



# PROCEDURE



Title: Isolation, Tag and Lock Out Procedure

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## CONTENTS

1.0	PURPOSE.....	2
2.0	CONTEXT .....	2
3.0	SCOPE.....	3
4.0	RESPONSIBILITIES.....	3
4.1	General Manager .....	3
4.2	Area Manager .....	3
4.3	Area Superintendent .....	3
4.4	Electrical Integrity Superintendent .....	3
4.5	Superintendent Contract Management .....	3
4.6	Supervisor.....	3
4.7	Electrical/Instrument Supervisor .....	4
4.8	Alumina Producer.....	4
4.9	Isolation Officer .....	4
4.10	Isolation Officer Own Work Group .....	4
4.11	Master Isolation Officer.....	5
4.12	Trainee Isolation Officer .....	5
4.13	Person in Control (Energised Work) .....	5
4.14	Recipient.....	5
4.15	Personal Red Lock Holder.....	6
4.16	Visitor Lock Holder .....	6
4.17	Safe Access Coordinator.....	6
4.18	Notes .....	6
5.0	REFERENCES.....	7
6.0	DEFINITIONS.....	7
6.1	Authorised Person.....	7
6.2	Competent .....	7
6.3	Control Point .....	7
6.4	Energy Source .....	7
6.5	Energised Work.....	7
6.6	External Energy Source.....	8
6.7	Extra Low Voltage Electrical System .....	8
6.8	High Voltage Electrical System.....	8
6.9	Isolation List.....	8
6.10	Isolation Statement .....	8
6.11	Isolator.....	8
6.12	Major or Remote Components .....	8
6.13	Person in Control (Energised Work) .....	8
6.14	PPM.....	8
6.15	Process Isolators.....	9
6.16	Recipient.....	9
6.17	Stored Energy .....	9
6.18	Visitor.....	9
6.19	Zero Energy .....	9
7.0	ISOLATION SYSTEM.....	10

FORM NO: QA-053-0216	IF THIS DOCUMENT IS IN PRINTED FORMAT, AND NOT CONTAINED IN A CONTROLLED MANUAL, THIS IS <u>NOT</u> A CONTROLLED QUALITY SYSTEM DOCUMENT	PAGE 1 of 32
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7.1	Isolation Processes .....	10
7.2	Planning for an Isolation.....	11
7.3	Isolating Plant or Equipment.....	12
7.4	Proving Isolation.....	15
7.5	Locking Out.....	16
7.6	Identification of Equipment .....	17
7.7	De-Isolating.....	17
7.8	Return to Service .....	18
7.9	System Hardware - Isolation Locks.....	18
7.10	System Hardware – Information Tags.....	21
7.11	Forced Removal Procedure.....	30
7.12	Verification and Auditing of the Isolation System.....	31
7.13	Training.....	31
7.14	Records .....	31
8.0	ATTACHMENTS.....	32
9.0	REVISION HISTORY.....	32



## 1.0 PURPOSE

To define the system used to protect people from injury, exposure to hazardous substances, equipment from damage and the environment from harm when people work on equipment throughout the plant.

## 2.0 CONTEXT

The Isolation, Tag and Lockout System is based on the following fundamentals:

- All potentially hazardous energy sources are to be removed or isolated before commencing work
- All isolation points that form part of the isolation shall be locked to prevent inadvertent operation or activation of the plant or equipment
- Only personnel who hold approved competencies shall isolate a piece of plant or equipment
- Personnel must receive authority from the Recipient before they can apply their Personal Red Lock and commence work on isolated plant or equipment
- Personal Red Locks shall only be attached and removed by their Owner

The basic steps are:

- Step 1 Plan the isolation**
- Step 2 Effectively isolate the equipment** to be worked on from all external energy sources ensuring the drainage area is clear of personnel before proving isolation
- Step 3 Prove isolation** at each isolator
- Step 4 Lockout the isolation points** so that no one can accidentally re-energise the system before work is complete
- Step 5 Clearly identify the equipment** to be worked on and **identify any residual stored energy**
- Step 6 Remove all locks to complete the job**
- Step 7 Re-energise the equipment to resume normal operation**

### 3.0 SCOPE

This procedure applies to all employees, Contractors and Visitors engaged in activities involving operations, maintenance, plumbing, modification, construction, commissioning, demolition or fixed and mobile plant or equipment on the QAL site.

This procedure applies to energy sources such as, but not limited to, electrical, mechanical, hydraulic, pneumatic, chemical, radiation, thermal, compressed air and gas, energy stored by pressure and static heads, capacitors, vehicle batteries, tension in springs, chains, belts and ropes, and the potential energy from bulk materials, suspended parts (gravity) and equipment due to its position.

This procedure also applies to removal of asbestos containing material from behind cladding.

Exceptions to the procedure are managed by the application of the following:

- Imperfect Procedure P314.270
- Emergency Response First Response Team P746.211

Only QAL Red Locks shall be used by Personal Lock Holders, not Red Locks from other sites.

### 4.0 RESPONSIBILITIES

#### 4.1 General Manager

The General Manager is accountable for:

- ensuring the QAL Isolation, Tag and Lockout system meets or exceeds the RTA Standards and complies with regulatory requirements.
- authorising the forced removal of any Personal Lock or Person in Control Tag.
- participating in audits and investigations pertinent to this procedure.

#### 4.2 Area Manager

An Area Manager is accountable for:

- ensuring only trained and competent personnel perform work in accordance with this procedure.
- training of personnel in the procedure.
- participating in audits and investigations pertinent to this procedure.

#### 4.3 Area Superintendent

An Area Superintendent is accountable for:

- authorisation of Isolation Officers and Recipients within their teams.
- ensuring personnel involved with isolations within their team are competent and that they conduct all work in accordance with this procedure.
- ensuring nominated personnel conduct regular audits of the procedure in their area.
- ensuring isolation and related incidents are investigated with key learning's communicated.
- participating in audits and investigations pertinent to this procedure.

#### 4.4 Electrical Integrity Superintendent

In addition to the Area Superintendent's accountabilities, the Electrical Integrity Superintendent is also accountable for:

- conducting practical assessments of competency for Master Electrical/Instrument Isolation Officers.
- conducting practical assessments of competency for Contractor E/I Isolation Officers.
- authorisation of Contractor E/I Isolation Officers.

#### 4.5 Superintendent Contract Management

The Superintendent Contract Management is accountable for:

- authorisation of Recipients within the contracting teams.

#### 4.6 Supervisor

A Supervisor is accountable for:

- coaching all personnel in their team in all aspects of isolations and ensure that they are competent and that personnel conduct all work in accordance with this procedure.
- participating in auditing and investigations pertinent to this procedure.

**4.7 Electrical/Instrument Supervisor**

An Electrical/Instrument Supervisor is accountable for:

- coaching all personnel in their team in all aspects of isolations and ensure that they are competent and that personnel conduct all work in accordance with this procedure.
- conducting practical assessments of competency for Electrical/Instrument Isolation Officers.
- completing competency to operate assessments for electrical isolators and electrical circuit breakers.
- participating in auditing and investigations pertinent to this procedure.

**4.8 Alumina Producer**

An Alumina Producer isolating equipment for further work to be conducted is accountable for:

- ensuring the system is isolated, drained and proven de-energised.
- hanging Drainage Confirmed and/or Drainage Not Confirmed Tags and removing them on completion of the work.
- re-energising the equipment on completion of the work.

**4.9 Isolation Officer**

Isolation Officers are personnel who have been trained and assessed competent and authorised to:

- lock out for Single Point isolations.
- lock out for Own Work Group isolations.
- set Piping and Electrical Permits only for specific equipment for which they have been trained and assessed competent.

These tasks can be performed within:

- a sub area of a section (eg. Mills in Digestion).
- specific plant or equipment (eg. Filter Press in Clarification).
- and/or generic equipment group (eg. pumps in Precipitation).

Isolation Officers shall only lock out to the level and area they have been assessed as competent.

Isolation Officers are accountable for:

- developing Isolation Lists for work.
- prior to making plant or equipment available for isolation lock out, ensuring that all sources of hazardous energy have been removed, proved and secured or controlled and piping systems are drained.
- recording equipment isolations on Isolation Lists and signing against these.
- reviewing Isolation Lists to ensure they are accurate for the work scope.
- ensuring that plant or equipment can be safely de-isolated.
- communicating to the Area Supervisor any conditions that may introduce unforeseen risk/s associated with plant or equipment isolation, i.e. inability to flush, imperfect isolations, etc.
- issuing Permits as authorised by the Supervisor for plant or equipment within their area of authority.
- managing lock out devices.
- managing Lock Sets including returning all locks from Permits.
- participating in any audits or investigations as requested.

**4.10 Isolation Officer Own Work Group**

Isolation Officers Own Work Group are personnel who have been trained and assessed competent and authorised to lock out for Own Work Group isolations only.

These tasks are approved by the Area Superintendent with a Register displayed in the section.

