

Energy Tag and Lockout

Document number: PRO-00014

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Ver No.	Description	Document Owner		Document Approver		
		Position	Approval	Position	Approval	Approval Date
9	Amended Version	Programs & Systems Business Partner	Refer to supporting Info in Rex	Manager Health, Safety & Quality	Refer to supporting Info in Rex	08/05/2025

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1. Purpose and Scope

The intent of this document is to eliminate or minimise the risks of fatalities, injuries and events arising from exposure to hazardous energy at Seqwater workplaces through establishing processes to isolate energy sources.

Reference should be made to Seqwater's Electrical – High and Low Voltage Procedure ([PRO-00006](#)) for further requirements on the isolation of electricity.

2. Critical Controls

Critical Controls for Energy Tag and Lock Out		
	Critical Controls	Objective
1	Isolation of energy sources (excluding electrical)	To prevent de-energised fixed plant / equipment from becoming energised or inadvertently operated
2	Isolation of all low voltage electrical sources of energy	To ensure all sources of electrical energy have been de-energised, and positively isolated

3. Additional Controls

- All works involving the isolations must have a risk assessment completed prior to the completion of the task and where applicable an isolation instruction.
- Work on de-energised electrical equipment shall only proceed if the electrical equipment is isolated and any other exposed conductors or conductive parts in the work area are either:
 - de-energised and isolated; or
 - separated by barriers or are an appropriate distance based on risk assessment (workers should refer to the Electrical Safety Standard ([PRO-00006](#)) for exclusion zones for electrical parts).
- Where guards or other plant protection devices need to be removed in order to perform dynamic work, specific risk controls must be implemented to manage the risks of working near moving parts.
- The preferred method for isolating liquids, gasses or vapours is through the use of double valve isolations.
- Double valve isolations must be implemented for all work activities where there is a risk of engulfment in a confined space. Where this is not reasonably practicable, additional risk controls must be identified and documented in a risk assessment (e.g. isolation points being continuously visually monitored, open scour valves being continuously visually monitored, etc.).
- All confined space work activities being undertaken under the control of a single point isolation must be approved by a Line supervisor prior to any workers entering the confined space and the isolation must not be removed until all work is complete and all workers have left the space.
- Where Seqwater is performing isolations for a Principal Contractor an authorised isolator will work with the Seqwater Project Manager and/or Principal Contractor representatives to agree on how isolations will be managed and performed; and completed in accordance with this Procedure.
- SCADA, control circuits or emergency stops must not be used as methods of isolation.

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- Due to the nature of the work undertaken, and the method of engaging contractors to perform work in administrative areas and residential buildings, Licensed tradesman performing isolations in these buildings need to be assessed as authorised isolators. Engaging Officers must ensure only licensed Tradespersons conduct isolations in line with their trade.
- Where the administrative area where an isolation is being performed forms part of an operational site (e.g. an office building within a WTP), the tradesman performing the isolation must liaise with an authorised isolator for the site to ensure that isolations will not impact on the operation of the site.
- The steps for isolating, testing for dead and de-isolating must be documented on either a SWMS or isolation instruction when isolating fixed plant in administrative and residential buildings and appropriate lockout equipment used to secure all isolation points.

4. Procedure

4.1. Planning

When performing a work activity where the isolation of an energy source is required, the following process is used:

1. Plan the isolation and identify isolation points
2. Stop the plant (where required)
3. Isolate energy sources and discharge any stored energy (in a controlled manner)
4. Attach isolation locks and tags. Where not possible, ensure plant/equipment cannot be re-energised.
5. Verify isolations are effective (i.e. test for dead / prove for dead)
6. Perform work activity
7. Remove isolation locks and tags
8. Reinstate energy sources (in a controlled manner)
9. Test and confirm operational status of plant
10. Return isolation equipment.

4.1.1. Isolation Instruction

Isolation instructions are used to document the process that will be implemented to protect workers from sources of hazardous energy when performing a complex, tiered or isolation.

The Isolation Instruction template ([TEM-00077](#)) is used to document the steps required to isolate energy sources, to verify energy sources are isolated and any stored energy is dissipated, and to reinstate energy sources.

All isolation instructions developed to isolate assets at operational sites must be developed in collaborative manner with an authorised isolator or reviewed by an authorised isolator.

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Step	Action
Step 1	Identify the type/s of energy sources to be isolated. Identify the type/s of energy sources to be isolated.
Step 2	<p>Confirm who needs to be involved in the development of the isolation instruction, considering the following:</p> <ul style="list-style-type: none"> For isolations that only require operational workers to complete the isolation (e.g. isolating a filter at a WTP to inspect the filter media), the isolation instruction may be developed by operational workers without consulting with any other stakeholders. For isolations that require trade specific isolations (i.e. electrical, mechanical), the isolation instruction must be developed collaboratively between the relevant trade/s and operational workers. Any required authorised isolators to develop, review or approve the isolation instruction.
Step 3	<p>Write the isolation instruction clearly defining:</p> <ul style="list-style-type: none"> The steps required to isolate the item of plant. The description and location of the isolation points. The process that will be used to verify the isolation (test for dead / prove for dead process). The steps required to de-isolate the item of plant.

Previously developed and proven isolation instructions may be used, prior to use they must be reviewed by an authorised isolator to confirm the isolation instruction is still valid;

- Control mechanisms and isolation steps remain appropriate and that there are no modifications or alterations to the plant that could give rise to a new or different risk to health and safety that the existing control measure may not effectively controlled; and
- The isolation points are numbered in accordance with the isolation instruction (e.g. identification tags or markers have not been changed).

Where a change is identified, an authorised isolator must be consulted to confirm how the isolation instruction needs to be amended. No deviations from the instruction are allowed unless the instruction is rewritten to include the change.

4.2. Who can perform isolations?

The following table provides a summary of who may perform isolations at Seqwater workplaces:

Type of Site	Authorised Isolator	Isolation Officer
Administrative area within an operational site	May perform any isolation within the scope of their authorisation.	May perform any isolation for which they are appropriately licenced, qualified and experienced. They must liaise with an authorised isolator for the site prior to commencing the isolation
Administrative areas and residential buildings	N/A	May perform any isolation for which they are appropriately licenced, qualified and experienced

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Type of Site	Authorised Isolator	Isolation Officer
Operational site	May perform any isolation within the scope of their authorisation.	May perform an isolation with approval from an authorised isolator. An authorised isolator must approve the SWMS or Isolation Instruction Template that documents the isolation processes.
Portable assets connected via a socket outlet	N/A	Any authorised worker may disconnect a portable asset from a Socket Outlet
Principal Contractor site	Agreement to be reached between the Site Owner Representative, an authorised isolator, the Seqwater Project Manager and the Principal Contractor Representative on how isolations will be managed and performed.	

4.2.1. Isolations performed by a worker who is an authorised isolator

- They have been appointed as an authorised isolator for the site where the isolation will be performed; and
- They hold the relevant qualification for the type of isolation being performed.

4.2.2. Isolations performed by a worker who is not an authorised isolator

Where a worker is not an authorised isolator for the site where the isolation is required to be completed, the following process must be used to perform an isolation:

#	Step
1	The authorised isolator confirms that the worker has the required qualifications and skills to perform the isolation(s).
2	The person performing the work provides the following for review <ul style="list-style-type: none"> • developed on either a SWMS (simple isolations only) OR; • Isolation Instruction Template (TEM-00077) The authorised isolation instruction must include any hold points that require authorised isolator involvement.
3	The person performing the work completes the isolation(s), following contact with the Access officer/duty operator to confirm that the isolation can proceed.
4	The intended work is completed.
5	Where required as part of the approved isolation instruction, evidence of testing is provided to the authorised isolator prior to commencing de-isolation.
6	The person performing the work completes the de-isolation, following contact with the Access officer/duty operator to confirm that the de-isolation can proceed.

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4.3. Type of Isolation

The specific requirements for each isolation will vary depending on the plant being isolated and the complexity of the required isolation. To address these requirements Seqwater use four isolation processes:

- Simple isolation – refer to Appendix B
- Complex isolation - refer to Appendix C
- Tiered isolation - refer to Appendix D
- High Voltage (HV) isolation (refer to the Electrical Safety Procedure ([PRO-00006](#)) for HV isolation requirements).

