

## Purpose

To describe how plant and equipment shall be isolated within Melbourne Water to reduce the risk of hazardous energy release.

## Scope

This procedure applies to all assets and premises owned, leased or occupied by Melbourne Water employees and contractors.

It does not cover the process of applying locks to isolation points. This is addressed in [CORP H&S 080 – Lock Out Tag Out Process](#)

## Overview

When working on equipment, inadvertent movement of machinery or sudden release of energy is a hazard to workers and needs to be regarded as dangerous until the separation of the energy source can be proved to be effective.

Isolation means the separation of plant and equipment from every source of energy including but not limited to:

- Electrical – Extra Low, Low and High Voltage
- Mechanical
- Hydraulic
- Fluids under pressure
- Chemical
- Air
- Gas
- Steam

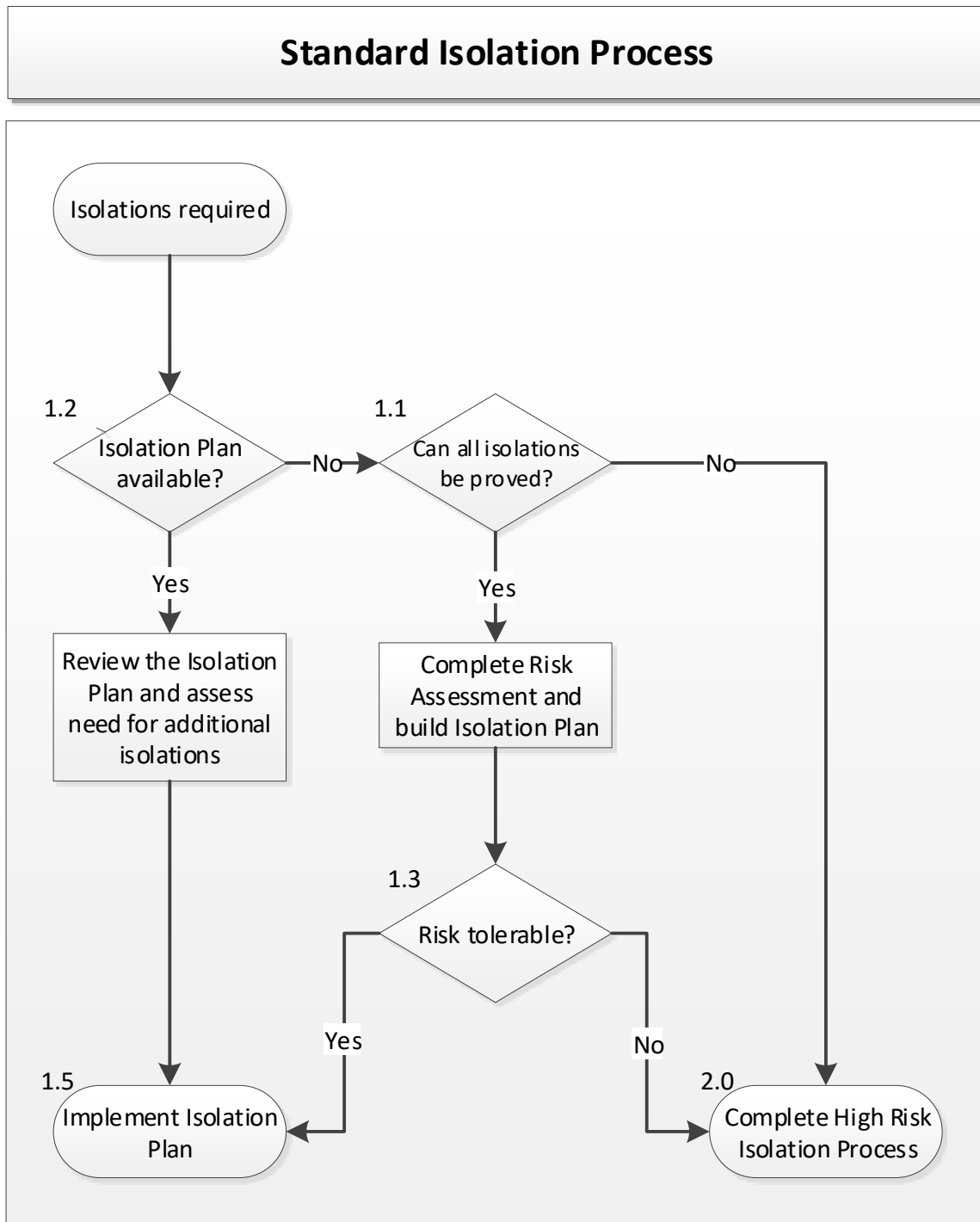
Before any work commences, appropriate isolations must be in place to prevent any inadvertent movement of machinery or other sudden release of energy. All isolation points shall have the ability to be verified before work commences.