Isolation Officers Own Work Group are accountable for:

- developing Isolation Lists for the task.
- prior to making plant or equipment available for isolation lock out, ensuring that all sources of hazardous energy have been removed, proved and secured or controlled and piping systems are drained.
- recording equipment isolations on the Isolation Statement and signing against these.
- ensuring that plant or equipment can be safely de-isolated.

- communicating to the Area Supervisor any conditions that may introduce unforeseen risk/s associated with plant or equipment isolation, i.e. inability to flush, imperfect isolations, etc.
- managing lock out devices.
- managing Lock Sets and Lock Boxes.

#### 4.11 Master Isolation Officer

Master Isolation Officers are personnel who have been trained and assessed competent and authorised to:

- lock out for Single Point isolations.
- lock out for Own Work Group isolations.
- set Piping and Electrical Permits and Confined Space Isolation Permits.

These can be performed within all areas of a section (eg. all areas of Boilerhouse).

Master Isolation Officers are accountable for:

- developing Isolation Lists for work.
- prior to making plant or equipment available for isolation lock out, ensuring that all sources of hazardous energy have been removed, proved and secured or controlled and piping systems are drained.
- recording equipment isolations on Isolation Lists and signing against these.
- reviewing Isolation Lists to ensure they are accurate for the work.
- ensuring that plant or equipment can be safely de-isolated.
- communicating to the Supervisor any conditions that may introduce unforeseen risk/s associated with plant or equipment isolation, i.e. inability to flush, imperfect isolations, etc.
- issuing Permits as authorised by the Supervisor for plant or equipment within their area of authority.
- managing lock out devices.
- managing Lock Sets including returning all locks from Permits.
- participating in any audits or investigations as requested.

#### 4.12 Trainee Isolation Officer

Personnel undergoing training and assessment as an Isolation Officer may be in possession of an Isolation Officer's key, provided:

- they have been authorised in writing by the Area Superintendent as a Trainee Isolation Officer.
- they have successfully completed SM197 and the theory assessment.
- they are under the close personal supervision of an authorised Isolation Officer at all times when performing tasks under this procedure (section 7.7 lists one potential exception).
- when setting a Permit, the Trainee Isolation Officer signs the bottom of the Permit along with both authorised Isolation Officers who assisted the Trainee in setting the Permit.

A Trainee Isolation Officer may lift a Piping and Electrical Permit if deemed competent by the person's Supervisor.

#### 4.13 Person in Control (Energised Work)

The Person in Control is accountable for:

- developing a pre-task hazard assessment JHA for the energised work task and obtaining approval for the work if an approved PPM does not exist.
- confirming the effectiveness of the controls associated with the live work.
- ensuring the work area is controlled to prevent unauthorised access.
- being part of the Work Group and directing all work associated with the task including effective communication with all personnel working on the energised equipment.

#### 4.14 Recipient

A Recipient is accountable for:

- checking that the Permit isolations cover the work scope.
- ensuring the Permit Board is secured, isolation list is signed and attached, the Blue Isolation Lock key is secured in the Permit Board and the Permit is not suspended or restricted to another work group.

- attending the work site with an Isolation Officer for placement of the Orange Equipment Identification Tag on the equipment to be worked on.
- ensuring any electrical equipment isolated under a Piping and Electrical Permit cannot be energised or started prior to hanging of any Personal Red Locks.
- stopping all work and notifying the Supervisor if any isolation points are compromised.
- ensuring all Personal Lock Holders understand the isolation and work scope and that they attach and remove their Personal Red Lock as required.
- signing on and off the Work Scope during the shift.
- signing off the Work Scope jobs when completed.

#### 4.15 Personal Red Lock Holder

A Personal Red Lock Holder is accountable for:

- before commencing work, having a face to face meeting with the Recipient when working under a Permit or Isolation Officer when working under an Isolation Statement to review the isolation and work scope.
- confirming the equipment to be worked on corresponds with the Permit Work Order Number
- checking the Yellow Isolation Lock has secured the Blue Lock key in the Permit Board.
- notifying the Recipient if any isolation point is compromised.
- checking the Isolation List / Statement is in place and corresponds to the Permit to Work number.
- locking on to the Permit.
- signing on to and off an Isolation Statement for a Single Point isolation.
- signing on to and off a Confined Space Entry Permit.
- completing a pre-task hazard assessment with the work group.
- removing their Personal Red Lock;
  - if there is an extended break in work.
  - if they transfer to another work area.
  - prior to leaving the site.
  - on completion of the work.

The competency of a Personal Lock Holder is not area or system specific.

#### 4.16 Visitor Lock Holder

A Visitor issued with a Personal Red Lock assumes the same accountabilities as a Personal Lock Holder. Their Red Lock shall be returned to the Safe Access Coordinator at the end of the visit.

#### 4.17 Safe Access Coordinator

A Safe Access Coordinator is accountable for:

- issuing and controlling locks and keys associated with the Isolation Tag and Lockout system in their operational area.
- conducting theory training for all Isolation Officers and personal Red Lock holders.
- conducting practical assessments of competency for all personal Red Lock holders including Contractors.
- conducting practical assessments of competency for all Isolation Officers except Electrical/Instrument.
- recording competency assessments against the individual's profile in SAP.
- maintaining a database of system hardware.
- conducting scheduled audits and investigations.

This role is the only one authorised for the purchase, removal from service or replacement of any Locks and Keys used in this procedure.

#### 4.18 Notes

No person is authorised to remove or operate an isolator that has an Isolation Lock attached. A radiation source that is a part of a density meter is able to be moved to the radiation safe storage area with a Blue Isolation Lock in place on the shutters. The reason for this being allowed is that the energy source is still contained and controlled by the Blue Lock. This task must be done in accordance with Work Instruction W202.902.09.

There shall be no delegation in the hanging of any Tag or Red Personal Lock. The person who hangs a Tag shall be the person whose name appears on the Tag. A personal Red Lock shall only be hung and removed by the person who owns the Red Lock.

## 5.0 REFERENCES

P001.010 Control of Entry To and Exit From the Site  
 P314.101 Management of Ionising Radiation Sources  
 P314.227 Alternate Lockout for Electrical Enclosures  
 P314.264 Orange Tag Procedure  
 P314.270 Imperfect Procedure  
 P314.274 High Voltage Access and Switching Procedure  
 P314.314 Permit to Work  
 P314.315 Permit to Remove Non-Coloured Red or Green Cladding  
 P314.611 Electrical Installations Testing  
 P314.618 Unterminated Electrical Cables  
 P314.619 Working On or Near Live Low Voltage Electrical Equipment  
 P746.211 Emergency Response First Response Team  
 P756.049 Relief Valve Access  
 PM316.001.52 Conveyors – Change Out Rollers  
 W202.902.09 Radiation Source Storage and Movement  
 W314.260.01 Management of Piping and Electrical and Confined Space Isolation Permits  
 W314.260.15 Managing the Safety Tag Database  
 W314.260.16 CSIP Isolations for Precipitation and Digestion Baro Cells  
 W314.260.17 Hanging of Blue Lock over the Radiation Safety Officers “Source Lockout Lock”  
 W314.260.18 Isolation Process for Plumbing and Fire Water System Work  
 W314.260.19 Work Performed by Electrical/Restricted Electrical Contractor Isolation Officers  
 W314.260.20 Work Instruction for Energised Work  
 W314.260.21 Work Instruction for Lifting Conveyor Counterweights  
**W716.300.05 Isolation of ATOM Systems from QAL Equipment (Outside Fuel Bunds)**  
 SM195 Personal Red Lock Holder Training Module  
 SM196 Recipient Training Module  
 SM197 Isolation Officer Training Module  
 SM198 Isolation Officer Own Work Group Training Module  
 SM199 Person in Control for Energised Work Training Module

## 6.0 DEFINITIONS

### 6.1 Authorised Person

A person trained and assessed as competent and appointed by their Superintendent.

### 6.2 Competent

Being assessed by the person’s Supervisor as having the skill or ability to carry out the work without direction or supervision or able to assess if a particular piece of equipment is safe to use.

### 6.3 Control Point

A point used to operate and/or control an item of plant or equipment under the energised work process. Control points may occur at multiple locations. This point is controlled by the Person in Control.

### 6.4 Energy Source

Energy source is any energy that can harm individuals or damage equipment eg Steam, Heat, Electricity, Pressure, Caustic Liquor, Fuel, Radiation, Mass and Height (falling, sliding, or slipping objects and person falling) and Tension (spring, belt, cable or rope). Energy is either external to the isolated system being worked, or stored within.

### 6.5 Energised Work

Work on plant or equipment where it is not possible to complete the work while the equipment remains isolated. Energised work includes work on online equipment involving removal of any components or putting a person’s body or body parts at risk. It may include tasks such as testing, commissioning, adjusting, inspecting, pre and post maintenance tasks and pre-start checks.