Each isolation will need to be suitable to support ongoing operational requirements and be appropriate for the particular work activity being performed.

4.3.1. Simple Isolation

The simple isolation process is used when the isolation of the energy source **can** be achieved by either:

- unplugging the energy supply and applying a plug isolation device locked out with a personal lock; or
- removing an ignition key (for mobile plant) and securing in a lock box; or
- switching a proven single point isolator where it is tagged and locked using a personal safety lock (Note: the proven single point isolator could be an electrical isolation switch or an isolation valve).

Simple isolations do not require an isolation instruction, however the steps required to isolate, verify the isolation is effective, de-isolate and reinstate the item of plant must be clearly documented in a SWMS for the work activity being performed and developed/reviewed by an authorised isolator.

Where multiple workers are working under the control of a simple isolation, a lock board must be used to secure the key to the isolation lock for the duration of the work activity. All workers must affix their blue personal lock to the lock board whenever they are working under the control of a simple isolation.

The removal of a piece of portable equipment from service for the purpose of transporting to a workshop to be worked on is not considered an isolation.

Refer to appendix B for specific guidance on performing simple isolations

4.3.2. Complex Isolations

The complex isolation process is used in operational areas, where the requirements for a simple isolation cannot be met, such as when multiple sources of energy need to be isolated to make an item of plant safe.

The steps required for a complex isolation must be documented in an isolation instruction.

Refer to appendix C for specific guidance on performing complex isolations.

4.3.3. Tiered Isolation

A tiered isolation process is used where work activities are being performed by multiple work groups locked onto different lock boxes on equipment that is part of a process stream which when deisolated could affect downstream worker safety.

The tiered isolation process ensures that the de-isolation and re-energisation occurs in the correct sequence, so as not to affect the safety of the downstream workgroup.

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The Isolation process ensures that the primary isolation is not removed until all work activities being performed under the control of subordinate isolations have been completed.

Refer to appendix D for specific guidance on performing tiered isolations.

4.4. Verifying isolations

The process for verifying isolations (also referred to as test for dead / prove for dead) is a critical step in the isolation process. It must be performed for all types of isolations and must consider all energy sources involved in an isolation (i.e. electrical, hydraulic, pneumatic, moving plant and equipment, etc.).

The verification process confirms that all required isolation steps have been performed in accordance with the isolation instruction or SWMS and defines a process for testing that the isolations are effective, sources of stored energy have been dissipated and a zero-energy state achieved.

The isolation verification process to be implemented must be recorded on the isolation instruction or SWMS for the work activity. It must not create or introduce new hazards into the work activity.

Verification of isolations is achieved through the following processes:

- Visual inspection of the following:
 - plant or process controls (push buttons, switches, etc.) are engaged or activated
 - electrical switches or contactors to ensure that they are in the open position
 - valves are in the operating mode defined on the isolation instruction
 - suspended parts are lowered to a resting position or blocked to prevent movement
 - moving parts are restrained
 - flows have ceased from drain or scour valves
 - locks and/or tags are in place to secure the isolation points.
- Testing of the following:
 - electrical equipment has been de-energised and that all electrical energy has been dissipated
 - opening drain or scour valves to ensure fluids have been drained
 - observing a decreasing pressure on a pressure gauge to ensure hydraulic or pneumatic energy has been removed.
- Attempting to start an item of plant under controlled conditions taking into account scenarios where interlocks and other safety devices may interfere with verification.

4.5. Handing over Isolated Plant

Where plant or equipment has been isolated by an isolation officer who then hands the isolated plant or equipment over to another worker to perform a work activity, the following process and conditions apply:

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#	Step
1	The isolation officer isolates the plant or equipment in accordance with the requirements of the SWMS (simple isolations only) or isolation instruction.
2	The isolation officer verifies the isolation and signs the (simple isolations only) or isolation instruction confirming that the plant or equipment is isolated and the isolation has been proven effective (i.e. test for dead / prove for dead).
3	The isolation officer places all keys to the isolation locks into a lock board and places an out of service lock on the lock board, the isolation officer stores the key to the out of service lock in the relevant secure location within operations / maintenance depot.
4	The isolation officer hands the plant or equipment over to the worker who will be working on the plant or equipment in an out of service state. This is done by handing over the lock board and signed isolation instruction and briefing the worker receiving the plant or equipment on the isolations performed.
5	Prior to working on the out of service plant or equipment, the worker receiving the isolated plant must document and perform their own test for dead prove for dead process to verify that the isolation is effective.
6	Once the worker working on the plant has confirmed that the isolation is effective, they secure the keys in the lock board with a personal lock.
7	<p>The worker may then work on the plant or equipment.</p> <p>The worker must liaise with the isolation officer if they need to de-isolate the plant or equipment at any time during the work to perform testing.</p> <p>Following completion of the testing, the worker must document and perform a test for dead / prove for dead process to verify that the plant remains isolated prior to performing further work.</p>
8	The worker notifies the isolation officer that the work is complete and ready to be handed back to the isolation officer.
9	The worker must notify the isolation officer of the work performed on the isolated plant or equipment and where required, provide relevant test certificates for the completed work for the isolation officer's review and sign off.
10	When satisfied that the plant or equipment is safe to be returned to service, the isolation officer notifies the worker that the plant or equipment can be handed back.
11	The worker removes their personal lock from the lock board and hands the plant or equipment and lock board over to the isolation officer
12	The isolation officer removes the out of service lock from the lock board and the worker or isolation officer then reinstates the plant or equipment in accordance with the SWMS (simple isolations only) or isolation instruction.

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4.6. Inch and Test requirements

The Inch and Test process is used to temporarily remove isolations from an item of plant to allow workers to test the operation of the plant during commissioning (e.g. to confirm phase rotation, checking pipework / fittings for leaks, etc.).

The following process is used to temporarily remove isolations from an item of plant to allow workers to test the operation of the plant:

#	Step	Instruction
1	Isolation instruction	The isolation officer must complete section 5 of the Isolation Instruction (TEM-00077) to describe the steps that will be performed during the Inch and Test process.
2	Communicate	Before commencing an Inch and Test process, the Work coordinator (or Representative) must liaise with the relevant Access officer to confirm that the Inch and Test process can proceed as planned.
3	Workers remove personal locks and tags	All workers (including the work coordinator) must remove their blue personal locks and personal danger tags from the lock board and sign off the isolation instruction.
4	Perform Inch and Test	<p>The isolation officer removes the keys to the isolation locks from the lock board and de-isolates the plant in accordance with the requirements of section 4 of the isolation instruction.</p> <p>Once the plant has been de-isolated, the work coordinator performs the Inch and Test process in accordance with the requirements of section 5 of the isolation instruction.</p> <p>Once the Inch and Test process is complete, the isolation officer re-instates all isolations in accordance with the requirements of section 2 of the isolation instruction and places all keys to the isolation locks into the lock board.</p>
5	Complete Inch and Test (continue work activity)	<p>Once the Inch and Test process is complete, all isolations have been reinstated and isolation locks have been affixed to isolation points, all workers (including the work coordinator) must re-attach their blue personal locks and personal danger tags to the lock board.</p> <p>Once workers have attached their blue personal locks and personal danger tags to the lock board and sign on to the isolation instruction, they may resume the work activity in accordance with the SWMS.</p>
6	Complete Inch and Test (reinstate plant)	If the Inch and Test process was successful and the plant is ready to be returned to service, the isolation officer will remove any remaining isolations and return the plant to service in accordance with the isolation instruction.

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4.7. Dynamic Work

In certain circumstances it may be necessary to perform a work activity on an item of plant that is still operating and has not been isolated from energy sources. Work activities such as greasing, making minor adjustments, monitoring, identifying operational issues, etc. may require the item of plant to remain in an energised and operating state whilst the work activity is performed.

Where guards or other plant protection devices need to be removed in order to perform dynamic work, specific risk controls must be implemented to manage the risks of working near moving parts (refer to the process for identifying and managing hazards established in the Hazard Identification and Risk Management Procedure ([PRO-00657](#))).

