

9 Isolation of Energy – Four (4) Step Process



Figure 2: Four (4) Step Isolation of Energy Process

9.1 Identify

Plan the isolation activities before the physical work starts. The following principles should be considered:

- Refer to appropriate plant and instrument diagrams, electrical, hydraulic and pneumatic drawings and/or schematic diagrams to confirm that the isolation points will give complete isolation.
- When planning the work, check to confirm if there is a Procedure, Safe Work Instruction or specific isolation procedure available for the task.
- Identify all equipment and systems that will be affected by the isolation.
- Identify all energy sources involved in the isolation (e.g. hydraulic, electrical, water, compressed air, vacuum, gravitational energy, traffic control).
- Identify and confirm all isolation points for each energy source (e.g. isolation valves, mechanical lockable stops and pins, electrical circuit breakers, battery isolators).
- Complete a risk assessment before starting the work.
- The NSW Code of Practice for Confined spaces should be referred to when planning isolations of confined spaces.

Note: Before isolating equipment, notify all people who will be affected by the isolation.

9.2 Isolate

Isolate and secure all energy sources before physical work starts. The following principles shall apply:

- Stop the equipment in the required position for the work (e.g. the equipment must be safely parked).
- Isolate primary isolation points in an approved manner (e.g. operate whole current isolator, remove plugs, close valve).
- Isolate and secure all secondary energy sources.
- Dissipation of energy is critical in an effective isolation. This may include shedding electrical loads, bleeding off stored hydraulic or pneumatic pressure, de-tensioning conveyor belts or ropes. Other secondary energy sources may include conveyor loop take ups, springs, accumulators, pressure vessels, elevated equipment, material hung up in chutes or truck bodies, material on a conveyor, unplanned movements.
- An effective isolation may include isolating drain valves in the open position as a secondary protection against pressure building in a circuit due to an isolation failure such as an undetected slow leaking isolation valve.
- Where hazardous energy cannot be isolated, other hazardous energy reduction treatments must be applied, such as blocking/chocking.
- Auxiliary/control devices, such as push buttons, control circuit devices, emergency stop buttons and key-switches, are not to be used for isolation purposes.
- Isolating control energies such as the pneumatic / electric circuit of a pilot / solenoid controlled valve is not considered an effective isolation. The primary energy must be controlled meaning the valve itself must be isolated in the required position.

9.3 Lock

Relevant locks and tags are to be used in accordance with details set out in the following sections:

- Section 11 – Locks, Tags, and Permits
- Notes:
- A Personal Danger Lock is to be placed by every person conducting work under an Isolation.
- All personnel exposed to an energy must place their own PDL(s) on Isolation Points or Isolation Lock Boxes.

- All personnel can only place and remove their own PDL.
- A person shall remove their PDL upon completion of work or prior to leaving the work site for any reason or the work area for any length of time.
- Failure to apply a PDL in accordance with this Standard or removal of another person's PDL (except in accordance with Appendix A) is a serious breach of this Standard and will be subject to disciplinary action and possible dismissal.

9.4 Verify

All isolations must be checked to verify the isolation has been effective. The following principles should be considered:



- Identify suitable verification and testing methods that are to be applied (e.g. Safe Work Instructions).
- Check test equipment is fit for purpose, in good operating condition and is set to the correct scale (e.g. pressure gauges, non-contact voltage detector, multimeters).
- Test the isolation has been effective. For example, by:
 - checking for the presence of voltage (check circuits are de-energised),
 - opening valves in pipelines (to discharge pressure in a safe manner),
 - confirming secondary energies are secured, or
 - Attempting to start mobile plant / equipment.
- If opening a valve in a pipeline or other pressurised circuit do so in a safe and controlled manner.
- When isolating a localised section within a live pipe range ensure that during the verification steps of opening a drain valve that the primary source (pumps / compressors) are turned on and are operational. Performing a verification with the primary source not operating or in fault and not isolated could give a false indication that the isolation has been successful.

All potentially hazardous services should be isolated prior to any person entering the confined space. The isolation shall prevent:

- the introduction of contaminants or conditions through piping, ducts, vents, drains, conveyors, service pipes and fire protection equipment
- the activation or energising of machinery in the confined space
- the activation of plant or services outside the confined space that could adversely affect the space (for example heating or refrigerating methods)
- the release of any stored or potential energy in plant
- the inadvertent use of electrical equipment.

