps Sheet to be completed.
Within the Plant Isolation Steps sheet:
Section 1: Isolation Steps section (which includes detailing the isolation and restoration steps required for the isolation inclusive of: location and description of plant component to be isolated; description of the isolation action required; and an indication of a corresponding isolation tag number to which the step coincides where applicable)
Section 2: Isolation Preparation acknowledgement (indicating that they have undertaken suitable investigations and research with respect to the scope of plant required to be isolated and have prepared the Plant Isolation Steps listing to enable safe isolation and associated de-energised work.
A second Isolation Person is to document the following within the Plant Isolation Steps sheet:
Section 1: Isolation Verification acknowledgement (indicating that they have undertaken an independent review of the prepared Plant Isolation Steps listing and concur that it will enable safe isolation and associated de-energised work with respect to the scope of plant identified for isolation.

8 Isolating the Plant: In addition to the requirements outlined in the Basic Isolation section of this procedure, the Isolation Person is to isolate, dissipate or restrain the energy sources so the plant is in a safe state to work on, in accordance with the list of the isolation steps within the Plant Isolation Steps sheet.

9 Isolation Lock-Out, Tag-Out & Verification**:** In addition to the requirements outlined in the Basic Isolation section of this procedure, once the Isolation person is satisfied with each progressive isolation step and isolation tag placement, each isolation step needs to be progressively initialled within section 1 of the Plant Isolation Steps sheet.

10 Isolation Communication, Confirmation & Work Party Member Control: In addition to the requirements outlined in the Basic Isolation section of this procedure, the isolation Person is to show the work party members the Plant isolation Steps sheet with completed isolation sequence.

11 Plant Isolation Changes: If an isolation change is required between the initial isolation and full restoration milestones, (for reasons such as testing, commissioning or alter isolation purposes), these are to be tracked within Section 2 of the Plant Isolation Steps sheet.

No isolation change is to be made unless it is planned, communicated and documented thoroughly. This includes the following milestones:

- detailing the planned change (Columns 1, 2 & 3 of Section 2 of the Plant Isolation Steps sheet)
- communicating to the work party members, the need:
    - for the isolation change
    - to suspend work
    - to remove their own personal locks and tags
    - to sign off the Permit to Work
- verifying that work party members have all signed off the Permit to Work and are clear of the plant, (via Column 4 of Section 2 of the Plant Isolation Steps sheet)
- undertaking the isolation changes in a safe manner
- once complete, communicating any isolation status changes and re-authorising work to recommence (via Column 5 of Section 2 of the Plant Isolation Steps sheet)

Following such changes, the work party members are to apply their own personal locks and tags as per the standard working on plant requirements and sign on at per Permit to Work process requirements.

Work Completion & Plant Isolation Restoration:

In addition to the requirements outlined in the Basic Isolation section of this procedure, the Isolation Person is to progressively request the work party members to:

- remove their own isolation locks and isolation tags
- restore / re-energise the plant
- initial each restoration step as complete within Section 1 of the Plant Isolation Steps sheet.

Once fully restored and re-energised, the plant restoration process is to be documented by acknowledging the plant isolation restoration component within Section 6 of the Plant Isolation Control Form.

7.4 High Voltage – Documented Switching Steps

For high-voltage electrical switching isolations only.

Key requirements:

- Must be performed by **specifically trained and authorised employees or contractors** (licensed electrical workers and HVIA authorised).
- Planning and documentation must align with PBPL and external entities (e.g., Energex) using:
    - High Voltage Switching Sheet
    - High Voltage Access Permit
    - High Voltage Test Permit
- Isolation steps include:
    - Documenting isolation and restoration in the High Voltage Switching Sheet
    - Issuing and surrendering Access and Test Permits (cannot be issued simultaneously)
    - Locking out all isolation points and operator earths with tags or Do Not Operate Boards

- Only authorised persons may act as Switching Coordinator, Operator, or Assistant and issue permits.
- Unplanned switching is permitted only in emergency or fault scenarios to ensure safety and plant protection, followed by full documentation and Permit to Work process.