Any dynamic work activity that exposes a worker to an energy source (other than electrical energy) must be:

- planned by the worker performing the work activity; and
- undertaken in accordance with specific risk controls identified.
- a SWMS must be developed for all dynamic work activities.

4.8. Break in work requirements

The break in work process must be used where a work activity cannot be completed in a single shift and the plant being worked on will remain isolated until the work activity can be completed.

In these situations, a process must be implemented to inform workers of the risks associated with the item of plant and to prevent the use or operation of the item of plant until the work activity has been completed.

#	Step	Instruction
1	Leave isolations in place	All isolation points must remain isolated and all red isolation locks and isolation tags must remain in place.
2	Workers remove personal locks and tags	All workers (with the exception of the Work coordinator or Representative) must remove their blue personal locks and personal danger tags from the lock board and sign off the isolation instruction.
3	Attach out of service lock and tag	<p>Once the work coordinator has confirmed all workers have left the work area and have removed their blue personal locks and personal danger tags from the lock board and signed off the isolation instruction, the work coordinator attaches a yellow out of service lock and yellow out of service tag to the lock board.</p> <p>The work coordinator's details, the reason for attaching the out of service lock and who holds the out of service lock key must be recorded on the yellow out of service tag.</p> <p>The work coordinator then removes their blue personal lock and personal danger tag from the lock board.</p> <p>Where possible the lock board must be placed in a secure location at the site of the isolation for the duration of the break in work. Where this is not practical (i.e. there is no secure location or the lock board will be exposed to rain, etc.) the work coordinator must transfer the lock board to the relevant operations control room or maintenance depot until the work resumes.</p>

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#	Step	Instruction
4	Out of service lock key	<p>The Work coordinator (or Representative) must attach an information tag to the out of service key to record their contact details and to identify the plant that is out of service.</p> <p>The Work coordinator (or Representative) must transfer the out of service key to the relevant secure key cabinet until the work resumes.</p> <p>Key cabinets for securing out of service keys should be installed at all operational control rooms and maintenance depots.</p>
5	Work activity documentation	<p>Documentation associated with the work activity (i.e. SWMS, Isolation Instruction, High-Risk Work Permits) must remain at the location of the work (preferably using a lock board), provided they can be secured and protected from the environment.</p> <p>Where documentation cannot be secured and protected from the environment, the work coordinator must transfer the documentation to the relevant operations control room or maintenance depot until the work resumes.</p> <p>All documentation must be reviewed prior to recommencing the work activity.</p>
6	Removal of out of service lock	An out of service lock may only be removed by an authorised isolator for the site where the out of service plant is located.
7	Assessing for change	<p>Before resuming a work activity after a break in work, the work coordinator must inspect the work site to confirm if any conditions have changed during the break in work that may impact on the completion of work (e.g. rainfall, changed operating conditions, other work activities occurring in the vicinity, etc.).</p> <p>Where required, additional risk controls must be implemented to ensure that the work activity can be safely completed. The SWMS for the work activity must be reviewed and updated to reflect any additional risk controls implemented.</p>
8	Resume work activity	<p>After the work coordinator has confirmed that the work activity can resume, the work coordinator affixes their blue personal lock and personal danger tag to the lock board and signs on to the isolation instruction. The work coordinator may then remove the yellow out of service lock from the lock board.</p> <p>Once the work coordinator has affixed their blue personal lock and personal danger tag to the lock board, all other workers involved in the work activity must then affix their blue personal locks and personal danger tags to the lock board and sign on to the isolation instruction.</p> <p>Once workers have affixed their blue personal locks and personal danger tags to the lock board and sign on to the isolation instruction, the work activity may resume in accordance with the SWMS.</p>

4.9. Out of service requirements

The out of service process must be used where an item of plant is found to be faulty or unsafe to use.

The out of service process is used to inform workers of the risks associated with a faulty item of plant and to prevent the use or operation of the item of plant until it has been repaired and made safe to operate.

Work must not be performed on an item of plant that is out of service until workers confirm that the plant is isolated and all isolation points are secured

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#	Step	Instruction
1	Make the item of plant safe	<p>All items of plant must be made safe before they are taken out of service. Plant must be made safe by performing the following actions:</p> <ul style="list-style-type: none"> • communicate with plant operator / asset owner / duty operator • stop the operation of the plant • isolate all sources of energy feeding or leaving the plant • where relevant the items below must also be applied: <ul style="list-style-type: none"> ○ dissipate all energy from within the plant ○ terminating any exposed conductors ○ physically securing any exposed conductors or surrounding metal work ○ informing affected persons at the workplace the work is not complete and advising of potential hazards ○ taking any necessary precautions to ensure that electrical equipment cannot become inadvertently re-energised ○ ensuring that the status of switchboards and plant are clearly and correctly labelled ○ barricade the plant to prevent entry (where required) ○ providing adequate information to workers who will be working on out of service plant to allow them to safely perform the work.
2	Locking and tagging of out of service plant	<p>After the item of plant is made safe by isolation, an out of service tag must be affixed to the controls of the plant to identify that the plant is unsafe to operate. The following processes may be used to isolate out of service plant:</p> <ul style="list-style-type: none"> • Where a single red isolation lock and isolation tag has been used to isolate an item of plant which is now is out of service, the red isolation lock and isolation tag must be removed from the isolation point and replaced with an out of service lock and an out of service tag. • Where multiple red isolation locks have been used to isolate an item of plant that is out of service, the keys to all red isolation locks must be placed into a lock board and a yellow out of service lock and an out of service tag must be placed on the lock board. <p>Details of who holds the out of service lock key and the reason the plant has been placed out of service must be recorded on the yellow out of service tag.</p>
3	Out of service lock key	<p>The worker who placed the item of plant out of service, must affix an information tag to the out of service key to record their contact details and to identify the plant that is out of service and the reason that the plant is out of service.</p> <p>The Work coordinator (or Representative) must transfer the out of service key to the relevant secure key cabinet until the work resumes.</p> <p>Key cabinets for securing out of service keys should be installed at all operational control rooms and maintenance depots.</p>
4	Removal of out of service lock	<p>An out of service lock or tag must only be removed by an authorised isolator for the site where the out of service plant is located.</p>

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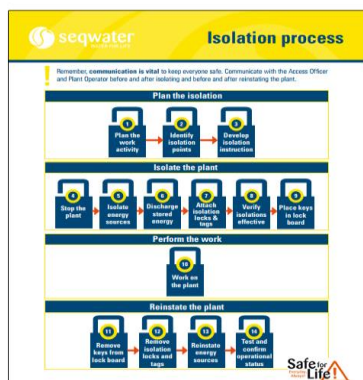
#	Step	Instruction
5	Working on out of service plant	<p>The process for commencing work on plant that has been placed out of service will vary depending on the type of isolation used to make the plant safe.</p> <p>NOTE: Before commencing work on an item of plant that is out of service, the work coordinator must:</p> <ul style="list-style-type: none"> • apply the appropriate risk management tool for the work activity, and • prove that the item of plant is isolated (i.e. a test for dead / prove for dead process must be applied before the work activity commences). <p>Single isolation point used to make the out of service plant safe</p> <p>Once a work coordinator has confirmed that the work activity on the out of service plant can commence, the Work coordinator (or Representative) may remove the out of service lock and tag from the isolation point and affixes a red isolation lock and tag to the isolation point. The work coordinator secures the key to the isolation point for the duration of the work activity.</p> <p>Multiple isolation points used to make the out of service plant safe</p> <p>Once a work coordinator has confirmed that the work activity on the out of service plant can commence, the Work coordinator (or Representative) affixes their blue personal lock and personal danger tag to the lock board. The Work coordinator (or Representative) may then remove the yellow out of service lock from the lock board.</p> <p>Once the Work coordinator has affixed their blue personal lock and personal danger tag to the lock board and signs on to the isolation instruction, all other workers involved in the work activity must then affix their blue personal locks and personal danger tags to the lock board and sign on to the isolation instruction.</p> <p>Once workers have affixed their blue personal locks and personal danger tags to the lock board the work activity may resume in accordance with the SWMS.</p>

4.10. Isolation Equipment types

Types of Isolation equipment that is acceptable at Seqwater sites are below (full poster is [D16/109874](#))

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Energy Tag and Lockout Equipment



Isolation tag



Isolation tags are attached to red isolation locks or spindle caps which have been used to secure an isolation point. Isolation tags identify who has performed the isolation and also provide information regarding any specific hazards associated with the isolation.