## 6.6 External Energy Source

External energy source is any energy source from outside the system that needs to be isolated to allow work to be done safely. All external energy sources shall be proven to be isolated before work commences.

## 6.7 Extra Low Voltage Electrical System

An extra low voltage electrical system is any electrical system of 50 volts AC or less or 120 volts DC or less. Examples may be but not limited to: -

- Vehicle batteries and electrical systems.
- Instrument control circuits.
- DCS / Bailey systems.
- Substation trip supplies

## 6.8 High Voltage Electrical System

A high voltage electrical system is any electrical system above 1000 volts AC or 1500 volts DC. Examples may be but not limited to: -

- Primary distribution transformers and air break switches.
- Electrostatic precipitator transformers.
- 11 and 3.3 kV motors and switch gear.

## 6.9 Isolation List

A list of isolation points logged on a Permit or Isolation Statement

## 6.10 Isolation Statement

A Tag that records the list of isolations used by Isolation Officers for isolating equipment under the Single Point and Own Work Group Isolation processes.

## 6.11 Isolator

An isolator is a physical device that people can reliably apply or activate to stop the flow of energy from any energy source.

- Isolators of external energy sources feeding into the system that is being made safe to work on can be but not limited to, a switch, circuit breaker or fuse in an electrical circuit, valve or blind in a piping circuit.
- Isolators of stored energy within the system to be worked on can be but not limited to:
  - a shutter on radiation source eg density meter,
  - mechanical clamp on spring hangers and conveyor counterweights,
  - restraints or chocks on masses that can move, roll or fall,
  - a plug screwed into the end of a small-bore pipe.

A blockage holding back a head of liquid is not an isolator as it can let go at any time. The blockage is not within the control of the operator and cannot be "reliably applied." Pressure relief devices such as relief valves and rupture disks are not isolators. They are safety devices that can function at any time due to process upsets or mechanical failure.

## 6.12 Major or Remote Components

Major components are the significant pieces of equipment to be removed from a system that can be mistaken for similar components that are in service.

Remote components are parts of the isolated system that are to be removed but need separate identification because of their separation and possibility of confusion with adjacent piping.

## 6.13 Person in Control (Energised Work)

A person who is a Personal Red Lock Holder, assessed competent against training module SM199 to control energised work and approved by a Superintendent.

## 6.14 PPM

Picture Process Map



**6.15 Process Isolators**

Process isolators cover all isolators that are not electrical. These are isolators of:

- Process streams such as steam, caustic liquor, slurry (ground bauxite, red mud, hydrate), condensate, water (cooling, process, potable or safety shower), air, gas, fuel oil, acid, and flocculants.
- Bulk materials such as alumina, bauxite, coal and lime.
- Hydraulic power.

A cold valve is a closed valve that has atmospheric pressure on either side of the valve.

A hot valve is a closed valve that has system pressure on one side of the valve and atmospheric pressure on the other.

**6.16 Recipient**

A person assessed as competent as a Recipient by completing SM196 training module, who is an authorised representative and member of the Work Group performing the work. The person must hold the competency for hanging a personal Red Lock by completing SM195 training module. Fourth and fifth year QAL Apprentices may qualify as Recipients if they are deemed competent and are authorised by their Superintendent.

**6.17 Stored Energy**

Stored energy is trapped energy within an isolated system that needs to be de-energised, contained or controlled before work can be done safely. Identifying the stored energy in an isolated system is a necessary step in conducting a pre-task hazard assessment prior to work starting.

The following list gives examples of stored energy to be considered:

- A head of liquid (due to blinds, undrained valves, blockages or goosenecks in pipes, temporary vacuum) when draining sealed vertical piping.
- Combustible material (natural gas, heater vent gas, coal, fuel oil, diesel, lube oil and grease, degreasers, cooling tower packing, conveyor belting, powdered flocculants).
- Radiation source such as density meter.
- Mechanical energy in spring hangers and stretched cables.
- Tensioned conveyors due to counter weights or product on the belt.
- The weight of a hanging chain over a sprocket.
- Any piece of equipment or object that can roll or rotate eg boiler air heaters, mill beater wheels, and all mobile equipment.
- Any piece of equipment or object that can move or fall.
- Hung up material such as clinker in boilers, bauxite and coal in bins, scale on flash tank domes and swirlers.
- Electrical energy stored in capacitors and batteries.

**6.18 Visitor**

A person visiting the site who is not a QAL employee or Contractor employed on site and who is not site inducted and has not completed SM195 training. The visitor shall be issued with a Visitor Lock for the purpose of inspections or work performed under the emergency access procedure P001.010.

**6.19 Zero Energy**

Zero energy means all the external energy sources have been isolated and there is no stored energy where the isolated system is going to be broken into. Examples may be but not limited to:

- Valves closed, system probed and drained, with no heads of liquid.
- Conveyor counterweight energy secured.
- Electrical systems isolated, tested to prove "dead" and field tested at local stop/start.
- Static and induced electrical energy discharged with earths applied.
- Radiation source holder shutter closed and locked.
- Pipe vacuum breakers open to prevent syphoning of system contents.
- Action necessary to prevent external energy sources being introduced.

The zero-energy state can change by introducing energy sources such as cranes, turfsors, chain blocks, manual force, applying heat and by removing pieces of equipment and structure as part of the work. The work team shall consider this when the pre-task hazard assessment is done.

## 7.0 ISOLATION SYSTEM

### 7.1 Isolation Processes

There are five separate processes for managing isolations at QAL. These are:

- Single Point Isolation
  - Single person, single shift
  - Multiple person
- Own Work Group Isolation
- Multiple Point Isolation for Piping and Electrical Permits, Confined Space Entry Permits and High Voltage Access and Test Permits
- Energised Work Isolation

The isolation process for plumbing and fire systems work shall follow W314.260.18. Work able to be performed by Electrical or Restricted Electrical Ticket Contractors who are authorised Isolation Officers is covered in W314.260.19.

#### 7.1.1 Single Point Isolation, Single Person, Single Shift

This Isolation process shall only be utilized when the following conditions can be met:

- All work is carried out and completed by a single person.
- There is only a single source of energy to be isolated.
- The Work Scope shall be completed within the current shift.
- The person carrying out the work shall be an Isolation Officer authorised for the nominated plant or equipment.
- The isolation of the energy source shall be proven prior to the work commencing.
- The isolation point shall be secured by attaching a Personal Red Lock and an Isolation Statement which the Isolation Officer signs on to and off.

This process cannot be used if an Orange Tag is needed. In this case a Piping and Electrical Permit is required.

If the work cannot be completed within the shift then at the completion of the shift the Isolation Officer shall remove the personal Red Lock and Isolation Statement and hang a Yellow Lock and Out of Service Tag on the isolator. The Isolation Officer shall then arrange for a Piping and Electrical Permit to be set for the next Work Group to complete the job.

#### 7.1.2 Single Point Isolation, Multiple Persons

A Single Point, Multiple Persons Isolation involves an Isolation Officer and Personal Lock Holders. The procedure is described below.

- Work is carried out by more than one person.
- The work may be performed over more than one shift.
- There is only a single source of energy to be isolated.
- The isolation shall be performed by an authorised Isolation Officer.
- The authorised Isolation Officer performing the isolation is a member of the nominated Work Group.
- The isolation of the energy source shall be proven prior to the work commencing.
- The isolation point shall be secured by locking the isolation point with a Yellow Lock and hasp. An Isolation Statement signed by the Isolation Officer shall be attached to the hasp.
- Personal Lock Holders shall lock onto the hasp and sign onto and off the Isolation Statement.

This process cannot be used if an Orange Tag is needed. In this case a Piping and Electrical Permit is required.

At the completion of the shift, the Isolation Officer shall ensure all personal Red Locks are removed and an Out of Service Tag is hung on the isolator with the Yellow Lock.

The on-coming Isolation Officer shall sign on the Isolation Statement before Personal Lock Holders lock onto the hasp and sign onto the Isolation Statement.

### 7.1.3 Own Work Group Isolation

Own Work Group isolations are designed for frequent tasks carried out within a shift that involve breaking into process equipment eg. pulling screen boxes, opening filter presses, standard work for an instrument PM requiring isolation. They shall only be performed when:

- There is only one Work Scope performed within the isolation boundary.
- There is only one Work Group working within the isolation boundary.
- The Work Scope shall be completed within the current shift.
- The authorised Isolation Officer performing the isolation is a member of the nominated Work Group.
- There is only one Isolation Officer required to perform the necessary isolations.
- The isolation of the energy source shall be proven prior to the work commencing.
- An approved PPM shall consider all the hazards associated with the work including hazardous energy and shall identify all isolation points required to safely complete the work.
- Own Work Group isolations shall be recorded on the Isolation Statement at the time of isolation.
- All personnel working under the Own Work Group Isolation shall attach their Personal Red Lock to the hasp on the Blue Own Work Group Isolation Lock Box and sign on to and off the Isolation Statement.
- Isolations using this process shall be authorised by the Area Superintendent and documented in writing.
- No Orange Tags are hung under an Own Work Group isolation.

