Blinding and Isolations

Overview

Purpose

The purpose of this standard practice is to establish guidelines for safe and consistent isolation of refinery equipment and machinery at Los Angeles Refinery (LAR) to facilitate servicing, maintenance, or testing.

Scope

The scope of this standard practice applies to the servicing, maintenance, or testing of all refinery equipment and machinery that may be subject to unexpected energizing or release of stored energy causing

(a) injury to personnel,
(b) adverse environmental impact, or
(c) damage to equipment.

Out of Scope

This standard does not apply to Minor Servicing Activities, Hot Taps, In-Service Welds and activities under Exclusive Control.

Implementation Schedule

Provisions of this standard shall be fully implemented by 01/01/21.

Records Retention

Printed copies of this document shall not be retained more than 12 months. Any revision to this document will be retained indefinitely.

Table of Contents

1.0 References and Terms

1.1 Refining References The table below lists the Refining references used with this document.

Number	Description
RRD-1323-000	Safe Equipment Preparation Guidelines
RSP-1127-000	Confined Space Entry
FS-315	Confined Space Entry
RSP-1128-000	Safe Work Permit
HSS-201	Safe Work Permit
RSP-1150-010	Caustic and Utility Connections to Process Lines and Vessels
RSP-1700-000	Life Critical Safety Rules & Accountability
HSS-010	Life Critical Safety & Accountability
RSP-1715-000	Hot Work
HSS-630	Hot Work Safety
RSP-1121-010	Blinding and Isolation
SAF-4007	Control of Hazardous Energy Sources
SP-50-05	Caustic and Utility Connections to Process Lines and Vessels
SP-50-39	Pressure-Rated Blinds, Non-Rated Blinds, Vent (Bleeder) Blinds, and Bleed Rings

1.2 Industry References The table below lists the industry references used with this document.

Number	Description
American Petroleum Institute (API)	
API 570	Piping Inspection Code: In-service Inspection, Rating, Repair, and Alteration of Piping Systems
American Society of Mechanical Engineers (ASME)	
ASME B16.5	Pipe Flanges and Flanged Fittings NPS 1/2 Through NPS 24 Metric/Inch
ASME B31.3	Process Piping
ANSI/ASSE Z244.16	Control of Hazardous Energy Lockout/Tagout and Alternative Methods

1.3 Regulatory References The table below lists the regulatory references used with this document.

Number	Description
OSHA 29 CFR 1910.146	Permit Required Confined Space
OSHA 29 CFR 1910.147	Control of Hazardous Energy Sources
OSHA 29 CFR 1910 Subpart O	Machinery and Machine Guarding
OSHA CPL 02-00-147	The Control of Hazardous Energy – Enforcement Policy and Inspection Procedures
Cal OSHA, Title 8 CCR	§3312, §3314, §2320.4, §2320.5, §6815, §6816

1.4 Terms

The following terms are used in this document:

- Affected Employee
- Authorized Employee
- Bleeder Blind
- Bleeder Blind Flange
- Blind List
- Blinding
- Cold Work
- Confined Space Entry
- Double Block and Bleed
- Energy Isolating Device (EID)
  Energy Isolation List
- Engineered Isolation Plug
- Equipment Isolation Lock
- Exclusive Control
- Freeze Plug
- Group Lock
- Hazardous Energy
- Heavy Materials / Solids
- Hot Work
- Invasive Work Risk Assessment
- Isolation / De-Isolation
- Isolation Blind
- Isolation Verification Point
- Lockbox (Master)
- Lockout
- Minor Servicing Activities
- Owning Department
- Pancake Bleeder Blind
- Perimeter (Battery Limit) Blind
- Permanent Blind
- Personal Lock
- Ping & Ding
- Primary Isolation Point (PIP)
- Qualified Isolation Authority
- Satellite Lockbox
- Servicing Representatives
- Status Change / Temporary Release Form
- Supplemental Energy Isolation List
- Tagout
- Test Blind

Reference: For details, see Appendix A: Terms and Definitions.

2.0 Roles and Responsibilities

Roles	Responsibilities
2.1 Owning Department (OD) **e.g., Operations, Construction Group, Power Distribution Group (PDG), etc.**	2.1.1 Oversees the entire Equipment Shutdown and Isolation Process. 2.1.2 Ensure that the limitations of the number of changes made to the isolation plan does not exceed five (5). 2.1.3 Identifies any upstream/downstream isolations that are with their isolation perimeter, and: a) Secure a Single Point of Contact (SPOC) for the upstream and downstream affected isolations. b) Ensure that the upstream/downstream groups apply their Department Lock to the equipment owner's isolation lockbox. c) Ensures that only one (1) version of the Active Iso-Plan is being utilized as the Controlled Document, e.g., stored in the "Active Isolation Binder". • Copies of a Controlled / Active Iso-Plan, and its supporting documents, e.g., EIL, Blind List, etc., is prohibited.

2.2 Los Angeles Refinery	2.2.1 Has established a site-specific Control of Hazardous Energy Standing Instruction to include: a) Procedures for equipment isolation/de-isolation, b) Training of "Authorized" and "Affected" employees, and c) Auditing and retraining based on audit findings. 2.2.2 As part of the site-specific Control of Hazardous Energy Standard practice, LAR has developed an electronic isolation plan system, called the Isolation Planning Tool, to track lockout/tagout devices. The system would include an isolation list with the following information: a) Type of isolation/energy source, b) LOTO lock or tag number, c) Description of isolation point/type of service, d) Date installed, e) Installer, f) Date removed, g) Remover, h) Description of isolation verification points, including the means used to verify control of hazardous energy, and i) Owning Department isolation list and verification approval signatures j) Use of P&ID that identifies the isolation & verification points for Confined Space Entry, Attended Hot Work and for complex isolations. **Note:** In the event that the Iso-Plan tool is experiencing technical issues, a "hard copy" of an isolation plan is located on the LAR SharePoint in the Blinding and Isolation tab. 2.2.3 LAR shall use the Isolation Blind List system to track blinds. It shall include*:* a) blind identifier (e.g., tag number), b) blind location/description (**Example:** 3-inch 150 class heater fuel gas inlet), c) installer/remover, d) date installed/removed, and e) Owning Department isolation list and verification approval signatures.

3.0 Equipment Shutdown and Isolation Process

3.1 Equipment Shutdown and Isolation Process

3.1.1 The table below describes the procedures for equipment shutdown, isolation, de-isolation and startup.

Important: When a Single Valve Isolation (SVI) is utilized to isolate two or more streams (e.g., utility steam tie-in to a product stream) then the isolation method, and controls must meet the higher hazard stream. See Appendix B: Process/Energy Isolation Matrices for detailed information on isolation requirements.

3.2 Preparation

3.2.1 The shutdown of refinery equipment, machinery, and/or systems, required for servicing/maintenance shall be conducted by the owners of such equipment. The Energy Isolation Plan must be prepared in advance, in the Isolation Planning Tool, by the Owning Department's Qualified Isolation Authority (ISA) representative and developed consistently with the Process/Energy Isolation Matrices (Appendix B). All Energy Isolation Plans, that meet the minimum standard of isolation, must have both an ISA and a second ISA to approve the isolation Plan. The Energy Isolation Lists will specify the energy isolation devices, isolation verification points and the means to verify control of hazardous energy in order to safely prepare the equipment for the servicing representatives. The Energy Isolation and Blind Lists serve as supplemental procedures to this HSS for the isolation of specific equipment and systems.

a) Additions, deletions, and changes to isolation lists must be approved by Owning Department Supervision or designee.

b) Locations where tubing, unions, pipes, etc. have been disconnected as part of the isolation shall be included on the energy isolation list.

Notes:

- Disconnected piping shall be positioned so that it does not remain in alignment with or within close proximity to the isolated equipment.
- As allowed by **1910.147(c)(4)(i)** and the OSHA Compliance Directive, an energy isolation list is not required while working on equipment that has a single isolation point that is locked out and tagged.
  - Examples include working on HVAC units, lighting circuits, etc.
  - This does not include isolations that involve process related equipment, e.g., fin-fan isolation, etc.
- Equipment shall be prepared for maintenance activities per refinery specific operating procedures and in accordance with guidelines outlined in RRD-1323-000 Safe Equipment Preparation Guidelines.

3.2.2 When a single point of isolation is used for equipment that contains heavy materials/solids (see definition in Appendix A.21) additional considerations shall be taken by Owning Department Representatives as follows:

a) Consult Appendix I for strategies to ensure effective single point isolation of heavy materials/solids.
b) Instruct the Servicing Group to work the job continuously to completion when possible and minimize the time that equipment is open by providing the anticipated manpower, tools and parts at the jobsite prior to line break.
c) The *Heavy Materials/Solids Single Point Isolation Checklist* (Appendix J) provides an optional tool that can be used to safely plan, authorize and execute work involving isolation of equipment in heavy oil/solids service.

3.2.3 All bleeders and valves used to verify equipment has been depressured and that will remain open during the maintenance work must be tagged (Appendix E) and listed on the Energy Isolation List in the section of the form designated "**Energy Isolation Device Identification**".

Note: In some cases, the checks to ensure that a fully de-energized system exists will involve equipment that will not be locked or tagged out. Examples include bleeder valves that are opened to verify the system is depressured but will not remain open for the duration of the maintenance work or electrical motor switches that do not get locked out because the upstream electrical breaker is the energy isolation point. These isolation verification points shall be listed on the Energy Isolation List, along with the means used to verify control of the hazardous energy and any special instructions, in the section designated "**Verification of Isolation**".

3.2.4 Tagging valves that will remain open during the maintenance work will help ensure the equipment / system remains in a controlled energy state. This practice will also help ensure that the valves are closed before the equipment / system is returned to operation.

Important: When installing and removing primary isolation point (PIP) blinds, the appropriate vent/drain valve between the PIP and the blind must be opened prior to installing/removing the blind to verify the system is depressured. This valve only needs to remain open and tagged if continuous bleed is needed to facilitate the blind installation/removal.

3.2.5 The practices in **3.2.3 & 3.2.4** of this section shall only apply to routine (non-shutdown related) work. For turnaround, major maintenance and project work, the elements discussed in this section shall be included in the operating procedures, PSSR documentation, and/or functional checkout procedures

3.3 Isolation and Lockout/Tagout

3.3.1 Owning Department shall perform the following:

a) Isolate the hazardous energy according to the Process/Energy Isolation Matrices (see Appendix B) and the Isolation List.

- Each Energy Isolation Device (EID) shall have their own equipment locking device, e.g., one isolation lock per EID.

Note: Using one lock for multiple EIDs, also known as "Daisy Chaining", is not an acceptable practice, but if it is not avoidable a Site Variance (HSS-004) will be required to implement this method.

b) Following the Owning Department's isolation, arrange for the isolation of maintenance required tasks such as blinding, high voltage breaker deactivation, plug installation, etc. as required by the isolation list(s) and in accordance with the Process/Energy Isolation Matrices (Appendix B).

c) When installing isolation blinds a **Blind Tag** for each blind location shall be attached as close to the blind location as possible. Before the blind can be installed or removed, the applicable part of the tag (installing blind or removing blind section) must be signed by both the Owning Department Representative and Servicing Group Representative. This tag may be used in lieu of the Equipment Isolation Tag by completing the back side of the tag, unless it is a "shared" EID. If it is a shared EID, an Equipment Isolation Tag shall be applied for each EIL with one Blind Tag with all the EIL's listed in the Back side.

d) **ALWAYS** think about how the air free and blind removal procedure is going to be executed. The use of a bleeder blind will be considered where feasible, if:

- a bleeder is not present to properly air free the system, or
- an isolation valve is known to be leaking and there is not a bleeder present between this isolation valve and the blind location.

e) See Section 4.12 for additional guidelines on the use of Bleeder Blinds.

f) The Qualified Isolation Authority shall be positioned up wind, remain at a safe distance from the work, and be present at the job site during the first flange break.

g) Verify that equipment and/or piping is completely de-energized and depressured according to the instructions in the "Verification of Isolation" section of the Energy Isolation List. This verification will include the following as applicable:

- Opening a bleeder or valve in close proximity to the work location. For large / complex systems multiple bleeders and valves will be opened to ensure that the entire system is de-energized.
- Pushing any start buttons on pumps, compressors, fans, etc.
- Ensure systems with potential "vapor lock", e.g., vertical piping/tubes, are verified energy free via opening applicable vents and bleeders and/or, where necessary, cold drilling/cutting holes above and below work location.
- Taking any other physical actions necessary or any actions outlined in Owning Department procedures.

h) If de-pressuring cannot be verified (e.g., absence of a bleeder to relieve pressure), then the refinery line breaking procedures must be followed with additional precautions implemented to protect workers. This may include:

- Using additional/specialized PPE as dictated by the Invasive Work Risk Assessment Score,
- Having fire protection onsite and attended, or
- Utilizing a qualified electrician to test electrical equipment to ensure the system is de-energized. Refer to Field Isolation of Electrical Equipment

i) If the equipment cannot be verified as de-pressured, then the Owning Department Shift Supervision (Day Foreman or Operations Shift Supervisor) and Maintenance Supervision (Foreman or designee) will sign the work permit to designate their approval to proceed with the work, the methods to de-pressure and the precautions being implemented. This requirement only applies to the following services: hydrogen, flare gas, corrosives, and high temperature hydrocarbons (>400°F).

Note: The potential for liquid to remain in a de-pressured system exists, therefore the Owning Department must ensure no liquid material remains or incorporate additional measures (PPE) to protect workers.

j) If the isolation device has been identified as not holding; a risk assessment form shall be used to identify the hazard and mitigations.

- The isolation plan shall be approved by the Area Team Lead (ATL)

k) Affix Owning Department equipment isolation locks and tags to all subject valves, actuators, motor starters, circuit breakers, etc., according to the isolation plan/equipment isolation list.

- All keys to the Equipment Isolation Devices (EID) locks must be placed into the "active" lockbox for the isolation.

l) For common isolation points that are listed on multiple isolation plans, each Energy Isolation Device (EID), e.g., valves, blinds, breakers, etc., shall have a separate lock and tag for the respective isolation plan.

m) Only the lock and/or tags for the completed task can be removed while leaving the active task's isolation lock and tags in place.