## 1. Standard Isolation Process

A process to capture isolation activities which either:

- follow a pre-authorised Isolation Plan/s or,
- all isolation points can be proved.

Any outcome which does not comply with the above criteria will need to follow the High Risk Isolation Process.



## 1.1 Minimum Isolation Standard

All isolation points must have the ability to be proved. This means that the effectiveness of the isolation can be verified by either physical separation or an appropriate testing method.

Examples include:

- Removing electrical fuses
- Locking electrical isolators in the OFF position and proved.

The following Process Isolations are deemed to meet the Minimum Isolation Standard:

Category	Features	Method	Illustrative example
<b>Positive isolation</b>	Complete separation of the plant/ equipment to be worked on from other parts of the system.	Physical disconnection (eg spool removal)	
	Valved isolation of an appropriate standard is required during the installation of positive isolation.	Double block, bleed and spade	
		Single block and bleed and spade	
<b>Proved isolation</b>	Valved isolation. Effectiveness of valve closure(s) can be confirmed via vent/ bleed points before intrusive work commences.	Double block and bleed (DBB)	
		Double seals in a single valve body with a bleed in between	
	Within this isolation category the level of mechanical security is greatest for DBB and lowest for SBB.	Single block and bleed (SBB)	

Key:

	Process
	Equipment being isolated
	Isolation Valve
	Bleed/Vent Valve
	Blank Flange
	Pressure Gauge/Transmitter

## 1.1.1 Unproved Isolations

A Valved Isolation which does not have the ability to be proved is considered to be an unproved isolation.

This type of isolation shall be used in conjunction with other control methods as it does not meet the minimum isolation standard requirements.

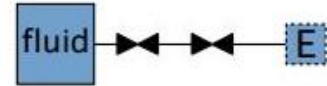
This includes the following isolation types:

### Unproved isolation

Valved isolation. No provision to confirm effectiveness of valve closure prior to breaking into system.

Where possible, double valve isolation should be used rather than single valve.

Double valve



Single valve



Key:



Process



Equipment being isolated



Isolation Valve



Bleed/Vent Valve



Blank Flange



Pressure Gauge/Transmitter

## 1.2 Isolation/Outage Plans

An Isolation Plan is a list of isolations required for a task. When executed, the Isolation Plan ensures the appropriate controls are in place to prevent any inadvertent movement of machinery or sudden release of energy. Isolation Plans allow a repeatable, consistent approach to isolations.

Any new Isolation Plan must be peer reviewed before being carried out. Once the Isolation Plan has been carried out successfully, the Permit Authoriser shall produce an Isolation Plan that is available for future isolation activities on the same piece of equipment.

As a minimum, an Isolation Plan shall meet the requirements of '1.2.1 – Standard Isolation Procedure'

### 1.2.1 Standard Isolation Procedure (SIP)

Standard Isolation Procedures (SIP) include specific details on how to conduct isolations and are developed by a person with the knowledge and skills required to conduct the isolation, in consultation with appropriate Site Management, Operators and Maintenance Technicians. SIP's provide a Permit Authoriser a documented process for conducting specific isolations safely and confidently.