Out of service tag



Out of service tags are used to communicate that an item of plant is unsafe, defective, damaged or otherwise out of service. Out of service tags are attached to an out of service lock and/or to plant operational controls.

Personal danger tag



The personal danger tags identify who a blue personal lock belongs to. Personal danger tags are attached to blue personal locks. Personal danger tags may only be removed by the person who attached the tag.

Information tag



Information tags are used to communicate messages to others regarding:

- Who is responsible for an out of service key that the tag is attached to; or
- The status of / or information about an item of plant (e.g. type of oil being used, any specific operational requirements)

Information tags must never be used as a personal danger tag, to identify an item of plant as being out of service, or to identify a hazard associated with the item of plant.

Isolation lock



Isolation locks are used to physically lock a device that is isolating an energy source. An isolation tag must be attached to all isolation locks to identify why the equipment is isolated and who isolated the equipment. Isolation locks should only be attached to a lock board when the lock board forms part of a tiered isolation.

Personal lock



Personal locks are attached to a lock board to prevent the lock board being opened while a worker is performing a work activity under the control of the isolation. A personal danger tag must be attached to all personal locks to identify who the blue lock belongs to. Personal locks may only be removed by the person who attached the lock.

Out of service lock



Out of service locks are used to prevent the operation of unsafe, defective, damaged or otherwise out of service plant or equipment. They may be attached directly to an isolation device or a lock board. Out of service locks are also used on lock boards when handing over an item of isolated plant. This prevents unauthorised removal of isolation locks for the duration of the work activity. An out of service tag must be attached to all out of service locks to identify what plant or equipment is out of service, why the plant or equipment is out of service and who placed the plant or equipment out of service.

Lock board



Lock boards are used to secure the keys for isolation locks used to perform complex or tiered isolations. Lock boards are also used for the retention and display of work activity documentation (e.g. isolation instruction, JSEA/SWMS, Major Works Permit, etc.)

Valve Shrouds



Valve shrouds are used to prevent the operation of a valve that is being used as an isolation point. Valve shrouds are red in colour and allow a worker to attach an isolation lock to secure the shroud to the valve.

Plug Lockout Device



A plug lockout device is used to secure a plug that has been removed from a GPO or similar to allow work to be performed on an item of plant.

Cable Device



Cable devices are used to secure valves and other devices that cannot be secured using locks or shrouds.

Circuit Breaker Lockout Device



A circuit breaker lockout device is used to secure circuit breakers to allow work to be performed on an item of plant.

Spindle Caps

Spindle caps are used to identify the position of valves. The caps are placed over the top of the valve spindle. Where possible, valves should be secured with an isolating device.



Green Spindle Cap
Indicates a normally open valve.



Red Spindle Cap
Indicates a normally closed valve.



Yellow / Green Spindle Cap
Indicates that the valve is not in its normal operating position and is currently open.



Yellow / Red Spindle Cap
Indicates that the valve is not in its normal operating position and is currently closed.

4.11. Removal of isolation locks and tags

An isolation lock or tag must only be removed by:

- the worker who attached the isolation lock or tag; or
- if the worker who attached the isolation lock or tag is not available, the isolation lock or tag can only be removed by another worker in the following circumstances:

where a handover has been provided by the worker who attached the isolation lock detailing the reason for attaching the lock and the work required to safely de-isolate and return the plant to service; **and** the worker who will be removing the isolation lock is an authorised isolator for the site and holds the appropriate qualifications and experience to remove the isolations; **and** details of the handover have been documented on the SWMS for the work activity.

4.12. Forced removal of locks and tags

The following process must be used where a worker has left a workplace without removing their personal lock and/or tag from a lock board and the isolated plant needs to be returned to service:

1. All attempts must be made to contact the owner of the lock and/or tag.
2. Where the owner of the lock and/or tag is not available to remove the lock and/or tag, the work coordinator must complete section 1 and 2 of the Forced Lock Removal Form ([FRM-00424](#)).
3. The work coordinator must personally inspect the isolation including the area where the worker was working to determine that no workers are in danger, or potential danger, as a result of the work activity.
4. The works coordinator must appoint an authorised isolator to remove the personal lock. They must have intimate knowledge of the isolated plant and hold the appropriate qualifications and experience to remove the isolations.
5. The work coordinator must contact the relevant Level 3 Manager for the site where the plant is isolated to obtain approval to remove of the lock and/or tag. Approvals are recorded in section 3 of the Forced Lock Removal Form ([FRM-00424](#)).
6. If approval is given, the work coordinator directs the authorised isolator or isolation officer to remove the lock and/or tag and reinstate the item of plant to service.
7. The forced lock removal event must be reported as an incident by the work coordinator by notifying Seqwater's incident hotline on (07) 3270 4040.
8. The work coordinator must complete section 4 of the Forced Lock Removal Form ([FRM-00424](#)) to complete the process. Any removed locks, tags and/or documentation must be retained as evidence for further investigation.

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4.13. Detached tags

Any worker who finds a detached tag must assume that the tag has been unintentionally detached from the isolation device or item of plant.

A worker who finds a detached tag must:

- if the details on the detached tag are clear and legible:

contact the worker named on the tag or their Line supervisor, so that the situation can be rectified; or

- if the details on the detached tag are not clear nor legible:

The event must be reported to the Site Owner or Site Owner representative so that the situation can be rectified.

5. Definitions

Term	Definitions
Access officer	The worker responsible for managing entry by other workers onto Seqwater workplaces.
Administration area	Any area that is used for administrative purposes only, consisting of offices, desks and meeting rooms.
Authorised isolator	A worker who has been assessed and authorised to manage isolation arrangements for isolation officers, develop, review and approve isolation instructions for the sites at which they are authorised and for the types of isolations relevant to their qualifications. The Authorised Isolator Assessment Work Instruction (PRO-02008) is used to assess and authorise workers to perform the role of an Authorised Isolator.
Break in work	Where a work activity cannot be completed in a single shift and the plant being worked on will remain isolated.
Contractor	Any person or firm engaged under contract by Seqwater to undertake work. A contractor is not an employee.
De-energised	Means separated from all sources of supply but not necessarily isolated, earthed, discharged or out of commission.
Double valve isolation	The use of two isolation valves, in series, on the same feed-in pipeline to isolate a potential source of engulfment. A penstock valve, gate valve or a baulk gate is considered to be equivalent to a double valve isolation.
Dynamic work	The process of performing a work activity on an item of plant that is operating and has not been isolated from energy sources. Dynamic work exposes workers to energy sources and must be appropriately planned and performed in a controlled manner. Dynamic work does not include work activities that expose workers to electrical energy.
High Voltage (HV)	Voltages in excess of 1000 volts AC or 1500 volts ripple-free DC.

