



JOSOP 460 — Isolation of Hazardous Energy Standard

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1.0 Purpose, Objectives and Scope

1.1 Purpose

The purpose of this standard is to ensure that isolation of hazardous energy and/or opening of equipment is performed in a safe and controlled manner.

1.2 Objective

This standard establishes requirements for performing isolation of machinery, equipment, vessels, piping and systems from sources of hazardous energy.

1.3 Scope

This Isolation of Hazardous Energy Standard covers work performed by JO employees and their delegates and contractors within JO operational control.

Included in the scope of this standard is the opening of process equipment as it relates to isolation of hazardous energy.

When work to be performed meets the following criteria:

- no other specialized work permits are required, and
- no simultaneous operations are occurring, and
- no transfer of work responsibilities will occur, and
- a qualified Standard Operating Procedure describes the work scope, and
- qualified personnel perform the Job Safety Analysis, and
- qualified personnel, per the [JO MSW SOP Qualification Procedure](#), will perform the work,

an SBU may choose to evaluate whether or not an Isolation Permit (Certificate) will further reduce the inherent risks of the work.

If the SBU:

- determines that an Isolation Permit (Certificate) will not further reduce either the likelihood or consequence of an incident occurring, and
- meets all of the above criteria, and
- has documented in its Isolation of Hazardous Energy Safe Work Practice Standard, under what circumstances a waiver may be put in place and revoked, then the SBU may waive the requirement for an Isolation Permit (Certificate).

2.0 Requirements

1. Personnel performing isolation of hazardous energy must be trained and competent in the roles for which they are responsible.
2. Hazards associated with isolation of hazardous energy shall be identified and mitigated prior to beginning work.

3. A Job Safety Analysis (JSA) shall be conducted at the work site in accordance with the U&G Standardized MSW Hazard Analysis Procedure prior to conducting work involving isolation of hazardous energy.
 4. Positive physical isolation is required for vessel entry and hot work.
 5. Isolation points shall be locked, tagged and documented.
 6. Equipment involved in isolation of hazardous energy shall meet applicable regulatory requirements, industry standards or good engineering practice.
 7. Each personal lock/tag used for energy control will only identify and be used by a single individual. Group locks are discouraged but may be used if: (a) an individual who is responsible and accountable for the group lock is identified on the permit, and (b) a method is in place for the responsible person to account for all of the individuals covered by the group lock prior to placing or removing the group lock. The first lock to be installed and the last lock to be removed shall be fitted by operating personnel or their designee.
 8. For isolation of hazardous energy involving a change to an operational procedure or method, or in any other situation where an operational or equipment change is undertaken, the installation or change must comply with the requirements in the *JO – Management of Change (MOC) process*.
 9. A suitable means of communication shall exist to advise different work crews that the equipment is out of service and to provide details of any safety or operational precautions to be undertaken.
 10. Facility management shall conduct periodic audits and verifications to ensure compliance to this standard.
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3.0 Terms and Definitions

The following terms and definitions apply to the JO – Safe Work Practice (SWP) – Isolation of Hazardous Energy Standard:

Blind/Spade – A circular metal plate used to block the flow path in a pipeline that is bolted between two pipe flanges. The circular plate should have a portion attached that extends outside of the pipeline to show that a blind/spade is installed. Typically, either a “pancake blind” (sometimes called a “skillet blind”) or “spectacle blind” is used. The blind/spade must be designed for the full, maximum design pressure of the equipment into which it will be installed.

Blind/Blank flange – A blind/blank flange installed either at the end of an open pipeline, nozzle, or a valve in service. A blind/blank flange is a flat flange, with no hole through the center that bolts to the flanged end of a run of pipe or to a flanged equipment nozzle or valve.

NOTE: a blind flange shall be stamped with its rated pressure.

Bonding – Electrically tying or connecting two conducting metal bodies to the same potential. Bonding prevents static accumulation by providing a low resistance path for the generated static charge. Bonding wires shall be sufficiently sized to provide adequate electrical continuity, for example, 4 American Wire Gauge (AWG) or larger copper wire or braided metal grounding straps.

Classified Hazardous Area – Any area classified as a hazardous zone area (Zone 0, 1 or 2 or Class I, Division 1 or 2) in accordance with the [American Petroleum Institute Recommended Practice \(API RP\) 505/API RP 500](#) or other equivalent local standards.

Double Block and Controlled Bleed – Either a special valve or a combination of valves that close a line, duct or pipe by closing (blocking) the main line and opening a drain or vent valve in the line between the two closed valves to bleed off pressure.

Electrical Isolation – The opening and locking of electrical switched or circuit breakers at the main power source, disconnecting leads, or removing fuses to make it physically impossible for electrical power to energize the equipment.

Facility Operating Personnel – In the context of this standard, this means company or contractor employees who have knowledge of and responsibility for the operations, equipment and processes at the facility. Examples of facility operating personnel may include offshore installation manager, terminal operators, designated contractors, and project managers.

Grounding – The act of providing an intentional connection to earth through a ground connection of sufficiently low impedance and with sufficient current carrying capacity as to prevent voltage build-up that might result in undue hazards to persons or to connected equipment. Grounding is also referred to as “earthing”.

Hazardous Energy – Any of the following energy forms:

- Electricity
- Kinetic energy (energy of a moving object or materials)
- Potential energy (stored energy that an object has the potential to release)
- Pressurized liquid or gases, including air
- Chemical energy
- Thermal energy
- Mechanical energy
- Hydraulic energy
- Pneumatic energy
- Radiation

Isolation – The process that segregates the hazardous energy or toxic substance from the recipient. This may be achieved by a number of methods such as blinding, electrical isolation or positive physical isolation.

Isolation of Hazardous Energy Permit – A separate document attached to a Permit to Work specifying the control measures necessary to carry out the isolation of hazardous energy work safely.

Isolation device – A mechanical device that physically prevents a transmission or release of energy. The method of prevention may be by opening the path (such as circuit breaker) or by blocking the path (such as a blind). Examples include: manually-operated electrical circuit breaker, disconnect switch, a blind, blank or double-block valve and bleed system.

Lock Box – A lockable metal box that is used when more than one person works on complex equipment. A single key or keys locking out the equipment is placed in the lock box, and then each person attaches their own lock to the box.

Lockout – A process where a lock is used to lock a device in the “off” or “safe” position.

Lockout Device – A device used to aid in locking out an isolation point. Lockout devices may include a chain, valve handle, lockable switch, etc. Note: A retrofitted lockout device may be required for equipment that was not originally designed to be locked out.

Low Voltage - Voltage that is less than 1000 volts AC or 1500 volts DC between conductors or less than 600 volts AC or 900 volts DC between conductors and earth.

