

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.

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