Own Work Group isolations may also be used for change out of rollers on conveyor systems in Raw Materials as per PM316.001.52. The above criteria also applies to these tasks.

### 7.1.4 Multiple Point Isolation

Multiple Point isolations are used when more than one isolation point is required to effectively de-energise plant or equipment. This excludes isolations conducted under the Own Work Group Isolation procedure in 7.1.3.

Work under multiple point isolations requires either a Piping and Electrical Permit, Confined Space Isolation Permit or High Voltage Access Permit. The detailed steps for setting and managing a Piping and Electrical Permit and a Confined Space Entry Permit are listed in Work Instruction W314.260.01. The setting and management of a High Voltage Access or Test Permit is detailed in Procedure P314.274. There will be some cases where a single point isolation will require a Piping and Electrical Permit eg. if an Orange Tag is involved. The linking of Permits is also covered in Work Instruction W314.260.01.

### 7.1.5 Energised Work Isolation

The Energised Work isolation process is used when it is not possible to complete work on plant or equipment while the equipment remains isolated or for working on or troubleshooting on-line equipment. This may include but is not limited to: testing, adjusting, inspecting, inching, commissioning, tracking, fault finding, pre and post maintenance tasks, pre-start checks etc. The procedure for carrying out energised work is detailed in Work Instruction W314.260.20.

**The Energised Work isolation process shall never be used as a substitute when normal isolation and lockout is possible.**

## 7.2 Planning for an Isolation

For each of the above processes, the basic steps in the isolation process are:

- **Plan** the Isolation
- Effectively **isolate the equipment** to be worked on from all external energy sources ensuring the area is clear of personnel before proving isolation

- **Prove isolation** at each isolator
- **Lockout the isolation points** so that no one can accidentally re-energise the system before work is complete
- Clearly **identify the equipment** to be worked on and **identify any residual stored energy**
- **Remove all locks** to complete the job
- **Re-energise the equipment** to resume normal operation

Sections 7.2 to 7.8 describe these steps.

For isolation processes other than Own Work Group isolations, planning the isolation involves the section Planner allocating a Work Order Number and specifying the work scope of each job. This determines the isolation requirements and resources needed to do the job. The Planner then needs to schedule the equipment to be isolated, drained, locked out and the Permit set. Special consideration needs to be given to the scheduling of the hanging of any Orange Tags by an authorized Isolation Officer and a Recipient of the Work Group and the workflow where Permits need to be suspended or restricted to a single Work Group (see Orange Tag Procedure P314.264 and Work Instruction W314.260.01).

The authorised Isolation Officer(s) who will conduct the lock out needs to review the Isolation Lists (filed in the Safety Tag Database) for that piece of plant or equipment to determine if the isolations adequately cover the scope of work. If not, a new Isolation List needs to be developed.

### 7.3 Isolating Plant or Equipment

This step involves the physical act of operating a device such as a valve, switch or circuit breaker, or breaking a line to insert a blind, chocking, securing, discharging or rendering energy incapable of being made live or operational.

Typical isolators of stored energy within the system to be worked on can be, but are not limited to:

- Valves
- A shutter on a radiation source
- Mechanical clamp on spring hangers
- Pins or mechanical clamps on conveyor counterweights
- Restraints or chocks on masses that can move, roll or fall.

#### Note:

- **A blockage holding back a head of liquor is not an isolator as it can release at any time. The blockage is not within the control of the operator.**
- **In scaling environments in the Bayer plant, it is essential to get metal to metal contact of the valve disk against the valve seat to prevent isolating on scale which can be dislodged at a later date either mechanically or during chemical cleaning.**

The following devices shall not be used as isolators:

- Local start/stop buttons
- Emergency stop buttons
- Pull wires
- Interlocks
- Control circuitry
- Non-return valves
- Pressure relief valves
- Rupture discs
- Modulating control valves
- Solenoids
- Contactors

#### 7.3.1 Isolation for Piping and Electrical Permits

Process isolators for Piping and Electrical Permits can be:

- positive isolators eg blinds

- proven or acceptable standard valve isolation (see section 7.4)

All process isolators shall have a locking device attached and secured with a Blue Lock. The locking device shall not allow the isolator to be operated.

The Imperfect Procedure P314.207 applies if isolation is not to the acceptable standard (see section 7.4.3).

When isolating equipment such as fans or agitators, consideration shall be given to this equipment having the potential to rotate or move due to natural convection.

Electrical isolators or circuit breakers for Piping and Electrical Permits shall involve:

- turning off full load switches and noting change in isolation lights on the door of the cabinet from three lights on to three lights off and then locking by an Isolation Officer, or
- isolating and then unplugging a de-contacter plug and locking the plug and socket end directly with separate Blue Locks or by locking the plug and socket together in the de-contacter isolation cabinet by an Isolation Officer, or
- turning off full load switches and then voltage testing for isolation by an Electrician in the presence of an Isolation Officer, or
- removing fuses by an Electrician and then voltage testing for isolation by an Electrician in the presence of an Isolation Officer, or
- racking out or removal of a switchgear circuit breaker by an Electrician with a White Information Tag hung on the circuit breaker, or
- isolating as per Procedure P314.227 Alternate Lockout for Electrical Enclosures.

People working on the isolated system can verify electrical isolation by:

- matching the equipment ID number located on the electrical isolation point or switchgear circuit breaker with the equipment in the field.
- checking the White Information Tag on the sub-station breaker to confirm that it is signed off and tested dead by the Isolation Officer or Electrician.
- testing the local start button to confirm the motor does not start, then push the stop button in.

All substation cubicles and fuse boards must be lockable. If the cubicle cannot be locked, an alternate method of circuit lockout shall be developed with the Safe Access Coordinator utilising electrical lockout devices shown in Form EI-064.

### 7.3.2 Isolation for Confined Space Isolation Permit (CSIP)

Process isolators for Confined Space Isolation Permits can be:

- blind or blank flanges properly fitted with gaskets.
- removed piping spool with a physical barrier to prevent reattachment of spool. This is usually a tightened bolt through one of the boltholes of the adjoining pipe flange. The open pipe flange cannot be directed at the confined space opening.
- Dampers or Louvre Blinds in air or gas ducting that are closed and Blue Locks attached.
- Blue locked gate valves or weir blinds to separate cooling tower ponds.
- Blue locked gate valves on fire water supply lines to FFE Calciner cooling towers and Boilerhouse Turboalternator cooling tower.
- Blue locked isolation valves on water supply lines to Turboalternator cooling tower cells with drain valves Blue locked open (this only applies until blinding stations are fitted to each of the four supply lines)
- Blue locked gate valves at the sewerage treatment plant.
- Blue locked knife gate (Clarkson KGD Knifegate) on Mainland A frame air slide air supply.

- 16A303 and 16D001 emergency chute knife gates that are pinned and blue locked closed and actuator air lines that are disconnected and blue locked.
- **16Q134, 16Q135, 16Q136 & 16Q137 HVAC knife gates that are pinned and blue locked closed and actuator air lines that are disconnected and blue locked**

**Special Note:** With the exception of Boiler Turnarounds, Double Block & Bleed Isolation Permits are to be used when performing work in the Superheater, Convection Pass and Furnace of Coal Fired Boilers 1 to 7. Required isolation permits can be located in the Safety Tag Database.

Positive electrical isolation for Confined Space Isolation Permits shall involve:

- isolating and unplugging a de-contactor plug and locking the plug and socket end directly with separate Blue Locks or by locking the plug and socket together in the de-contactor isolation cabinet by an Isolation Officer, or
- isolating a full load circuit breaker and then voltage testing for isolation by an Electrician in the presence of an Isolation Officer, or
- isolating full load fused isolators and then removing main phases and control fuses and then voltage testing for isolation by an Electrician in the presence of an Isolation Officer, or
- removing fuses by an Electrician and then voltage testing for isolation by an Electrician in the presence of an Isolation Office, or
- racking out or removing a switchgear circuit breaker by an Electrician and hanging a White Information Tag hung on the circuit breaker, or
- isolating as per Procedure P314.227 Alternate Lockout for Electrical Enclosures.

People entering dry cargo holds on ships berthed at the QAL wharf shall follow the isolation requirements under the ship's isolation and work procedures and QAL's Work Instruction W314.308.01.

### 7.3.3 Isolation of a Conveyor for Lifting of the Counterweight

Where a counterweight on a conveyor has to be lifted, the Work Instruction W314.260.21 shall be followed.

### 7.3.4 Isolation for Vehicles

Light vehicles with no battery isolator require no lockout as long as the ignition key is held by the person working on the vehicle.

All other vehicles shall have the battery isolated and locked as per the Single Point Isolation process (section 7.1.2).

### 7.3.5 Isolation for Extra Low Voltage Systems

Hazard identification and management of risks must be applied when working on extra low voltage systems. Electrical isolation for such tasks is not mandated but should be used where possible and available as per the pre-task hazard assessment.

