Contents

1.0 INTRODUCTION 3
- 1.1 Purpose 3
- 1.2 Scope 3
- 1.3 Out-of-Scope 3

2.0 REFERENCES 4
- 2.1 Marathon Standards, Policies & Procedures 4
- 2.2 Government Regulations 5
- 2.3 Industry Regulations 5

3.0 DEFINITIONS 6

4.0 EQUIPMENT SHUTDOWN AND ISOLATION PROCESS 14
- 4.1 Equipment Shutdown and Isolation Process 14

5.0 BLIND TYPES AND CLASSIFICATIONS 20
- 5.1 Classification of Blinds 20
- 5.2 Custom Test Blinds 21
- 5.3 Blinding Protocols 21
- 5.4 Hydrogen Service 23

6.0 MISCELLANEOUS REQUIREMENTS 24
- 6.1 Blinding Open Ended Lines or Equipment 24
- 6.2 Hot Work and Blinding 25
- 6.3 Confined Space Binding 25
- 6.4 Energy Isolation Verification Inspection 25
- 6.5 Status Change/Temporary Release of LOTO (Appendix F) 27
- 6.6 Engineered Isolation Plugs 29
- 6.7 Isolation Using Freeze Plug 30
- 6.8 Alternate Use of Locked Double Block and Bleed Valves 30
- 6.9 Permanent Blinds 31
- 6.10 Electrical LOTO Procedures for TAR 31
- 6.11 Bleeder Blind Guidelines 32
- 6.12 Exclusive Control 32
- 6.13 Minor Servicing Activities 32
- 6.14 Criteria for Using a Relief Valve as an Energy Isolation Device (EID) 32
- 6.15 Unremoved Lockout Device or Danger Tag 33
- 6.16 Hot Tap Sequence and Transition to Stopple Energy Isolation 33

7.0 TRAINING 34

8.0 LOTO AUDITS 34
- 8.1 Audit Requirements 34

9.0 REVIEW AND REVISION HISTORY .35

10.0 APPENDIX A – PROCESS/ENERGY ISOLATION MATRICES 36
- 10.1 Minimum Process Isolation Requirements 36

11.0 APPENDIX B – ENERGY ISOLATION PLAN FORM SAMPLE (R-11-032-F01) 37

12.0 APPENDIX C – SUPPLEMENTAL ENERGY ISOLATION PLAN FORM SAMPLE (R-11-032-F02) 38

13.0 APPENDIX D – ISOLATION BLIND LIST FORM SAMPLE (R-11-032-F03) 39

14.0 APPENDIX E – ISOLATION BLIND LIST SUPPLEMENTAL FORM SAMPLE (R-11-032-F04) 40

15.0 APPENDIX F – STATUS CHANGE/TEMPORARY RELEASE LOG SAMPLE (RSP-1121-010-FORM04) 41

16.0 APPENDIX G – HOT WORK ISOLATION BY ENGINEERED

PLUG APPROVAL FORM SAMPLE (RSP-1121-010-FORM05) 42

17.0 APPENDIX H – APPROVED MINOR SERVICING ACTIVITIES MATRIX ...43

18.0 APPENDIX I – LOTO/CONFINED SPACE BLIND/BLEEDER/RETURN TO SERVICE TAGS.....46

19.0 APPENDIX J – BLINDING AND ENERGY ISOLATION INSPECTION FORM SAMPLE (RSP-1121-010-FORM06).....49

20.0 APPENDIX K – ALTERNATIVE GROUP LOCKOUT/TAGOUT PROCEDURES.....50

20.1 When Alternative Procedures are Permitted.....50
20.2 Factors to be Evaluated.....50
20.3 Acceptable Approach to Personal Locks.....50
20.4 Elements to be in Place for Alternative System.....50