Items to be considered during the development and review of an SIP shall include:

- equipment configuration
- operational and health and safety risks
- MHF and HACCP implications
- EPA licence compliance

Although the SIP includes specific details on how to conduct an isolation, the Permit Authoriser shall consider the specific circumstances of the work to be undertaken to ensure that all requirements are met and that safe work on the equipment is possible.

The standard isolations may have to be augmented to ensure that any risks and hazards associated with the isolation and subsequent works are mitigated. These changes shall result in either a new SIP being created or amended.

### 1.2.2 Standard Isolation Procedure (SIP) with Hold Points and Sign Off

This is in addition to the requirements described in 1.2.1 Standard Isolation Procedure.

A SIP with Hold Points should be used under any or all of the following circumstances:

- Where an Isolation Plan will be carried out over an extended period of time by multiple Permit Authorisers.
- Where there are critical steps of an Isolation Plan that require confirmation before moving to next stage. E.g.: Purging of Chlorine Lines.
- When the Isolation could impact external plant or processes

## 1.3 Risk Assessment

In situations where a Standard Isolation Plan or a documented Isolation Plan do not exist, but the intended isolations are able to be proved by the Permit Authoriser, a Risk Assessment must be conducted in addition to the Isolation Plan as per [CORP H&S 008 Task Risk Assessment](#).

The assessment should cover all stages of the isolation activity, including:

- Preparatory work for the isolation – Including depressurisation and release of stored energy, draining/venting, purging and washing out.
- Installation/removal and proving of the isolation.
- The integrity of the isolation during the works.
- Requirements for testing and reinstatement of plant.

## 1.4 Implementing an Isolation Plan

Once Isolation Plans have been Risk Assessed and deemed to be acceptable by the person conducting the task, the isolations can be carried out as per the Permit and Risk Assessment requirements.

Where an isolation plan exists, all relevant parties shall discuss the Isolation Plan and agree on the approach before the isolations are carried out.

## 1.5 Verification of Isolation Points

The isolation process conducted prior to issue of a Permit must include steps to confirm these isolations are effective and that all sources of energy have been removed. The person completing the isolation is responsible for conducting isolation verifications.

Verification steps shall include but not be limited to the following:

- Confirm no identification errors were made (correct isolator or valve).
- Confirm the isolator is in the safe position.
- Ensure all stored energy is dissipated or restrained.
- Test for zero energy state for all potential energy sources.
- Observe a change of state of energy when isolating.