Note: Owning Department and MPC Personal Locks shall be standardized at each site in at least one of the following criteria: color, shape or size. The color, shape, size, and use are discussed in HSS-008A. ABUS 72/40 style locks are to be utilized for isolations involving maintenance activity. Contractor's personal locks do not need to be an ABUS 72/40 lock.

n) The Owning Department will then affix a departmental lock and energy isolation tag to the appropriate Lockbox. The Owning Department shall also attach the "MPC Equipment Return to Service" tag (Appendix E) to the Owning Department lock on the Lock Box.

o) All Servicing Group Representatives shall then affix their personal locks to the Lockbox that is controlling the isolation. All locks must be tagged or labeled for identification of the lock's owner. This requirement is in effect for normal operations and maintenance.

- Active lockboxes shall be stored in a controlled location determined by the Owning Department.
  - If the lockbox is stored in the field, it shall be secured utilizing an equipment isolation lock assigned to the lockbox to prevent relocation of the lockbox.

Note: There may be some utility streams and electrical installations which are not capable of or configured for Lockout isolation. In the rare event Lockout isolation cannot be utilized for a utility stream then Tagout isolation methods may be used. For electrical situations that cannot be locked out, an additional measure of isolation must be implemented (e.g., removal of circuit element, removal of fuse, disconnect wire, opening a second disconnecting device).

p) The Owning Department Representative shall conduct the Joint Job Site review of all isolation points with affected service group representatives as required by the Safe Work Permit

q) The Owning Department Representative shall place the Isolation Plan /Equipment Isolation List in the "Active Isolation" binder as the controlled copy.

r) During Turnarounds, Routine Shutdowns, Major Maintenance, and major construction projects, an alternative accountability procedure may be used. The alternative procedure must meet the requirements of ***Chapter 4 Section 6*** of the OSHA Compliance Directive for Control of Hazardous Energy (**CPL-02-00-147**). The requirements for alternative procedures are listed in Appendix G.

3.3.2 Documentation of the Isolated equipment.

a) The IsA performing the isolation shall identify themselves by placing their name on the tag that is applied to the isolation device.

- This IsA shall also initial the isolation step on the isolation plan.

b) A different individual (Competent IsA) shall sign off on the Co-Signer page of the isolation plan identifying that they have verified that the isolations have been conducted per the isolation plan.

c) When blinds are installed and removed the Servicing Group Representative shall sign off that the task has been performed on the Blind List.

3.4 De-Isolation

3.4.1 The Servicing Group Representative shall inform the Owning Department

a) Informs the Owning Department that the

- work is complete, and
- equipment and systems are ready for removal of blinds/energy isolation devices at the Owner's discretion.

b) Following the removal of a bolted slip blind, blind flange, plug, etc.,

- return any blind identifiers (tags) to Owning Department personnel, and
- sign and date the appropriate blind list at each listed blind point for which they removed a blind.

c) After all work is completed, authorized employees remove their personal locks.

3.4.2 Owning Department Personnel shall

a) verify that the work is complete by reviewing the job location and through communication with the servicing representatives.

b) Prepares equipment and systems for the removal of blinds per Operational procedures and RRD-1323-000 Safe Equipment Preparation Guidelines.

Important: The Qualified Isolation Authority shall be positioned up wind, remain at a safe distance from the work, and be present at the job site during the first flange break.

c) Prior to the removal of any personal locks, a qualified owning department representative will issue the servicing representatives a work permit and directs the removal of blinds/energy isolation devices and reconnection of electrical power, hydraulic/pneumatic lines and re-energization of breakers according to the isolation list(s).

d) Prior to removing "Owning Department" locks, at a minimum, one of the following methods must be completed by a qualified owning department representative to verify that the equipment is fit for service following maintenance activities:

- **P&ID Walkdown:** Utilize the complete system P&ID to verify and document that all affected bleeders/valves are closed, plugged and capped and all flanges parted have been checked to ensure the gasket is installed correctly and have been checked for loose bolts by completing a ping and ding check.

Note: The completed and signed P&ID shall be turned into the Owning Department supervision for review and retention (if requested).

- **Pressure Leak Test:** The equipment and/or piping within the maintenance scope shall be leak tested by either:
  - Pressuring the system with a utility (steam, soft water, condensate) and visually checking for leaks:
    - When using steam, caution shall be taken to ensure that equipment Maximum Allowable Working Pressure (MAWP) and Maximum Allowable Working Temperature (MAWT) is not exceeded and to avoid pulling a vacuum on the system.
    - When liquid filling equipment, a review shall be completed to ensure the equipment is structurally designed to handle the volume of liquid.
    - Ensure that the utility selected is compatible with the process and metallurgy.

Note: The use of air is not a recommended practice. The use of air requires the completion of a hazard assessment and approval of the Owning Department Operations Shift Supervisor.

- Pressuring the system with nitrogen and complete a hold step:
  - During the hold step, the system pressure shall be monitored closely. Flanges parted and other connections made up during the maintenance work shall be checked for leaks using a leak detection solution (e.g., Snoop). Do not exceed the MAWP of the equipment / piping.
  - If the hold step cannot be completed, a system walk must be completed to identify the leak source.
  - The equipment cannot be returned to service until a successful pressure test is completed.
  - The owning department shall have a means to document that the pressure leak test was completed, all affected bleeders/valves are closed, plugged, and capped and all flanges parted have been checked to ensure the gasket is installed correctly and have been checked for loose bolts by completing a ping and ding check. This can be done in the form of a procedure, checklist, work closure form or other equivalent means. The completed and signed document shall be turned into the owning department supervision for review.

Exception: The requirements outlined in this section apply to routine maintenance or servicing activities in which energy isolation was applied and invasive work was performed. Further, the requirements only apply to work performed on equipment in hydrocarbon, corrosive, toxic or hot service (>140°F) and are applicable to activities performed by either Maintenance or Operations/Product Control. The following items are not subject to these requirements:

- Equipment in utility service with an operating temperature below 140°F.
- Items considered as minor servicing activities or exclusive control. These are not subject to energy isolation.
- For turnaround, major maintenance and project work, the elements discussed in this section shall be incorporated into the operating procedures, PSSR documentation, and/or functional checkout procedures.

e) Removes any remaining Owning Department equipment isolation locks from valves, actuators, motor starters, circuit breakers, etc.

Note: Complete the "*MPC Equipment Return to Service Checklist*" in Appendix E.1 that is attached to the equipment appropriate lock box.

f) When the isolation is complete and the system has been reinstated, the Owning Department Representative shall submit the completed Isolation Plan /Equipment Isolation List with the completed permits for record retention.

3.4.3 Documentation of the reinstated equipment.

a) This IsA shall also initial the isolation step on the isolation plan identifying the reinstatement of the equipment.

b) A different individual (Competent IsA) shall sign off on the Co-Signer page of the isolation plan identifying that they have verified that the reinstatement step has been conducted per the isolation plan.

c) When blinds are installed and removed the Servicing Group Representative shall sign off that the task has been performed on the Blind List.

4.0 Miscellaneous Requirements

4.1 Lockout Device

4.1.1 Lockout devices shall be substantial enough to prevent removal without the use of excessive force or unusual techniques, such as with the use of bolt cutters or metal cutting tools.

a) Tags shall be used in conjunction with each lockout device.

4.1.2 Types of isolation locks for MPC personnel and equipment:

a) Equipment lock (red) is the lock that is applied directly to the isolation device.

b) Unit locks (silver) are used to secure the key to the equipment locks inside the lockbox. This is also the continuity lock to ensure the integrity of the isolation when no work is actively being conducted. This is the first lock on the lockbox and the last one off.

c) Personal lock (blue) is the lock each Affected Worker applies to the isolation device or lockbox to ensure the isolation remains in a safe condition while conducting work on that system. Once applied the Affected Worker must always be in control of the lock's key when it is applied.

- Contract employees may utilize any color lock as their personal lock, but they must be uniquely keyed for their personal safety.

d) Electrical Department locks (yellow) are the locks that are applied by a Qualified Electrician to an electrical isolation device to ensure that only a Qualified Electrician can operate the electrical isolation device.

- If the electrical isolation is performed by Operations an equipment lock can be used in lieu of the yellow lock.

e) Radiation Safety Officer lock (magenta) is the lock applied by the Radiation Safety Officer (RSO) or their Alternate to a radiation isolation device to ensure that only the RSO or the Alternate can operate the isolation device.

f) **TAR locks:** the TAR Department will supply lockboxes, equipment locks (orange) and unit (green) locks for TAR activities.

- The Owning Department is responsible for identifying and requesting the required LOTO equipment from the TAR Department and the TAR Department will be responsible for supplying the equipment to the Owning Department for the TAR Event.
- Routine equipment (red) and unit (silver) locks may be used in lieu of the TAR locks, and those will be supplied by the Owning Department.

Note: The process for ordering LOTO Material can be found in HSS-008 Att5

4.1.3 Quarter (1/4) turn valves shall be locked utilizing the manufacturer's locking mechanism.

a) If there is no manufacturer locking mechanism, then an approved locking mechanism can be obtained from the Warehouse.

4.1.4 Chain Operated Valves must utilize a nearby stanchion or equipment to secure the chain.

a) If there is no available location to secure the chain, at the highest point available combine both sides of the chain and apply the LOTO device.

b) For heavy material isolations refer to I.1.2 in Appendix I.

4.1.5 Bolted blank flanges and bolted slip blinds are considered to be capable of being locked out, per OSHA CPL 02-00-147.

4.2 Isolation Plan

Planning Phase

4.2.1 Once the IsA develops the Isolation Plan it shall be verified and approved by a second IsA in the Iso-Plan Tool.

a) If there is an electrical component to be isolated a Qualified Electrician shall approve the electrical isolation point via the Iso-Plan Tool.

NOTE: Depending on the type of isolation available a Higher Level Approver(s) (HLA) may be required before the isolation plan can be used.

Execution Phase

4.2.2 Once the plan has been executed per the plan the IsA shall sign off on each individual step of the plan.

NOTE: Copies of the isolation plan may be used for multiple IsAs to assist in the isolation.

4.2.3 When there is an electrical isolation then the Qualified Electrician shall sign the step for the electrical isolation.

4.2.4 An IsA or competent isolation authority, different from the IsA that signed off on the plan step, shall field verify that the isolation was conducted per the plan and shall sign off on the Co-Signature section of the plan verification section.

4.2.5 The isolation plan that has all of the appropriate sign offs shall be clearly identified as the "Controlled Copy" and shall be placed in the Active Isolation Book.

Closure Phase

4.2.6 When reinstating the isolation steps the IsA shall sign off on the reinstatement steps on the isolation.

NOTE: When an electrical isolation is reinstated, the Qualified Electrician shall sign off on the corresponding reinstatement step on the isolation plan.

4.2.7 An IsA or competent isolation authority, different from the IsA that signed off on the plan step, shall field verify that the de-isolation was conducted per the plan and shall sign off on the Co-Signature section of the plan verification section.

4.2.8 Once the equipment has been instated the closed-out isolation plan shall be submitted to the LAR Safety Department for auditing and retention.

4.3 Blinding Open Ended Lines or Equipment

4.3.1 Open ended piping, tubing or equipment that is only isolated by a valve must be blinded (tubing capped) if the work extends past the current maintenance shift, unless it is continuously worked to completion in the field.

Notes: South Coast Air Quality Management Division (SCAQMD) Rule 1173 prevents the Los Angeles Refinery from utilizing the practice of using valve isolation with an open bleed as a valid isolation without an active Safe Work Permit for the task. To protect LAR from potential violations the verbiage from RSP 1121-010 section 4.2.1 (1) & (2) has been removed from this standard.

4.3.2 This requirement only applies to the following services:

a) hydrocarbons,

b) corrosives, and

c) toxic systems

4.3.3 This requirement does not apply to turnaround, shut down and/or project work when perimeter isolation / blinding and decontamination has been completed.

4.3.4 Any plugs or caps that were removed by the Owning Department as a zero-energy verification point shall be reinstalled by the Owning Department.

4.3.5 If a blind(s) needs to be installed or tubing needs to be capped, as part of the isolation process, and the Owning Department shall verify the isolation is complete.

a) Any additional isolation points or devices not listed on the Isolation Plan shall be documented on the Isolation Change Log and blinds added to the Blind List.

4.3.6 When installing and removing primary isolation point (PIP) blinds, the appropriate vent/drain valve between the PIP and the blind must be opened prior to installing/removing the blind to verify the system is depressured. This valve only needs to remain open and tagged if continuous bleed is needed to facilitate the blind installation/removal.

4.4 Hot Work and Blinding

4.4.1 Blinds shall be installed according to the Process/Energy Isolation Matrices (Appendix B) and at the closest flange to the hot work. If blinding at the closest flange creates additional risk, exceptions must be reviewed and approved by the Operations and Maintenance Front Line Supervisors, via the Iso-Plan Tool (planning phase) or if this occurs on the day of then it shall be documented and approved on the Isolation Change Log.

NOTE: Blind location requirements do not apply when perimeter or battery limit blinds are utilized, and the unit has been decontaminated. Sites may choose to install additional blinds closer to the hot work depending on the equipment and piping configuration and condition.

4.4.2 The area between the blind and the hot work shall be cleaned, and gas freed and tested Prior to the commencement of work.

Note: Atmospheric Testing shall be done at the hot work location. If bleeders are not available at the location, consideration should be given to drill a hole in the line, part flange, etc. in order to verify no hazards are present. This is especially important on long piping runs or complex systems.

4.5 Confined Space Blinding

4.5.1 Blinds shall be installed according to the Process/Energy Isolation Matrices (Appendix B).The isolation blind for a confined space must be tagged with a "*Confined Space Isolation Point - Do Not Remove*" tag (Appendix E) listing the Owning Department and blind number. This isolation point (blind, plug, physical separation, etc.) cannot be removed / reconnected until approved by an Owning Department representative.

4.5.2 Blinds shall be installed at the closest flange to the confined space. If the closest flange poses a safety hazard, then the next available flange may be utilized. In this situation the following steps shall be followed:

(a) Operations and Maintenance Foremen shall approve Iso-Plan for the alternate location during the planning phase.

- If identified after the "planning phase" then the Operations and Maintenance Front Line Supervisors shall approve the relocation via the Isolation Change Log.

(b) The piping between the vessel and the blind shall undergo the same preparation as the vessel (i.e., wash, steam, etc.).

(c) Spacers must be installed on the vessel side of the blind, unless there is another means (bleeder) proximal to the blind which allows proper piping preparation and internal gas detection.

(d) The Owning Department shall check the opening of the piping at the blind with a gas detector.

(e) The atmosphere must meet the same minimum requirements as the vessel prior to confined space entry permit being issued.

4.5.3 In lieu of blinding vessel appendages (e.g., sight glasses, level bridles), the appendages must be properly decontaminated, verified clean, e.g., by atmospheric testing, pH testing, etc., and isolation and verification methods must be included on the Energy Isolation Plan.