Positive Physical Isolation – A state where the equipment is positively separated from the hazardous energy and toxic substance by use of one of the following methods (may also be referred to as “Daylighting” or “Air Gapping” in some locations):

- Removal of a section (spool) of piping
- Physical removal of a circuit breaker and grounding (earthing) the system
- Removal of mechanical couplings
- Disconnection and/or physical removal of a circuit breaker and grounding (earthing) the system
- Use of spectacle blinds
- Use of spade/skillet blinds with spacers
 - Positive Physical Isolation can be achieved by installing a minimum skillet, blind or spade at the closest practical connection to the vessel or equipment being isolated. The skillet, blind, or spade must be properly sized for fit and anticipated pressures that could be seen at that point in the system given the operating conditions present (and/or anticipated) at the time of isolation. In addition to this first physical isolation, there must be an additional physical block upstream/downstream, where the section in between must be able to be bled. (Double Block and Controlled Bleed)

Tag – A device used to identify an isolation point and to indicate the reason for the isolation. Tags warn personnel not to operate the tagged item. Each tag must indicate when it was fitted and who fitted it. Refer to [Appendix E: Minimum Tag Requirements](#) for minimum requirements for tags.

Tagout – The act of attaching a tag at each isolation point to warn personnel not to operate the tagged item. The means of attaching the tag must comply with the requirements detailed in [Appendix E: Minimum Tag Requirements](#) of this standard.

Zero Energy State – The maximum protection against unexpected movement or activation of equipment or machinery, release of stored pressure, or flow of liquid or gas when maintenance or repair is performed.

4.0 Roles, Responsibilities and Training Requirements

There must be clearly defined roles, and personnel must meet the training and competency requirements of this standard prior to starting work. JO is responsible for establishing the methodology to achieve competence.

A single individual may fulfill more than one role as long as he or she meets the competency requirements and is able to fully meet multiple responsibilities. When selecting personnel for these positions, consideration should be given to the candidate's level of experience and past performance.

The following role is specific to Isolation of Hazardous Energy:

- Authorized personnel

Refer to the [JO – Training Requirements Tool](#) for further instructions.

4.1 Initial Training

Personnel must meet the competency requirements of this standardized safe work practice prior to starting work. Refer to the [JO – Training Requirements Tool](#).

4.2 Refresher Training

Refresher training must be provided as follows:

- As required by applicable regulations or JO policy
- As needed when identified by: verification, inspections, incidents or audits

5.0 Standard Instructions

When considering work that involves isolation, always consider whether there is a safer alternative than isolation. For example, can the work be deferred until the process is shut down? Isolation systems may leak or fail, and installing isolation blinds is in itself a hazardous activity to be avoided if possible.

Isolation of process streams, electrical systems, and some mechanical systems requires special consideration and shall only be performed by competent personnel who specialize in isolation of those systems.

5.1 Assessing and Managing Hazards

Prior to conducting any work that will require isolation of equipment and/or opening of process equipment, competent personnel must conduct a hazard analysis to identify the potential hazards associated with the isolation and to determine the controls necessary to ensure that isolation and/or opening of process equipment can be performed safely. The hazard analysis shall identify any potential for the presence of stored energy, flammable or toxic gases and other potential hazardous conditions or substances.

All isolation of hazardous energy must be permitted and managed in accordance with the JO - Permit to Work Standard.

In addition,

- Empty any equipment being prepared for opening of any noxious, toxic, or flammable liquid or vapors in a controlled manner.

- Depressurized lines containing liquids must be drained into a bonded form of containment to prevent static ignition.
- Adequately isolate and check the opened equipment, which must be found free of potential hazardous materials and/or conditions. If previously unidentified hazards exist or previous safeguards are determined to be inadequate, equipment must be closed until safeguards are taken.
- Isolate (blind or air gap) the process equipment whenever possible at the first flange nearest the equipment to be opened. Valves will be locked and tagged, and blinds must be listed on an equipment isolation checklist. The equipment isolation checklist shall be maintained with the Permit to Work the work site.
- Lock out or otherwise secure prime mover energy sources associated with the equipment to be opened.
- Blind or air gap any pressurized connection to a vessel or system before the equipment is opened.
- Double block and Controlled bleed may also be used to isolate equipment from process lines. Bleed lines should be carefully checked to ensure they are not plugged.
- Any pressurized connecting points to equipment being opened will be blind flanged before being left unattended. Air gapping alone is not adequate.
- Depressurize and drain process equipment to be opened to a safe area such as a flare system or recovered oil system. Depressurizing and draining into a closed system is the best practice.
- Do not allow hot work in the immediate area during draining or depressurizing of process equipment if there is a possibility of flammable vapor release. Refer to the JO - Hot Work Standard.
- Adequately purge, steam, or wash opened equipment to ensure removal of toxic or flammable commodities to safe levels. Purged equipment shall be vented to a safe area where potential ignition sources are not present. Appropriate flammability and toxic chemical monitoring will be conducted on the equipment before it is declared safe for work. The potential for pyrophoric material such as iron sulfide in sour plants shall be considered and mitigation measures implemented.
- Isolate and/or drain gauge glass columns before equipment is declared safe for work.
- Take appropriate precautions with process equipment contaminated with Naturally Occurring Radioactive Material.

5.2 Documentation

5.2.1 Permit to Work

Isolation of Hazardous Energy [Certificates](#) must be used in conjunction with a Permit to Work. Isolation of Hazardous Energy Certificate [is](#) distinguishable from other [Certificates](#). Additional [Certificates](#) may also be required depending on the nature of the work (i.e., hot work, confined space entry, electrical). The [certificates](#) must have a duplicate copy at a minimum. The certificate and associated documentation must be available in the language appropriate for the Permit Approvers and Work Team Leaders. To ensure an Isolation of Hazardous Energy Certificate is consistent with this Standard refer to [Appendix A: JO Isolation of Hazardous Energy Certificate](#) and [Guidance for](#)

[Specialized Work Permits \(certificates\)](#). The Isolation of Hazardous Energy Certificate should include the information found on the sample certificate in Appendix A and any additional information that JO deems necessary.

5.3 Isolation

This section contains details of the requirements for isolating equipment to allow personnel to work safely during activities such as hot work, confined space entry or while performing maintenance activities. Requirements of this section shall be observed whenever it is necessary to isolate the equipment.

Isolation activities shall address the basic steps outlined in the [Appendix B: Isolation Flowchart](#).

Use this section in conjunction with section [5.4 – Lockout Tagout](#) of this standard whenever there is a need to lockout or tagout equipment.