## 1.6 Storing of Isolation Plans

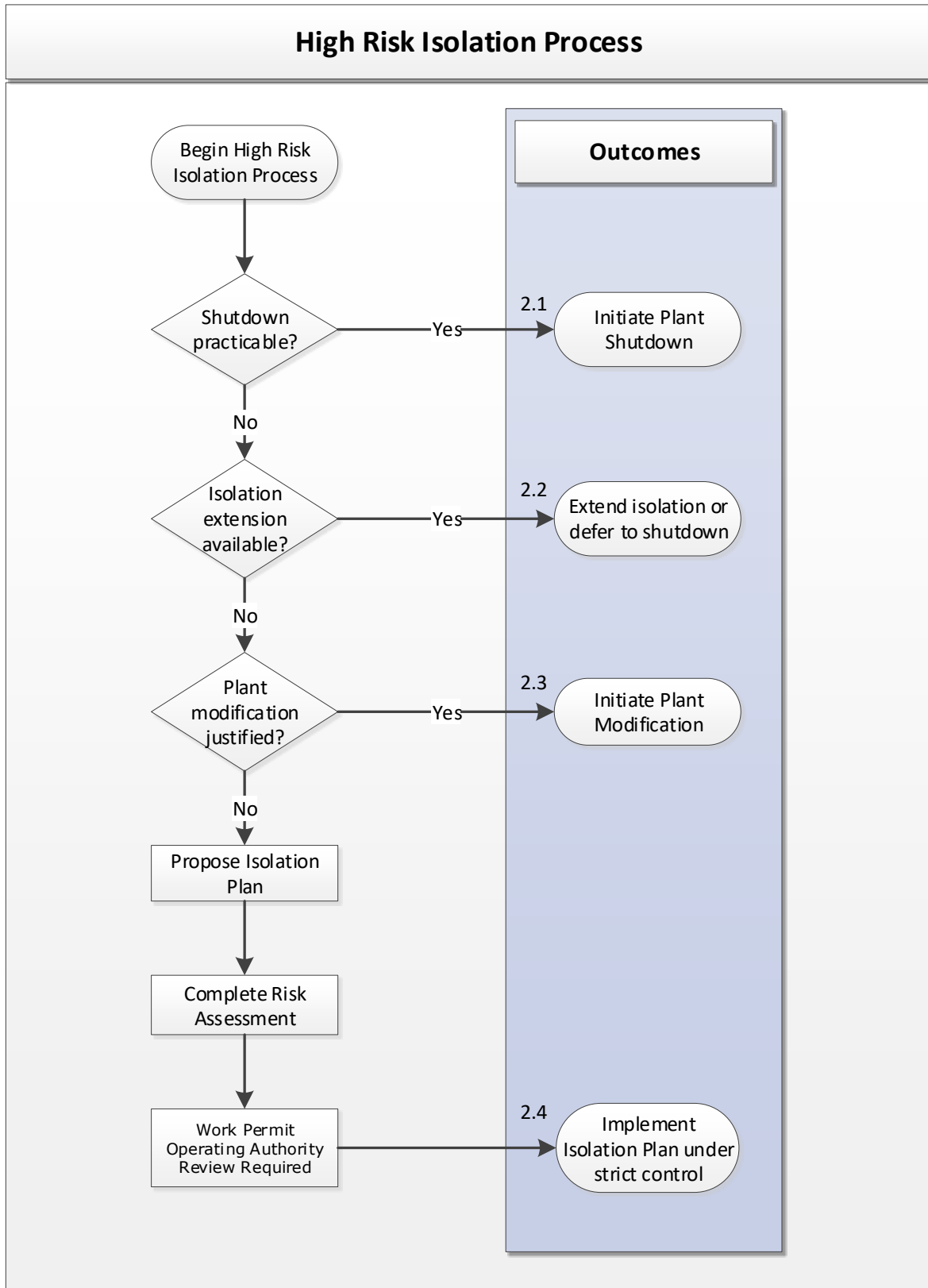
Isolation Plans shall be stored on Inflo using a common location for each group, ST, WTP, ETP, WS and WWL.

Where possible, Isolation Plans should be stored in the following Inflo file structure:

Enterprise  
Transfer (or WTP, ETP, WS, WWL)  
Operations and Maintenance  
Isolation Plans  
Specific Area

## 2. High Risk Isolation Process

When an Isolation Plan is not available and when the proposed isolations cannot be proved, the High Risk Isolation Process shall be followed:



## 2.1 Plant Shutdown

When practicable, a plant shutdown should be considered to carry out the required work. A shutdown requires all hazardous sources to be isolated from the proposed worksite.

The scope of this term is dependent on the site's complexity, and the feasibility of conducting a plant shutdown should be determined on a case by case basis, before work is carried out.

## 2.2 Extend Isolation

If the available isolation points do not have the ability to be proved, an extension of the isolation shall be considered.

The required Isolation Plan needs to incorporate upstream/downstream isolation points until the isolations can be proved.

## 2.3 Plant Modification

A plant modification may be justified to allow the isolation to be proved.

Asset Management must be involved at this stage to ensure all 'Management of Change' requirements are met. An example of this would be installing Hot Taps in pipework between two isolation valves.

A plant modification shall be treated as a unique task and follow the Isolation Standard as applicable.

## 2.4 Approval of High Risk Isolations

After all of the above options have been exhausted, an Isolation Plan which cannot be proved must be reviewed by the site/area's Work Permit Operating Authority (WPOA), before work is carried out.