4.5.4 If there is a potential for an atmospheric contaminate to enter a Confined Space through the appendage(s) then blinding or disconnection is required prior to entry.

4.5.5 Entry into the shroud area of cooling towers (e.g., for gear box repairs, motor PMs) does not require blinding. The water to the cell must be locked out and the fan must be locked out. The fan blades shall be tethered or otherwise fixed to prevent movement while personnel are inside the shroud, Entry into an in-service cooling tower is acceptable, if the following conditions are met:

a) Water to the cell is locked out,

b) Platforms and walkways are structurally sound, and

c) Appropriate PPE is utilized.

4.0 Miscellaneous Requirements, Continued

4.5.6 Blinds are not required to isolate fire water/water to flow test nozzles in towers/vessels with the approval signatures from the Ops/Products Control and Maintenance Supervisors. The remainder of the tower/vessel must be blinded for confined space entry. Following the completion of flow tests, blinds must be installed in the test nozzle locations.

4.5.7 Due to the inability to insert blinds into most firewater piping configurations, a valve lockout is acceptable isolation for firewater systems when line repair requires excavations at a depth requiring classification as a confined space.

4.5.8 Isolation requirements do not apply to gases utilized for inerting equipment and vessels.

4.5.9 Lockout/Tagout is acceptable for confined space entry above the roof on internal and external floating roof tanks.

a) For tanks that cannot be isolated refer to HSS-660 (Safe Entry on Top of Tanks in Service)

4.6 Energy Isolation Verification Inspection

4.6.1 Energy isolation lists shall be walked down by the Owning Department and Servicing Group representatives as part of the Joint Job Site Visit (JJSV). This is to be conducted on the first day and night shift to verify that energy isolation is accurate and complete prior to issuing a Safe Work Permit.

4.6.2 After confirmation of the isolation has been conducted each Servicing Group Representative for each company affected by the isolation shall complete the Isolation Shift Verification Log with the Owning Department and ensure that the personal locks are applied to the lockbox.

4.6.3 During Turnarounds, if the isolation walkdown and verification goes across two shifts, it is acceptable for one Servicing Group Representative on one shift to walkdown a portion of the isolation and a Servicing Group Representative from the second shift to complete the walkdown and document the completion of the isolation walkdown and verification completing the isolation Shift Verification Log.

a) The Servicing Group Representative that verified the isolation shall apply a lock & tag to the appropriate lockbox as well as ensure that a lock and tag is present on the lockbox for each shift for the duration of the job.

4.6.4 Each shift shall complete the Shift Isolation Verification Log confirming and documenting that no isolation changes have been conducted prior to authorizing work for the shift.

4.6.5 When using a valve(s) as the isolation point, verification of the isolation must occur with the system at the normal expected operating pressure and temperature.

a) The Owning Department must verify that the zero-energy verification points (e.g., bleeders and vents) are clear from blockage that may provide a false zero energy verification.

4.6.6 Systems with cyclic or batch operations subject to significant variation in operating temperature and pressure require verification of isolation at the expected extremes while the system will be isolated. If isolation cannot be verified at the expected operating conditions positive isolation (such as blinding) must occur or measures taken to ensure the batch/cyclic operation does not change while the system is isolated.

4.6.7 If isolation changes occur, the energy isolation points altered/changed shall be re-verified and walked down with Owning Department and the Servicing Group representatives before work is continued and on the first affected (day or night) shift following the change, and reverification is to be documented on the Isolation Shift Verification Log. Examples of changes that would require the isolation verification inspection to be repeated include:

a) Removing a lock to exercise a valve or breaker, or

b) Opening a lockbox.

NOTE: Individual authorized employees must be provided the opportunity to verify isolation locations if requested.

4.6.8 When using a blind as a primary isolation point, i.e., the valve isolation used to set the blinds are no longer used as part of the LOTO or when utilizing TAR Plot Edge isolations to set the blinds, the following shall be followed: (*reference OSHA CPL 02-00-147)*

(a) An isolation plan shall be developed that is specific to the equipment/system being blinded.

(b) Use the Iso-Plan that identifies the valve isolation to set the blinds, e.g., TAR Plot Edge Iso-Plan.

(c) Once the blinds are installed the Servicing Group shall sign off on the Blind List associated to the equipment/system isolation plan.

(d) The Blind List shall be inserted into a lockbox, as the controlled document, and the Owning Department along with the Affected Workers shall place locks and tags on the lockbox.

(e) Prior to removing the blinds, the valve isolations shall be reinstated, or the TAR Plot Edge isolation shall be utilized.

(f) The Blind List in the lockbox (controlled document) shall be removed and used to identify the blinds that are to be removed / installed per the plan.

(g) Once the blinds have been placed in their normal position (start-up position) the Servicing Group shall sign off on the Blind List and the Owning Department to sign off on the Iso-Plan steps

4.0 Miscellaneous Requirements, Continued

4.7 Temporary Release of LOTO

4.7.1 A temporary release shall be used when a piece of equipment that is being serviced under lockout/tagout must be temporarily energized for testing, positioning, steaming, rinsing, purging, etc.

Exceptions:

a) Temporary release requirements do not apply to the hot alignment of pumps when the warm-up lines are used and all other energy sources for the pump remain isolated.

b) An operating procedure may be used in lieu of the temporary release form to document actions followed during the testing of equipment. The operating procedure must contain the following steps:

- Prior to testing:
  - Verify equipment is intact and non-essential items have been removed from the work area, and
- Verify all workers have removed their lock and tag and are clear of the equipment.
- After testing is complete and prior to allowing work to resume:
  - Re-apply and verify proper energy isolation, and
  - Verify the equipment is adequately de-energized and de-pressured.

4.7.2 The Owning Department Representative shall ensure:

a) All affected employees are aware of the temporary release and clear of the area,

b) All personal and servicing group locks/tags are removed from all of the applicable lockboxes, and

c) Any item or equipment that could present a hazard during the re-energization is removed from the area.

4.7.3 The Owning Department Representative shall:

a) Complete a Temporary Release Form and document the reason for the Temporary Release on the Temporary Release Log.

b) The Temporary Release Log shall be maintained with the Energy Isolation List and utilize the EIL number as the document identification.

c) Remove Department locks, tags, and keys from lockbox,

d) Remove equipment isolation locks/tags from those devices necessary for re-energization,

e) Sign and date the Temporary Release Log to indicate re-energization is ready to commence,

f) Place a Temporary Release of LOTO Tag on the Lockbox indicating that the re-energization is in effect.

g) After the temporary release is complete, replace equipment isolation locks and tags after the energy isolation device(s) are returned to proper status,

Note: If locks/tags are reused, the name/date on the tags does not need to be changed.

h) Test to verify that the equipment is isolated and de-energized according to the instructions in the "Verification of Isolation" section of the Energy Isolation List.

i) Lock lockbox with Owning Department lock and tag, and

j) Sign and date the Isolation Reinstated section of the Temporary Release Log.

k) Sign and date the Temporary Release of LOTO Tag on the Lockbox.

4.7.4 After the temporary release has been performed, the Owning Department and the Servicing Representatives shall:

h) Verify that equipment is isolated and de-energized, and

i) Install required servicing group and personal locks and tags on the appropriate lockboxes.

4.8 Status Change / Relocation of LOTO

4.8.1 A Status Change Log shall be used when there is a need to change the isolation from the approved isolation plan. This includes adding any isolation points to an approved plan or omitting an existing isolation points that is on the approved isolation plan. The Change Log does not replace the need for a Risk Assessed checklist or Pre-Approval Form.

NOTE: When temporarily reinstating an energy source for testing, see Temporary Release of LOTO process.

Important: A status change shall also be utilized to document the removal of a piece of equipment that is part of the isolation (i.e., removing a valve, closing a bleeder that was tagged open, etc.).

4.8.2 The Owning Department Representative shall:

a) Identify isolation points required to maintain the integrity of the existing work scope,

b) Verify equipment is intact and non-essential items have been removed from the work area

c) Verify all workers have removed their lock and tag from the lock box and are clear of the equipment.

d) Document the isolation change and the reason for the change on the *Status Change Log*,

- Each change shall have its own line on the Change Log
- If blinds are involved in the change the Blid List shall also be updated to reflect the change.

e) Enter the isolation point for each Energy Isolation Device (EID) on the Energy Isolation List,

f) Field verify the status change with the Owning Department Supervisor or Ops designee,

g) Once verified, Owning Department Front Line Supervisor or designee signs the Status Change Log indicating approval to proceed with implementation,

h) Limit the number of changes to no more than five (5). This limitation applies to TAR activities as well as routine.

- The Owning Department is responsible for identifying the number of changes on the Change Log
- If there are more than five (5) changes to the approved Isolation Plan, then the plan shall be revised in the Iso-Plan Tool to reflect the changes.
- Once the revised Iso-Plan is approved and issued, the previous plan shall be discarded and a new isolation verification walk shall be conducted with the Servicing Group Representative.

i) Line preparation and de-energization shall be completed to ensure safe condition of any additional lines and/or equipment included in the new LOTO system,

j) Re-apply locks and verify proper energy isolation, i.e., zero energy,

k) Sign and date the Status Change Complete section of the Status Change Log,

- The Owning Department shall obtain the signature of any Higher Level Approver(s), if required.

l) Verify the equipment is adequately de-energized and de-pressured, and

m) Review the change with the Servicing Group Representative associated with the job.

4.0 Miscellaneous Requirements, Continued

4.9 Engineered Isolation Plugs

4.9.1 Equipment isolation by blinds, threaded caps/plugs and/or physically disconnected equipment is recommended overusing an engineered isolation plug. The *Hot Work Isolation by Engineered Plug Approval Form* in Appendix C shall be completed prior to utilizing an engineered isolation plug.

4.9.2 If a flanged connection is unavailable for blinding, an engineered isolation plug may be used in place of a blind for hot work.

4.9.3 An engineered plug may also be utilized when there is significant risk associated with the installation of the necessary blinds. An explanation of the risk / hazards of blinding shall be included on the *Hot Work Isolation by Engineered Plug Approval Form* in Appendix C.

4.9.4 In order to use engineered isolation plugs as the only isolation for Hot Work:

(a) *Hot Work Isolation by Engineered Plug Approval Form* in Appendix C shall be completed by Maintenance, and

(b) Engineered isolation plugs must have two seals, and be designed, and pressure rated for the potential pressure of the line

IMPORTANT: The plug must also be applicable to the equipment service (e.g., liquid, vapor, corrosive, etc.).

NOTE: Single sealing, sewer/plumbers plugs shall not be used for hot work.

4.9.5 If a line cannot be made hydrocarbon free, the end of the line on which the hot work is to be performed shall be sealed with an Engineered plug.

4.9.6 The following precautions shall be in place before hot work begins:

a) The open end must be made hydrocarbon free, and scale removed.

b) The engineered isolation plug shall be installed past the heat-affected zone to ensure that the hot work will not burn or melt the sealing surfaces of the plug.

c) Provisions shall be made for the continuous venting of any accumulation of gases or vapors to a safe location away from the hot work.

NOTE: When it is deemed necessary to establish a purge through the engineered isolation plug, the vent line shall be safely vented to assure a flow is maintained. The method of venting the purge shall be indicated on the *Hot Work Isolation by Engineered Plug Approval Form* in Appendix C.

(d) If applicable, the Engineered Isolation Plug shall be equipped with a means to monitor and verify the sealing pressure to ensure maintenance of the 100% positive pressure vapor barrier. Also, a means to monitor the buildup of pressure behind the plug is required to not exceed the plug specifications.

(e) A flammable gas test shall be made around the plug as part of the permit.

(f) The location of the engineered isolation plug must be tagged with a blind tag and entered on the corresponding energy isolation and blind lists for the job.

(g) The potential exists for engineered isolation plugs to be blown out of lines due to the buildup of pressure. Always work to one side of an inserted plug, never work in front of the plug.

(h) Engineered isolation plugs used on lines containing flammable vapors shall not be left unattended past the end of the maintenance shift (work will continue until completed and system is sealed or blinded)

(i) If applicable, the Engineered Isolation Plug shall be equipped with a means to monitor and verify the sealing pressure to ensure maintenance of the 100% positive pressure vapor barrier. Also, a means to monitor the buildup of pressure behind the plug is required to not exceed the plug specifications.

4.10 Isolation using Freeze Plug

4.10.1 In rare cases, a freeze plug may be used to isolate a section of piping, but this is typically conducted as a last resort and requires in depth analysis, planning and preparation.

4.10.2 HSS-004 Site Variance Procedure Form must be completed for any isolation utilizing a freeze plug. The variance must document why freezing the line was chosen over alternative solutions, the findings and recommendations from the hazard review and the precautions to safely complete the task.

4.10.3 The following factors must be satisfied prior to using a freeze plug:

(a) There are no valves available to isolate the line or the valves are not operating properly,

(b) The line contains a freezable product (e.g., water, amine, heavy product),

(c) The flow/velocity in the line is at an acceptable rate for freezing,

(d) The line pressure and metallurgy allow for the use of a freeze plug,

(e) Only cold work is allowed on lines containing hydrocarbons, and

(f) Continuous monitoring of the line atmosphere and plug is required to ensure the plug remains in place and is performing as designed.

4.0 Miscellaneous Requirements, Continued

4.11 Permanent Blinds

4.11.1 Permanent blinds are typically installed in locations where it is critical to prevent leakage of material into undesired locations such as abandoned equipment or utility systems. Therefore, a system shall be in place to ensure proper management of the permanent blinds. The system shall include the following requirements:

a) The owning department will ensure all permanent blinds shall be identified with a tag in the field.

b) Blinds shall be shown on P&IDs and included on a permanent blind list so they can be verified in place after maintenance.

c) Permanent changes to the permanent blind list or P&IDs require a normal MOC.

d) A system to verify blinds are re-installed after maintenance.

- For major maintenance this can be accomplished as part of the pre-startup checklist or part of an MOC.
- For routine maintenance this can be accomplished using operating procedures/guidelines or other methods a refinery may implement.

e) A Permanent blind installation shall be verified by the Owning Department as often as necessary to ensure proper management of the program, but no less than once per year.

Note: The Operations group will own the permanent blind, and locked valve management program and ensure that the lists are kept accurate.

4.12 Electrical LOTO Procedures for TARs

4.12.1 The refinery Electrical Department will work with the Owning Department to coordinate all work and energy isolation within substations.

4.12.2 The Owning Department will prepare unit equipment for maintenance and perform isolation and LOTO per normal procedures.