5.3.1 General Requirements

5.3.1.1 Authorization

Isolation work shall only be performed after the Work Team Leader has authorized the isolation. Refer to [Appendix C: General Isolation Guidelines for Hazardous Energy Sources](#) for examples of typical isolation procedures that can be used when isolating a plant or equipment.

5.3.1.2 Worker Safety and Access Control

Ensure the safety of the workers carrying out the isolation work by securing the work area where the isolation tasks are being performed. This may include the need to erect barricades or safety cones in areas of traffic or public access.

5.3.1.3 Responsibility Changes

For project-type work, certain responsibilities and tasks of the operations staff may be undertaken by the project management and project engineering staff, as agreed between the project group and facility management prior to the commencement of work.

5.3.1.4 Isolation Point Identification

Identification of isolation points for all energy sources and sources of toxic substance release shall be completed for each machine, device or process equipment that requires isolation.

5.3.1.5 Equipment Operating Procedures

A Standard Operating Procedure (SOP) that defines how to shut down, de-energize, isolate, depressurize, purge, ventilate, drain, flush, lockout/tagout and start up the equipment shall be available for equipment that requires maintenance or repair on an annual or more frequent basis. The procedure shall identify all points that require **verification** of isolation or lockout/tagout or both prior to commencing work on the equipment. For other equipment, competent personnel shall perform a JSA to assess the steps that must be performed from shutdown through to startup prior to commencing work on the equipment.

5.3.1.6 Additional Documentation

Specific isolation diagrams or procedures shall be readily available for any equipment that requires annual maintenance or repair. **Isolation diagrams shall be current and verified prior to use.** This may include, but is not limited to:

- Compressors
- Generators
- Fuel filters
- Water treatment skids
- Other complex equipment with multiple isolation points requiring isolation of stored hazardous energy

5.3.1.7 Electrical Isolation

Electrical work shall be carried out in accordance with the [JO Electrical Standard](#). Electrical isolation shall only be carried out by competent electrical personnel, except for the following, which may be carried out by appropriately trained personnel:

- Electrical isolation on circuits operating at less than 50 volts
- Tripping of circuit breakers on low voltage (voltage that is less than 1,000 volts AC or 120 volts DC between conductors or less than 600 volts AC or 900 volts DC between conductors and earth) circuits.

5.3.1.8 Safety, Fire, and Health Control Measures

When isolating pipelines or storage vessels, safety, fire and health considerations must be reviewed, and the appropriate control measures must be implemented.

5.3.1.9 Pipeline Isolation and Fluid-Containers

When isolating pipelines or other fluid-containing vessels, provision for pressure relief must be considered for both the section of pipeline being isolated and pipelines on either side of the isolated section. Consideration of the need for pressure relief alternatives (e.g. temporary pressure relief systems) should be part of the pre-job hazard analysis.

5.3.1.10 Pipeline Blocks

Pipe-stoppers, pipe plugs or other temporary pipeline “blocks” shall not be used where positive physical isolation is required. These blocks may be used for short duration isolation tasks if the JSA determines that positive physical isolation is not required due to the duration and nature of the tasks being performed. When the use of pipe-stoppers is permitted, they must be used in full accordance with the manufacturer’s recommendations.

Use of any pipe stopper (plug) should be controlled by way of the isolation checklist and considered similar to a blind.

5.3.1.11 Temporary Systems

When isolation requires the installation of temporary systems, such as temporary pressure relief, or when the isolation process will involve a change to an operational procedure or method, or in any other situation where an operational or equipment change is undertaken, the installation or change must comply with the requirements in the *JO – Management of Change Process*.

5.3.1.12 Permanent and Long Term Lockouts

Permanent closures occur when a process or a piece of equipment in the process is taken out of service for an indefinite period of time, with no immediate plans to use the equipment (such as a decommissioned unit). In many cases, these long term isolations must be approved through the *JO – Management of Change Process*.

5.3.2 Work Instructions

5.3.2.1 Equipment Preparation

The facility operating personnel shall prepare any equipment before any isolation tasks are performed. Such preparation work may include, but is not limited to:

- Emptying, flushing or purging pipelines or vessels as required
- Closing operations valves, switches or other devices as necessary, and ensuring that these are locked and tagged in accordance with section [5.3 – Isolation](#)
- Ensuring that affected personnel are made aware of the changed status of the equipment
- Where possible, arranging other work tasks to minimize the amount of other work being performed in the vicinity of the isolation work
- Conducting gas tests

5.3.2.2 Operations personnel or their Designee Tasks

After the isolation of equipment is complete, operations personnel or their designee personnel shall perform the following tasks:

- Assess the work area to ensure that it has been left in a safe condition and that it is free from any hazards to personnel, for fire or to the environment.
- Affix locks and tags to isolation points as appropriate. (See instructions in section [5.4 – Lockout Tagout](#).)
- Record each isolation point in the Equipment Isolation Checklist. See [Appendix D: JO Equipment Isolation Checklist](#) for an example of the form.

5.3.2.3 Maintenance Personnel Tasks

Following completion of the isolation tasks by either operations personnel or their designee personnel, maintenance personnel, or both, the following tasks shall be performed:

- Visually inspect the site to ensure that identified isolation points have been correctly isolated.
- Leave the work site in a clean and safe condition, and check to be sure that any necessary barricades have been erected.
- Remove any waste materials and dispose of them in accordance with company policy and local requirements.
- After operations personnel or their designee personnel have fitted their locks and tags, maintenance personnel affix their locks and tags to isolation points as appropriate. (See instructions in section [5.4 – Lockout Tagout](#).)

5.3.2.4 Returning Equipment to Service

At the completion of work that requires isolation, the equipment shall be returned to service by removing all isolation points in the reverse sequence of the isolation point installations, which are specified in the equipment's isolation plan.

5.3.2.5 Record Lock and Tag Removal

Final removal of locks, tags, and isolation points shall be recorded on the Equipment Isolation Checklist (see [Appendix D: JO Equipment Isolation Checklist](#)) by facility operating personnel.

5.4 Lockout Tagout

This section contains detailed requirements associated with isolating, locking out and tagging equipment prior to any work being carried out on the equipment. Apply these requirements any time it is necessary to work on any plant or equipment that has been identified as requiring lockout/tagout to safely isolate the equipment.

This section shall be used in conjunction with section [5.1 – Assessing and Managing Hazards](#) of this standard whenever there is a need to isolate equipment.

Lockout/tagout activities shall address the basic steps outlined in [Appendix B: Isolation Flowchart](#).

5.4.1 General Requirements

5.4.1.1 Lockout and Tagout Requirements

Prior to start of any operational, construction, or maintenance work that may expose personnel, equipment or the environment to hazardous energy or toxic substances, equipment controls (such as electrical switches, valves, or motor controllers) that could introduce energy, product, toxic materials, or other hazards into the work area shall be locked and tagged as out-of-service. This may require controlling one or several of the [hazardous energy](#) sources as defined in section [3.0 – Terms and Definitions](#).