21.0 APPENDIX L – ISOLATION OF EQUIPMENT CONTAINING HEAVY MATERIALS/SOLIDS.....52

22.0 APPENDIX M – HEAVY OIL SERVICE SINGLE POINT ISOLATION CHECKLIST SAMPLE (R-11-032-F05) 53

23.0 APPENDIX N – MAINTENANCE ISOLATION DEVICE LIST SAMPLE R-11-032-F06).....54

24.0 APPENDIX O – MASTER BOARD SAMPLE (R-11-032-F07).....55

25.0 APPENDIX P – HOT TAP/STOPPLE ILLUSTRATION 57

26.0 APPENDIX Q – CUSTOM TEST BLIND REQUEST FORM SAMPLE (R-11-032-F08) 58

27.0 APPENDIX R – BLIND TYPES 59

28.0 APPENDIX S – DOUBLE BLOCK AND BLEED ISOLATION 60

29.0 APPENDIX T – VERIFICATION PATH EXAMPLE 61

List of Tables

Table 1 Definitions 6
Table 2 Definitions - Additional Terms Used During Turnarounds 13

1.0 INTRODUCTION

1.1 Purpose

The purpose of this standard practice is to establish guidelines for safe and consistent isolation of refinery equipment and machinery at all refineries to facilitate servicing, maintenance, or testing. In addition, this document sets forth in detail the procedures to be followed for control of blinds. This procedure helps to ensure uniform practices are followed throughout the Marathon Anacortes Refinery.

1.2 Scope

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

- injury to personnel,
- adverse environmental impact, or
- damage to equipment.

1.3 Out-of-Scope

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

Work on cord and plug connected electric equipment for which exposure to hazards of unexpected energization or start-up 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 individual performing the service or maintenance.

Routine instrument testing, calibration, trouble shooting and repair procedures which require the equipment to be in service.

Minor tool changes, adjustments, and other minor service during normal production operations if: They are routine, repetitive, and integral to the use of the equipment for production; and the work is done using measures which provide effective protection from hazards. Examples include, but are not limited to steam traps, utility station repair, packing adjustments, domestic water plumbing in buildings, installing/removing temporary piping no greater than 2" in size (refer to R-50-002).

Hot tap operations involve transmission and distribution systems for substances such as gas, steam, water, or petroleum products when they are performed on pressurized pipelines. Provided that the facility has documented procedures that demonstrate that:

- Continuity of service is essential.
- Shutdown of the system is impractical.
- Documented procedures are followed; and

Special equipment is used which will provide proven effective protection for employees (refer to R-53-457).

See Appendix P for Hot Tap/Stopple Illustration sheet and section 6.16 for Hot Tap Sequence and Transition to Stopple Energy Isolation.

Systems that cannot be totally isolated from energy sources, such as the Flare (refer to R-11-012) but are still applicable to the connected portion of the system that can be isolated. The communication of the partial isolation state is indicated on the EIP, and hazard mitigation is addressed via the Safe Work Permit (refer to R-11-005).

Continuous nitrogen flow requirements for an inert entry. A supply of nitrogen will be controlled to the affected vessel while maintaining the equipment energy isolation devices in a secured state, such as but not limited to during some specialized Catalyst Changes (refer to Corporate Standard RSP-1121-020 Inert Entry).

When the following conditions apply to electrical work, a Lock Box will be optional and only trained and competent Instrument and Electrical personnel will be required to install a personal lock and Yellow I&E Craft Danger Tag on the isolation device unless Operations deems it necessary to install an operations lock and tag as additional safeguards. See R-53-851 for more information on single source electrical LOTO.

- The equipment has a single, electrical energy source that's easily identified and can be isolated.
- The electrical energy is below 480 volts.
- Only Instrument/Electrical employees will perform work on this electrical equipment.

Note: For further information refer to Appendix H - Approved Minor Servicing Activities.