4.12.3 When the Electrical Department must isolate an MCC for electrical maintenance, the needed loads will be transferred to a temporary distribution source, and the MCC main breaker will be placed in an electrically safe working condition and LOTO installed.

Note: When temporary power is utilized, extreme cautioned must be exercised to ensure that electrical power is not being supplied to isolated equipment.

4.12.4 The Electrical Department will coordinate with the Owning Department to have all previously installed LOTO locks and tags removed from the MCC individual breakers and transferred to the lock box for the MCC main breaker. This will ensure that the energy source remains isolated at all times protecting the persons performing work in the field.

4.12.5 When the MCC is to be re-energized, the Owning Department shall remove any locks and tags on the lock box for the MCC main breaker and install their locks on the original equipment breaker for any work being performed in the field.

4.12.6 For situations where isolated equipment must be tested, positioned, temporarily operated, etc., the removal of locking devices and de-isolation must be managed via the "Temporary Release" procedures and the task may be performed during shift change to minimize work disruptions.

4.0 Miscellaneous Requirements, Continued

4.13 Bleeder Blind Guidelines

4.13.1 Where feasible, bleeder blinds shall be used in situations where:
(a) Bleeders are not present to properly air free the system, or
(b) An isolation valve is known to be leaking and there is not a bleeder present between this isolation valve and the blind location.

4.13.2 Bleeder blinds should not be used in heavy product service or in other services that are prone to plugging.

4.13.3 Bleeder blinds shall be designed per **SP-50-39**.

4.14 Exclusive Control

4.14 The "Exclusive Control" exception to LOTO may only be applied to cord and plug electrical equipment. Examples include drill presses, saws, copiers, etc. that possess a cord and plug. The isolation of equipment by local switches, disconnects, valves, etc. is not considered "Exclusive Control" by OSHA.

4.15 Minor Servicing Activities

4.15.1 This policy and **OSHA Standard 1910.147** (The Control of Hazardous Energy – Lockout / Tagout) does not apply to tasks classified as Minor Servicing Activities.

4.15.1 Tasks designated as Minor Serving Activities (routine, repetitive, integral to the process) are listed in Appendix D.

4.15.1 As required by **OSHA 1910.147**, alternative protective measures have been developed for Minor Servicing Activities and included in Appendix D.

4.15.1 Minor Servicing Activities must be attended at all times. If left unattended for any reason (breaks, lunch, relief, etc.) LOTO must be applied.

4.16 Criteria for using a Relief Valve as an Energy Isolation Device (EID)

4.16.1 A relief valve may only be utilized as an Energy Isolation Device (EID) for the purpose of inserting a blind.
(a) A relief valve can be considered an EID to prevent backflow from the flare header for the purposes ***of installing or removing pre-decon blinds and installing or removing relief valve blinds.***

(b) Respiratory protection and other required personal protective equipment (PPE) while installing/removing blinds shall be determined by atmospheric testing and analysis of the process equipment. Where monitoring near the flange cannot be conducted, blinds shall be installed using supplied air until the flare is isolated from equipment by blinds.

(c) Process operations must be monitored continuously during the installation of blinds to warn workers of any process upsets.

4.16.2 The relief valve shall be listed as an EID on the Energy Isolation List and must be tagged.

4.17 **Non-Standard LOTO Removal**

4.17.1 If the need to forcefully remove an isolation lock is a result of an emergency, then the Incident Commander and Safety Officer shall document the decision to remove the isolation lock on the Non-Standard Lock Removal Form (Appendix G).

4.17.2 During a non-emergency event; the Operations Shift Superintendent is the only person authorized to forcefully remove locks that were applied by another person or unit (e.g. equipment, unit or personal locks) after the Non-Standard Lock Removal Form (Appendix G) has been completed.

(a) An attempt shall be made to contact the owner of the lock to understand why the lock was left on, and the owner's comments shall be document on the form.

- If the owner cannot be contacted, then the method for contacting them shall be documented in section 5 on the Non-Standard Lock Removal Form (Appendix G).

(b) If there is a specific hazard present (e.g. electrical hazard) then the OSS shall have the appropriate / qualified individual perform this task, after it has been risk assessed and deemed safe.

4.17.3 Prior to the removal of any isolation lock the Operations Shift Supervisor (OSS) and the Maintenance Supervisor or if the lock is owned by a contractor then a contractor Foreman (for that company and craft) shall complete the Non-Standard Lock Removal form, Appendix G

(a) In the event that the lock that is to be cut has been applied to a system or lockbox that maintenance has not worked on (e.g. isolated but then the job was postponed) then the Maintenance Supervisor /Contractor Foreman's signature is not required after OSS has verified no work has been performed.

4.17.4 The OSS shall distribute the copies of the Non-Standard Lock Removal form to the other signers and keep the original for a minimum of 1 year to date.

4.17.5 It is the responsibility of the OSS, Maintenance Supervisor or the contractor's foreman to notify the individual that their lock has been forcefully removed.

(a) In the event that it is a department lock, or an equipment lock then the OSS / Maintenance Supervisor shall communicate this action to their department.

5.0 Training

5.1 **Training Requirements**

5.1.1 Training shall be provided to ensure that the purpose and function of the energy control program are understood by employees and that the knowledge and skills required for the safe application, usage, and removal of the energy controls are acquired by employees. The training shall include the following:

5.1.2 Each authorized employee shall receive training on the local LOTO standard and in the recognition of applicable hazardous energy sources, the type and magnitude of the energy available in the workplace, and the methods and means necessary for energy isolation and control.

5.1.3 Each affected employee shall be instructed in the purpose and use of the energy control procedure and about the prohibition relating to attempts to restart or reenergize machines or equipment which are locked out or tagged out.

5.1.4 Contract companies performing work involving energy isolation must be trained and knowledgeable of the requirements of the OSHA Lockout / Tagout standard and the local LOTO standard.

5.1.5 Non-compliance with any portion of this HSS will be evaluated to determine violation(s) of a Life Critical Safety Rule (see **RSP-1700-000**).

6.0 Inspections and Audits

6.1 **Inspection and Audit Requirements**

Apply the following requirements for inspections and audits:

6.1.1 LAR shall conduct inspections of their energy control procedure at least annually to ensure that the procedure and the requirements of this HSS and the OSHA standard are being followed.

6.1.2 The inspections must include a representative sampling (to be determined by the Safety Supervisor) of the various types of isolations (i.e., vessels, pumps, electrical, etc.), the site and its authorized employees.

6.1.3 The periodic inspection shall be performed by an authorized employee other than the ones(s) utilizing the energy control procedure being inspected.

6.1.4 The periodic inspection shall be conducted to correct any deviations or inadequacies identified.

6.1.5 The periodic inspection shall include a review, between the inspector and each authorized employee, of that employee's responsibilities under the energy control procedure being inspected.

6.1.6 The employer shall certify that the periodic inspections have been performed utilizing the *Control of Hazardous Energy Inspection Form* in Appendix F. The certification shall identify the machine or equipment on which the energy control procedure was being utilized, the date of the inspection, the employees included in the inspection, and the person performing the inspection.

Appendix A: Terms and Definitions

A.1 Affected Employee	An ***Affected Employee*** is an employee whose job requires him/her to operate or use a machine or equipment on which servicing, or maintenance is being performed under lockout or tagout, or whose job requires him/her to work in an area in which such servicing or maintenance is being performed.
A.2 Authorized Employee	An ***Authorized Employee*** is a person who locks out or tags out machines or equipment in order to perform servicing or maintenance on that machine or equipment. An affected employee becomes an authorized employee when that employee's duties include performing servicing or maintenance.
A.3 Bleeder Blind	***Bleeder Blind*** is a blind designed for the isolation of a piece of equipment and contains a bleeder valve for the purpose of hydrotesting, steaming, purging, depressuring, etc. while still maintaining the energy isolation. The two types of bleeder blinds used at MPC are Bleeder Blind Flanges and Pancake Bleeder Blinds.
A.4 Bleeder Blind Flange	***Bleeder Blind Flange*** is a bleeder blind where the pipe nipple and valve are added to the inside diameter of the bolt circle on a full pressure, stamped, rated blind flange. Bleeder blind flanges are fabricated of piping components following the applicable line specifications. Bleeder blind flanges may be used as a ***permanent*** piping component.
A.5 Blind List	***Blind List*** is the standardized form used to document the location, size, installation and removal of isolation and test blinds. (*Also referred to as Isolation List*)
A.6 Blinding	***Blinding*** is the absolute closure of a pipe, line or duct achieved by fastening a solid plate, threaded plug or cap across its bore to completely cover it. The cover must **(a)** at least cover the outer edge of a flange's mating surface, and **(b)** be capable of withstanding the maximum upstream system pressure. **Blinds include:** blanks, slip plates, blind flanges, threaded caps, physical disconnects The three types of blinds utilized include: **(a)** Isolation, **(b)** Hydrotest, and **(c)** Permanent.
A.7 Cold Work	***Cold Work*** is maintenance, repair, cleaning, or construction activity, not requiring the use of fire, hot surfaces, spark producing equipment, or electrical equipment that is not classified for use in the area. **Examples:** Vibration monitoring, control valve tuning, valve packing adjustment.
A.8 Capable of being locked out	An energy isolating device is capable of being locked out if it has a hasp or other means of attachment to which, or through which, a lock can be affixed, or it has a locking mechanism built into it. Other energy isolating devices are capable of being locked out if a lockout can be achieved without the need to dismantle, rebuild, or replace the energy isolating device or permanently alter its energy control capability. Equipment that accepts bolted blank flanges and bolted slip blinds are considered to be capable of being locked out.
A.9 Complex Isolation	A **Complex Isolation** may include, but are not limited to, work requiring isolation of dual energy sources (e.g., electrical power supplied to one piece of equipment by two different sources), isolations required by multiple Owning Departments, configuration and multiple tie-ins to a system and Equipment Isolation devices greater than 50 feet apart (electrical breakers excluded).
A.10 Confined Space Entry	***Confined Space Entry*** means the action by which any part of a person passes through an opening into a permit-required confined space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space, whether or not such action is intentional, or any work activities are actually performed in the space.

Appendix A: Terms and Definitions, Continued

A.11 Controlled Isolation Plan	Also known as an Active Isolation Plan, is the Isolation Plan that all the appropriate signatures have been obtained and has been placed in the Active Isolation book.
A.12 Designee	***Operations:*** Designated by the Operations Shift Supervisor (permanent or step-up) and is fully qualified (PS5). ***Maintenance:*** Designated by the Maintenance Foreman (permanent or step-up) and is L5/L6 qualified.
A.13 Double Block & Bleed (DB&B)	***Double Block and Bleed*** is the closure of a line, duct or pipe by closing and locking two (2) in-line valves and by opening a drain or vent valve in the line between the two closed valves
A.14 Energy Isolation Device (EID)	***Energy Isolating Device (EID)*** is a mechanical device that physically prevents the transmission or release of energy including but not limited to the following: a) manually operated electrical circuit breaker b) disconnect switch, c) blind, d) Motor Operated Valve (MOV), once the motor has been deactivated and isolated, and e) Any similar device used to block or isolate energy. **The following are not energy isolation devices:** 1) Control valves 2) Butterfly valves, unless engineered for 100% shutoff 3) Push buttons, 4) Selector switches, 5) Other control circuit type devices, and 6) Emergency Isolation Valves (EIV) • An EIV may be used as an EID with a Site Variance Approval (HSS-004)
A.15 Energy Isolation List	***Energy Isolation List*** is the standardized form used to document isolated energy sources (e.g., breakers, valves, blinds), isolation verification points and the means used to verify the control of hazardous energy. (*Also referred to as Isolation List*)
A.16 Engineered Isolation Plug	An ***Engineered Isolation Plug*** is an engineered tool used to safely provide 100% positive pressure vapor barrier against residual contents in the pipe.
A.17 Equipment Isolation Locks	***Equipment Isolation Locks*** are locks assigned to the owning department for the purpose of isolating equipment. These locks will be placed on breakers, valves, etc. Locks shall be standardized by color, shape or size
A.18 Exclusive Control	***Exclusive Control*** is work on cord and plug connected electric equipment for which exposure to the hazards of unexpected energization or startup of the equipment is controlled by the unplugging of the equipment from the energy source and by the plug being under the exclusive control of the employee performing the servicing or maintenance.
A.19 First Break	***First Break*** is when a Servicing Group initially opens a system to atmosphere. This requirement resets whenever the system is "closed", e.g., installing and removing blinds
A.20 Freeze Plug	***Freeze Plug*** is the practice of freezing a section of the contents of a line (pipe) to isolate equipment.
A.21 Group Lock	***Group Lock*** is a lock applied to the Master Lockbox representing a servicing group
A.22 Hazardous Energy	***Hazardous Energy*** is any energy, including mechanical, pneumatic, hydraulic, electrical, chemical, radiation, and thermal energies that could cause injury to workers.