5.4.1.2 Lock Specifications

Energy-controlling locks and tags shall meet the following requirements:

- Each personal lock/tag used for energy control will identify and be used by a single individual.
- Locks used for hazardous energy isolation should be standardized at each facility and should be used only for hazardous energy isolation.
- Personal locks and keys must be under one person's control at any given time. This is accomplished by keying each lock differently so that only the employee placing the lock can remove it. See section 5.4.1.5 for specific requirements for Group Locks.
- Locks and tags must withstand their environment for the maximum period of time that exposure is expected.
- Duplicate keys for facility and equipment locks must be under the exclusive control of supervision.
- Locks must be strong enough to prevent removal without using excessive force or unusual techniques.
- Locks will meet applicable regulatory requirements and industry standards or engineering best practices.

5.4.1.3 Tag Specifications

Tags shall be of a suitably durable material for the environment in which they are used. Tags must contain at least the minimum information specified in [Appendix E:](#)

[Minimum Tag Requirements](#). Tags must be legibly signed and dated by the installer of the tag. The tags shall be securely fastened to isolation points using the shackle of the lock or a self-locking nylon cable tie with a breaking strength of at least 22 kilograms of force (50 pounds of force). All information required on the form must be filled out. Refer to [Appendix E: Minimum Tag Requirements](#) for more details.

5.4.1.4 Using Locks at Isolation Points Where it is Not Physically Possible to Fit a Lock

For isolation points where it is not physically possible to fit a lock, consideration shall be given to moving further back in the system to identify a point where the system can be locked out. For example, if a pipeline leading to a filter cannot be locked out at the filter, competent personnel shall consider whether it is possible to apply a lock to a valve farther down the pipeline, or, if a switch cannot be locked out, whether the switch can be opened and the entire electrical panel door locked out.

Where it is determined that it is not possible to apply a lock, it may be acceptable to fit a tag, provided that additional measures are taken to ensure that the tagged item is not inadvertently operated. The additional measures that are required shall be determined by a hazard analysis and an assessment of the degree of harm that may occur if the equipment is operated. At a minimum, personnel working in the area of the tagged equipment must be briefed on the reason why the item is tagged out and the implications of operating the equipment.

5.4.1.5 Using Group Locks

The use of group locks is discouraged, however, if group locks are used, the following must be met: (a) an individual who is responsible and accountable for the group lock must be identified on the certificate, and (b) a method must be in place for the responsible person to account for all of the individuals covered by the group lock prior to placing or removing the group lock.

5.4.1.6 Using a Single Block Valve

Isolation using a single block valve is not an acceptable alternative in most cases. The use of a single block valve for isolation is only allowed under the following conditions.

[Not acceptable at Joint Operations](#)

5.4.1.7 Recording Lockout Tagout Points

Lockout/tagout points shall be identified on [Appendix D: JO Equipment Isolation Checklist](#).

5.4.1.8 Recording Changes in Isolation Points

Modifications to processes or components that change the isolation points must be reflected on updated isolation point diagrams, and standard operating procedures in accordance with the *JO - Management of Change Process*.

5.4.2 Work Instructions

5.4.2.1 Lock and Key Supply

The Work Team Leader shall ensure that relevant personnel involved in the work have an appropriate number of individually keyed locks, each with only one key. Locks should be color coded by craft. If a lock must be removed by someone other than the person who fitted it, then the requirements for lock removal specified in [Appendix F: Guidelines for Removal of Lockout/Tagout Devices by Persons Other Than Those Who Fitted the Lock or Tag](#) must be followed.

The person who fits the lock shall retain control of the lock's key, and has principal responsibility for ensuring that the lock is removed at the completion of the job. If work is not completed prior to end of shift or rotation, transfer of keys and the job status must be communicated via written documentation to the next person responsible.

Locks used for hazardous energy isolation should be standardized at each facility and should be used only for hazardous energy isolation. Locks must be strong enough to prevent removal by excessive force or unusual techniques.

5.4.2.2 Installing Locks

Each trade (or contractor) working on equipment requiring isolation shall install his or her own lock at each isolation point, except where locks cannot physically be used (see section [5.4.1.4. Using Locks at Isolation Points Where it is Not Physically Possible to Fit a Lock](#)).

A lock hasp (sometimes called a multi-lock device) may be used when multiple locks are necessary. Where a lock hasp is used, it is important that the last hole is not used to add a lock. This provides room for an additional lock hasp to be inserted so more locks can be added later, if required. (For example, a 6-hole hasp is only used for five locks plus an additional hasp, not six locks). Alternatively, a lock box may be used where one lock is applied to each isolation point requiring a lock, and the key to the locks are placed inside a lock box, to which each worker applies their own lock.

5.4.2.3 Lock Fitting Order

Locks shall be fitted in the following order (as appropriate to the type of work being performed):

- Facility operating personnel shall ensure that their locks and tags are the first installed and the last removed.
- After ensuring that the facility operating personnel have installed their locks and tags, electrical personnel shall install their own locks and tags, if needed.
- Personnel involved in non-electrical work shall ensure that their locks and tags are installed last, after ensuring that the facility operating personnel and electrical personnel (as appropriate) have fitted their locks and tags.

5.4.2.4 Further Isolation

If the equipment requires further isolation after the work has started, all work will stop immediately. No work will take place until the required isolation is complete, properly locked/tagged and noted on the [energy isolation checklist](#). Personnel involved in the work must be made aware of the further isolation methods/points.

5.4.2.5 Portable Equipment and Extension Cords

When servicing portable equipment or equipment attached with extension cords, equipment shall be unplugged with the lockout device installed over the plug.

5.4.2.6 Lock Removal

Once installed, the locks and tags shall not be removed except by the persons who installed them or the new documented key holder (see section [5.4.2.1 Lock and Key Supply](#)).

In exceptional circumstances, someone else may be required to remove a lock, but this may only be authorized by the Work Team Leader and must follow the specific

guidelines in [Appendix F: Guidelines for Removal of Lockout/Tagout Devices by Persons Other Than Those Who Fitted the Lock or Tag](#).

5.4.2.7 Recording Lockout Tagout Points

All the lockout/tagout points shall be recorded in the [Appendix D: JO Equipment Isolation Checklist](#).