Work on battery systems with a total capacity of 20A.h or higher shall require arc fault PPE protection (CAT Level 1) with the use of voltage rated insulated tools and a safety observer present.

### 7.3.6 Radiation Sources

Isolation of radiation sources shall be performed by a Radiation Safety Officer as per Procedure P314.101 – Management of Ionising Radiation Sources.

Radiation Source Permit lockouts shall be performed as per Work Instruction W314.260.17 – Hanging of Blue Lock over the Radiation Safety Officers "Source Lockout Lock".

**7.3.7 Isolating of Dry Steam Instrument Lines**

During the isolation process, dry steam lines shall be safely drained to minimise the likelihood of contact with black oily residues. Black oily residues can be extremely corrosive and skin contact should be avoided.

**7.3.8 Isolation for ATOM fuel pipeline system**

*Isolation of connections between QAL equipment and ATOM equipment shall be provided per work instruction W716.300.05.*

**7.4 Proving Isolation****7.4.1 Positive Isolation**

Positive isolation is where a physical barrier prevents energy sources from compromising isolation integrity irrespective of changes in conditions.

This can be achieved by removing a valve or spool, removing control fuses, unplugging a de-contacter, racking out a circuit breaker and installing a blind in the system. Alternatively, a blind can be inserted between flanges to eliminate potential energy sources.

Blinds are locked to prevent inadvertent tampering.

**7.4.2 Proven Isolation**

Proven isolation is where physical checks have been made to satisfy the Isolation Officer that the isolator does in fact isolate the external energy source. Proven process isolation is a valve isolated against normal operating pressure or voltage testing by an Electrician after isolation. Flushing liquor or hose water at matching normal process operating pressure can be used to prove valve isolation. Isolation can only be proved when the valve is opened and flow is observed from the drain and then re-isolated and no flow is observed from the drain.

Proven isolation is "hot" valve isolation. A single "cold" valve shall not be used as a proven isolator.

Only proven "hot" valve isolation is acceptable for mid and high-pressure slurry or liquor systems (300 psi and 600 psi) in Digestion ie. no hot drips or puffs of steam from the bayonet drain.

**7.4.3 Acceptable Isolation**

Isolations of external energy sources shall be proven to the satisfaction of the work group who do the work. The standard for acceptable isolation is:

- Low-pressure systems (150 psi rating) - no more than a "pencil lead" thickness of liquid draining from the system.
- Two "cold" valves with a proven open drain between them. A White Information Tag shall be hung on the cold valve where the Blue Isolation Lock is hung to indicate that it is a cold valve. If two "cold" valves with a proven open drain between them are to be used for isolation in the mid and high-pressure slurry or liquor systems (300 psi and 600 psi) in Digestion, then the Imperfect procedure P314.270 must be invoked.
- Steam valves - no steam issuing from the drain. A water hose may be applied to the cast steel body of the valve to achieve this. As the water hose is integral to achieving the acceptable isolation to allow a Piping & Electrical Permit to be set, the water hose must be affixed to the steam valve. The method of affixing the hose and the water flow control valve must be Blue locked as part of the Permit.
- Electrical isolators – isolation of full load switches turned off and isolation lights change state (three lights on then three lights off) on the door of the cabinet.

**7.4.4 Isolation of Gas Systems**

The CSIP isolation standard shall apply for any work on gas systems where a Hot Work Permit is mandated.

For all other work, the minimum standard of isolation shall be double block and bleed with the upstream valve a "hot" valve. The exception to this is the main isolation valves for each of the

FFE Calciners and the Lurgi. Isolation here is obtained by isolating the main isolation valve, opening the downstream vent valve and checking the downstream pressure gauge is reading zero pressure.

#### **7.4.5 Drainage Tags**

A green Drainage Confirmed Tag shall be hung on drain valves by the person isolating the system when the expected volume has been released and drainage has been confirmed (see section 7.10.1).

If drainage cannot be confirmed, the person isolating the system shall hang a red Drainage Not Confirmed Tag to indicate the isolation is not acceptable.

**If isolation is not to the acceptable standard, the section Safe Access Coordinator shall be contacted to invoke the “Imperfect Procedure” P314.270.**

For complex systems with multiple drainage points or syphon breakers, the Drain/Syphon Breaker Check List (Form S-049) may be used to log all locations of where Drainage Tags have been hung. This can assist with the line-up check before the system is returned to service. The Check List is placed behind the Permit in the Permit Board.

### **7.5 Locking Out**

After successfully proving the isolation, an Isolation Officer shall attach an Isolation Lock to each isolation point to prevent inadvertent operation or activation. An authorised locking mechanism may be incorporated to ensure the security of the isolation point. This Lock may be:

- a Personal Red Lock if that Isolation Officer is to perform a single point, single person task with duration of less than one shift
- a Yellow Master Lock and hasp for Single Point isolations with multiple persons performing a task with duration of one or more shift
- a Blue Lock for multiple point isolations

The positive, proven or acceptable isolation point shall be signed off on the Isolation List or Isolation Statement at the time of attaching the Lock.

Once all isolation points are locked, the Isolation List is locked in the Permit Board with a Yellow Master Lock for Piping and Electrical and Confined Space Isolation Permits or a Black Lock for High Voltage Access Permits. The Isolation Statement is attached to the single point isolation point or the Own Work Group Isolation Box.

**Two authorised Isolation Officers will go together locking isolators, signing off the Isolation List and setting all Permits. Only one authorised Isolation Officer is required to set the isolation for Single Point isolations and Own Work Group isolations.**

#### **7.5.1 Lock Out for Single Point, Single Person, Single Shift**

The isolation point shall be secured by the Isolation Officer by attaching a Personal Red Lock and an Isolation Statement. The Isolation Officer shall sign on and off the Isolation Statement.

#### **7.5.2 Lock Out for Single Point, Multiple Person**

The isolation point shall be secured by the Isolation Officer by locking the isolation point with a Yellow Lock and hasp. An Isolation Statement shall be attached to the hasp.

Personal Lock Holders shall lock onto the hasp and sign on and off the Isolation Statement.

#### **7.5.3 Lock Out for Own Work Groups**

The isolation points shall be secured by the Isolation Officer by locking each isolation point with a Blue Lock and securing the key in the Own Work Group Lock Box with a hasp and Yellow Lock. The Isolation Officer shall attach an Isolation Statement to the Blue Lock Box. Personal Lock Holders shall lock onto the hasp on the Blue Own Work Group Lock Box which is located near the work area and sign on and off the Isolation Statement.

#### **7.5.4 Lock Out for Permits**

The isolation points shall be secured by two Isolation Officers by locking each process isolator and electrical isolator with a Blue Lock and securing the key in the Permit Board with a hasp



and Yellow Lock. Excess Blue Locks from a matched set can be secured with the Permit either by the Isolation Bag or Carry Ring.

Personal Lock Holders shall lock on to the hasp. The Recipient shall sign on and off the Work Scope each shift. Personal Lock Holders shall sign on and off a Confined Space Entry Permit.

#### **7.5.4.1 Lock Out for Equipment within a Confined Space**

There are some instances where equipment that has a single isolator (eg Grantomatic or Hydroblast equipment) has to be isolated and worked on inside a confined space. In this case the equipment will be isolated under a single point isolation process by an authorised Isolation Officer within the overriding Confined Space Isolation Permit.

Personal Lock Holders will use their primary Personal Red Lock to lock on to the Confined Space Isolation Permit. Their secondary Personal Red Lock will be used to lock on to the single point isolator for the equipment.

#### **7.5.5 No Lockout Required**

For some work that can be done with no risk of exposure to potential energy sources, then no Lock out is required.

Examples of work where no Lock out is required are:

- When working on on-line systems and equipment with no exposure to what is inside eg. scaffolding erection and removal, Furmanite sealing, hot-tapping, NDT testing, vibrational analysis, checking, measuring and drilling tapping points using a packed gland stuffing box. (This does not include scaffolding under the Filter Press Floor.)
- Working on equipment remote from the plant eg. working on a heater removed from the heater deck, or a control valve in the workshop.
- Installing / erecting equipment or removing redundant equipment that is not connected to any possible energy source. There can be no isolation point. Unterminated electrical cables shall be managed as per Procedure P314.618 Unterminated Electrical Cables.
- Working on overflow launders or overflow lines of tanks where the level is pumped down so that there is a low risk of overflow while work is in progress. A “cockatoo” is required to continually monitor the level.
- Working on portable electrical equipment with the plug pulled out of the socket

**The Safe Access Coordinator shall be consulted if there is doubt Lock out is required.**

#### **7.6 Identification of Equipment**

For Piping and Electrical Permits, Confined Space Isolation Permits and High Voltage Access Permits, the identification of equipment to be worked on is managed by the Orange Tag procedure P314.264.

For Single Point and Own Work Group isolations, the identification of equipment to be worked on is listed in the Task section of the Isolation Statement attached to the isolation point.