Appendix A: Terms and Definitions, Continued

A.23	**Heavy Materials / Solids**	The term ***Heavy Materials/Solids*** refers to; process materials that solidify as they are cooled to near ambient temperatures and/or process materials that typically contain solids, e.g., coke, catalyst. These materials include, but are not limited to; mixed crude oils, slurry, molten sulfur, sulfur, various gas oils, low sulfur vacuum gas oils (LSVGO), black oil, pet coke, catalyst, asphalt, bunker fuel, vacuum/atmospheric resid, CBO (Carbon Black Oil), CSO (Coker Slurry Oil), Claroil, decant oil, Black Oil, pitch and any other process materials with similar physical properties
A.24	**Hot Work**	***Hot Work*** is repair, maintenance, or construction activity, which requires the use of spark- producing equipment or may create an ignition source.
A.25	**Invasive Work Risk Assessment**	***Invasive Work Risk Assessment*** refers to a tool to be utilized to determine mitigation actions that should be taken when doing any invasive work. Once the invasive work task has been identified, use the tool to generate a numerical value for the categories of exposure concern, volume and impact. These values can then be multiplied to generate the Risk Assessment Score. This overall score is applied to the Mitigation Levels that include clear definition on the type of PPE, tools, protective actions and other mitigations that should be taken to complete the task.
A.26	**Isolation / De-isolation**	***Isolation / De-isolation*** is valve positioning, blinding, plugging, disconnecting, installing or removal that requires process hazard lockout by its owner.
A.27	**Isolation Blind**	***Isolation Blind*** a blind designed for the process isolation of a piece of equipment, vessel, piping, etc., during servicing or maintenance activities.
A.28	**Isolation Verification Point**	***Isolation Verification Point*** is a device within an isolated system that is used to verify that hazardous energy is being controlled, but it is not part of the lockout/tag out for the system because it remains in its original state/position during the servicing of the equipment. Isolation verification points are recorded on the Energy Isolation List
A.29	**Lockbox**	***Lockbox*** is the equipment isolation lockbox into which all of the keys from the equipment isolation locks securing the machines or equipment are inserted and which would be secured by an Owning Department lock
A.30	**Lockout**	***Lockout*** is the placement of a lockout device on an energy-isolating device to ensure that the energy-isolating device and the equipment it controls cannot be operated until the lockout device is removed. Lockout devices use positive means such as locks, blank flanges and bolted slip blinds.
A.31	**Minor Servicing Activities**	***Minor Servicing Activities***, which take place during normal production operations, are not covered by this standard if they are routine, repetitive, and integral to the use of the equipment for production, provided that the work is performed using alternative measures which provide effective protection. **Reference:** A list of approved Minor Servicing Activities can be found in Appendix D.
A.32	***Owning Department***	***Owning Department*** is the department that normally owns and operates equipment, machinery and/or systems.
A.33	***Pancake Bleeder Blind***	***Pancake Bleeder Blind*** is a bleeder blind where the pipe nipple and valve are on the outer circumference of the blind with the vent hole drilled perpendicular and horizontal to the vent port. This type of bleeder blind is intended to slip between two mating flange faces. Normally, pancake bleeder blinds are non-rated and considered as *temporary* devices typically used for equipment preparation and maintenance activities. Pancake bleeder blinds may be used as permanent components in a piping system if they are pressure-rated and designed according to **SP-50-39** as a "pressure-rated" vent (bleeder) blind".
A.34	***Perimeter (Battery Limit) Blind***	***Perimeter (Battery Limit) Blind*** is a blind placed at the perimeter of a unit or system that will provide isolation for the entire unit/system. Perimeter blinding will typically occur during turnarounds and will be required for hydrocarbons, toxics, corrosives, chemicals, and nitrogen. Water, steam and air may need to remain in service within area isolated by perimeter blinds.

Appendix A: Terms and Definitions, Continued

A.35	***Permanent Blind***	***Permanent Blind*** is a blind that is in place during normal operations. This includes blinds on drain piping, utility connections, spec blinds normally rolled in the closed position, and decommissioned equipment. This does not include blind flanges.
A.36	***Personal Lock***	***Personal Lock*** is a lock assigned to an employee that is individually identified and keyed. This lock will only be installed and removed by the assigned individual and shall remain in place while the individual is performing work on the isolated equipment. Personal locks will normally be applied to lockboxes.
A.37	***Ping & Ding***	***Ping & Ding*** is a method used to check for loose bolts on flanges. A ball peen hammer is used to strike each bolt listening for a sound indicating the bolt is loose.
A.38	***Primary Isolation Point (PIP)***	***Primary Isolation Point (PIP)*** is the point of isolation located immediately adjacent to the hazardous energy source
A.39	**Qualified Isolation Authority**	A competent individual, who is qualified in the job duty station being isolated, shall be responsible for creating, approving and executing isolation plans for equipment/systems (e.g. Operator or Electrician)
A.40	**Servicing Representatives**	***Servicing Representatives*** are the individuals working on the equipment/process. This may include operations, blending, shipping, maintenance, contractors, and salaried employees.
A.41	**Status Change Form**	***Status Change Form*** is form used to document changes to the Energy Isolation List when there is a change from the original isolation plan
A.42	**Supplemental Energy Isolation List**	***Supplemental Energy Isolation List*** is the standardized form used to document additional isolated energy sources (e.g., breakers, valves, blinds) and/or isolation verification points that are not able to be included on the Master Energy Isolation List. This form is typically used during complex isolations.
A.43	**Tagout**	***Tagout*** is the placement of a tagout device on an energy-isolating device to indicate that the energy-isolating device and the equipment it controls may not be operated until the tagout device is removed.
A.44	**Temporary Release of LOTO Form**	***Temporary Release of LOTO Form*** is the form used to document the required steps for the temporary de-isolation of equipment for the purposes of testing, positioning, steaming, rinsing, purging, etc. and re-isolation prior to the authorized employees resuming work on the isolated equipment.
A.45	**Test Blind**	***Test Blind*** is a blind installed for the sole purpose of tightness testing of piping and/or equipment. **Example:** A hydrotest blind.

Appendix B: Process/Energy Isolation Matrices

B.1 Minimum Process Isolation Requirements

The required approvers in this table are only approving the Isolation Plan. Any additional approvers (e.g., RSP Waiver, Forms or Safe Work Permit still apply and must be obtain prior to commencing work.

When a Single Valve Isolation (SVI) is utilized to isolate two or more streams (e.g., utility steam tie-in to a product stream) then the isolation method, and controls must meet the higher hazard stream.

REQUIRED ISOLATION FOR INSTALLING OR REMOVING A BLIND

Task	Minimum Isolation Type	Minimum Isolation not achievable	
		Alternative 1 **Alternative 2** **Alternative Other**	**Required Approver for Isolation Plan Utilizing an Alternative Isolation Method**
<u>Achieving or Removing Positive Isolation</u> (breaking containment on a system **≤ 725 psig** to insert a blind)	Verified Single Valve Isolation (SVI)	Unverified Single Valve Isolation (USVI)	**Operations Shift Supervisor**
		Valve not holding (≤2psig)	**Day Foreman** **B-04 or B-06 SWP Form Required**
		No Isolation point or Alternative isolating device (e.g., stopple, plug, balloon, etc.…)	**Area Team Lead after RSP Waiver approval**
<u>Achieving or Removing Positive Isolation</u> (breaking containment on a system **>725 psig** to insert a blind)	Double Block & Bleed	Verified Single Valve Isolation	**Operations Shift Supervisor**
		Unverified Single Valve Isolation	**Day Foreman**
		Alternative Isolating Device (e.g., stopple, plug, balloon, etc.)	**Area Team Lead after RSP Waiver approval**

REQUIRED ISOLATION FOR PERFORMING WORK

Task	Minimum Isolation Type	Minimum Isolation not achievable	
		Alternative 1	**Required Approver for Isolation Plan Utilizing an Alternative Isolation Method**
		Alternative 2	
		Alternative Other	
<u>Cold Work</u> **"Breaking Containment"** Utilities systems such as: • *Utility air & water* • *Instrument air* • *Fire Water* • *Process Cooling Water* • *Nitrogen* • *Treated Process Water*	Verified Single Valve Isolation (SVI)	Unverified Single Valve Isolation	**Operations Shift Supervisor**
		• Alternative Isolating Device (e.g., stopple, plug, balloon, etc.)	**Day Foreman**
		(1) Valve not holding (2) No isolation	**Area Team Lead** **(1) B-04 SWP Form Required** **(2) Requires an RSP Waiver**

<u>Cold Work</u>
"Breaking Containment"
Process Streams such as:
• *Toxic, Corrosive, Chemical and Hydrocarbon systems*
• *Heavy Material / Solids*
• *Boiler Feedwater*
• *Steam*
• *Hydraulic & Pneumatic*
  ○ *FCC Slide Valves*
  ○ *Hydraulic Motors*
  ○ *Air Driven Actuators*
	Double Block & Bleed	Verified Single Valve Isolation	**Operations Shift Supervisor**

		• Unverified Single Valve Isolation • Alternative Isolating Device (e.g., stopple, plug, balloon, etc.)	**Day Foreman**
		(1) Valve not holding (2) No isolation	**Area Team Lead** **(1) B-06 SWP Form Required** **(2) Requires an RSP Waiver**
<u>Hot Work</u> **Non-Flammables, such as:** • *Utility water and air* • *Instrument air* • *Fire and Cooling Water* • *Boiler Feedwater* • *Steam* • *Nitrogen* • *Treated Process Water*	Double Block & Bleed	Single Valve Isolation (Verified or Unverified)	**Operations Shift Supervisor**
		Engineered Plug	**Day Foreman** • **Engineered Plug Form Required**
		Valve not holding	**Area Team Lead after RSP Waiver approval**

REQUIRED ISOLATION FOR PERFORMING WORK

Task	Minimum Isolation Type	Minimum Isolation not achievable	
		Alternative 1	**Required Approver for Isolation Plan Utilizing an Alternative Isolation Method**
		Alternative 2	
		Alternative Other	

Hot Work
Not identified as Non-Flammables", such as:
• *Toxic, Corrosive, Chemical and Hydrocarbon systems*
• *Hydraulic & Pneumatic*
  ○ *FCC Slide Valves*
  ○ *Hydraulic Motors*
  ○ *Air Driven Actuators*
	Blind (closest to work)	Relocations of blinds	**Operations Shift Supervisor and Maintenance Foreman**

		Engineered Plug	**Day Foreman and an Engineered Plug Form**
		Any valve isolation	**Area Team Lead after RSP Waiver approval**
Confined Space Entry **Tank Roof Tops** • *Internal and external floating roofs*	Unverified Single Valve Isolation	Alternative Isolating Device (e.g., stopple, plug, balloon, etc.)	**Operations Shift Supervisor**
		Valve not holding	**Day Foreman after RSP Waiver approval**
		No isolation	**Area Team Lead after RSP Waiver approval**
Confined Space Entry Cooling Tower Basin & Cells (water only) and Firewater systems	Double Block & Bleed	Verified Single Valve Isolation	**Operations Shift Supervisor**
		Unverified Single Valve Isolation	**Day Foreman**
		Alternative isolating device (e.g., stopple, plug, balloon, etc.)	**Area Team Lead after RSP Waiver approval**
Confined Space Entry For all other systems **excluding**: • Tank Roof Access • Cooling Towers Basin & Cells (water only) • Firewater systems • Electrical Vaults	Blind	Relocations of blinds	**Operations Shift Supervisor and Maintenance Foreman**
		Any valve isolation	**Day Foreman** **RSP Waiver approval** (Utility/Instrument air & Utility/Fire Water does not require an RSP Waiver when DB&B w/bleeder locked open)
		Alternative Isolating Device (e.g. stopple, plug, balloon, etc.)	**Area Team Lead after RSP Waiver approval**

REQUIRED ISOLATION FOR PERFORMING WORK

Energy Type	Minimum Isolation Type	Minimum Isolation not achievable	
		Alternative 1 / **Alternative 2**	**Required Approver for Isolation Plan Utilizing an Alternative Isolation Method**
Electrical Examples are: • Motor / Control Circuits • Busses • Battery Circuits • Feeders	Verified Lockout / Tagout	Tagout Only	**Day Foreman and Electrical Foreman**
		No Isolation	**Area Team Lead and Electrical Superintendent**
Radiation Examples are: • Level Measurement Devices • Laboratory Instrumentation	Verified Lockout / Tagout	Tagout Only	**Day Foreman and Radiation Safety Officer**
		No Isolation	**Area Team Lead and Radiation Safety Officer**

Appendix C: Hot Work Isolation by Engineered Plug Approval Form

I.1 Form The following is the Hot Work Isolation by Engineered Plug Approval Form (**RSP-1121-010-FORM05**).

Reference: For the most up-to-date, working copy of this form, go to: http://cbgrs20/red/copyout.aspx?lib_no=32&doc_no=3449

Hot Work Isolation by Engineered Plug Approval Form
(RSP-1121-010-FORM05)

Job Description/Scope of Work:

Material in Line:

Line Location:

CHECKLIST	YES	NO
1. Can lines be blinded? If yes, explain why engineered plug is being requested_____		
2. Is sealing gasket surfaces of the engineered plug compatible for the temperature and service of the line?		
3. Has the proper size of the engineered plug been determined? Size Required: _____		
4. Is there any pressure on the system that will exert pressure on engineered plug? (If purge is used, a gauge must be used to ensure that the pressure does not exceed the manufacturer's pressure rating)		
5. Have arrangements been made to vent the engineered plug or the line upstream of the engineered plug and has the vent been verified to be unobstructed (e.g., by bubbling through water, using a bleeder reamer, etc.)? Have arrangements been made to monitor the line pressure? Provide details: _____ _____ _____ _____		
6. Have stress relieving requirements been designated & implemented? List requirements: _____ _____ _____		

APPROVALS

MPC Maintenance Planner/Foreman: _____ Date: _____

MPC Engineer: _____ Date: _____

MPC Day Foreman: _____ Date: _____

MPC Safety Representative: _____ Date: _____

Engineered Plug Contractor Representative:_____ Date: _____

Maintenance Manager: _____ Date: _____

Operations Manager: _____ Date: _____

Completed form shall be attached to the Safe Work Permit

Appendix D: Approved Minor Servicing Activities

D.1 Matrix The table below is the Approved Minor Servicing Activities Matrix.

Activity	Justification	Alternative Measures to LOTO
Replacing pressure gauge and servicing pressure transmitters	• Done during normal production (intended function of process equipment un-interrupted) • Routine, Repetitive and Integral – action is repeated on a regular basis during routine technician rounds to ensure equipment and process monitoring is available	• Verification that isolation valve is closed • Ensure not in line of fire
Light bulb replacement (bulbs not broken)	• Done during normal production (intended function of process equipment un-interrupted) • Routine, Repetitive and Integral – action is repeated on a regular basis during routine technician rounds to ensure safety and equipment/process monitoring	• Verification that power is off (switch, etc.) • Wear proper hand protection
Installing and removing utility hoses, fire water hoses and drain hoses/tubing. This includes small bore piping (valves, check valves and other fittings) that are required to connect utility hoses and drain hoses to the process.	• Done during normal production (intended function of process equipment un-interrupted) • Routine, Repetitive and Integral – action is repeated on a regular basis during routine operator rounds to ensure equipment and process monitoring is available and during equipment troubleshooting	• Verification that isolation valve is closed • Ensure not in line of fire • Reference **RSP-1150-010** and **SP-50-05** (Caustic and Utility Connections to Process Lines and Vessels)
Removing plugs and caps from bleeders/valves	• Done during normal production (intended function of process equipment un-interrupted) • Routine, Repetitive and Integral – action is repeated on a regular basis during routine operator rounds for equipment or process monitoring and during equipment troubleshooting	• Verify the isolation valve is closed • Ensure not in line of fire • Installing bleeder cleaners and conducting gauging actions - operating guidelines/ training documents shall be in place to define actions and safety provisions to be followed.
Installing and removing bleeder cleaner tools		
Gauge catalyst hopper, salt drier, tank, etc.		
Removing blind flange to back flush a cooling water exchanger	• No potential for release of hazardous material • Done during normal production (intended function of process equipment un-interrupted) • Routine, Repetitive and Integral – activities are repeated during routine operator rounds or PM frequency, monitor process conditions or ensure integrity of system	
Remove coupon holder in cooling water curcuit		
PM pH probes in cooling water circuits		
Replacing small cooling water PSVs (3/4”x1”)	• No potential for release of hazardous material • Done during normal production (intended function of primary process un-interrupted) • Routine, Repetitive and Integral – action is repeated based on a PM frequency to ensure adequate relief protection is in place.	Refer to local policies and procedures for relief valve isolation.