8 Out of Service Tag Out Process

The **Out of Service Tag-Out process** is a **warning system only**. It provides a **visual indication** that plant or equipment is **unfit for use** or may present an **unacceptable level of risk** if operated. **Important:** This process **does not provide protection for people working on plant** and must never be used as a substitute for isolation or lock-out/tag-out procedures.

8.1 Tag Types

- **"DANGER Out of Service"** – Red and white tag
- **"CAUTION Out of Service"** – Yellow and black tag

These tags are applied to protect individuals and equipment and **must only be removed by the person who placed and signed the tag**.

8.2 Removal Rules

- The person who placed the tag must be contacted and attend site to remove it before any work occurs on the tagged item.
- **Unauthorised removal** of these tags is a serious breach and may result in **disciplinary action and legal consequences** under the **Work Health and Safety Act 2011 (Qld)** and **Model WHS Regulations**, which require PCBUs to control hazardous energy and prevent inadvertent energisation.

8.3 Application Requirements

- The person applying the tag must first bring the plant to a **safe state**. If not part of an isolation process, this includes stopping the plant and isolating, dissipating, or restraining any significant energy sources.
- Attach the Out of Service Tag to the **controls or a prominent position near the controls** and complete all required details on the tag.

8.4 Notification and Follow-Up

- When an Out of Service Tag is applied to identify equipment requiring repair, a **Variation** must be sent to the responsible work group (e.g., Marine Maintenance for vessels, Facilities Management for building items).
- Marine Maintenance maintains a **Quarantine Area** for items awaiting repair.

9 Removal of Locks, Lock Out and Out of Service Tags of an Absent Staff Member

Locks and tags are applied to equipment to protect people while work is being performed or until the equipment can be repaired and made safe. Changeover procedures may be required in certain situations, or an **Out-of-Service Tag** must be placed if an item is unfit for use after the worker has left.

Important:

- Leaving a lock or tag in place when leaving site may be considered **misconduct**.
- Removal of a lock or tag by anyone other than the person who placed it, without following the procedure below, is an **extremely high-risk activity** and would breach legislative obligations under the **Work Health and Safety Act 2011 (Qld)** and **Model WHS Regulations**. These laws require PCBUs to ensure isolation of hazardous energy and prevent inadvertent energisation during maintenance.
- Failure to comply may result in disciplinary action and potential legal consequences.

Procedure:

1 A**ttempt Contact:** The supervisor must make every effort to contact and return the person who placed the tag to site (at the person's expense if necessary).

2 **Authorisation to Proceed:** If the person cannot return and removal is essential, the following people must be notified and agree before removal begins:

- Business Unit Leader*
- Manager of the Site*
- Health and Safety Manager*

Or their representative if on leave.

3 **Risk Confirmation:** Contact the person who placed the lock/tag to confirm:

- Work completed to date
- Remaining work
- That removal will not expose others to unknown hazards
- This confirmation must involve:
    - Manager of the Site*
    - Head of Health Safety & Wellbeing*
    - A person thoroughly familiar with the equipment and reason for lock-out, *or representative if on leave.*

4 **Written Detail:** The supervisor must provide written details of work performed and confirm that all required work has been completed and checked.

5 **Inspection:** Once certified fit for service, the three people above must physically inspect the equipment and processes to ensure:

- All persons are clear of the equipment
- No one can be harmed by malfunction on start-up

6 **Formal Authorisation:** All signatories record their authorisation on the designated form.

7 **Final Safety Check:** Conduct a final inspection to ensure equipment and processes are inaccessible to anyone except essential personnel for start-up.

8 **Removal and Recommissioning:** When satisfied of safety, locks/tags can be removed, and the equipment recommissioned. **All authorising persons must be present to assist or supervise the entire recommissioning procedure.**

10 Non-Compliance

Breaches of this procedure may result in disciplinary action being initiated in accordance with PBPL's Code of Conduct

11 Appendix 1: Isolation Method Decision Flowchart