The WPOA shall be briefed on the work requirements and be presented with the proposed Risk Assessment and Isolation Plan for the works. The WPOA shall log the event in IRIS as a 'proactive event' to assist with tracking the amount of requests which have required review.

The WPOA has the authority to approve or reject the Isolation Plan after completing their review. If they deem that the task has a high enough potential for injury, they should escalate the Isolation Plan to the appropriate Senior Management or Safety Group representative for approval.

High Risk Isolation Plans requiring WPOA review should be raised as an agenda item in the scheduled WPOA meetings, with the intent of minimising and/or addressing common themes with these types of Isolation Plans.



## 3. Managing Isolation Activities

### 3.1 Documentation used for isolations

Accurate reference information is vital for planning and implementing isolations. All Melbourne Water sites shall maintain the following documentation at all times and ensure it is updated when plant modifications occur:

- Piping and Instrumentation Diagrams (P&IDs)
- Single Line Diagrams
- Cause and Effect diagrams
- Loop Diagrams
- Piping general arrangements

### 3.2 Competency requirements

All personnel involved in the isolation of plant and equipment shall have an understanding of:

- the purpose, principles and practices of this isolation procedure
- the responsibilities for all others involved in the operation of isolation systems
- their site’s significant hazards and the consequences of any releases of that hazardous substance
- that managing isolations is a Melbourne Water Life Saving Rule
- Lock Out Tag Out processes as per CORP H&S 080 – Lock Out Tag Out (LOTO)

### 3.3 Intrusive Electrical Isolations

To conduct intrusive isolations where live electrical conductors or components may present during the isolation activity, an individual must:

- have completed a Victorian Restricted Electrical Licence (REL) Course, or;
- be a qualified A Grade Electrician

**Table 1: Examples of Intrusive and Non- Intrusive Electrical Isolations**

<b>Intrusive</b>	<b>Non-Intrusive</b>
Removing Bolt-In Fuses	Switching off an Electrical Isolator
Accessing a live electrical panel to remove cartridge fuses	Opening a Switchboard to turn off a Circuit Breaker
Removing Motor Tails	Removing a Plug from a GPO

If the individual conducting the isolation does not have the required electrical licence or skills, they can use a suitably qualified maintenance technician to carry out the electrical isolations listed the Isolation Plan.

## 3.4 High Voltage Electrical Isolations

All High Voltage Isolations are to be carried out in accordance with the Code of Practice on Electrical safety for working on or near High Voltage Electrical Apparatus, 'The Blue Book' and [CORP H&S 066 - High Voltage Procedure](#)

## 3.5 Live Electrical work

This practice will apply whenever people are working on, or near, or testing LIVE electrical equipment in a Low Voltage Electrical Installation.

All live electrical work is to be carried out in accordance with AS/NZS 4836 by appropriately licenced personnel.

The following considerations must be addressed as part of the Risk Assessment before commencing works:

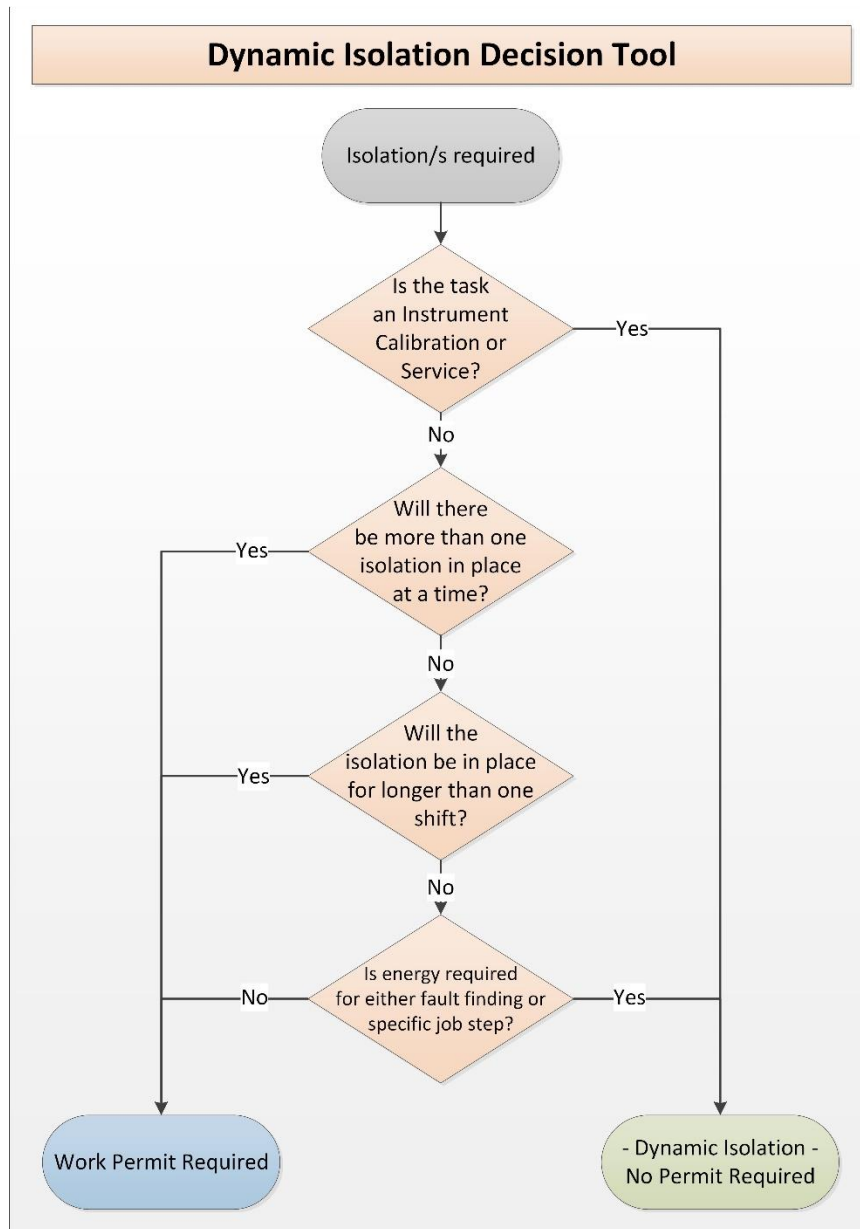
- Investigate alternatives to working live including equipment modification or plant shutdown.
- Identify hazards e.g. Exposed energised conductors, live parts, cramped conditions, hot/wet areas, Hazardous area.
- Assess and prioritise the risk
- Implement controls for the identified risks

## 3.6 Dynamic Isolations

A Dynamic Isolation is an Isolation Point that needs to be operated by a qualified tradesperson to either:

- successfully complete a specific job step or task or;
- during fault finding work

Dynamic Isolations do not require a Work Permit if the requirements of the below decision tool are met:



Dynamic Isolations can only be carried out by a qualified tradesperson under the following conditions:

- The tradesperson that is an authorised Permit Holder.
- A Risk Assessment is on site and documents the proposed method of isolation.
- [CORP H&S 080 - LOTO](#) - 'Section 4' is adhered to.