2.0 REFERENCES

2.1 Marathon Standards, Policies & Procedures

- D-30-003, Equipment Air Freeing
- R-11-005, Safe Work Permit
- R-11-019, HazCom/SDS
- R-11-024, Safety Signs, Ground Level Warnings and Barricades
- R-11-030, Hot Work Operations
- R-12-006, Management of Change (MOC) and Pre-Startup Safety Review Including Management of Organizational Change
- R-12-009, Process Safety Management (PSM) Training
- R-14-008, Respiratory Protection Program
- R-30-001, Operating Procedures
- R-50-008, Non-Welded Repairs of Pressure Equipment and Piping in Service
- R-50-015, Bolted Flange Joints in Piping and Fixed Equipment
- R-53-106, Idled/Retired/Scrapped/Spare Equipment
- R-53-409, Precautions for Stainless Steel Equipment and Piping

- R-53-850, Operation of Electrical Distribution System & Plant Electrical Equipment for Operators
- R-53-851, Operation of Electrical Distribution System & Plant Electrical - For I/E Personnel
- RRD-1323-000, Safe Equipment Preparation Guidelines
- RSP-1121-010, Blinding and Energy Isolation
- RSP-1127-000, Confined Space Entry
- RSP-1128-000, Safe Work Permit
- RSP-1150-010, Caustic and Utility Connections to Process Lines and Vessels
- RSP-1162-000, Electrical Safe Work Practices
- RSP-1700-000, Life Critical Safety Rules & Accountability
- RSP-1715-000, Hot Work
- 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

2.2 Government Regulations

- OSHA 29 CFR-1910.146, Permit Required Confined Space
- OSHA 29 CFR-1910.147, Control of Hazardous Energy Sources
- OSHA 29 CPL-02-00-147, The Control of Hazardous Energy – Enforcement Policy and Inspection Procedures

2.3 Industry Regulations

- API-570, Piping Inspection Code: In-service Inspection, Rating, Repair, and Alteration of Piping Systems
- ASME B16.5, Pipe Flanges and Flanged Fittings NPS 1/2 Through NPS 24 Metric/Inch Standard
- ASME B31-3, Process Piping

3.0 DEFINITIONS

The following definitions are applicable to this procedure.

Table 1 Definitions

Term	Description
Affected Employee	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.
Authorized Employee	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.
Babine Blind	A blind stamped with size and rating (ANSI class) and "BABINE"; these blinds are used where details are to be removed and to minimize the impact of being exposed to an open-ended line. The holes in the blind are threaded. Bolts are used to secure the blind in place with a gasket of suitable size and make for service. The new detail or a blind flange must be installed immediately. The appropriate blind flange must be available at the location prior to starting the work.
Bleeder Blind	A blind designed for the isolation of a piece of equipment and contains a bleeder valve for the purpose of hydrotesting, steaming, purging, de-pressuring, etc., while still maintaining energy isolation. The two types of bleeder blinds used at MPC are Bleeder Blind Flanges and Pancake Bleeder Blinds.
Bleeder Blind Flange	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 with piping components following the applicable line specifications. Bleeder blind flanges may be used as a *permanent* piping component.
Bleeder Tag (Energy Verification location)	A tag attached to a valve or location that is used to verify equipment has been de-pressured and will remain open during the maintenance work. The verification point must be listed on the Energy Isolation Procedure.
Blind Flange	Always pressure rated; stamped with size, rating (ANSI class) and material specification and grade. It is used for Isolating Energy of all forms at the end of a pipe.
Blind List	Standardized form used to document the location, size, installation and removal of isolation and test blinds. Also referred to as Isolation List.
Blind Tag	Used to identify blinding locations and hung at or near the installed blind.
Blind Spacer	Used where a gap is needed between flanges to install a blind. Used in locations with difficult working access and or spec blind size and configuration that hinders blind installation.

Table 1 Definitions

Term	Description
Blinding	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
Class 1 Blind	Isolation blinds or plugs falling in this classification are those which must be installed to isolate equipment or the unit from active incoming and outgoing process and utility lines, and are full pressure rated. All (PIP) blinds are required to be Class 1.
Class 2 Blind	Personnel entry, hot work. Usually, thin blinds that are not full pressure rated.
Cold Work	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.
Confined Space Entry	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 such action is intentional, or any work activities are performed in the space.
Continuous Work	Work that is performed until the task is completed. This includes tool to tool handoff between workers. A craft person must remain at the jobsite until the assigned task is completed.
Custom Test Blinds	May or may not be rated to the full flange rated pressure. The thickness of custom test blinds used for pressure testing shall be per paragraph 304.5.3 of ASME B31.3, except that the allowable stress shall be equal to 90% of the specified minimum yield strength of the material. Custom test blinds should NOT be considered as a permanent blind. **Important**: Custom test blinds designed on the above basis should be marked or tagged with their pressure rating or MAWP and may be used up to that pressure.
De-Energized	Disconnected from all energy sources and not containing residual or stored energy. (A physical step such as the use of a bleeder reamer tool to verify a drain valve is clear, may be required to ensure the energy free state of a machine, process, or equipment.)