Appendix D: (continued)

Activity	Justification	Alternative Measures to LOTO
Steam trap replacement and cold work steam tracing repairs (systems that can be isolated by two valves)	• Done during normal production (intended function of primary process un-interrupted) • Routine, Repetitive and Integral – action is repeated on a regular basis based on observations from routine operator rounds. Properly operating steam tracing is essential to operation of the process.	• Verify system is isolated and de-pressured • PPE requirements include typical Class D PPE nitrile insulated gloves and a face shield
Remove and clean lube oil filters and "Y" strainers.	• Done during normal production (intended function of process equipment un-interrupted) • Routine, Repetitive and Integral – action is repeated on a regular basis during routine operator rounds to ensure integrity of system	Operating guidelines or training documents shall be in place to adequately define actions and safety provisions that must be followed.
Connect hoses for caustic, acid and chemical deliveries Completing hose loops for product transfer	• Done during normal production (intended function of process equipment un-interrupted) • Routine, Repetitive and Integral – action is repeated on a regular basis and is inherent for process operations	• Verify isolation valve(s) is isolated • Operating Procedures and/or guidelines shall be in place to adequately define actions and safety provisions to be followed.
Blow down sight glass Steaming out sight glass, control valve, etc. Blow down high and low side taps of flow cell	• Done during normal production (intended function of process equipment un-interrupted) • Routine, Repetitive and Integral – action is repeated on a regular basis during routine rounds to ensure process monitoring is available and during troubleshooting	• Verify system is blocked in (if applicable) • Additional PPE will be utilized based on Invasive Work Risk Assessment Matrix, other form of hazard review, or other policy • Ensure not in line of fire
Troubleshooting/servicing transmitters with a manifold between root valves & transmitter that allows for isolation Calibration and repair of equipment in analyzer buildings	• Done during normal production (intended function of process equipment un-interrupted) • Routine, Repetitive and Integral – action is repeated on a regular basis during routine rounds to ensure process monitoring is available and during troubleshooting	• Verification that isolation valves are closed • Additional PPE will be utilized based on Invasive Work Risk Assessment Matrix, other form of hazard review, or other policy • Required safety measures shall be documented on the work permit • Ensure not in line of fire
Changing motor and blower air filters	• Done during normal production (intended function of process equipment un-interrupted) • Routine, Repetitive and Integral – action is repeated on a regular basis during routine operator rounds to maintain condition of equipment.	--

Appendix D: (continued)

Activity	Justification	Alternative Measures to LOTO
Blinding small bore fuel gas piping to process heaters Repair/Cleaning of tips or replacement of flex hoses for burners or process heaters	• Done during normal production (intended function of process equipment un-interrupted) • Routine, Repetitive and Integral – action is done based on observations from routine operator rounds to maintain equipment reliability.	• Verification of isolation • Guideline or training document shall be in place to adequately define actions and safety provisions that must be followed.
Replace Pin orifice in reboiler CO_2 vent	• Done during normal production (intended function of primary process un-interrupted) • Routine, Repetitive and Integral – action is repeated on a regular basis based on observations from routine operator rounds for equipment reliability.	• Verify isolation valve is isolated. • PPE requirements include typical Class D PPE nitrile insulated gloves and a face shield
Perform maintenance or calibration of control valves by blocking in and disconnecting the supply air tubing	• Done during normal production (intended function of process equipment un-interrupted) • Routine, Repetitive and Integral – action is repeated on a regular basis to ensure equipment is available • No potential for release of hazardous material	• Verification that isolation valves are closed • Additional PPE will be utilized based on Invasive Work Risk Assessment Matrix, other form of hazard review, or other policy • Required safety measures shall be documented on the work

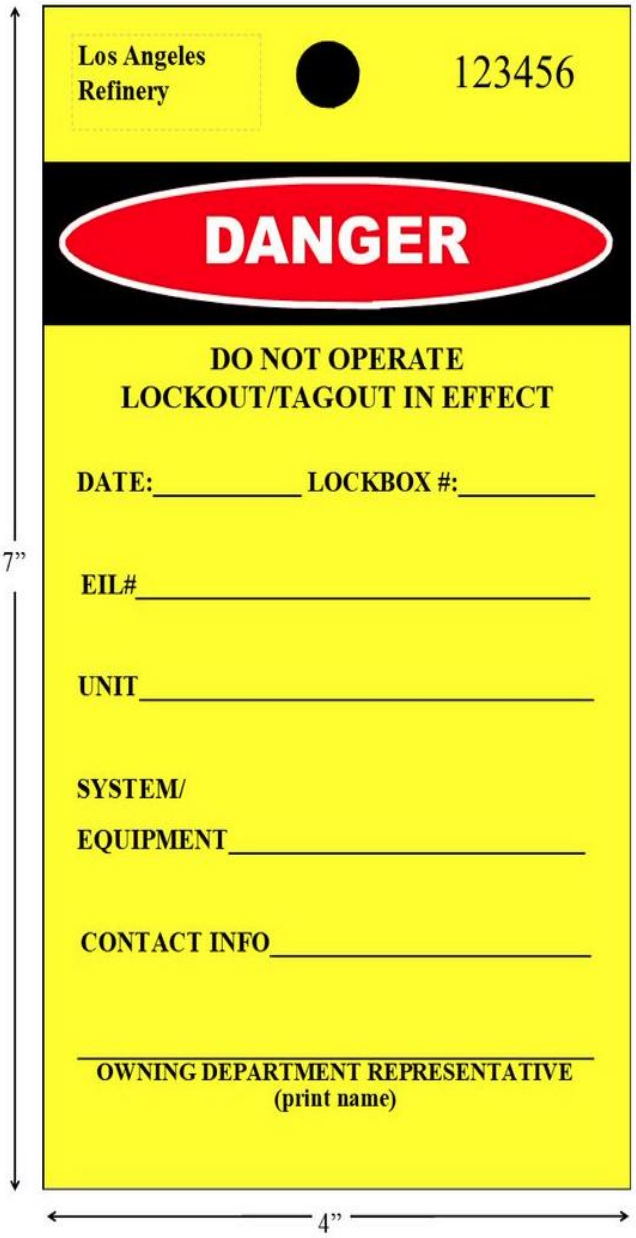
Appendix E: Tags

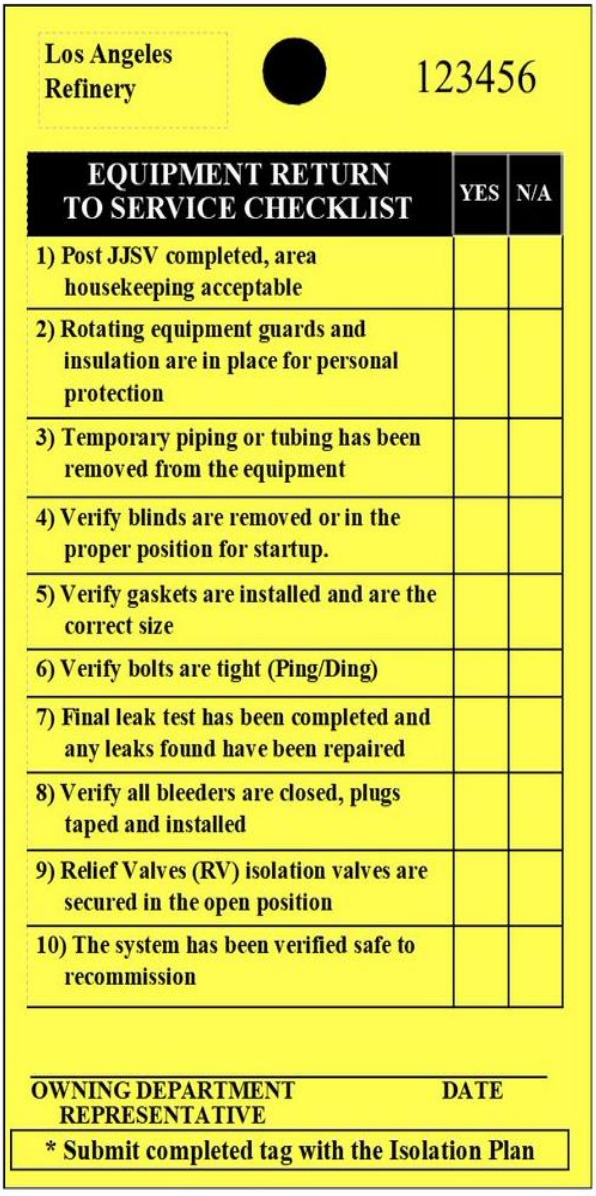
E.1 **Return to Service Tags** are placed on the Lockbox, via the unit/contingency lock during the lockout phase and is completed when the task is complete, but before locks are removed. The completed tag shall be submitted with the Isolation Plan.

Front

Equipment Return To Service Tag

Back



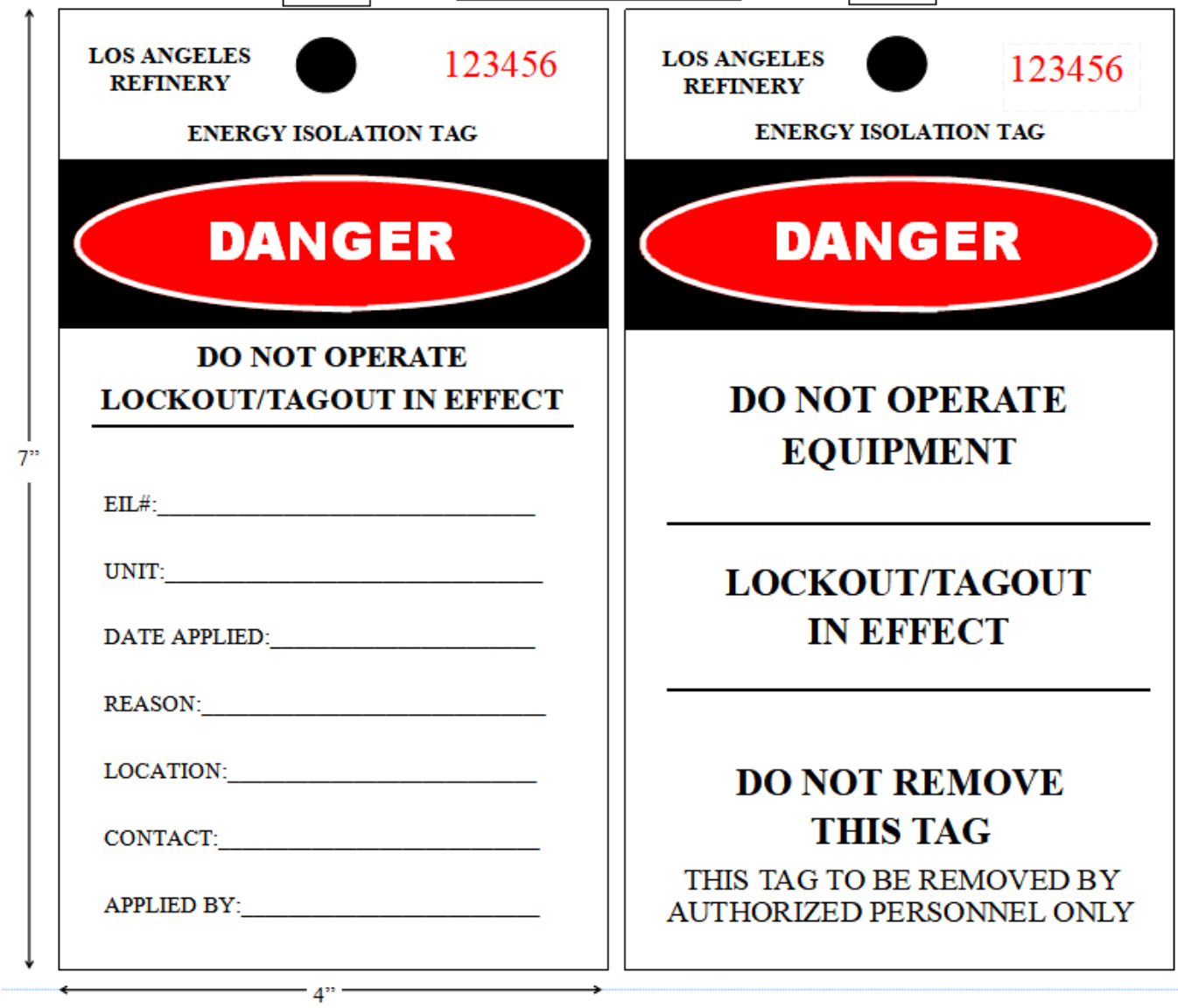


Continued on next page

Appendix E: Tags, Continued

E.2 Equipment Isolation Tag is to be placed on all isolation points and verification points (e.g. bleeders and vents)