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Term	Definitions
High-risk work permit	A permit that is used to manage the hazards associated with high-risk work activities. High-risk work permits define specific risk controls that must be implemented.
Inch and test	The process of functional testing of equipment during commissioning. The Inch and Test process may require the partial or full de-isolation of plant. The steps to undertake inching and testing are recorded on the isolation instruction.
Isolation instruction	A document that defines the steps required to isolate and reinstate an energy source in order to allow a work activity to be undertaken safely.
Isolation officer	The worker who is responsible for developing and performing an isolation when approved by the authorised isolator.
Live electrical work	Work that exposes electrical workers to live electrical components. There are specific legislative and procedural requirements that must be met in order to perform live electrical work.
Low Voltage	An operating voltage that exceeds extra-low voltage and does not exceed 1000V AC or 1500V ripple free DC as defined in the <i>Electrical safety code of practice 2013 – Managing electrical risks in the workplace</i> .
Operational area / operational site	Any area of a Seqwater workplace that is not an administration area. Includes any area within five metres of a Seqwater water main.
Operational maintenance	Operational maintenance consists of inspecting, cleaning, servicing, preserving, lubricating, and adjusting, as required.
Plant	<p>Includes any machinery, equipment, appliance, container, implement and tool, and includes any component or anything fitted or connected to any of those things. Plant includes items as diverse as lifts, cranes, computers, machinery, conveyors, forklifts, vehicles, vessels, power tools, playground equipment and cathodic protection systems.</p> <p>Plant that relies exclusively on manual power for its operation and is designed to be primarily supported by hand (e.g. a screwdriver) is not covered by the <i>Work Health and Safety Regulation 2011</i> (Qld). The general duty of care under the <i>Work Health and Safety Act 2011</i> (Qld) applies to this type of plant.</p> <p>Certain kinds of plant, such as forklifts, cranes and some pressure equipment, require a licence from the WHS regulator to operate and some high-risk plant must also be registered with the WHS regulator.</p>
Proven single point isolator	A proven single point isolator (e.g. a local isolator switch) is an isolation point that when operated, prevents the operation of an item of plant. Proven single point isolators must have been tested and proven to securely isolate the item of plant.
Site	A workplace at a defined location that is owned, managed or controlled by Seqwater e.g. a water treatment plant, administrative building or pump station.

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Term	Definitions
Site access	<p>Site access controls entry to Seqwater workplaces.</p> <p>Site access is administered by an Access officer who has responsibility for the coordination of work activities to:</p> <ul style="list-style-type: none"> manage the impacts of work activities on Seqwater operations, and eliminate conflicts between multiple work parties.
Subordinate isolation	An isolation performed under the control of an isolation. Subordinate isolations will generally be performed in accordance with the requirements of a complex isolation.
Trunk main isolation	An isolation performed to isolate a section of trunk main to allow a work activity to be performed.
Verification of isolation (Test for dead / prove for dead)	<p>A process for verifying that an isolation has been effective in isolating all energy sources associated with an item of plant.</p> <p>The verification of isolation process must be documented for all types of isolation (i.e. electrical, mechanical, pneumatic, etc.)</p>
Work Coordinator	<p>An appropriately trained and competent Worker who has responsibility for managing the completion of a Work Activity.</p> <p>A Work Coordinator may be either a Seqwater employee or a Contractor depending on the work being performed.</p> <p>A Work Coordinator may include the Project Manager responsible for the delivery of a Project or the supervisor of a team responsible for the completion of a Work Activity.</p>

6. Roles and Responsibilities

Role	Responsibility
Access officer (or Duty Operator)	<ul style="list-style-type: none"> Manage access to workplaces within their area of responsibility. Liaise with workers planning and performing isolations to manage the impacts of the isolations on normal workplace operations. Enter and manage information in the PASS CIS Module.

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Role	Responsibility
Authorised Isolator	<ul style="list-style-type: none"> • Manage and approve isolation arrangements. • Ensure that no isolation at an Operational Plant will interfere with production without authorisation from the Site Owner Representative. • Communicate the need for ensuring positive isolation and test for dead is the responsibility of the Isolation officer performing the actual isolation. • Provide advice to Isolation officers, Project Managers and Principal Contractors on isolation requirements and the operational impacts of isolations. • Develop, review and approve isolation instructions relevant to their qualifications for the sites that they have been authorised for. • Perform isolations relevant to their qualifications on sites for which they have been authorised for.
HSQ Team	<ul style="list-style-type: none"> • Provide HSW resources to support the implementation and monitoring of this procedure. • Undertake reviews and inspections of work conducted at Seqwater workplaces to verify compliance with the requirements of this procedure. • Provide guidance and/or training on energy tag and lock out as required or when requested.
Isolation Officer	<ul style="list-style-type: none"> • Obtain approval for isolation arrangements from a relevant Authorised isolator. • Identify isolation points required to complete the isolation. • Identify isolation equipment required to complete the isolation. • Develop isolation instructions to document the steps required to successfully complete an isolation. • Perform all isolations in accordance with the isolation instruction. • Confirm the status of isolations with the Work coordinator and Access officer.
Line supervisor	<ul style="list-style-type: none"> • Implement the requirements of this procedure within their area of responsibility. • Complete workplace monitoring activities to verify the implementation and effectiveness of this procedure. • Facilitate the provision of appropriate information, instruction and training to each of their employees for planning and performing isolations.
Managers	<ul style="list-style-type: none"> • Communicate and implement the requirements of this procedure within their area of responsibility.
Site Owner or Site Owner Representative	<ul style="list-style-type: none"> • responsible for managing and approving isolation arrangements for all isolations performed on Seqwater operational sites

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Role	Responsibility
Work coordinator (or Representative)	<ul style="list-style-type: none"> Plan work activities to identify all isolation and risk control requirements. Confirm the authorised isolator/s that will be managing the isolation. Manage and monitor workers performing work activities under the control of an isolation. Make sure all isolations and risk controls are in place prior to the work activity being undertaken to enable the work activity to be safely performed. When a work coordinator also performs the role of an Isolation officer, the work coordinator assumes the responsibilities applicable to that role as well.
Workers	<ul style="list-style-type: none"> Comply with all site access requirements when entering and leaving site. Hold the appropriate licences and qualifications for the work activity being performed. Confirm that all isolations have been implemented and are effective before commencing a work activity under the control of an isolation. Attach a blue personal lock and personal danger tag to the lock board before commencing the work activity under the control of the isolation. Comply with all risk controls defined in the SWMS or high-risk work permits. Report all incidents to Seqwater's incident hotline (07) 3270 4040.

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7. Training

Isolations may only be performed at Seqwater sites by workers who are trained and competent who:

- Hold the appropriate qualification for the type of isolation being performed; and
- Have successfully completed the PASS overview module and all isolation training modules.

Training Module	Training Method	Time	All	Contractors	Work Team Member	Work Coordinator	Project Manager	Isolation Officer	Access Officer
PASS Overview Training (includes Site Access Training)	Online	30 mins	<input checked="" type="checkbox"/>	<input type="checkbox"/>	The PASS Overview Training module must be successfully completed before any other training modules can be undertaken.				
Major Works Permit Training	Online	30 mins		<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Introduction to isolations	Online	30 mins		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Planning and documenting isolations	Online	30 mins		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Applying isolation processes	Online	60 mins		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Access Officer Training (includes IT Solution Administration)	Face to face	3.5 hours		<input type="checkbox"/>					<input checked="" type="checkbox"/>
Notes: Contractors must undertake training relevant to the role they are performing Once a worker has completed all three isolation modules they will need to be assessed as competent by their Line supervisor or other appropriate person. This may be through the development of an Isolation instruction or demonstrating that they are able to perform an isolation.							<input checked="" type="checkbox"/>	Compulsory	
							<input type="checkbox"/>	Not compulsory however it may be required due to the requirements of the work activity.	

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8. References

8.1. Legal and other requirements

Description
<i>Work Health & Safety Act 2011 (QLD) and Work Health & Safety Regulation 2011 (QLD)</i>
<i>Electrical Safety Act 2002 (Qld) and Electrical Safety Regulation 2013 (Qld)</i>
<i>Electrical Safety Code of Practice - Managing electrical risks in the workplace (Qld).</i>
AS4836 – Safe Work: Safe working on or near low-voltage electrical installations and equipment must be considered

8.2. Seqwater documents

Description	Location
D16/109874 Isolation Equipment Poster	REX
FRM-00424 Forced Lock Removal Form	REX
MAN-00313 Critical Control Handbook	REX
PRO-00002 Management System Audit and Assurance Procedure	REX
PRO-00006 Electrical – High and Low Voltage Procedure	REX
PRO-00657 Hazard Identification and Risk Management Procedure	REX
PRO-01120 Learning and Professional Development Procedure	REX
PRO-01820 Permit Access Safety System (PASS) Procedure	REX
PRO-02008 Authorised Isolator Assessment Work Instruction	REX
RSK-00481 Combined Generic SWMS	REX
TEM-00013 Safe Work Method Statement (SWMS) Template	REX
TEM-00077 Isolation Instruction Template	REX

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Appendix A – Isolation Examples