#### **7.7 De-Isolating**

De-isolation is the process of removing the isolation locks from the isolation points enabling the plant or equipment to be returned to service. De-isolation is only possible when the following has occurred:

- the nominated Work Scopes are complete.
- all Permits associated with the isolation are closed.
- all Personal Lock Holders have removed their Red Personal Locks.
- the work area is in a safe state.

De-isolation shall be carried out by an Isolation Officer or a Trainee Isolation Officer who has been deemed competent to lift a Permit by the person's Supervisor who shall:

- check all Red Locks have been removed.
- check all Work Scopes have been signed off and are complete.
- check all Orange Tags have been returned.
- check the work area is in a safe condition.

- remove all isolation locks and initial against each isolation point on the Isolation List. All locks must be accounted for and the Lock Set is complete.
- complete the sign off section on the Isolation List and return documentation to the Safe Access Coordinator.
- contact the Permit Issuer / Supervisor to notify de-isolation is complete and equipment is ready to be returned to service.

## 7.8 Return to Service

The person returning the equipment to service or stand-by after de-isolation must be competent to do so and shall ensure that all work is complete, permits signed off and the equipment is walked to ensure it is safe to return to service or stand-by. The person shall remove any Drainage Confirmed or Not Confirmed Tags during recommissioning.

Some equipment has return to service check sheets that must be filled out. Such checks include:

- checking all work scopes have been completed
- ensuring all permits associated with the isolation have been handed back and closed
- ensuring there is no outstanding maintenance required on the equipment
- checking the area has been left safe and clean by the Recipient and Personal Lock Holders and all tools, old parts etc. have been removed
- checking all flanges, doors, inspection hatches, spools, valves etc. have been correctly reinstated and that they have been properly tightened to prevent leaks when restarted.
- checking of electrical installation test check sheets for new or modified installations by electrical contractors as per Procedure P314.611 Electrical Installations Testing.

## 7.9 System Hardware - Isolation Locks

All locks shall have the danger tag sticker attached with the mandatory requirement – “DANGER, LOCKED OUT, DO NOT REMOVE”. All Locks when in use shall be securely attached.

### 7.9.1 QAL Red Personal Lock

A Personal Red Lock which is keyed individually, is used to protect the Personal Lock Holder by preventing the plant or equipment the person is working on from being started or operated. The Lock shall be attached to the hasp on Piping and Electrical Permits, High Voltage Permits, Confined Space Isolation Permits, Own Workgroup isolations and the isolator for Single Point isolations.

Each Personal Lock Holder shall be issued a Personal Red Lock by a Safe Access Coordinator when they have successfully completed SM195 training module. A Personal Red Lock shall have the name, badge number and photo of the Personal Lock Holder on one side of the Lock.

Some members of the QAL Turnaround and Contract Hydroblast teams, authorised by the QAL Turnaround Superintendent, may be issued with an additional secondary Personal Red Lock for isolation of equipment in confined spaces (see section 7.5.4.1). The secondary Personal Red Lock will have a separate identification to the primary Personal Red Lock engraved on the Lock and shall only be used for the purpose stated in section 7.5.4.1.

A person shall NOT use another person's Personal Red Lock and key under any circumstances. No person shall remove another person's Personal Red Lock, except as allowed under the Forced Removal Procedure (see section 7.11).

Each person shall remove their Personal Red Lock, either at the end of the job, or prior to leaving the site.

If a Visitor requires a Personal Red Lock then it will be issued by a Safe Access Coordinator without a photo on the Lock. The Visitor shall be supervised by a competent Personal Red Lock Holder at all times.



### 7.9.2 Blue Isolation Lock

Blue Isolation Locks are used to lock plant and equipment where there are multiple energy sources to be isolated for the work. Specifically, the Locks are used for:

- securing electrical and process isolators for Piping and Electrical Permits, High Voltage Permits, Confined Space Isolation Permits and Own Workgroup isolations
- locking or linking two permits together,
- securing the control fuse cabinet. When Electricians remove control fuses, they secure the control fuse cabinet with a Blue Lock. The key and the control fuses are placed in a Yellow Isolation Bag and secured by a Yellow Lock and hasp to the lockout of the breaker or switch.

These locks come in sets and have a common key for each separate set. No two sets are the same. The Safe Access Coordinator shall be responsible for isolation lock and key sets for their section.

The Blue Isolation Lock shall only be attached and removed by an Isolation Officer who has been trained and assessed as competent to carry out the isolation procedure for that piece of plant or equipment. Unused Locks in a set will be retained in the Permit Room.



### 7.9.3 Yellow Master Lock

Yellow Master Locks which are keyed alike, are used to secure the hasp and the Isolation List and Blue Isolation Lock keys in Permit Boards.

The Locks shall only be attached and removed by an Isolation Officer who has been trained and assessed as competent to carry out the isolation procedure for that piece of plant or equipment. Each of these Isolation Officers will hold a key.



#### 7.9.4 Black High Voltage Lock

Black High Voltage Locks which are keyed alike are used to secure the hasp and the Isolation List and Blue Isolation Lock keys for High Voltage Access and Testing Permits.

The Locks shall only be attached and removed by a High Voltage Switching Officer who has been trained and assessed as competent as per procedure P314.274.



#### 7.9.5 Orange Lock

An Orange Lock is used to lock open an isolation valve between a vessel or process line and an in-service relief valve. This is necessary to prevent the relief valve being isolated and rendered inoperable putting the pressure system integrity it is designed to protect at risk.

These locks come in sets and have a common key for each separate set. No two sets are the same. The Safe Access Coordinator shall be responsible for isolation lock and key sets for their section.

The procedure for use of Orange Locks is detailed in P756.049 Relief Valve Access.



## 7.10 System Hardware – Information Tags

There are a number of different coloured tags in the Isolation, Tag and Lockout System. Each has a specific purpose for communicating information about the isolation, the plant or equipment or the status of work.

### 7.10.1 Drainage Confirmed Tag

Drainage Confirmed Tags are hung by anyone on drainage points when a system is being drained for isolation prior to lock out for a Permit or when taking a system off line and placing it in standby.

**DRAINAGE CONFIRMED**

**DRAINAGE CONFIRMED**

**PERSON HANGING TAG:**

I confirm I have witnessed a flow out of the drain after opening the valve and the system is drained down in this section of pipework.

Date: \_\_\_\_\_

Name: \_\_\_\_\_

Badge #: \_\_\_\_\_

Signature: \_\_\_\_\_

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

The person signing this tag is confirming they have witnessed a flow out of the drain after opening the valve and that the system is drained down in this section of pipework. Water, air or liquor may be used to flush the system to verify drainage if necessary.

For systems that take multiple shifts to drain the following procedure will be used.

- The person who initially opens the drain and observes a flow out of the drain will hang a White Information Tag stating their Badge number, the date and time and that a flow has been witnessed out of the drain.
- If the drain continues to flow during subsequent shifts then the Supervisor will record in the shift log results of inspection of the progress of the system being drained.
- On the shift that the flow from the drain stops, then that person will hang the Drainage Confirmed Tag.

These tags must be removed before bringing a system back into service.

**7.10.2 Drainage Not Confirmed Tag**

Drainage Not Confirmed Tags are hung on drainage points by anyone attempting to drain a system for isolation prior to lock out for a Permit.

DRAINAGE  
NOT  
CONFIRMED

Potential energy sources have not been removed from this system. The integrity of the isolation must be assessed using the Imperfect Isolation Procedure.

DRAINAGE NOT  
CONFIRMED

**PERSON HANGING TAG:**

I have not been able to achieve drainage. Integrity of isolation to be assessed & appropriate controls implemented using the Imperfect Isolation Procedure.

Date: \_\_\_\_\_

Name: \_\_\_\_\_

Badge #: \_\_\_\_\_

Signature: \_\_\_\_\_

POTENTIAL ENERGY SOURCES	
Head of liquor (caustic, acid etc)	NOT proven under system pressure
Airlock on closed system	Scaled pipework or valve
Isolation valve passing	Solids (mud, hydrate etc)
Other	

Comments: \_\_\_\_\_

The person signing this tag is confirming they have not been able to achieve drainage after opening the valve and that the system is potentially not drained down in this section of pipework. Reasons for not being able to achieve drainage should be listed on the tag.

The Imperfect Procedure P314.270 must be invoked for work to proceed on this system.

These tags must be removed before bringing a system back into service.

**7.10.3 Isolation Statement Tag**

The purpose of this Tag is to identify the isolation point for a Single Point isolation and for an Own Work Group isolation. The Tag is also used to allow Personal Lock Holders to sign on to the work and off when completed.

The Tag is hung by the Isolation Officer on completion of the lock out and removed when the Locks are removed at the completion of the work. The Tag may be re-used where the task remains the same for the duration of the work.