Exceptions to this requirement include all of the following:

- Equipment has a single energy source which can be readily identified and isolated
- The isolation and locking out of that energy source will completely de-energize and de-activate the equipment
- The equipment remains isolated and de-activated during service and/or maintenance
- A single lockout device will achieve a locked out condition
- The lockout device is under the exclusive control of the authorized personnel performing the service or maintenance
- The servicing or maintenance of the equipment does not create hazards for other personnel

5.4.2.8 Facility Operating Personnel or their Designee Pre-Work Tasks

Prior to starting work on the isolated equipment, facility operating personnel or their designee shall ensure that:

- The appropriate controls (valves, circuit breakers, switchgear, etc.) are locked and tagged with completed locks and tags. Use a lock hasp/multi-lock (a clip or bar with multiple holes) if more than one lock will be installed.
- If facility operating personnel are performing the work, the equipment is to be tested after lockout tagout to ensure and demonstrate that it will not start while work is being performed.
- If personnel other than the facility operating personnel perform the work, such as the electrical, maintenance or contractor personnel, they shall be informed when the equipment has been locked and tagged. Personnel performing the work shall physically verify that the equipment is isolated by observing an attempted startup to ensure that the equipment will not start while work is being performed.

5.4.2.9 Maintenance Personnel Pre-Work Tasks

Prior to starting work on the isolated equipment, the electrical/maintenance/contractor personnel performing the work shall ensure that:

- All of the necessary work permits are in place.
- All controls (valves, circuit breakers, switchgear, etc.) are locked and tagged with the completed locks and tags.
- The Work Team Leader is informed that the locks and tags are in place.
- The equipment is tested after lockout and tagout to demonstrate that the equipment will not start while work is being performed.

5.4.2.10 Maintenance Personnel Post-Work Tasks

After completing work on the isolated equipment, the electrical/maintenance/contractor personnel shall ensure that:

- When the equipment is ready for operation, each person may remove only his or her own locks and tags. Do not remove the locks or tags of other people. (Refer to [Appendix F: Guidelines for Removal of Lockout/Tagout Devices by Persons Other Than Those Who Fitted the Lock or Tag.](#))
- Facility operating personnel are informed that the electrical/maintenance/contractor locks and tags have been removed. Do not start the equipment until a responsible facility operating person is present for the startup, and all of the facility operating personnel have removed their locks and tags and prepared the equipment for startup.

5.4.2.11 Facility Operating Personnel Post-Work Tasks

After completing work on the isolated equipment, facility operating personnel shall ensure that:

- All of the electrical/maintenance/contractor locks and tags have been removed by the electrical/maintenance personnel.
- After the electrical/maintenance/contractor locks and tags have been removed, the operations locks and tags are also removed. Do not remove the locks and tags placed by another person. (Refer to [Appendix F: Guidelines for Removal of Lockout/Tagout Devices by Persons Other Than Those Who Fitted the Lock or Tag.](#))
- Before energizing the isolated equipment, reconfirm with the electrical/maintenance/contractor personnel who carried out the work on the equipment that the equipment is safe to operate.

5.4.2.12 Shift Change Handoff

- The electrical/maintenance/contractor personnel shall ensure that the incoming personnel from their group are informed of the work in progress and hand over the key if the work is not complete.
- The facility operating personnel or their designee shall ensure that the incoming facility operating personnel are informed of the work in progress and hand over the key to the outgoing shift's locks and ensure that the incoming shift is aware of each isolation point.
- A suitable means of communicating that the equipment is out of service, such as a handover process or an "outstanding work" notice board, shall exist to advise that the equipment is out of service and to detail any safety or operational precautions that need to be undertaken.

5.4.2.13 Lock and Tag Removal

At the conclusion of work, locks and tags shall be removed by the person who fitted them. (Refer to [Appendix F: Guidelines for Removal of Lockout/Tagout Devices by Persons Other Than Those Who Fitted the Lock or Tag.](#)) This must be carried out in the reverse order to the fitting of the locks and tags, as follows:

- The maintenance personnel remove their locks and tags.
- The electrical personnel remove their locks and tags.

- The facility operating personnel remove their locks and tags.

5.4.2.14 Lock and Tag Removal Documentation

Check off each removal against the [Appendix D: JO Equipment Isolation Checklist](#) as the locks and tags of personnel are removed.

5.4.2.15 Equipment Air Purging

On the removal of positive physical isolations (i.e., blinds, etc.) from equipment and process vessels, any air must be removed prior to the introduction of hydrocarbons to avoid explosive mixtures from occurring. If required, equipment air-purging shall be conducted in accordance with industry standards. Wherever possible, a purge gas buffer should be placed between air and hydrocarbon.

5.4.2.16 Final Work Site Inspection

Prior to returning equipment to service, a final work site inspection shall be carried out. Checks made during this inspection may include, but are not limited to, the following:

- Equipment guards and covers have been re-installed.
- Fastenings (such as flange bolts) have been reinstated and proper torque has been applied.
- Seals, connections, or flanges of equipment do not leak.
- Scaffolding/Staging is removed.
- Work tools have been removed from the work area.
- Consumables or waste materials such as rags or cleaning cloths have been removed from the equipment and work area.
- Isolation blanks or blinds have been removed. (See [Appendix D: JO Equipment Isolation Checklist](#).)
- Operational valves have been correctly set (either open or closed, as appropriate).
- Notification to inform affected personnel and other potentially impacted workers that equipment is ready to put back in service.

5.4.2.17 New Equipment Purchase

New equipment purchased must be designed and installed so that energy isolation is possible. This includes purchasing equipment such as lockable valves and electrical breakers. Piping should be configured to allow the use of the appropriate isolation method for the energy source, such as double block and Controlled bleed.

5.5 Contractors

5.5.1 Permit Authorization

Prior to entering any facility to commence work, authorization shall be obtained from the facility supervisor or authorized designee. Work must not commence until isolation of hazardous energy competency is established, and written authorization is granted in the form of the appropriate permit to work. Refer to [JO – Permit to Work Standard](#).

Additional Requirements

If contractors are involved in work that requires isolation of hazardous energy:

- Contractors must be informed of facility isolation procedures, including permit procedures, and must conform to all such requirements.
- Each contractor must use his or her own lock on the equipment or isolation lock box.

5.5.2 Contractors Using Their Own Permitting Procedures

Contractors may permit work if they meet the requirements in the [JO – Permit to Work Standard](#) and the [JO - Isolation of Hazardous Energy Standard](#). Contractors shall use JO's procedures unless they have been reviewed by JO and approved by HES (usually through the *CHESM* process) to use their own procedure(s).