Table 1 Definitions

Term	Description
Dog Eared Blind	Stamped with size and rating (ANSI class). These blinds are used where details are to be removed and to minimize the impact of being exposed to an open-ended line. Clamps are used to secure the blind in place with a gasket of suitable size and make for service. The new detail or a blind flange must be installed immediately. The appropriate blind flange must be available at the location prior to starting the work. In unusual circumstances, it may be necessary to leave the dog-eared blind in for a longer duration, which requires review with the Health & Safety Department. The closure of a line, duct, or pipe by closing and locking two (2) in-line valves and by opening and locking a drain or vent valve in the line between the two closed valves.
Double Block and Bleed	Closure of a line, duct, or pipe by closing and locking two (2) in-line valves and by opening and locking a drain or vent valve in the line between the two closed valves.
Electrically Safe Work Condition (ESWC)	A state in which an electrical conductor or circuit part has been disconnected from energized parts, locked/tagged in accordance with established site standards, tested to ensure the absence of voltage, and grounded if determined necessary.
Energized	Connected to an energy supply or residual or stored energy.
Energy Isolation Device (EID)	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) manually operated switch that the conductors of a circuit can be disconnected from all ungrounded supply conductors and no pole can be operated independently, d) a line valve, e) a block valve, f) blind, and g) any similar device used to block or isolate energy. The following are not energy isolation devices: a) push buttons and b) selector switches.
Energy Isolation Plan	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.
Engineered Isolation Plug	Engineered tools are used to safely provide 100% positive pressure vapor barrier against residual contents in the pipe.
Equipment Isolation Lock	Locks assigned to the owning department for the purpose of isolating equipment. These locks will be placed on breakers, valves, etc. and only one key will operate each lock. Equipment isolation locks shall be standardized by color, shape, or size.
Exclusive Control	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.

Table 1 Definitions

Term	Description
Freeze Plug	Practice of freezing a section of the contents of a line (pipe) to isolate equipment. This "Specialty Isolation" is used only as a last resort.
Group Lock	Lock applied to the Master Lockbox representing a servicing group. Formerly known as a "Transition Lock" or "Craft Lock."
Hazardous Energy	Any energy, including mechanical, pneumatic, hydraulic, electrical, chemical, radiation, and thermal energies that could cause injury to workers.
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 (coke, catalyst). These materials include but are not limited to slurry, sulfur, various gas oils, asphalt, bunker fuel, vacuum resid, pitch and any other process materials with similar physical properties.
Hot Work	Repair, maintenance, or construction activity, which requires the use of spark-producing equipment or may create an ignition source.
Invasive Work Risk Assessment Matrix (RAM)	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 of the type of PPE, tools, protective actions, and other mitigations that should be taken to complete the task.
Isolation/De-Isolation	Valve positioning, blinding, plugging, disconnecting, installing or removal that requires process hazard lockout by its owner.
Isolation Blind	Blind designed for the process isolation of a piece of equipment, vessel, piping, etc., during servicing or maintenance activities.
Isolation Verification Point	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 Plan.
Joint Job Site Visit (JJSV)	A collaborative inspection conducted by the Owning Department and Servicing Group representatives to verify isolation points, LOTO integrity and communicate hazards before work begins, ensuring all parties are aligned on the scope of work safety measures.
Lock (Company)	Company locks are attached to a master lock box with the key placed in the satellite lock box for individuals working for that company to lock out.
Lock (Craft)	Craft locks are Common Keyed Locks for skill groups or companies. Skill group locks are colorized by the skill they represent. Green for builder and metal skill, blue for machinists, and yellow for I/E. Craft locks will go on the lock box first and remain on the box for the duration of the job. Craft locks will be accompanied with a tag to identify the installer (formerly called Transition lock).