**ISOLATION STATEMENT**

Isolation Officer:

1. Name: _____	Badge No: _____
Signature: _____	Date: _____
2. Name: _____	Badge No: _____
Signature: _____	Date: _____

Task : \_\_\_\_\_

Isolation Point(s)


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As a Personal Lock Holder, I confirm:

1. The Isolation has been verified
2. A Personal Lock has been applied

Name	Date	Sign ON	Sign OFF

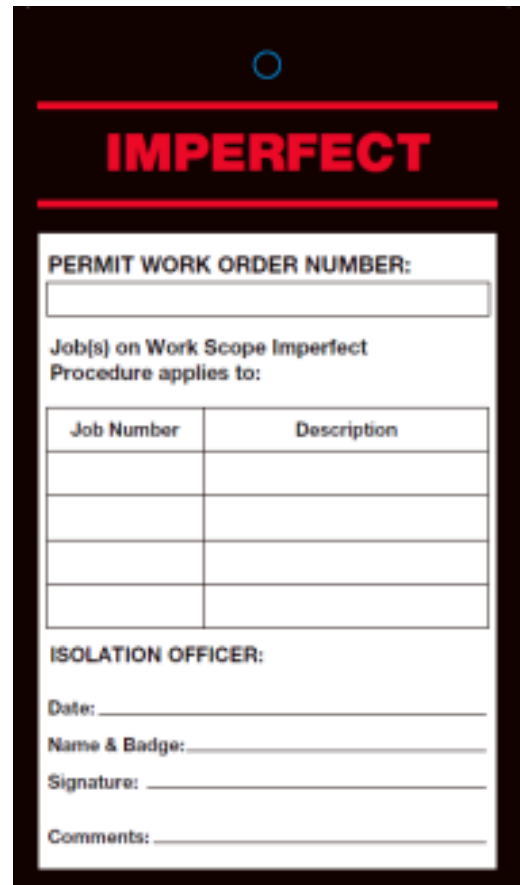
QUEENSLAND ALUMINA LIMITED

**7.10.4 Imperfect Tag**

The purpose of this Tag is to signify to a Personal Lock Holder who is locking on to the hasp of a Permit that one or more jobs in the Work Scopes covered by the Permit are being carried out under the Imperfect Procedure P314.270.

The Tag is hung on the hasp of the Permit by an Isolation Officer when isolation of an energy source cannot be proven or there is an excess of stored energy trapped in the isolated system.

The Tag is removed by an Isolation Officer when the particular job is completed or the Permit is lifted.





### 7.10.5 Caution Out Of Service Tag

The purpose of this Tag is to identify plant or equipment that is out of service and should not be started or operated as this could result in damage to the equipment and/or injury to people.

The Tag can be used when:

- fuses have been removed as part of an Electrical isolation
- work is incomplete
- plant or equipment is faulty, requires maintenance, requires commissioning or is redundant

The Tag can be hung by a person who wishes to take the plant or equipment out of service. The Tag is attached to the isolation point or point of control of the equipment, shall also have a Yellow Master Lock applied unless being used only for Permit purposes.

If the Isolation Point this is attached to is also required for a Piping & Electrical Permit or Confined Space Isolation Permit the Blue Isolation Lock shall be applied in addition to the existing Out Of Service Tag and Yellow Master lock.

The Caution Out of Service Tag / & Yellow Master Lock shall only be removed by a competent person when the equipment is deemed safe to start or operate.

**CAUTION**

**OUT OF SERVICE**

**DO NOT START / OPERATE / USE**

Name: \_\_\_\_\_

Badge No: \_\_\_\_\_

Section: \_\_\_\_\_

Date: \_\_\_\_\_

Action:  Fault  
 Maintenance  
 Commissioning  
 Redundant  
 Other

Detail:  
 \_\_\_\_\_  
 \_\_\_\_\_

Work Order No: \_\_\_\_\_

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**INSTRUCTIONS**

Tag attached when action required by competent person.

Tag must:

- be placed on controls /isolator(s)
- be prominently displayed
- protect equipment

Removal:

- by competent person

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**7.10.6 Energised Statement Tag**

The purpose of this Tag is to identify the primary control point for an energised work task and to warn unauthorised personnel not to operate that control point associated with the energised work task. The Tag is hung by the Person in Control on the primary control point or the Danger Energised Work Board and is used to allow Personal Lock Holders to sign on to the work and off when completed.

The Tag is removed by the Person in Control when the energised work task is completed.

**DANGER  
ENERGISED**

**PERSON IN CONTROL**  
Name: \_\_\_\_\_  
Badge No: \_\_\_\_\_  
Date: \_\_\_\_\_  
Signature: \_\_\_\_\_

**Task:**  
\_\_\_\_\_

**Control Point(s):**

1.	4.
2.	5.
3.	6.

**Comments:**  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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**As a Personal Lock Holder, I understand:**  
1. the Person in Control directs all work  
2. the equipment is energised

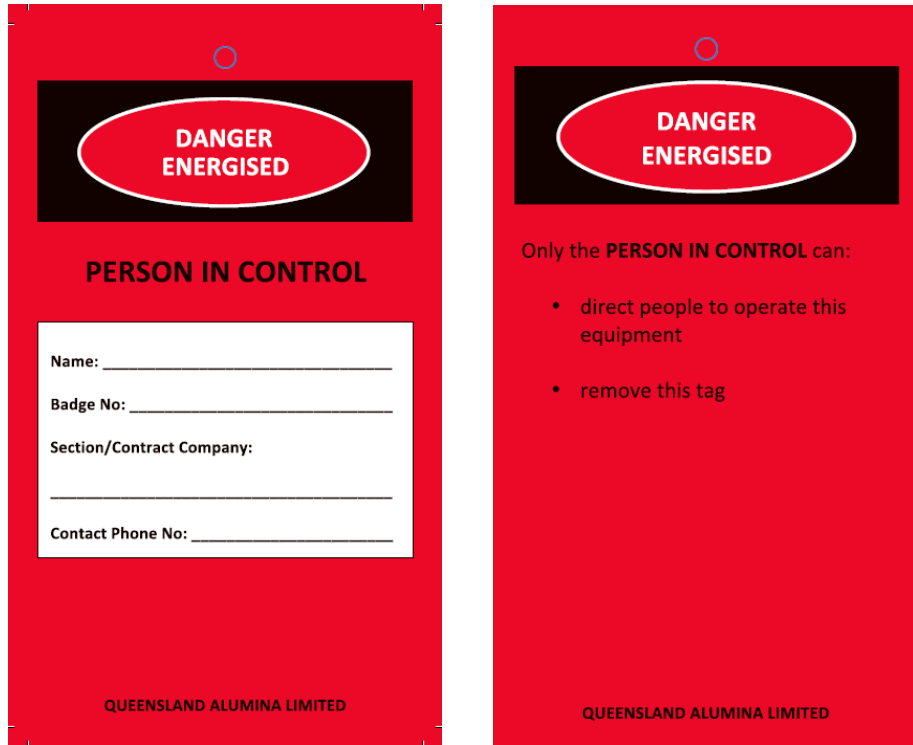
Name	Date	Sign ON	Sign OFF

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### 7.10.7 Person in Control Tag

The Person in Control Tag warns unauthorised personnel not to operate any isolator associated with the energised work task. It identifies the person in control of the equipment and is hung by that person on the isolators that have had a Blue Lock removed as part of the energised work isolation process. A Person in Control Tag does not have to be hung on the primary control point if there was a Blue Lock attached to that point as the Energised Statement Tag is hung on this point.

The Tag is removed by the Person in Control when the energised work task is completed.




### 7.10.8 Danger Energised Work Board

The Danger Energised Work Board is an additional warning for unauthorised personnel not to operate the primary control point associated with the energised work task. The Board is hung or placed near the primary control point by the Person in Control. The Energised Statement Tag may be attached to the Board.




**7.10.9 Orange Tag**

The Orange Tag identifies each piece of equipment to be removed from an isolated system and to indicate that the system is at zero energy between isolation points.



## Orange Tag

- Identifies equipment to be removed from system
- Indicates Zero Energy
- Applies to Piping, Tankage, Pumping and Electrical Systems.
- Together with the Permit it authorises work to start immediately and for up to 1 Day from Date of Hanging.



### Equipment Description

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Work Order No. \_\_\_\_\_

Name: \_\_\_\_\_

Badge No. \_\_\_\_\_

Date of Issue: \_\_\_\_\_

**Important!!**

This tag is only valid for one day after date of issue.

**Reminder!!**

Return this tag to appropriate drop point when removed.

The reason this tag was introduced originally was the result of an accident at QAL where one person was killed and another person blinded after removing a drain valve.

The system was isolated, drained and correctly white, red and blue tagged.

The maintenance people accidentally confused two identical valves adjacent to each other on two separate systems.

One was isolated but the other was energised by high temperature, high pressure caustic liquor.

The subsequent investigation showed that it was a relatively simple mistake to make.

The same type of accident has happened in other plants.