## Responsibilities

Role	Responsibility
<b>Senior Management</b>	Responsible for Melbourne Water’s Isolation Standard, in particular that they: <ul style="list-style-type: none"> <li>offer visible leadership and commitment</li> <li>resource for the development, implementation and periodic review of the policy</li> <li>review significant (negative and positive) results of audits</li> <li>resource necessary remedial actions and plant modifications</li> </ul>
<b>Site Management</b>	Responsible for ensuring that Melbourne Water’s Isolation Standard is fully implemented, in particular that: <ul style="list-style-type: none"> <li>Standard Isolation Procedures (SIP) are created and maintained to support the safe isolation of plant</li> <li>authorise the responsible people who can formally authorise deviations from standard isolation processes</li> <li>provide the plant and equipment necessary to ensure that isolation points comply to meet the required isolation</li> <li>all relevant site personnel trained and competent in their responsibilities in regards to isolations</li> <li>monitoring, auditing and reviews are undertaken and specialist advice is sought when required</li> <li>remedial actions and necessary plant modifications are implemented</li> </ul>
<b>Site Supervisors &amp; Lead Operators</b>	Responsible for ensuring that Melbourne Water’s Isolation Standard is fully implemented at the plant level, in particular that: <ul style="list-style-type: none"> <li>the Isolation Standard is fully understood and followed by everyone</li> <li>our minimum isolation standard is consistently delivered across the plant</li> <li>variations from standard isolation processes are authorised by the appropriate person before the work proceeds</li> <li>isolation and de-isolation is adequately planned and undertaken as per the schedule where practicable</li> <li>information is effectively communicated between all parties</li> <li>documentation is in use, accurate and current</li> <li>tasks are undertaken by competent persons</li> <li>they adequately supervise tasks</li> </ul>
<b>Operators, Authorised Permit Holders &amp; Work Party</b>	Responsible for carrying out work in accordance with Melbourne Water’s Isolation Standard, in particular that they: <ul style="list-style-type: none"> <li>understand and work to the procedures</li> <li>follow all other relevant safety procedures and the maintenance schedule</li> <li>will not proceed with a variation from normal procedures without proper authorisation</li> <li>adequately identify, test and secure isolations</li> <li>co-operate with supervisors to ensure that the policy is effectively implemented</li> <li>communicate effectively with other parties involved in the work</li> </ul>

## Definitions

Reference	Definition
<b>Should</b>	Indicates a recommendation
<b>Shall/Must</b>	Indicates a statement is mandatory
<b>SIP</b>	Standard Isolation Procedure
<b>Isolation Plan</b>	An Isolation Plan is a list of isolations for a task. When executed, the Isolation Plan ensures the appropriate controls are in place to prevent any inadvertent movement of machinery or sudden release of energy.
<b>High Risk Isolation Plan</b>	When an Isolation Plan is not available and when the proposed isolations cannot be verified, the High Risk Isolation Process shall be followed.
<b>Extend Isolation</b>	An extension of the isolation to incorporate upstream/downstream isolation points until the isolation can be verified.
<b>Reference Isolations</b>	A documented list of the isolations required to make a piece of equipment safe to work on.
<b>Shutdown</b>	When all hazardous sources are isolated from the proposed worksite.
<b>WPOA</b>	Work Permit Operating Authority
<b>Dynamic Isolation</b>	An isolation that can be carried out by an Authorised Permit Holder without the need for a Permit as long as the requirements of 3.6 are met.

## Training Requirements

Role	Training Requirements
Permit Authoriser / Permit Holder	Permit System Training Face to Face training every two years

## References

Reference	Definition
<b>Acts</b>	Occupational Health & Safety Act 2004
<b>Regulations</b>	Occupational Health & Safety Regulations 2017 Energy Safe Victoria Act 2005
<b>Code of Practice</b>	Code of Practice on Electrical safety for working on or near High Voltage Electrical Apparatus, 'The Blue Book'
<b>MWC</b>	<a href="#">CORP H&amp;S 008 – Task Risk Assessment</a> <a href="#">CORP H&amp;S 066 – High Voltage Procedure</a> <a href="#">CORP H&amp;S 080 – LOTO</a> <a href="#">CORP H&amp;S PRO – Work Permit</a>
<b>AS/NZS</b>	AS/NZS 4836 – Safe Working on or near Low-Voltage Electrical Installations

## Document History

Date	Reviewed/ Actioned By	Version	Action
26/07/2018	Scott McMillan	4	Updated document with feedback received from the business. Removed need for Dynamic Isolations to require a Work Permit.
08/05/2017	Scott McMillan	3	Reference to LOTO Added to Scope. Changed Dynamic Isolations to require a Work Permit.
10/04/2017	Gavin Kenny	2	Document Number Added
06/04/2017	Scott McMillan	1	Created new document