5.6 Troubleshooting

5.6.1 Required Equipment Procedures

If equipment must be placed back in an operating condition in order to identify problems (troubleshooting) or to test or position such equipment, such work may proceed provided that equipment-specific written procedures for troubleshooting are developed by competent personnel to control the sequence of actions to be taken. The procedures developed should conform to the guidelines discussed below for lock removal, as a minimum, and must be authorized and tracked, as appropriate by the [Sanction to Test Certificate \(Appendix G\)](#). Such work may trigger the requirement to issue a Permit to Work to undertake problem solving or testing. The specific procedures must be attached to the permit and posted in the work area.

The procedures for temporary removal of locks or tags, and reenergizing machinery or equipment, must provide maximum safety coverage for employees when the equipment or machinery must be energized during the course of servicing. The following sequence must be followed when testing or repositioning a machine or piece of equipment:

1. Clear the machines or equipment of tools and materials.
2. Remove employees from the machine or equipment area.
3. Remove the lockout or tagout devices as specified.
4. Energize and proceed with testing or positioning.
5. De-energize all systems, isolate the machine or equipment from the energy source and reapply the lockout or tagout devices as specified prior to affecting further repairs, adjustments or maintenance. The removal of lockout or tagout devices and the reenergizing of equipment shall be permitted only during the time necessary for the testing or positioning of the machine, equipment or component, and only when reenergizing is essential to accomplishing the servicing task.

5.6.2 Special Precautions

Special precautions must be taken when energizing electrical equipment that is located in a classified hazardous area, as this may introduce a potential source of ignition. Such testing or troubleshooting shall require issuance of a Hot Work Certificate in addition to a Permit to Work if the equipment is located within a classified hazardous area.

6.0 Records

6.1 Required Records

The following records will be kept:

- Copies of permit, [certificates](#) and associated documentation shall be maintained in accordance with JO's Permit to Work Standard.

6.2 Retention Requirements

Documentation shall be retained as required by local regulation, JO policy or for a minimum of six months, whichever is greater.

7.0 References

The following is a complete list of documents referenced by this procedure:

Table 1. Document List

| Title | File Name |
|-----------------------------------------------------------|-----------------------------------------------------|
| Joint Operations – Training Requirements Tool | JO_MSW_TrainingRequirementsTool.doc |
| Joint Operations – Permit to Work Standard | JO_MSW_PermittoWorkStandard.doc |
| Joint Operations – Hot Work Standard | JO_MSW_HotWorkStandard.doc |
| Corporate Electrical Safe Work Practice | swp-wu-5159.pdf |
| Guidance for Specialized Work Permits (certificates) | Guidance for Specialized Permits (certificates).doc |
| Joint Operations - Isolation of Hazardous Energy Standard | JO_MSW_IsolationofHazardousEnergyStandard.doc |

8.0 Other Guidance Documents

Table 2. Document List

| Title | File / Link Name |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| American Petroleum Institute (API) Recommended Practice (RP): <ul style="list-style-type: none">▪ 505 Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Zone 0, and Zone 2 | American Petroleum Institute (API) NOTE: You may need a subscription to access API documentation. If so, consult a librarian listed on the home page. |

| | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <ul style="list-style-type: none"> ▪ 500 Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Division 1 and Division 2 | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|

9.0 Document Control

Table 1: Document Control Information

| Description | GU Common | SBU-Specific |
|--------------------------|------------------|-------------------------|
| Approval Date | 27 February 2008 | <i>17 December 2008</i> |
| Next Revision Due | 27 February 2011 | <i>17 December 2011</i> |
| Control Number | | |

Table 2: Document History

| Version Number | Date | Notes |
|----------------|------------------|-------------------------------------------------|
| 1.0 | 27 February 2008 | GU Adoption |
| 1.1 | 8 December 2008 | Add OE Mentor Bookmarks |
| 1.1.1 | 17 December 2008 | SAC Adoption |
| 1.1.1.A | 26 March 2009 | Jo Version Created |
| 1.1.1.B | 15 December 2009 | Removed links for corporate electrical standard |
| 1.1.1.C | 23 May 2010 | Added new GU language in “Scope” |

Appendix A: JO Isolation of Hazardous Energy Certificate



Isolation of Hazardous Energy Certificate

Section A – To be completed by Permit User
 Section B – To be completed by responsible Permit Approver
 Section C – Approval and sign off to be completed by all relevant parties

This permit is only valid for one working shift

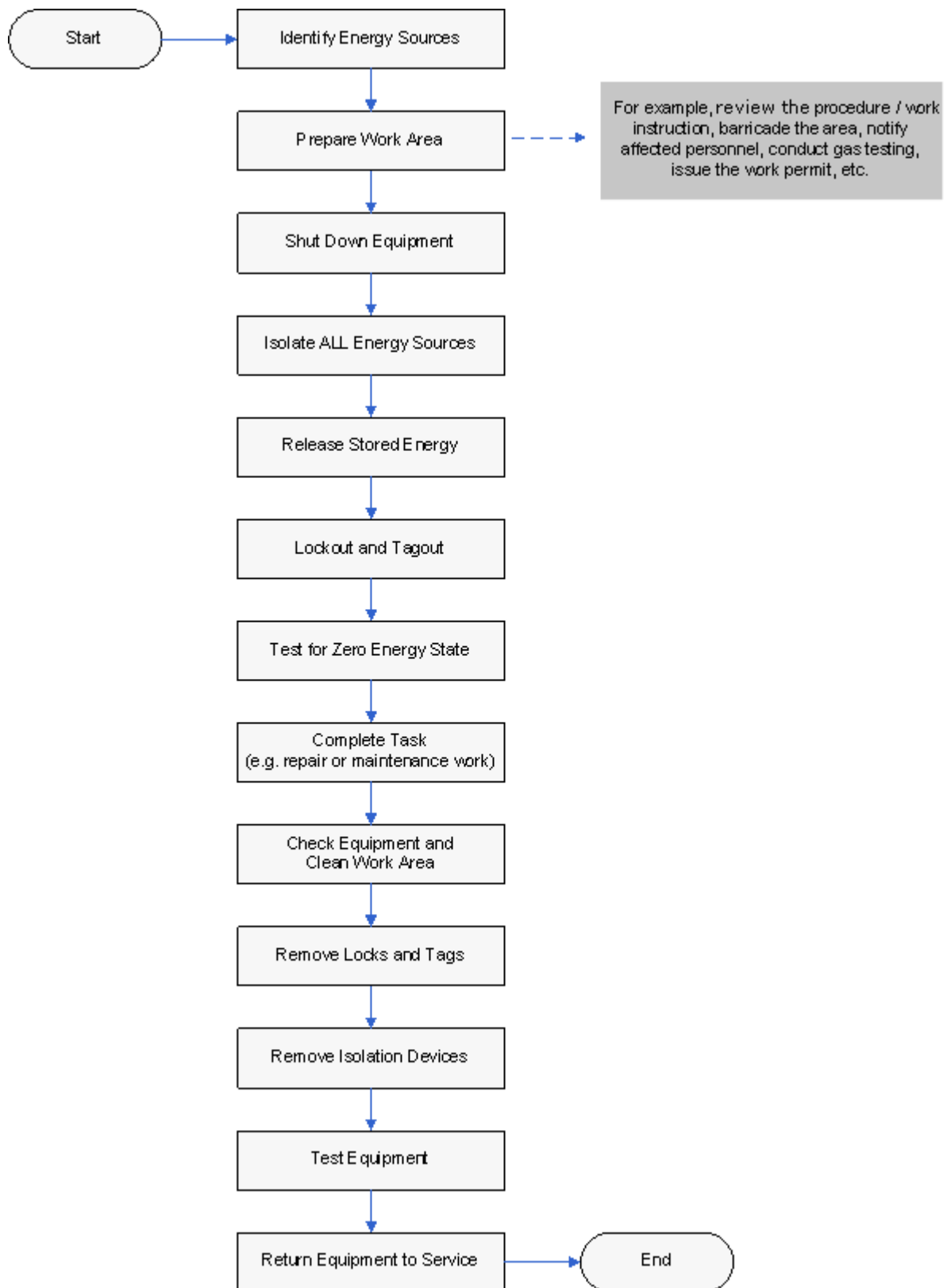
| | | |
|------------------|-----------------------------------------|--------------------------|
| SECTION A | Date: _____ | Company: _____ |
| | Permit User: _____ | Number of Workers: _____ |
| | Facility: _____ | |
| | Name of Equipment to be isolated: _____ | |
| | Reason for Isolation: _____ | |
| | Contents of Equipment: _____ | |