Table 1 Definitions

Term	Description
Lock (Operations)	Operations locks are White Banded Common Locks for Operating Zones distinguished by the numbering (i.e., #2397 for Zone A, #2395 for Zone B, #2398 for Zone C, and #2396 for Zone E).
Lockbox (Master)	Lockbox into which all the keys from the equipment isolation locks securing the machines or equipment are inserted and which would be secured by an Owning Department lock and Group Lock(s) (Transition locks).
Lockout	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.
Lockout Device	A device that uses a positive means, such as a key or combination lock, to hold an energy-isolating device in the "safe" or "off" position. This includes blank flanges, bolted slip blinds and Line Stopping machines (Stopple plug).
Minor Servicing Activities	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 H.
MOC Tag	Purple tag that is fastened (zip tied) to the Lockbox by the unit OMC or his/her designee. This tag is intended to be a visual reminder/awareness tool for the operators so that refinery processes are not lined up to piping and/or equipment before an MOC is given final start-up approval. Refer to R-12-006 for additional information about the MOC tag and to R-11-024 for an illustration.
Owning Department	The department that normally owns and operates equipment, machinery and/or systems.
Pancake Bleeder Blind	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.
Perimeter (Battery Limit) Blind	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.
Permanent Blind	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.

Table 1 Definitions

Term	Description
Personal Lock	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 satellite lockboxes but may also be applied to Master Lockboxes.
Ping & Ding	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.
Primary Authorized Employee	An authorized employee who has overall responsibility for meeting the requirements of the lockout/tagout procedures.
Primary Isolation Point (PIP)	The point of isolation is located immediately adjacent to the hazardous energy source.
Satellite Lockbox	A secondary lockbox or lockboxes to which the keys to Company Locks are placed and each authorized employee affixes their personal lock.
Servicing Representatives	The individuals working on the equipment/process. This may include operations, blending, shipping, maintenance, business partners, and salaried employees.
Slip Blind	Full pressure rate. Stamped with size, rating (ANSI class) and "SLIP." **Note:** Square cut at handle, same as "spacer" but different than diagonal cut "thin blind"; slotted hole same as "thin" blind.
Spec Blind	Full pressure rated. Stamped with size, rating (ANSI class) and material specification and grade. The Spec blind is denoted on the P&ID with normal operating position indicated.
Specialty Isolation	Isolations that are not typical such as freeze plugs or stopples. These types of isolation shall only be considered when all other methods of isolation/blinding are not feasible for the specific application. Each specialty isolation device is engineered for a specific application, considering the pressure and temperature design of the system.
Special Blind	Blinds rated to the piping system full flange rated pressure. These blinds must be engineered to the specific application and service. Examples include Hamer blinds and the ONIS blind for F-6655.
Status Change/ Temporary Release Form	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. This form is also used to document changes to the Energy Isolation List while the equipment / system is still isolated.
Stopple	A Line Stopple is a line Isolating Device Rated for full process pressure, temperature, and product in the line; used as #1 (PIP) isolation. Device is installed into a weldment after the weldment fitting and a hot tap have been completed to insert a plug or line blocking disc into the line to stop the flow. Generally used when the existing isolation device leaks through or in some cases is used where there is none present. Once Installed, the Stopple must be listed on the blind list.