Isolation Scenario	Simple	Complex	Tiered	Comments
Isolate the clear water main between clear water reservoir 1 and clear water reservoir 2 which will enable the safe installation of 1200 diameter butterfly valve and 'T piece'.	✗	✓	✗	Isolation of multiple sources of water required. This isolation could require a tiered isolation if other works are being undertaken whilst this isolation is in place.
Isolate the BAC filter channel between the BAC filters, clear water reservoir 2 and the settled water channel for safe installation of the penstock valve, removal of the aluminum blanking plate and core 200mm hole through wall within the chlorine dosing chamber.	✗	✓	✗	Isolation of multiple sources of water required. This isolation could require a tiered isolation if other works are being undertaken whilst this isolation is in place.
WTP shut down for 'T piece' cut-in reservoir 2 bypass.	✗	✓	✗	Isolation of multiple sources of water required. This isolation could require a tiered isolation if other works are being undertaken whilst this isolation is in place.
Isolate and disconnect power and control circuits from the filter inlet control valve.	✗	✓	✗	Isolation of multiple sources of energy required.
Isolation of a centrifuge to undertake weekly operational maintenance. The isolation can be achieved by switching a proven local isolator.	✓	✗	✗	Isolation effected by a proven local isolator and the only operational maintenance is being performed. If the work required invasive maintenance (i.e. replacement of hydraulic lines, etc.), a complex isolation might be required to allow the work to be undertaken.
Isolate the raw water off take to allow diver inspection of the raw water main. While the main is isolated work will be undertaken on the raw water pumps and flash mixers at the WTP.	✗	✗	✓	Isolation of multiple points required to isolate the raw water main and downstream assets. Multiple work activities being undertaken under the control of the raw water off take isolation.
Isolate a gas BBQ in a park to undertake operational maintenance. The gas supply can be isolated at a single proven isolation point.	✓	✗	✗	Isolation effected by a proven local isolator and only operational maintenance is being performed.
Isolate an air conditioner in an administration area at a WTP.	✓	✗	✗	Isolation can be performed by a trade qualified worker engaged by Seqwater Facilities. Isolation process must be documented on a SWMS or Isolation instruction. Isolation instruction must be reviewed by an authorised isolator to confirm that the isolation will not impact on the operation of the site
Isolate a chemical dosing pump to replace the diaphragm. The isolation will involve isolating a proven single point isolator along with the chemical feed and discharge lines.	✗	✓	✗	Isolation of multiple points required to isolate the chemical dosing pump. Work activity involves invasive maintenance and is not operational maintenance.
Isolate and drain a trunk main to replace a barrel union joint.	✗	✓	✗	Isolation of multiple points required to isolate and drain the trunk main.

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Appendix B – Simple isolation process steps

The following process must be used for all simple isolations.

1. Plan the work activity

The worker assigned the work activity must undertake planning to ensure that:

- All risk control requirements to perform the work activity have been identified and will be followed
- All impacts of the isolation of the plant are understood (where the simple isolation will be performed on operational assets (e.g. pumps, centrifuges, etc.) the job plan and/or SWMS must be developed or reviewed by an authorised isolator. This requirement has been included to manage the operational impacts of the simple isolation)
- All workers and plant impacted by the isolation are identified
- Appropriate coordination with operational staff is undertaken to ensure operational impacts are managed
- All tools and equipment are available to complete the work activity (including all required isolation equipment).

2. Identify energy sources

The worker performing the work activity must personally identify:

- All sources of energy feeding or leaving the plant
- All sources of energy contained within the plant
- Any part of the plant or contents of the plant that is likely to move.

Simple isolations will generally only have a single energy source feeding the plant being isolated, however all energy sources must be verified by the worker performing the work activity.

3. Communicate

Before isolating an item of plant, the worker performing the isolation must contact the Access officer and any other workers at the work location who may be impacted by the work activity to confirm that the isolation can proceed as planned.

4. Isolate energy sources and dissipate stored energy

The worker performing the work activity must make an item of plant safe by:

- Stopping the plant in a controlled manner
- Isolating all sources of energy feeding or leaving the plant
- Restraining the plant, materials and any other sources of energy associated with the plant that cannot be dissipated
- Dissipating any source of energy contained within the plant.

The isolation of energy sources for simple isolations will generally involve unplugging power leads, disconnecting water hoses, turning off and removing the ignition keys of plant, switching and securing a local isolation switch, etc.

The isolation point/s or control point must be secured with a red isolation lock and isolation tag.

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Where required, alternative control measures may include the use of additional lockout devices such as a small plug lockout device, hasp, etc. may need to be used in conjunction with a red isolation lock and tag to secure the isolation point.

Where an isolation lock or a lockout device cannot be used to secure an isolation point, an isolation tag must be attached to the isolation point/s.

SCADA, control circuits or emergency stops must not be used as methods of isolation.

Where multiple workers are working under the control of a simple isolation, a lock board must be used to secure the key to the isolation lock for the duration of the work activity. All workers must affix their blue personal lock to the lock board whenever they are working under the control of the simple isolation.

5. Verify the effectiveness of the isolation

The worker performing the work activity must verify the effectiveness of the isolation before commencing work.

Verification of simple isolations is performed by visually checking the local disconnection of leads, hoses, by confirming the local isolator is in the off position or by checking the ignition of the item of plant.

Workers must also confirm that any energy stored in the plant is either:

- Dissipated (i.e. air released from pressure vessels, water drained from discharge pipes); or
- Restrained (i.e. chocks in place to prevent a vehicle moving).

The process used to verify an isolation, and the outcomes of the verification process must be recorded in the SWMS for the work activity.

Note - re-testing should occur as necessary whilst electrical work is being undertaken if for example the worker carrying out the work temporarily leaves the immediate area, checks and tests must be carried out on their return to ensure that the equipment being worked on is still isolated to safeguard against inadvertent re-energisation.

6. Work on the plant

Following the verification of a simple isolation, the work activity may be performed in accordance with the SWMS.

Where the work activity cannot be completed in a single shift, the worker performing the work activity must:

- Notify the relevant Access officer that the item of plant is out of service
- Attach a yellow out of service lock and tag to the isolation point or control point for the item of plant to confirm that the plant is not safe to operate. Where a yellow out of service lock cannot be attached to an isolation point or control point, the minimum requirement is to attach a yellow out of service tag to the isolation point or control point for the isolated item of plant.

7. Communicate

Before reinstating an item of plant, the worker performing the work activity must contact the Access officer and any other workers at the work location who will be impacted by the de-isolation to confirm that the item of plant can be reinstated as planned.

8. Reinstatement plant

The worker performing the work activity must reinstate an item of plant by:

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- Removing any restraints applied to the plant
- De-isolating any sources of energy to the plant
- Confirming the plant is available to return to service
- Starting the plant in a controlled manner (where required / permitted).

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Appendix C – Complex isolation process steps

The following process must be used for all complex isolation:

1. Plan the isolation

The Work coordinator must plan the work activity to ensure that:

- All risk control requirements to perform the work activity have been identified and will be followed
- all impacts of the isolation of the plant are understood
- All workers and plant impacted by the isolation are identified
- Appropriate coordination with operational staff is undertaken to ensure operational impacts are managed
- All tools and equipment are available to complete the work activity (including all required isolation equipment)
- An Authorised isolator/s has been identified to review and confirm isolation requirements.

2. Appoint an Isolation officer

The work coordinator may appoint an Isolation officer to identify the isolation points, develop the isolation instruction and perform the isolations once approved by the Authorised Isolator.

Note: in some situations, the Work coordinator may also perform the role of an Isolation officer for a complex isolation provided they satisfy the requirements of an Isolation officer.

3. Identify energy sources

The Isolation officer must personally identify:

- All sources of energy feeding or leaving the plant
- All sources of energy contained within the plant
- Any part of the plant or contents of the plant that is likely to move.

Complex isolations will generally have multiple energy sources feeding the plant being isolated. Each energy source must be identified by the Isolation officer, in collaboration with relevant authorised isolators.

4. Develop isolation instruction

The Isolation officer must develop an isolation instruction that defines each step in the isolation process. The isolation steps must be documented on the Isolation Instruction Template ([TEM-00077](#)).