| | | |
|------------------|------------------------------------------------------------------------------------------------------------------------|--------------------------|
| SECTION B | Permit Conditions | |
| | The following are required in addition to those requirements listed on the Permit to Work | |
| | <input type="checkbox"/> Permit Approver to check items below and once verified the Permit User is to initial the form | |
| | <input type="checkbox"/> _____ All provisions and requirements specified on the associated Permit to Work are met | |
| | <input type="checkbox"/> _____ Equipment to be isolated has an isolation checklist | |
| | <input type="checkbox"/> _____ Special PPE equipment and/or clothing as listed | List type required _____ |
| | <input type="checkbox"/> _____ Respiratory protection as listed | Name: _____ |
| | <input type="checkbox"/> _____ Spill response plan in place | |
| | <input type="checkbox"/> _____ Additional Certificates required (e.g. Hot Work) | |
| | <input type="checkbox"/> _____ JSA conducted | |
| | <input type="checkbox"/> _____ | |
| | <input type="checkbox"/> _____ | |
| | <input type="checkbox"/> _____ Additional instruction, conditions, special requirements or instructions: | List: _____ |
| | <input type="checkbox"/> _____ | |
| | <input type="checkbox"/> _____ | |

List below any additional hazards, equipment or site precautions, special requirements or instructions:

| | | |
|---------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|
| Approval and Acceptance Section | | |
| SECTION C | My signature indicates that I fully understand and will fully comply with all conditions and requirements of this Isolation of Hazardous Energy Permit | |
| | Permit User: _____ | Date: _____ (dd/mm/yy) |
| | My signature below indicates that if all requirements and conditions of this Isolation of Hazardous Energy Permit and related permit forms remain in effect, isolation can be safely performed. | |
| | Record Sheet. | |
| | Permit Approver: _____ | Date: _____ (dd/mm/yy) |
| | Additional Approval (if required): _____ | Date: _____ (dd/mm/yy) |
| | Form Extension Section | |
| | Date: _____ (dd/mm/yy) | Extension Time From: (Start) _____ To (Stop): _____ |
| | Permit User: _____ | Date Signed: _____ |
| | Permit User: _____ | Date Signed: _____ |
| Isolation of Hazardous Energy No Longer Required: _____ | Date: _____ (dd/mm/yy) | |

Appendix B: Isolation Flowchart



Appendix C: Isolation Guidelines for Hazardous Energy Sources

| Energy Form | Energy Source (Examples) | General Lockout Guideline |
|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Electricity | <ul style="list-style-type: none"> ▪ Electric motors ▪ Solenoids ▪ Capacitors ▪ Electric cables/power cords ▪ Main power supply lines ▪ Batteries ▪ Impressed current cathodic protection | <ol style="list-style-type: none"> 1. Turn off the power at the machine 2. Turn off the power at the main supply circuit breaker, or isolate by removing the fuse 3. Lock and tag the main supply isolation switch 4. Discharge all capacitive circuits 5. Try to start the equipment or test with meter or go/no-go voltage tester <p>NOTE: Electrical isolation shall only be done by qualified electrical personnel (refer to section 5.3.1.7 – Electrical Isolation)</p> |
| Fluid Pressure | Hydraulic systems (for example, hydraulic rams, cylinders, cap presses or stamping machines) | <ol style="list-style-type: none"> 1. Shut off the hydraulic supply (for example, close the supply line valves) 2. Lock and tag the valves 3. Bleed off the stored hydraulic pressure slowly 4. Blank the lines as necessary 5. Tag all of the blanks |
| Air Pressure | Pneumatic systems | <ol style="list-style-type: none"> 1. Shut off the air supply 2. Lock and tag the air supply isolation points, or physically disconnect the air lines and tag them 3. Bleed the air pressure from the system 4. Where feasible, leave the bleed points locked open and tag them |
| Kinetic Energy (Energy of a moving object or materials) | <ul style="list-style-type: none"> ▪ Flywheels ▪ Materials in supply lines from overhead tanks, bins or silos ▪ Blades | <ol style="list-style-type: none"> 1. Stop all moving parts 2. Block movable parts to prevent movement (for example, chock flywheels, spade or blank lines to overhead storage) 3. Review to ensure all mechanical motion cycles are stopped and blocked 4. Lock and/or tag all block points |

| Energy Form | Energy Source (Examples) | General Lockout Guideline |
|--------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Potential Energy</p> <p>(Stored energy that an object has the potential to release)</p> | <ul style="list-style-type: none"> ▪ Counter balance weights ▪ Springs (such as spring-loaded valve actuators) ▪ Raised loads or objects | <ol style="list-style-type: none"> 1. Lower all elevated or suspended parts or loads to their rest (lowest) position 2. Block all of the parts that cannot be lowered to a rest position and those that may move due to gravity 3. Release any energy stored in springs, or block the springs if the energy cannot be released 4. Lock, where possible, all blocks and tag them |
| <p>Pressurized Liquid or Gases</p> <p>(Including chemical vapors, steam, etc.)</p> | <ul style="list-style-type: none"> ▪ Storage tanks ▪ Blending kettles ▪ Supply lines | <ol style="list-style-type: none"> 1. Close the valves on supply lines 2. Lock and tag all valves 3. Bleed off liquids or gases from pipelines 4. Blank the lines as necessary, and tag the blanks <p>NOTES:</p> <ul style="list-style-type: none"> ▪ Consider the need for double isolation (for example, double block and bleed valve), or physical disconnection of supply lines based on the risk if the product should bypass the closed valve ▪ Positive physical isolation must be achieved if entry to the vessel is required |

My signature below indicates that all required Equipment Isolation points have been isolated and equipment is ready, job can begin safely.