Table 1 Definitions

Term	Description
Supplemental Energy Isolation List	The standardized form is 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.
Tagout	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. See Note 2 in the Process/Energy Isolation Matrices (Appendix A).
Tagout Device	A prominent warning device, such as a tag and means of attachment. It can be securely fastened to an energy-isolating device to indicate that the energy-isolating device and the machine or equipment being controlled may not be operated until the tagout device is removed. Placing a tagout device on an energy-isolating device using an established Energy Isolation Plan to indicate that the energy-isolating device and the machine or equipment being controlled may not be operated until the tagout device is removed. • Operations personnel use White Danger Tags. • Builder Skills/Metal Skills and General Maintenance personnel use Green Danger tags. • Instrument & Electrical Maintenance personnel use Yellow Danger tags. • Machinists Maintenance personnel use Blue Danger tags. • See R-11-024 for a representation of these tags. **Note**: Tags and their means of attachment must be: Securely attached to energy-isolating devices so they cannot be inadvertently or accidentally detached; attachment is non-reusable, made of materials that will withstand the environmental conditions they will be exposed to, are self-locking, can be attached by hand and cannot be released with a force of less than 50 pounds.
Test Blind	A blind installed for the sole purpose of tightness testing of piping and/or equipment. A test blind must be Class 1 and rated for the test pressure.
Thin Blind	A non-pressure rated blind; stamped with size, rating (ANSI class), thickness, and 'THIN". **Note**: Diagonal cut of handle, slotted hole same as "slip" blind.
Verification Path	Any valves that need to remain open so that the verification point(s) can positively prove the system is energy free. These valves will be tagged with an orange LOTO tag.
Verification Point	A point on a LOTO that is used to prove the system is energy free. This is commonly a low point bleeder or a start stop switch.

Table 2 Definitions - Additional Terms Used During Turnarounds

Term	Description
Equipment Turnaround	Maintenance activity that is prolonged and requires a large number of isolation devices, making standard methods of isolation point verification impractical.
LOTO Inspector (ROVER)	A person who verifies that Energy Isolation Devices are in place during an Equipment Turnaround. A LOTO Inspector must be knowledgeable with LOTO procedures.
LOTO Inspector Danger Tag	A Red and White Danger tag attached to energy isolation devices during Equipment Turnarounds to indicate: • Verification of the energy isolating device placed correctly and properly installed. • That the LOTO Inspector is monitoring the energy isolating device and it has not been compromised since installation. R-11-024 shows a LOTO Inspector Danger Tag.
Maintenance Isolation Device List	A sheet established by Operations that lists all energy isolation devices related to an Equipment Turnaround. Used by the LOTO Inspector to identify Energy Isolation Devices and record verification. Appendix N shows Maintenance Isolation Device List.
Master Board	Used during Equipment Turnarounds or Large jobs by the LOTO Inspector to indicate that all energy isolation devices have been verified. All related Safe Work Permits must be recorded on the Master Board before they are issued. The Master Board could relate to a process system made energy free (i.e., Crude Unit Feed Stream) or may apply to specific pieces of equipment within the process (i.e., C-101 Crude Column). Appendix O shows Master Board.

4.0 EQUIPMENT SHUTDOWN AND ISOLATION PROCESS

4.1 Equipment Shutdown and Isolation Process

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

Stage	Activities
1	**Preparation:** A. The shutdown of refinery equipment, machinery, and/or systems, required for servicing/maintenance shall be conducted by the owners of such equipment. Energy Isolation Lists must be prepared in advance by the Owning Department representative and developed consistently with the Process/Energy Isolation Matrices (Appendix A). The Energy Isolation Lists will specify the energy isolation devices, isolation verification points and the means to verify control of hazardous energy to safely prepare the equipment for the servicing representatives. The Energy Isolation and Blind Lists serve as supplemental procedures to this document for the isolation of specific equipment and systems. 1. Isolation plans must be approved by Owning Department Supervision or designee. The manager will sign the energy isolation plan once all isolation and verification points are defined. This is an agreement with the manager that this plan will achieve energy isolation 2. Locations where tubing, unions, pipes, etc. have been disconnected as part of the isolation should be included on the energy isolation list. 3. Plans should detail the requirements for effective energy isolation of the machine, equipment, or process. **Notes:** i. Disconnected piping shall be positioned so that it does not remain in alignment with or within close proximity to the isolated equipment. ii. As allowed by **1910.147(c)(4)(i)** and the OSHA Compliance Directive, an energy isolation plan is not required while working on equipment that has a single isolation point that is locked out and tagged. Examples include working on AC units, lighting, etc. 4. Equipment should be prepared for maintenance activities per refinery specific operating procedures and in accordance with guidelines outlined in RRD-1323-000. B. When a single point of isolation is used for equipment that contains heavy materials/solids (see definition in Section 3) additional considerations shall be taken by Owning Department Representatives as follows: 1. Consult Appendix L for strategies to ensure effective single point isolation of heavy materials/solids.