Front | Equipment Isolation Tag | Back



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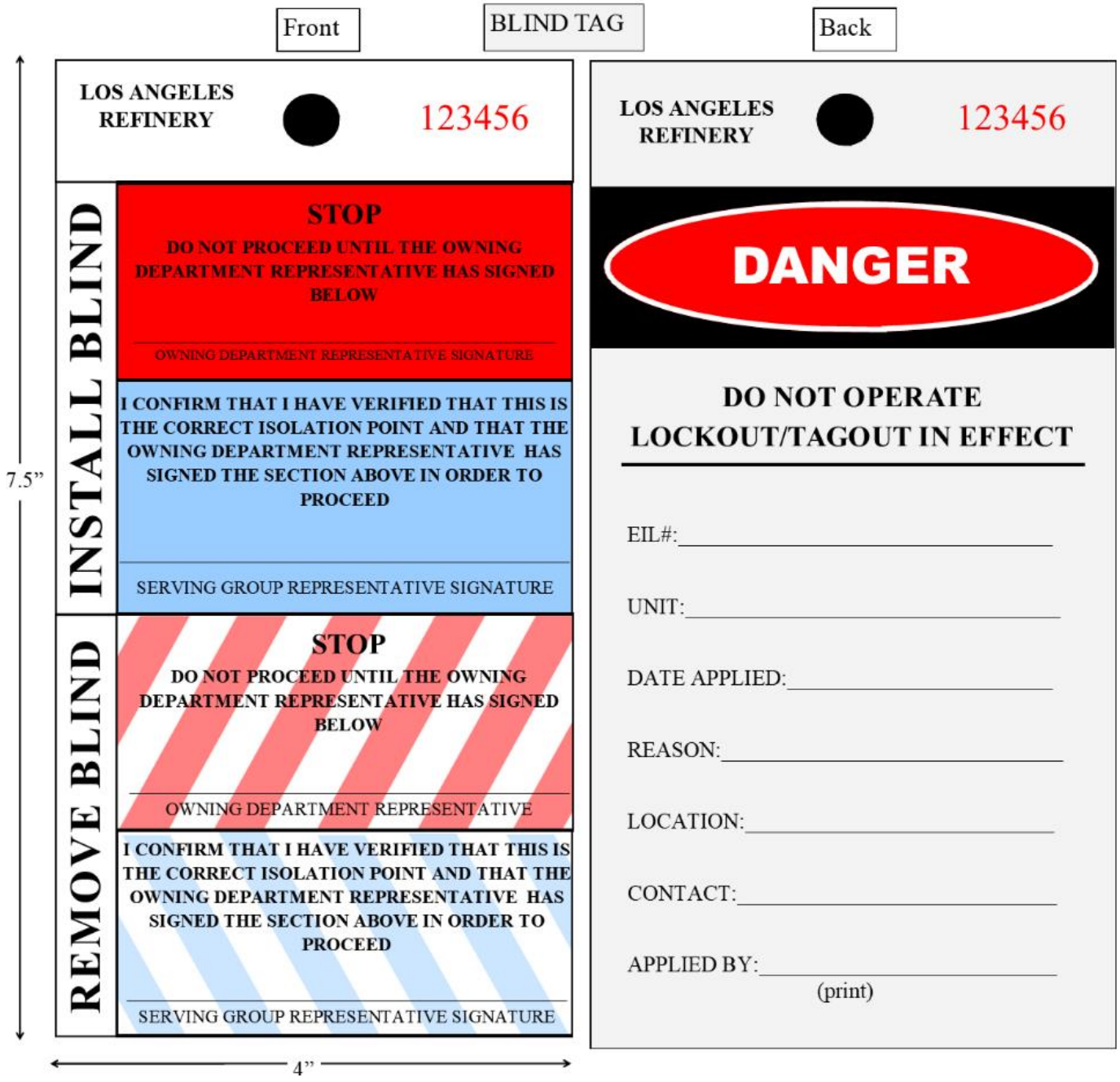
Continued on next page

Appendix E: Tags, Continued

E.3 Blind Tags are to be attached as close to the blind location as possible. Each stage of the work shall be signed off before the next stage can begin. This tag may be used in lieu of the K.2 tag by completing the back side of the tag, unless it is a "shared" EID. If it is a shared EID a K.2 tag shall be applied for each EIL with one Blind Tag with all of the EIL's listed in the Back side.



Appendix E: Tags, Continued

E.4 Temporary Release of LOTO tag is applied to the lockbox when hazardous energy is temporarily introduced to the locked-out system, e.g., performing an Over Speed Test on a turbine

Front | Temporary Release of LOTO Tag | Back

123456

TEMPORARY RELEASE OF LOTO

DANGER

A PORTION OF THIS EQUIPMENT HAS BEEN RE-ENERGIZED

EIL #:_____

LOCKBOX #:_____

UNIT & SYSTEM:_____

_____

REASON:_____

_____

HAZARD:_____

123456

TEMPORARY RELEASE OF LOTO

DANGER

Authorization for Temporary Release of LOTO

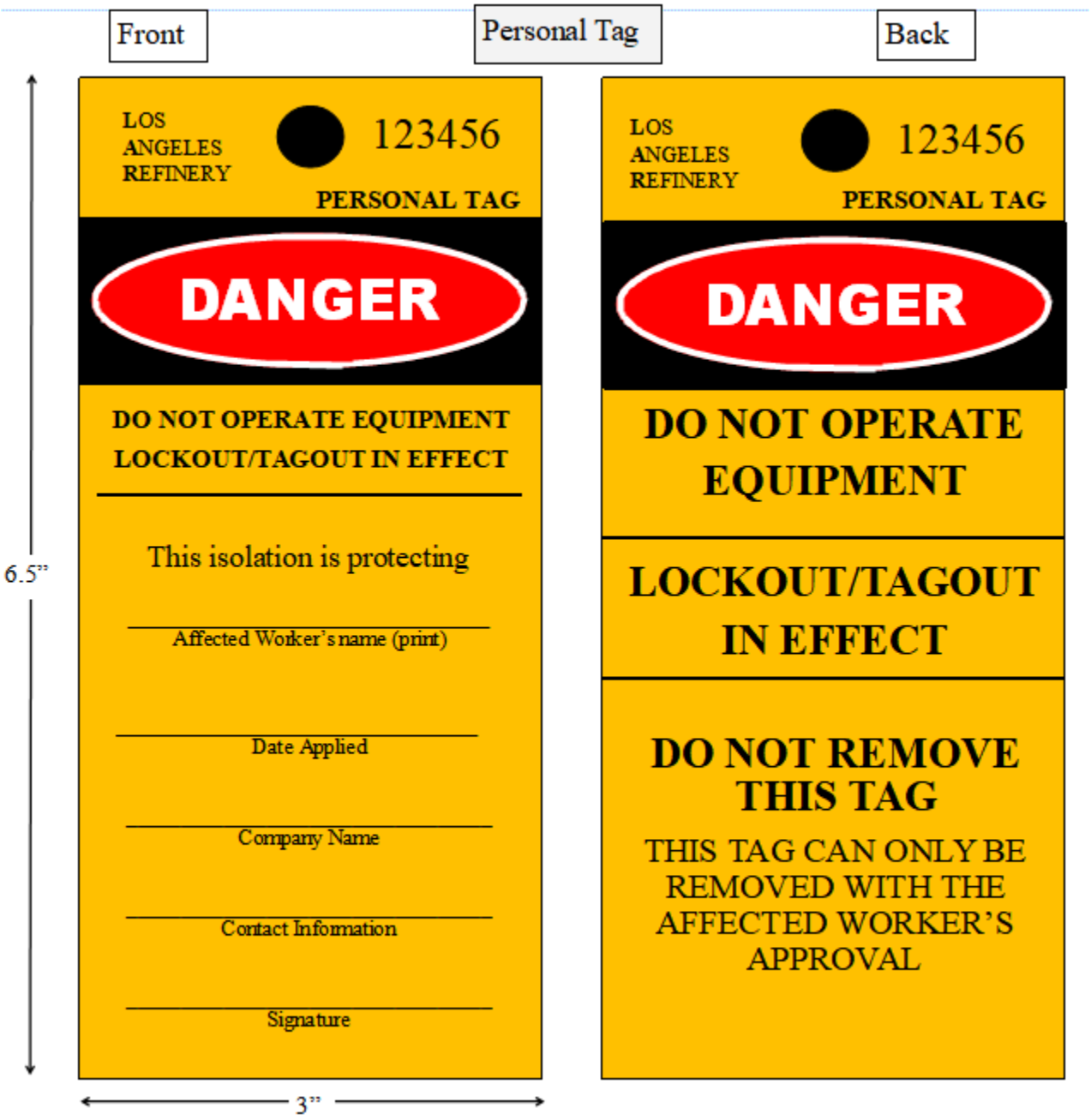
DATE		TIME	
Owning Department IsA (print)			
Owning Department IsA (signature)			

Verified Isolation Restored

DATE		TIME	
Owning Department IsA (print)			
Owning Department IsA (signature)			

Appendix E: Tags, Continued

E.5 Personal Tags the Affected Worker shall apply this tag to their personal lock



Appendix E: Tags, Continued

E.6 Master Tags is the Alternate Group Isolation tag that is used for TAR Events only. The owner of the lock completes the front side and the rest of the Affected Workers complete the back side. This tag is limited to same permit and company.

Front — Master Tag (AKA Group Isolation Tag) — Back

7”

Los Angeles Refinery 123456 **MASTER TAG**

DANGER

DO NOT OPERATE
LOCKOUT/TAGOUT IN EFFECT

DO NOT REMOVE THIS TAG WITHOUT AUTHORIZATION FROM THE CREW REPRESENTATIVE

DATE:_____ LOCKBOX #:_____

_____
EIL#

_____
LOCATION

_____
COMPANY

_____
CONTACT INFORMATION

_____
CREW REPRESENTATIVE (print)

_____
(SIGNATURE)

(This tag can only be used during a Turnaround event)

4”

Los Angeles Refinery 123456 **MASTER TAG**

DANGER

DO NOT OPERATE
LOCKOUT/TAGOUT IN EFFECT

ADDITIONAL WORKERS PROTECTED BY THIS LOCK

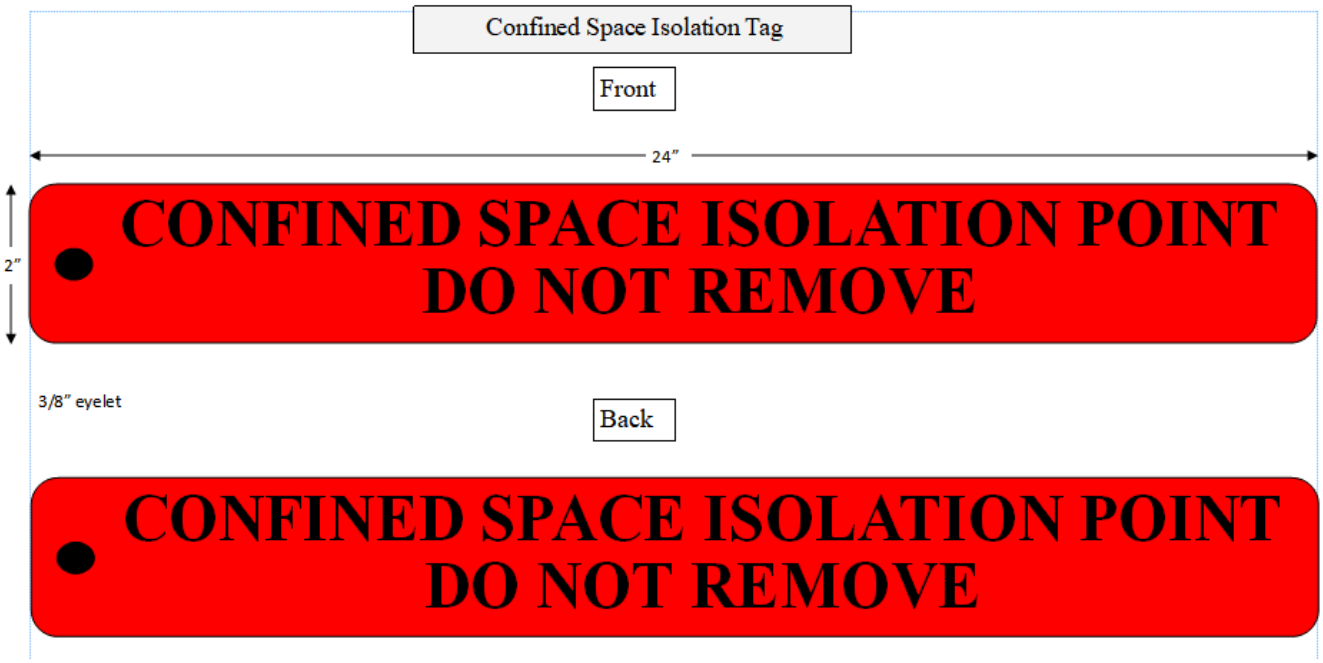
Print Name	Accept (initial) / Time On	Release (initial) / Time Off

Appendix E: Tags, Continued

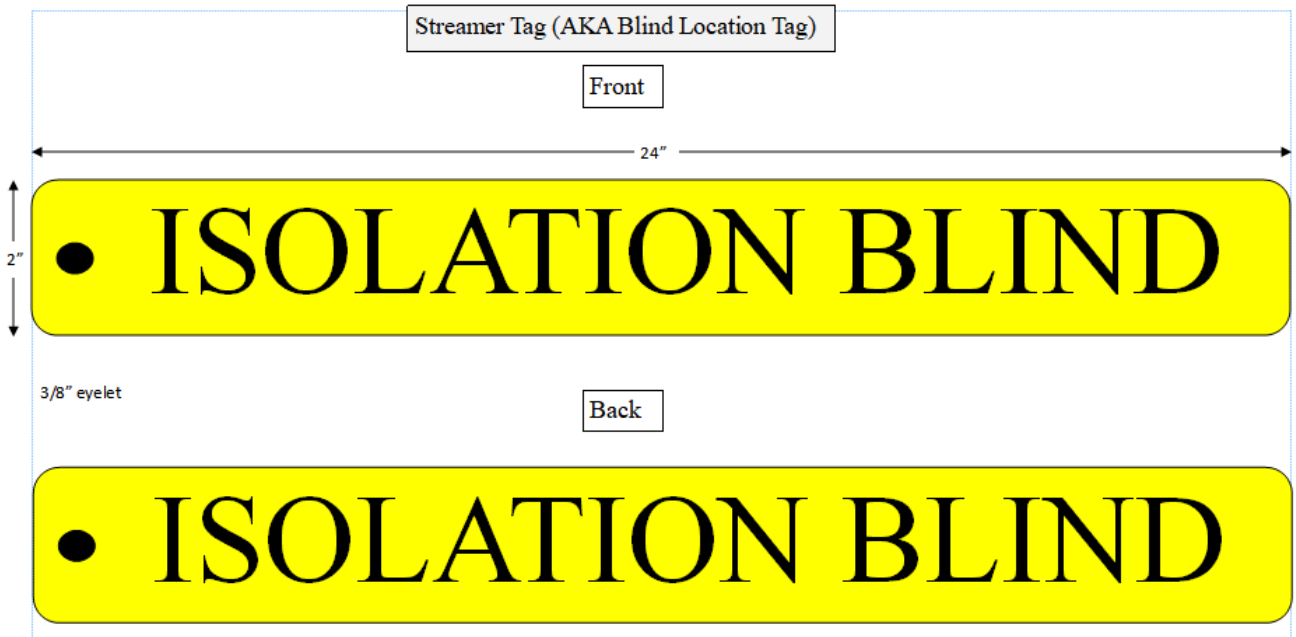
E.7 Electrical Tags are red and white striped is applied to the energy source and the solid red is applied to the local switch to alert that an electrical isolation is in progress

Appendix E: Tags, Continued

E.8 Confined Space Isolation Tag per section 4.3.2 this tag shall be applied to all confined space isolation points in addition to the Blind Tag



E.9 Isolation Blind Tag can be place on the isolation blinds as a visual aid to identify the physical location of a blind. The use of this tag is at the Owning Department discretion.