Area Controller: Name : _____ Company / Division : _____ Date / Signature : _____

Notes:

I. Refer the following attached drawings for Isolation point markups.

a. Electrical Drawings :

b. P&ID :

II. First lock to be installed, and, last lock to be removed by Permit Approver representative.

III. Removal sequence for particular equipment must be followed as defined in procedure

IV. Drawing must accompany this checklist

V. The equipment isolation check list shall be attached to the work permit and person installing /removing isolation shall sign the respective section after completion of isolation. After the completion of all isolations , area controller shall sign the checklist.

VI. Return to service by removing all isolation points in the reverse sequence of the isolation point installation.

Precautionary Measures:

- Special PPE equipment and/or clothing provided as listed List :
- Respiratory protection as listed List :
- Spill response plan in place
- Additional instruction, conditions, special requirements or instructions: List:

Appendix E: Minimum Tag Requirements

The following requirements apply to tags. Tags used at JO facilities must meet these requirements:.

Tags must:

- Be standardized by size, shape or color across the facility.
- Be distinguishable from tags used for purposes other than lockout or tagout.
- Be understandable by employees and contractors.
- Identify the individual who applied the tag.
- Withstand the environment to which they are exposed for the maximum period of time that exposure is intended. Tag must not deteriorate, and the message must not become illegible when exposed to weather, wet or damp conditions, or chemical or corrosive environments.
- Employ a means of attachment that is substantial enough to prevent accidental removal. The means of attachment must be of a non-reusable type, attachable by hand, self-locking, and have a minimum unlocking strength of not less than that of a nylon cable tie.
- Warn against hazardous conditions if the machine or equipment is energized.
- Include the words “Do Not Operate” in a legible font at least 12.5mm (½ inch) high.

Sample Tags

Following are examples of tag layouts that meet the content requirements.



Figure 1. GO 1493



Figure 2. Brady™ Tag



Appendix F: Guidelines for the Removal of Lockout/Tagout Devices by Persons Other Than Those Who Fitted Them

WARNING: This procedure must only be used when there are reasonable grounds to believe that the person who fitted the lock and/or tag has inadvertently forgotten to remove the lock and/or tag, or when that person is incapacitated and cannot remove the lock and/or tag. It is possible the worker may have temporarily left the facility to obtain spare parts or required equipment to complete the repair, so absence from the facility is not reason enough to initiate this procedure. Prior to using this procedure, a thorough effort shall be made to locate the person who fitted the lock and/or tag and get him or her to return to the facility to remove the item. In all cases where the person can be located, he or she shall be requested to return and remove the lock and/or tag instead of using this procedure.

When a worker who applied a lock or tag is not available to remove it, the lock or tag may be removed only by the Work Team Leader or his designee by following these procedures:

| Step | Action |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. | Make a reasonable and thorough attempt to locate the worker, such as making contact on his work telephone and/or mobile phone. If the worker is a contractor, request that the contracting company contact the worker. |
| 2. | Inform all relevant personnel that the removal of the lock is being undertaken, and specify what equipment the lock was isolating and who fitted the lock. |
| 3. | Evaluate if it is safe to reenergize the equipment by performing all of the following: <ul style="list-style-type: none"> ▪ Check the area thoroughly to ensure all equipment has been reassembled correctly. ▪ Ensure all connections to the equipment have been remade. ▪ Remove any tools or equipment from the area. <p>NOTE: This may require the assistance of a competent person.</p> |
| 4. | Clear the area of all personnel and tools. |
| 5. | Remove the lock and/or tag. |
| 6. | Re-start the equipment if necessary. |
| 7. | If and when the worker returns and before any further work is performed, notify him or her that the lock and/or tag have been removed. |

Appendix G: JO Sanction to Test Form

|  SANCTION TO TEST CERTIFICATE  | | | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-----------------------------------------------------|--|--|
| Section 1 To be Completed by Requester/ Work Team Leader | | | | | |
| 1a | IC Cert No: | | | | |
| 1b Test Valid From: | Test Valid To: | | | | |
| 1c Requester: | Company: | | | | |
| 1d Equipment: | No of Workers: | | | | |
| 1e Job Site Location: | Division: | | | | |
| 1f Test to be performed: test | | | | | |
| 1g Tools / Equipment required for test: | | | | | |
| SECTION 2 To be Completed / Verified by Approver & Area Controller | | | | | |
| 2a | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; text-align: center;">Isolations to Remain in position</th> <th style="width: 50%; text-align: center;">Isolations that may be removed to perform test only</th> </tr> </thead> <tbody> <tr> <td style="height: 200px;"></td> <td style="height: 200px;"></td> </tr> </tbody> </table> | Isolations to Remain in position | Isolations that may be removed to perform test only | | |
| Isolations to Remain in position | Isolations that may be removed to perform test only | | | | |
| | | | | | |
| 2b Safety precautions to be taken | | | | | |
| 2c Earths Applied | | | | | |
| SECTION 3 by relevant parties | | | | | |
| 3a | Approval and Acceptance | | | | |
| Approver: (If all the requirements and conditions of this certificate remain in effect, the test can be performed safely) | | | | | |
| Name | Signature | | | | |
| | Date | | | | |
| | Time | | | | |
| Area Controller: (Safety measures are in place and equipment / area is released for testing) | | | | | |
| Name | Signature | | | | |
| | Date | | | | |
| | Time | | | | |
| Work Team Leader: (Understand special precautions to be taken during Testing) | | | | | |
| Name | Signature | | | | |
| | Date | | | | |
| | Time | | | | |
| 3b | Stop Work Authority | | | | |
| Reason for stopping work: | | | | | |
| Name | Signature | | | | |
| | Date | | | | |
| | Time | | | | |
| 3c | Certificate Closure | | | | |
| | Signature | | | | |
| | Date | | | | |
| | Time | | | | |
| Work Team Leader (Test Completed) | | | | | |
| Area Controller (Test Completed and Isolations Restored) | | | | | |
| Approver (Certificate Closed) | | | | | |