11.1 Locks

Types of 'Locks' used at Mt Arthur Coal		
<p>Personal Danger Lock (Red)</p>	<p>Do's:</p> <ul style="list-style-type: none"> • Each person on a job must use PDL(s) when personal protection from an energy source is required. • Where a Group Isolation is used, PDLs must be placed on the Isolation Lock Box. • Each person is responsible for the security of his or her own PDLs key. • PDLs must be removed: <ul style="list-style-type: none"> - after the work is completed, - when you leave the job, and - when you leave the site. • PDLs should only be used for isolation of energy sources. • Shall display your name, company name and contact details. • Individually keyed and unique per set <p>Do not:</p> <ul style="list-style-type: none"> • Place PDLs on control devices such as emergency stops, conveyor lanyards, key switches or operator control handles. • Apply a PDL through another lock (i.e. lock to lock). Only apply to an Isolation point, Multi-lock device or Isolation 	

Types of 'Locks' used at Mt Arthur Coal		
	<p>Lock Box.</p> <ul style="list-style-type: none"> • Use or remove any PDL except your own. Always check the lock you are removing is your own. • Place PDL on an isolation point that already has a Group Isolation Lock attached to it. <p>Visitor's Locks</p> <ul style="list-style-type: none"> • Where visitors don't have appropriate Personal (Red) Locks, they will be issued "Visitor's Locks" which will be used as their Personal (Red) Locks. • Visitors will sign for the Visitor's Lock(s) in the book provided; • Visitors may be issued temporary locks while on site but the lock must be fitted with a Visitors Tag. • When you leave the job, you must remove your own Personal (Red) Lock and destroy your Personal Lock Identification Tag; and • Visitor's Locks must be returned to the Contractor Sign-on Point and signed back in prior to leaving site. 	
<p>Out of Service Lock (Black)</p>	<p>Do's:</p> <ul style="list-style-type: none"> • Keys must only be issued to Intermediate Authorised Isolators or above. • An Out of Service Lock can only be used by an Intermediate Authorised Isolator or above. • Out of Service Locks must be used in conjunction with Multi-lock devices and Out of Service Tags. • An Authorised Isolator must only remove the Out of Service Lock once all Personal Danger Locks have been removed and the equipment is safe to operate. • If you are unable to find out the reason for an Out of Service Lock being attached to an isolation point, or if you cannot find out if the plant or equipment has been repaired, then notify a Supervisor so that an inspection and test can be carried out before the lock is removed. <p>Do not:</p> <ul style="list-style-type: none"> • Use an Out of Service Lock as a substitute for a PDL or Group Isolation Lock. • Place an Out of Service Lock on control devices or switches. • Place an out of service lock on an isolation point that already has a Group Isolation Lock attached to it. 	
<p>Permit Holder Lock (Blue)</p>	<p>Do's:</p> <ul style="list-style-type: none"> • Permit Holder Locks and keys must be marked with a unique number. • A Permit Holder Lock is used whenever a Group Isolation is in place. • The Permit Holder for a Group Isolation uses the Permit Holder Lock to secure the Group Isolation Lock key(s) inside the Isolation Lock Box once all applicable points have been isolated and locked out. • Permit Holder Locks are to be locked directly onto the lock box and not via a multi lock device. • The Permit holder must remain in control of the Permit Lock key at all times. • The Permit Holder must not remove the Permit Holder Lock until all Personal Danger Locks have been removed and access to the Group Isolation Lock key is required. 	

Types of 'Locks' used at Mt Arthur Coal		
	<p>Do not:</p> <ul style="list-style-type: none"> Use for any other purpose than for securing a Group Isolation Lockbox. 	
<p>Group Isolation Lock (Yellow)</p>	<p>Do's:</p> <ul style="list-style-type: none"> Group Isolation Locks and key must be marked with a unique number. Each lock will be clearly label with <ul style="list-style-type: none"> Lockset number, and Lock number and total of locks in the set. A Group Isolation Lock is used whenever a Group Isolation is in place. The Group Isolation Lock key is kept inside the Isolation Lock Box once all applicable points have been isolated and locked out. <p>Do not:</p> <ul style="list-style-type: none"> Use a Group Isolation Lock as a substitute for a Personal Danger Lock. Place a Group Isolation Lock on control devices or switches. Place a Group Isolation Lock on an isolation point that already has an Out of Service Lock attached to it. Place a Group Isolation Lock on an isolation point that already has a PDL attached to it. 	

14.11 Training and Competence

All personnel carrying out isolations must be competent and authorised in the isolation activity they are conducting in accordance with the requirements set out in this standard.

Records of competency shall be maintained on the site Learning Management System (LMS).

It is the responsibility of the person to ensure that their competency remains valid if they are required to conduct isolations.

Refresher training to be completed at a maximum of 3 years

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