Appendix E: Tags, Continued

E.10 Out of Service Tags are used on isolations for equipment that will no longer be in commission

Appendix F: Control of Hazardous Energy Inspection Form

Blinding & Isolation Inspection Form

Date:	Location/Unit:	Energy Isolation List #:
Equipment Type:	Equipment #:	

Documentation				
1	Is the Energy Isolation list properly situated in the appropriate location?	☐ YES	☐ NO	☐ N/A
2	Does the Energy Isolation Plan have the appropriate level of approvals?	☐ YES	☐ NO	☐ N/A
3	Has each step of the Isolation Plan been signed off by an Authorized Employee?	☐ YES	☐ NO	☐ N/A
4	If required, has a Blind List been developed and signed off?	☐ YES	☐ NO	☐ N/A
5	Has the Isolation Verification (Co-Signer) been signed of, different from Authorized Personnel?	☐ YES	☐ NO	☐ N/A
6	Has the Shift Isolation Verification Log been completed?	☐ YES	☐ NO	☐ N/A
7	If required, has the Change Log or Temporary Release of LOTO been completed?	☐ YES	☐ NO	☐ N/A
Field Verification				
8	Did the Owning Department perform a Joint Job Site Visit (JJSV) with the Servicing Group Representative and demonstrate that the equipment is in a zero-energy state?	☐ YES	☐ NO	☐ N/A
9	Were all the energy sources properly isolated, locked and appropriately tagged (e.g., equipment, blind, return to service, CSE Streamer, etc.)?	☐ YES	☐ NO	☐ N/A
10	Do the tags have the necessary information on them, e.g., EIL#, Unit, Date Applied, Reason, Location, Contact Information and Applied By (individual's name).	☐ YES	☐ NO	☐ N/A
11	Are locks attached in a manner as to prevent movement of the isolation device?	☐ YES	☐ NO	☐ N/A
11	Did each Affected Worker apply a personal lock and tag on the energy isolation device or lockbox?	☐ YES	☐ NO	☐ N/A
12	**TAR Event Only** Did each Affected Worker sign the acceptance column on the Master Tag?	☐ YES	☐ NO	☐ N/A
13	Did all involved worker (Authorized Employees & Affected Workers) understand their roles & responsibilities per the Blinding & Isolation Standard?	☐ YES	☐ NO	☐ N/A
14	Does the field isolation match the active energy isolation plan?	☐ YES	☐ NO	☐ N/A
15	Was the Blinding & Isolation Standard properly followed by everyone involved?	☐ YES	☐ NO	☐ N/A

Provide details for any "NO" responses and include any corrective actions and/or recommendations

List the name(s) of the Authorized Personnel	

This Blinding & Isolation inspection was performed by:	

Appendix G: Non-Standard LOTO Removal Form

	Non-Standard LOTO Removal		
(1)	Isolation Plan #	(2)	Lockbox #
(3)	Equipment/system:		
(4)	Reason for lock removal:		
(5)			
	Affected Worker's Name	Affected Worker's Company Name	
	Affected Worker's comments: (if unable to contact the Affected Worker document the contact method used and move to section 6)		
(6)	Method used to ensure that the equipment / system is safe to be re-energized.		
(7)			
	Maintenance Supervisor or Contract Foreman (print & sign name)		Date
(8)			
	Operation Shift Supervisor (print & sign name)		Date

Appendix H: Alternative Group Lockout/Tagout Procedures

H.1 When Alternative Procedures are Permitted

When complex equipment is being serviced or maintained, when there are many sources of energy, and/or when servicing/maintenance work extends over multiple shifts, OSHA permits employers to utilize an alternative procedure to each employee applying personal locks. Furthermore, OSHA recognizes the need to modify normal group energy control procedures to ensure the safety of employees performing servicing and maintenance on sophisticated and complex equipment.

H.2 Factors to be Evaluated

The following factors shall be evaluated to determine whether the equipment being serviced or maintained is so complex as to necessitate a departure from the conventional group lockout/tagout procedures:

(a) Physical size of the equipment,
(b) Number of employees performing the servicing/maintenance,
(c) Number of energy isolating devices to be locked/tagged out, and
(d) Interrelationship of the components in the system or between different systems.

H.3 Acceptable Approach to Personal Locks

The alternative system, comprised of the work permit, group lock and signature log (i.e. Master Tag), is an acceptable approach to personal locks, as long as the control and accountability procedures provide a level of protection equivalent to each individual authorized employee affixing their personal lock. This tag is limited to same permit and company.

H.4 Elements to be in Place for Alternative System

In order to achieve the same protection as that provided by the application of personal locks, the following elements must be in place in the alternative system to be considered similar to the normal lockbox system.

H.4.1 Equipment owner performs shutdown, isolates equipment, verifies depressurization, applies equipment locks, and applies department lock to lockbox.

H.4.2 Owning department representatives review the job with the servicing and maintenance crew(s) and ensures comprehension of the energy controls necessary to conduct the work safely.

Note: *Actions taken in H.4.1 and H.4.2 above must be documented on the work permit.*

H.4.3 A Servicing Group Representative (SGR) may represent workers to verify equipment isolation and depressurization, but workers must be allowed to participate and must also be informed of their right to participate.

H.4.4 Following successful completion of the verification, the SGR will apply a group lock to the Lockbox.

H.4.5 Each Affected Worker must clearly print their name and initial the Master Tag "accept" column, indicating the acceptance of the isolation and use of the group lock.

- Once initialed the SGR cannot remove the group lock until all Affected Workers have initialed the release column, indicating that they are no longer being protected by the group lock.

H.4.6 The Master Tags must be attached to the appropriate lockbox so that the accountability of exposed employees is maintained.

H.4.7 When the work is completed, all Affected Workers shall initial the "Release" column on the Master Tag prior to the group lock being removed from the lockbox.

.4.8 Periodic audits must be conducted and documented to ensure the system remains effective.

Appendix I: Isolation of Equipment Containing Heavy Materials/Solids

I.1 Isolation of Equipment Containing Heavy Material / Solids

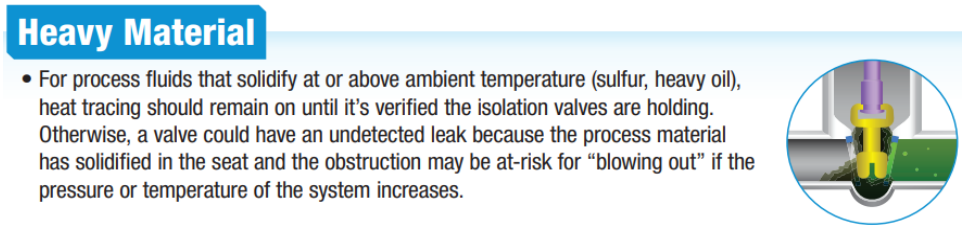
Energy isolation of heavy materials/solids (see definition in Appendix A.21) shall be accomplished following the steps outlined below

I.1.1 A "double block" isolation method shall be utilized.

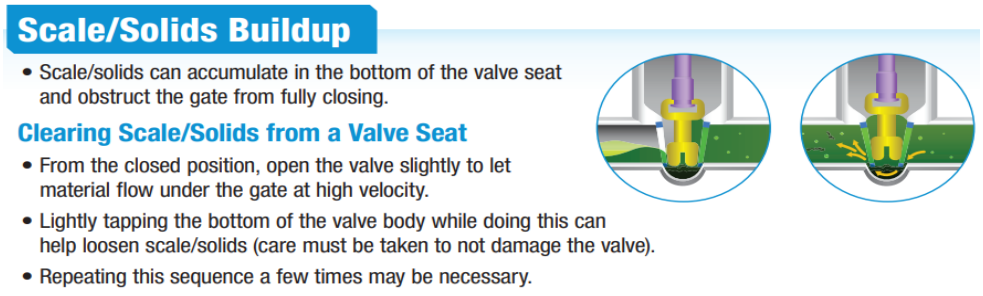
- If a double block & bleed is not practical review the Isolation Matrix (Appendix B) for approval levels.

I.1.2 When chain operated valves are used as the single point of isolation of heavy materials/solids the valves shall be verified closed by some other means beyond just relying on the chain wheel (due to reduced torque, loss of visual cues and chain hang-ups). Visual verification that the gate valve stem is in the lowest achievable position and wrench tightening valves is the preferred method for achieving effective single point isolations.

I.1.3 When isolating equipment that contains heavy materials/solids special care should be taken to keep the material hot and in a liquid state during the de-inventory and de-pressuring steps. If equipment has already been isolated and cooled down, it must be assumed that the system is "set up" and re-heating will be necessary before de-pressuring and de-inventory begins. Solvent materials (i.e., LCO) can be used to "cut" heavy process materials and remove them from process equipment



I.1.4 When isolating equipment with materials containing a large amount of solids (e.g. coke, catalyst, etc.), special care should be taken to ensure the isolation valves don't have solids built up in the gate valve seat. Before removing the plug or cap, or breaking the line, check the gate valve stem to determine if an abnormal amount of threads are showing while the valve is in the closed position – this could indicate the valve gate is not fully seated.



I.1.5 The following troubleshooting techniques can be used to assist in identifying leaking valves:

a) Portable temperature guns can be used to identify leaking valves. In heavy oil hot services, a leaking valve will exhibit an increase in temperature across it.

b) If a valve is leaking on a pump/compressor, the pressure will increase to either suction or discharge pressure.

Appendix J: Heavy Materials/Solids Single Point Isolation Checklist

J.1 Checklist

Heavy Materials/Solids Single Point Isolation Checklist

PURPOSE: Prior to isolating process equipment containing heavy materials/solids, conduct a thorough review of the planned isolation to evaluate the possibility of double blocking the equipment or removing the equipment from service. If a double block is not achievable, and single block isolation will be used, this form can be used to aid in the planning efforts for the job.

Equipment Name/Number:

Process Fluid: Temperature: Pressure:

Description of Work:

If answering "NO" to any of the following questions, Day Foreman approval is required.

	YES	NO
Was the system hot, and at normal operating pressure, during the isolation? (If system has steam tracing, the tracing should be in service during the verification process.)		
Was this isolated system purged (steamed, flushed, etc.) with adequate bleeders to allow for proper decon?		
What is the risk of deferring the work scope until the next scheduled outage?		
What steps have been taken to verify that the isolation valves are fully seated/isolated and holding? (e.g., visual confirmation of gate valve stem position, wrench tighten, pressure gauge w/ hold time, open bleeder)		
What mitigations are in place to prevent employee exposure in the event of a release (i.e., face shield, bunker gear, air movers, cooling vest, egress options, fixed monitor coverage, barricade, emergency shutdown steps, etc.)?		
Attach the energy isolation sheet and a marked-up P&ID (or detailed sketch/pictures showing the energy isolation and means of verification of no stored energy) to this document for review.		

	Name (Print)	Name (Sign)	Date
Unit Operator			
Shift Foreman			
Day Foreman			

Review this completed form with the Servicing Group during the JJSV and retain a copy in the Day Foreman's office until completion of the workscope. Attach this form to the completed Safe Work Permit and forward to the Safety Department.

Reviewing Comments:

Document Revision History

Complete the following table for each document revision.

Rev. No.	Description of Change	Author	Approved By	Rev. Date
000	First issue of the harmonized RSP / HSS document.	Brian Quinn	Connie Lema	10/01/21
001	a) Adopted RSP 1121-010 language with regards to Isolation of Equipment Containing Heavy Materials/Solids b) Modified the isolation matrix to shift Process Water isolation requirements c) Added restriction of "Daisy Chaining" Energy Isolation Devices	Brian Quinn	Connie Lema	01/19/23
002	**1. Section 3.3.1 (j)** added verbiage on the process of Breaking Containment for systems when the valve is not holding, ATL approval of the Iso-Plan and the use of a risk assessment (B-04 or B-06). **2. Section 3.3.1 (k)** added verbiage to identify that the LOTO keys are locked in the active lockbox for the system. **3. Section 3.3.1 (m) Note:** added verbiage to clarify the use of ABUS 72/40 style locks for isolation involving maintenance activities and excluded contractor's personal lock to utilize this style of lock. **4. Section 3.3.2** added verbiage to clarify proper documentation sign off that an isolation has been completed. **5. Section 3.4.3** added verbiage to clarify proper documentation sign off that the reinstatement step has been completed. **6. Section 4.1.5** added language on blinds "being capable of being locked out" **7. Section 4.4.3** clarifies the relocation of blinds for Confined Space Entries, e.g., replaced "feasible" with "available". **8. Section 4.4.6** added "Due to the inability to insert blinds into most firewater piping configurations, a valve lockout is acceptable isolation for firewater systems when line repair requires excavations at a depth requiring classification as a confined space."	Brian Quinn	Connie Lema	12/10/24

	9. **Section 4.5.3 & 4.5.4** isolation method for Vessel appendages 10. **Section 4.5.8** added process for using blinds as a Primary Isolation Point (PIP), i.e., the valve isolation used to set the blinds are no longer used as part of the LOTO or when utilizing TAR Plot Edge isolations to set the blinds (*reference OSHA CPL 02-00-147)* 11. **Section 4.6.2 and 4.6.3** clarified the process for the Shift Verification Log for routine and TAR 12. **Section 4.6.8 (d)** The Blind List shall be inserted into a lockbox, as the controlled document, and the Owning Department along with the Affected Workers shall place locks and tags on the lockbox. 13. **Section 4.7.1** added verbiage to clarify when adding or omitting isolation point require documentation on the Change Log 14. **Section 4.7.2 (d)** clarified that each change requires its own line on the Change Log. 15. **Section 4.7.2 (h)** added limitations on the number of changes allowed on the Change Log to five (5). This applies to routine and TAR activities. 16. **Section 4.7.2 (k)** added responsibility of OD and OSS to obtain HLA when required. 17. **Appendix A** added definition in A.8 "Capable of being locked out" per OSHA CPL 02-00-147 18. **Appendix B** updated the isolation matrix to allow the use of the B-04 and B-06 Risk Assessment Forms in lieu of a RSP waiver when the isolation valve is not holding. Also added the verbiage for Fire Water systems to utilize valve isolation for Confined Space Entry.			