It is critical that everybody understands the purpose and importance of this tag.

People shall stop work to question when an Orange Tag is not hung when given the job of breaking into a system or removing equipment.

Together with Isolation Permit it authorises work to start immediately and for up to one day from the date the Tag is hung. The Orange Tag is hung by an Isolation Officer.

The Personal Red Lock Holder who breaks into the pump, piping, tankage or electrical system removes the Orange Tag and places it in the Orange Tag collection bag provided. Further details on the use of Orange Tags are given in Procedure P314.264. When commencing work on a system -

**No Proven Drainage, No Orange Tag  
No Valid Orange Tag, No Work**

**7.10.10 Pink Tag**

Pink Tags identify the area of non-coloured bond red or green cladding to be removed.

**PINK TAG**

Description of Equipment

Work Order Number

Tag Hung By

Badge Number

Date of Issue                      Expiry Date

**CLADDING TO BE REMOVED FROM HERE**

(Indicate direction by Arrow in box)

Boundary Scope Information

**PINK TAG**

- Identifies boundary for cladding removal
- Indicates potential asbestos containing material underneath
- Adhesive backing for affixing to surface

The Pink Tag has an adhesive backing that can be affixed to the cladding

The Isolation Officer affixes Pink Tags to the cladding to clearly identify the area of cladding to be removed.

The supervision of the work group completing the repair or replacement of the cladding shall remove the Pink Tag(s) and destroy them so that they cannot be re-used. Further details on the use of Pink Tags are given in Procedure P314.315.

**7.10.11 White Information Tag**

White Information Tags are for passing on information about equipment condition, operating requirements and conditions when the person supplying the information is unable to be present at the equipment to tell the next person.

Plant or equipment to which a White Information Tag is attached may still be used or operated.

The Tag can be hung and removed by anyone.

**7.11 Forced Removal Procedure**

Forced Removal is the authorised process for removal of a Red Personal Lock or Person in Control Tag when it is not possible for the Personal Lock Holder or Person in Control to remove them. This process shall also apply in instances where personnel have failed to sign-off the relevant Isolation Statement or Permit to allow the de-isolation to proceed.

Personnel who leave the site without removing their Red Personal Lock, Person in Control Tag or do not sign-off on the relevant Isolation Statement or Permit shall be contacted and required to return to site immediately to remove the lock, tag or sign-off to allow the de-isolation to proceed.

If the Personal Lock Holder or Person in Control cannot be contacted or is unable to return to site to remove the lock, tag or to sign-off on the relevant Isolation Statement or Permit, the Forced Removal Procedure shall be invoked by the General Manager or acting Manager.

Prior to authorising the removal of the Red Personal Lock, Person in Control Tag or the relevant Permit or Isolation Statement, the General Manager or acting Manager shall confirm;

- No personnel are working on the plant or equipment and
- The plant or equipment is safe to return to service.

The General Manager or acting Manager shall then authorise a Leader to directly supervise the removal of the Red Personal Lock, Person in Control Tag or relevant Permit or Isolation Statement and initiate an Incident Report.

**7.12 Verification and Auditing of the Isolation System**

Verification of the process used to set Piping and Electrical, Confined Space and High Voltage Permits is fulfilled by having two Isolation Officers set and sign off on the Permits.

Auditing of the isolation process is through scheduled audits conducted by the Safe Access Coordinator in the relevant section and through Critical Control Field Verification (CCFV) and Critical Control Verification Standard (CCVS) Critical Risk Management audits.

**7.13 Training**

People using the isolation, tag and lockout system shall tag/lockout to the level and area of their competency as defined by the qualification imparted from the training they receive.

All roles shall have a re-assessment after the first year. The Safe Access Coordinator shall then decide if the person continues on an annual or biennial re-assessment.

<b>Role</b>	<b>Pre-Requisite</b>	<b>Theory and Practical Assessment</b>	<b>Trainer</b>
<b>Personal Lock Holder</b>	Nominated by Superintendent or Contractor	SM195 Theory and Practical Assessment	Safe Access Coordinator
<b>Recipient</b>	Nominated by Superintendent or Contractor Personal Lock Holder	SM196 Theory	Safe Access Coordinator
<b>Isolation Officer Own Work Group</b>	Nominated by Superintendent Personal Lock Holder Completion of task specific modules	SM198 Theory and Practical Assessment Sign off by Assessment Panel	Safe Access Coordinator
<b>Isolation Officer</b>	Nominated by Superintendent Personal Lock Holder Completion of Area or equipment specific modules	SM197 Theory and Practical Assessment Sign off by Assessment Panel	Safe Access Coordinator
<b>Master Isolation Officer</b>	Nominated by Superintendent Personal Lock Holder Completion of all Area modules	SM197 Theory and Practical Assessment Sign off by Assessment Panel	Safe Access Coordinator
<b>Isolation Officer E/I</b>	Nominated by Superintendent Personal Lock Holder Completion of Area or equipment specific modules	SM197 Theory Practical Assessment Sign off by Assessment Panel	Safe Access Coordinator E/I Supervisor – Practical assessment
<b>Master Isolation Officer E/I</b>	Nominated by Superintendent Personal Lock Holder Completion of all Area modules	SM197 Theory Practical Assessment Sign off by Assessment Panel	Safe Access Coordinator Electrical Integrity Superintendent – Practical Assessment
<b>Person in Control</b>	Nominated by Superintendent or Contractor Personal Lock Holder	SM196 Theory SM199 Theory	Safe Access Coordinator

The Assessment Panel that signs off on an Isolation Officer Qualification shall consist of the Safe Access Coordinator and the person's Supervisor. The person's Superintendent shall confirm the Assessment Panel recommendation by signing the Practical Field Assessment. For E/I Isolation Officers, the Assessment Panel shall consist of the person's Supervisor and the Electrical Integrity Superintendent.

**7.14 Records**

The Safe Access Coordinator shall maintain a list of generic tag out procedures and permits for the area as per Work Instruction W314.260.15 Managing the Safety Tag Database.

A record of all isolation lock set keys (Spare Key Issue Record) shall be kept by the Safe Access Coordinator and the issue of a spare key for any set shall be signed out and a reason for the issue recorded.

The Piping and Electrical System Permit, Confined Space Isolation Permit, High Voltage Access Permit, Work-scope covered by Permit and Permit Suspension Restriction Record shall be removed and returned to the Safe Access Coordinator and retained for three months.

The Safe Access Coordinator shall maintain a register of people in their area of responsibility which includes name; badge number; level of authority eg Personal Lock Holder, Recipient, Isolation Officers Own Work Group, Isolation Officers and Master Isolation Officers; area of authority eg. area or equipment or task for which authorisation is valid; expiry date and Red Lock number.

Once assessed as competent by the Trainer, the person's competency level shall be recorded as a qualification against their training record in SAP. This applies for both QAL employees and Contractors. The initial theory assessment shall be scanned and attached to the individuals training record in SAP. The hard copy of the most recent re-assessment shall be kept.

## 8.0 ATTACHMENTS

Nil

## 9.0 REVISION HISTORY

Issue	Revision	Revision date	Change Reason
3	18	16/06/2020	Update 5.0 References added Reference W716.300.05 Added step to Isolation for Confined Space Isolation Permit (CSIP) Step 7.3.2 to include use of knife gate Process isolators for Confined Space Isolation Permits on Raw Mat HVAC Added step to Isolation Plant or Equipment Step 7.3.8 information for isolation with ATOM Fuel pipeline system
3	17	05/12/2019	Update Step 7.3.2 Isolation for Confined Space Isolation Permit (CSIP) with Special Note – exceptions on Boiler Turnarounds New Step added 7.3.7 Isolation of Dry Steam Instrument Lines
3	16	21/12/2018	Update 7.5 Correction of Single Point Multiple Person task duration and 7.10.5 Clarify use of Out of Service tag with Yellow Master Lock Removed from 4.0 References and Action 6.4 Hanging an Orange Tag - PM716.001.28 Conveyors – Change Out Frames
3	15	15/10/2018	Removed reference to P314.265 Pink Tag Procedures and replaced with P314.315 Permit to Remove Non-Coloured Red or Green Cladding Update 4.0 References Update 7.10.10 Action – Pink Tag
3	14	23/11/2017	Added 7.4.4 Isolation of Gas Cylinders- Clarification of isolation requirements for gas systems Update 6.15 Process Isolators
3	13	15/08/2017	Clarification of isolation requirements for mid and high pressure piping systems in Digestion. Responsibilities of Recipients for testing electrical equipment for “dead”.
3	12	31/05/2017	Update to 7.4.3 Inclusion of requirement to Blue Lock water hoses used to secure acceptable isolation of hot steam valves for a Piping & Electrical Permit
3	11	16/09/2016	Document verification and audit process
3	10	27/05/2016	Update to 4.9 Isolation Officers accountabilities Update to 4.10 Isolation Officers Own Work Group accountabilities Update to 4.11 Master Isolation Officers accountabilities