Stage	Activities
	2. 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. 3. The *Heavy Materials/Solids Single Point Isolation Checklist* (Appendix M) provides a tool that will be used to safely plan, authorize and execute work involving isolation of equipment in heavy oil/solids service. C. If product is present at the verification point after system is de-pressured, blinding shall be required. All valves in the verification path need to be tagged with the standard orange LOTO tag (see appendix T for diagram). All bleeders and valves used to verify equipment that has been de-pressured and drained will remain open during the maintenance work must, at a minimum, be tagged open with a pink bleeder tag (Appendix I) and listed on the Energy Isolation Plan in the section of the form designated "Energy Isolation Device Identification". D. In some cases, the checks to ensure that a fully de-energized system exist will involve equipment that will not be locked or tagged out. Examples include bleeder valves that are opened to verify the system is de-pressured but will not remain open for the duration of the maintenance work. These isolation verification points shall be listed on the Energy Isolation Plan, along with the means used to verify control of the hazardous energy and any special instructions, in the section designated "Verification of Isolation". E. 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. 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 de-pressured. This valve only needs to remain open and tagged if continuous bleed is needed to facilitate the blind installation/removal. If the verification point is between the isolation point and the blind, it shall be closed after the blind has been installed and noted on the "Verification of Isolation" section. F. The practices in ***parts (c) through (E)*** of this stage shall only apply to routine (non-shutdown related) work. For turnaround, major maintenance and project work, the elements discussed in this section should be included in the operating procedures, PSSR documentation, and/or functional checkout procedures. **Note:** When using a valve(s) as the isolation point, verification of isolation must occur with the system at the normal expected operating pressure and temperature. 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.

2	**Isolation and Lockout/Tagout:** Owning Department shall perform the following: A. Isolate the hazardous energy according to the Process/Energy Isolation Matrices (see Appendix A) and the Isolation Plan. B. If Heat Tracing is part of the equipment being isolated, it must be identified, and the crew must be protected from the hazards (and part of the JSA). If the Heat Tracing can be shut down without affecting other equipment it shall be isolated and placed on the Energy Isolation Plan (EIP). C. Operations shut down the equipment or process and prepare for the isolation of the energy sources, de-inventorying, draining, flushing, steaming, removal of any stored energy, etc. When the system has been rendered energy free, Operations will apply all the necessary locking hardware and tags per the Isolation Plan. D. Owning Department representative, after the lockout device(s) have been installed and tried, will place the bottom tracking section of the Energy Control tag(s), any residual Keyed-alike locks, and the associated key, inside the selected Lock Box. The Lock Box is then secured closed with an Owning department Common lock, Operations Danger Tag, and the Energy Isolation Plan is placed inside a clear weather-proof container that accompanies the Lock Box at the job site for the duration of the work. After this point, if the job requires an MOC, the OMC or his/her designee will secure (zip tie) the MOC tag to the Lock Box where the common locks are attached to ensure no one can open the Lock Box without breaking the zip-tie. If blinds are to be installed Owning department hangs the appropriate equipment or process blind tags at the specified locations, identified on the Energy Isolation Plan and/or on a supplemental blind list. E. Where shared systems exist between Operations Zones or units, the operations area where the work is being done, must assume responsibility for the maintenance work on the machine, equipment or process and ensure proper communications and safe energy isolation is coordinated with the other affected areas. When an isolation point utilized is controlled by another operating zone, the owning zone will initial the isolation point as well on the Energy Isolation Form. If more than one EIP requires a common isolation point, then each job would require their lock box lockout device to be attached on the same isolation point. F. A chain wheel must not be the only means for closing a valve. Proper verification of valve closure and locking of the isolation point must take place at the valve body to ensure it is closed tightly and secured properly. An exception can be made on steam supply valves for turbine checks where the risk of climbing into the piperack to close a valve outweighs the safety benefits of putting a wrench on the valve. The line must still be verified to be energy-free. Chain wheel operators used on valves that are infrequently used or only used for maintenance isolation, should be permanently removed. G. 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 plan(s) and in accordance with the Process/Energy Isolation Matrices (Appendix A). **Notes:** 1. When installing isolation blinds ALWAYS think about how the air free and blind removal procedure is going to be executed. The use of a bleeder blind should 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. 2. See section 6.11 for additional guidelines on the use of Bleeder Blinds. H. Verify that equipment and/or piping is completely de-energized and de-pressured according to the instructions in the "Verification of Isolation" section of the Energy Isolation Plan.