Where the complex isolation will be performed on operational assets, the Isolation instruction must be developed or reviewed and approved by an Authorised isolator. This requirement has been included to manage the operational impacts of the isolation. Isolation instructions for complex isolations must clearly define:

- The points to be isolated
- The steps in the isolation process
- The method for dissipating stored energy
- The method of verifying the isolation (test for dead / prove for dead process) – refer to section 6 of this procedure for requirements
- Communication requirements and hold points in the process
- The process for reinstating the plant.

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5. Communicate

Before commencing a complex isolation, the Isolation officer must contact the Work coordinator, the Access officer and any other workers at the work location who may be impacted by the work activity to confirm that the isolation can proceed as planned, to ensure that the item of plant can be stopped without creating unacceptable operational disruptions and to advise of any potential danger to the health and safety of any workers or other persons.

6. Isolate energy sources and dissipate stored energy

The Isolation officer must isolate the item of plant by implementing the isolation steps documented in the isolation instruction, including:

- Stopping the plant in a controlled manner
- Isolating all sources of energy feeding or leaving the plant
- Dissipating all sources of energy contained within the plant
- Restraining the plant, materials and any other sources of energy associated with the plant that cannot be dissipated.

SCADA, control circuits or emergency stops must not be used as methods of isolation.

Consideration shall be given to the possibility of circuit wiring of plant or conductors becoming energised due to any operation of automatic control devices, e.g. thermostats, switches and other interface devices. Where an issue is encountered when performing an isolation (i.e. unexpected impact from an isolation step, isolation step is not effective, etc.), the isolation must be reversed and the plant reinstated.

7. Locking and tagging isolation points

The isolation officer must affix a red isolation lock and an isolation tag to secure all isolation points in accordance with the requirements of the isolation instruction.

Devices not capable of being locked should, as far as reasonably practicable, be secured with a shroud, valve cover, chain, pin or other suitable means, or by the removal of the handle or operating mechanism. As a minimum, an isolation tag must be affixed to any isolation point not able to be secured with a red isolation lock.

8. Verify the effectiveness of the isolation (test and prove for dead)

The Isolation officer must personally verify the effectiveness of the isolation before any work commences on the isolated plant.

Verification of isolations is performed by visually checking the isolation points and/or drainage points and where required, by attempting to start the item of plant.

The verification process and the outcomes of the process must be documented in the Isolation instruction for the work activity.

The Isolation officer must also confirm that any energy stored in the plant is either:

- Dissipated (i.e. air released from pressure vessels, water drained from discharge pipes, etc.); or
- Restrained (i.e. chocking wheels of mobile plant, securing counterweights, etc.).

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Risk controls must be identified, documented and implemented where the release of stored energy will impact on workers, the public or the environment (e.g. release of water to the environment, release of compressed air that produces noise hazards, etc.).

All workers participating in a work activity on an isolated item of plant must personally verify, or request the isolation officer to personally demonstrate, that all energy sources have been effectively isolated, dissipated or restrained. Once a worker has verified that the isolation is effective, they sign on to the Isolation instruction.

Note - re-testing should occur as necessary whilst electrical work is being undertaken if for example the worker carrying out the work temporarily leaves the immediate area, checks and tests must be carried out on their return to ensure that the equipment being worked on is still isolated to safeguard against inadvertent re-energisation.

9. Lock board requirements

Once the isolation has been verified, the Isolation officer places all of the keys to the red isolation locks used in the isolation into a lock board and informs the Work coordinator that the item of plant is isolated.

The Work coordinator (or Representative) then affixes their blue personal lock and personal danger tag onto the lock board to identify that they are responsible for the work activity being performed under the control of the complex isolation.

Each worker participating in the work activity must then affix their blue personal lock and personal danger tag to the lock board.

10. Work on the plant

After all workers participating in the work activity have locked onto the lock board, the work activity may be performed in accordance with the SWMS.

If it is possible for stored energy to re-accumulate over the duration of the work activity, the Work coordinator must implement appropriate measures to ensure the work activity can be completed safely (e.g. earthing electrical conductors, leaving drain valves open, etc. and verifying the isolation (testing for dead) as appropriate).

Red isolation locks must never be removed from an isolation point until the work activity associated with that isolation is complete.

Workers must remove their blue personal lock and personal danger tag from the lock board and sign off of the isolation instruction whenever they are not actively working on isolated plant.

Where a work activity cannot be completed in a single shift and the plant being worked on will remain isolated, the Work coordinator must apply the break in work process.

11. Removal of locks from lock board

At the completion of the work activity, each worker participating in the work activity must:

- Remove all tools and equipment from the work area
- Replace any guards or other protection devices
- Remove their blue personal lock and personal danger tag from the lock board.

The Work coordinator must remove their blue personal lock and personal danger tag from the lock board once they have confirmed that the work activity is complete, all tools and equipment have been removed from the work area and all workers have removed their blue personal locks and personal danger tags from the lock board.

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Once all workers have removed their blue personal locks and personal danger tags from the lock board, and signed off of the Isolation instruction, the isolation officer may retrieve the keys to the red isolation locks. All tags used as part of the isolation must be destroyed and disposed of appropriately after the work activity is complete.

12. Communicate

Before reinstating an item of plant, the Isolation officer must contact the Work coordinator, the Access officer and any other workers at the work location who will be impacted by the de-isolation to confirm that the item of plant can be reinstated as planned.

If the item of plant is not being reinstated by the relevant plant operator (i.e. water treatment plant or dam operator), the Isolation officer must liaise with the Access officer to ensure the item of plant can be returned to service without creating unacceptable operational disruptions.

13. Removal of locks and tags from isolation points

The Isolation officer must confirm that all workers who participated in the work activity have completed their work and are clear of the plant, all tools and equipment have been removed and the plant is safe to return to service.

The Isolation officer then removes all of the red isolation locks and tags from the isolation points in accordance with the requirements of the Isolation instruction.

All isolation tags used as part of the isolation must be destroyed and disposed of appropriately after the work activity is complete.

14. Reinststate plant

Plant may be reinstated to either:

- Test the operation of the plant
- Return the plant to service.

The Isolation officer must reinstate an item of plant in accordance with the requirements of the isolation instruction, including:

- Carrying out appropriate testing on any new, altered or repaired plan, for example tests for insulation resistance, earth continuity, polarity, correct connection and function testing
- Taking precautions to ensure that other plant is not inadvertently energised
- Confirming that the item of plant is safe to return to service
- Checking to ensure all workers, tools, equipment and waste have been removed from the work area
- Checking to ensure that all guards have been replaced and the plant is safe for use
- Re-establishing any sources of energy to the plant
- Removing any restraints applied to the plant
- Confirming that the plant is available for normal operations
- Confirm any SCADA alarms that have been disabled to perform the isolation are reinstated
- Starting the plant in a controlled manner (if required / permitted).

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Appendix D – Tiered isolation process steps

The following process must be used for all tiered isolations.

1. Plan the isolations

There are significant planning and coordination requirements associated with a tiered isolation.

The Work coordinator in control of the isolation must have intimate knowledge of the plant being isolated and have the skills and competencies to manage multiple work teams. The Work coordinator in control of the isolation must ensure that all work activities that are to be performed under the control of the isolation are appropriately planned so that they can be performed within the constraints of the isolation.

All subordinate isolations performed under the control of a tiered isolation must be planned and performed in accordance with the requirements of the complex isolation processes.

2. Appoint an Isolation officer

The Work coordinator in control of the tiered isolation must appoint an Isolation officer to:

- Develop the isolation plan and ensure Isolation instructions are accurate
- Perform the isolation
- Coordinate isolation activities with Isolation officers performing subordinate isolations.

The Isolation officer must be an Authorised isolator for the Site where the isolation is being performed, be competent to coordinate the isolation and have the skills and competencies to manage multiple work teams.

3. Identify energy sources

The Isolation officer must personally identify all sources of energy feeding or leaving the isolation points.

The Isolation officer must liaise with all other Isolation officers responsible for subordinate isolations to confirm the delineation between the isolation and the subordinate isolations (i.e. confirm who is isolating what and when).

4. Develop isolation instruction

The Isolation officer must develop an Isolation instruction that defines each step in the isolation process. This must be documented on the Isolation Instruction Template ([TEM-00077](#)). Isolation instructions must clearly define:

- The points to be isolated
- The steps in the isolation process
- The method for dissipating stored energy
- Communication requirements and hold points in the process
- The process for managing the subordinate isolations performed
- The process for reversing isolations when unexpected effects are observed as a result of an isolation
- The method of verifying the isolation (test for dead / prove for dead process)
- The process for reinstating the plant.

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5. Communicate

Communication is critical for the successful implementation of a tiered isolation process.

A pre-work meeting must be held with the relevant Access officer/s, all Work coordinators and all Isolation officers participating in the tiered isolation to confirm the communications methods and hold points that will be used. The pre-work meeting must also define the post-work requirements and responsibilities (e.g. requirements to stay on site to check for leaks, to confirm that plant is serviceable, etc.).

Before commencing a tiered isolation, the Isolation officer must contact all other Isolation officers responsible for the subordinate isolations to confirm that the work activity can proceed as planned.

The Isolation officer must also liaise with the relevant Access officer/s to ensure that the work activity can proceed as planned.

6. Isolate energy sources

The Isolation officer must perform all isolations in accordance with the requirements of the isolation instruction.

SCADA, control circuits or emergency stops must not be used as methods of isolation.

Consideration shall be given to the possibility of circuit wiring of plant or conductors becoming energised due to any operation of automatic control devices, e.g. thermostats, switches and other interface devices.

Where an issue is encountered when performing an isolation (i.e. unexpected impact from an isolation, isolation is not effective, etc.) the isolation must be reversed, the plant reinstated. Issues encountered when performing subordinate isolations must be immediately reported to the Isolation officer.

Locking and tagging isolation points

The Isolation officer must place a red isolation lock and an isolation tag on all isolation points in accordance with the requirements of the Isolation instruction.

Devices that are not capable of being locked should, as far as reasonably practicable, be secured with a shroud, valve cover, chain, pin or other suitable means, or by the removal of the handle or operating mechanism. As a minimum, an isolation tag must be affixed to any isolation point not able to be secured with a red isolation lock.

7. Verify the effectiveness of the isolation (test and prove for dead)

The Isolation officer must personally verify the effectiveness of the isolation before any subordinate isolations are performed, and before any work activity associated with any subordinate isolations commence.

Verification of isolations is performed by visually checking the isolation points and where required, by attempting to start the item of plant.

The Isolation officer must also confirm that any energy stored in the plant is either:

- Dissipated (i.e. air released from pressure vessels, water drained from discharge pipes, etc.); or
- Restrained (i.e. securing counterweights, etc.).

Risk controls must be implemented where the release of stored energy will impact on workers, the public or the environment (e.g. release of water to the environment, release of compressed air that produces a noise hazard, etc.).

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Where there are any subordinate isolation officers, they must all personally verify, or request the Isolation officer to personally demonstrate that all energy sources associated with the isolation have been effectively isolated, dissipated or restrained. Once a subordinate isolation officer has verified that the isolation is effective, they sign on to the Isolation instruction.

Note - re-testing should occur as necessary whilst electrical work is being undertaken if for example the worker carrying out the work temporarily leaves the immediate area, checks and tests must be carried out on their return to ensure that the equipment being worked on is still isolated to safeguard against inadvertent re-energisation.

8. Isolation lockbox requirements

Once the isolation has been verified, the Isolation officer places all of the keys to the red isolation locks used in the isolation into an isolation lock board.

The Work coordinator in control of the isolation then affixes their blue personal lock and personal danger tag onto the lock board to identify that they are responsible for the work activity being performed under the control of the complex isolation.

Where there are subordinate isolation officers the Work coordinator in control of the isolation must then confirm that the isolation is complete and that the subordinate isolations may proceed.

9. Lock onto isolation lock board

Before commencing subordinate isolations, the relevant subordinate isolation officer places a red isolation lock and isolation tag onto the isolation lock board.

The key to the red isolation lock attached to the isolation lock board is then placed into the relevant subordinate isolation lock board.

Placing a red isolation lock onto the isolation lock board prevents the de-isolation of the isolation until the associated subordinate isolation is de-isolated.

10. Perform subordinate isolations

Subordinate isolations are performed in accordance with the complex isolation processes defined in Appendix C of this procedure.

11. Work on the plant

Once the Work coordinator in control of the subordinate isolation attaches their blue personal lock and personal danger tag onto their subordinate isolation lock board, the work activity associated with the subordinate isolation can be performed.

If it is possible for stored energy to re-accumulate over the duration of the work activity, the work coordinator must implement appropriate measures to ensure the work activity can be completed safely (e.g. earthing electrical conductors, leaving drain valves open, etc. and verifying the isolation (testing for dead) as appropriate).

Workers must remove their blue personal lock and personal danger tag from the lock board and sign off the Isolation instruction, whenever they are not actively working on isolated plant.

Where a work activity cannot be completed in a single shift and the plant being worked on will remain isolated, the worker performing the work activity must apply the break in work process defined in Appendix F of this procedure.

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12. Removal of locks from isolation lock board

At the completion of a subordinate work activity, the relevant Isolation officer must:

- Confirm the work activity associated with the subordinate isolation is complete and all workers, tools and equipment have been removed from the work area
- Confirm all blue personal locks and personal danger tags have been removed from the subordinate isolation lock board
- Remove all red isolation locks and tags from subordinate isolation points
- Notify the isolation officer that the work activity related to the subordinate isolation is complete
- Remove the red isolation lock and isolation tag from the isolation lock board.

Once all subordinate isolation officers have removed their red isolation locks and isolation tags from the isolation lock board and signed off the Isolation instruction, the work coordinator in control of the isolation may remove their blue personal lock and personal danger tag from the master lock board and retrieve the keys to the isolation locks.

13. Communicate

Before reinstating the isolation, the Isolation officer must contact all subordinate isolation officers to confirm:

- All workers, tools and equipment have been removed from all work areas
- All items of plant are safe to be reinstated as planned
- All items of plant are available to be returned to service.

The Isolation officer must also liaise with the relevant Access officer and Work coordinator to ensure the reinstatement of plant can proceed as planned.

14. Removal of locks and tags from isolation points

The Isolation officer removes all red isolation locks and isolation tags from all isolation points in accordance with the requirements of the Isolation instruction.

Red isolation locks must never be removed from the lock board or from an isolation point until all work activities associated with the isolation and all subordinate isolations are complete.

15. Reinststate plant

Plant may be reinstated to either:

- Test the operation of the plant (refer to Appendix D for Inch and Test requirements)
- Return the plant to service.

The Isolation officer must reinstate an item of plant in accordance with the requirements of the isolation instruction, including:

- Carrying out appropriate testing on any new, altered or repaired plan, for example tests for insulation resistance, earth continuity, polarity, correct connection and function testing
- Taking precautions to ensure that other plant is not inadvertently energised
- Confirming that the item of plant is safe to return to service
- Checking to ensure all workers, tools, equipment and waste have been removed from the work area
- Checking to ensure that the plant is safe for use

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- Re-establishing the energy sources associated with the isolation
- Confirming that the plant is available for normal operations
- Confirm any SCADA alarms that have been disabled to perform the isolation are reinstated
- Starting the plant in a controlled manner (if required / permitted).

16. Post work requirements

All Work coordinators and Isolation officers who performed subordinate isolations must remain at the Site of their respective isolations to confirm that all plant is operationally available and that there are no faults, leaks etc.

Once reinstated, each Work coordinator must contact the Isolation officer to confirm that their plant is operationally available and that there are no faults, leaks etc.

Provided that there are no ongoing issues associated with the isolation, the Work coordinators and Isolation officers who performed the subordinate isolations may leave their respective work sites.

Any issues encountered with reinstated plant must be immediately reported to the Isolation officer. Depending on the type of issue encountered, the affected plant may be either:

- Re-isolated to rectify the issue; or
- Placed out of service until the issue can be rectified; or
- Where safe and appropriate to do so, left operating and a works request generated to rectify the issue at a later date.

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