This verification should include:

1. Opening a bleeder or valve in close proximity to the work location. For large / complex systems multiple bleeders and valves should be opened to ensure that the entire system is de-energized. Using a bleeder reamer or similar device to verify the bleeder is not plugged is recommended, especially when drained volume does not match anticipated volume.
2. Pushing any start buttons on pumps, compressors, fans, etc.
3. Taking any other physical actions necessary or any actions outlined in Owning Department procedures.

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

I. Work may not proceed without additional signatures if equipment cannot be verified meeting the following conditions:
   1. Verified Depressured or De-Energized: This includes situations where depressurizing cannot be confirmed (e.g., no bleeder available, isolation verification cannot be achieved upstream of the work).
   2. Verified Isolated: This includes cases where there is leak through the isolation method (e.g., valve not holding and alternative isolation cannot be achieved upstream of the work).

J. Before work may proceed under these conditions above, the refinery line breaking procedures must be followed, and additional worker protection measures must be implemented. Required precautions may include:
   1. Use of additional or specialized PPE as determined by the Invasive Work Risk Assessment Score or another approved hazard assessment.
   2. Fire protection onsite and continuously attended.
   3. Testing or verification by a qualified electrician, where applicable.

K. The Owning Department Supervisor and Permit User Supervisor (refer to Work Authorization Matrix in IG-86) must sign the work permit & confirm that alternative isolation points or methods have been evaluated, the planned line breaking/depressuring approach, and mitigation methods that will be implemented.

Note: Vertical sections of piping, without an adequate high point vent, can result in a "straw effect", where liquid will not drain from the vertical section. Care should be taken to ensure zero energy including cold drilling/cutting to provide venting of liquids in vertical piping where necessary.

L. Representative must sign the work permit to designate their approval to proceed with the work, methods to de-pressure and the precautions being implemented. This requirement does not apply to utilities or cooling water.

M. Affix Owning Department equipment isolation locks and tags to all subject valves, actuators, motor starters, circuit breakers, etc., according to the Refinery Energy Isolation/LOTO Procedure and the isolation plan(s). Owning Department and MPC Personal Locks shall be standardized in at least one of the following criteria: color, shape, or size.

N. The Owning Department will then affix a departmental lock and Operations Danger Tag to the appropriate Master Lockbox. The MPC Equipment return to service tag shall be attached to the lock box before isolation of equipment is considered complete. The Owning Department shall attach the "MPC Equipment Return to Service" tag (Appendix I) to the Owning Department lock on the Master Lock Box.

Stage	Activities
	O. All Servicing Representatives shall then affix a Group Lock (Transition Lock) to the Master Lockbox and all "Authorized Employees" shall then affix their personal lock to either the Master Lock Box or an appropriate Satellite Lockbox. All locks must be tagged or labeled for identification. This requirement is in effect for normal operations and maintenance. During turnarounds 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 – Control of Hazardous Energy (**CPL-02-00-147**). The requirements for alternative procedures are listed in Appendix K. 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 Procedure (R-11-005). Q. The Owning Department Representative and Service Group Representative will sign in the appropriate boxes to verify each LOTO point and that the LOTO is adequate for the task being performed. **Note:** For tasks or work to be performed on electrical conductors or circuit parts, in addition to establishing adequate LOTO, an electrically safe work condition (ESWC) in accordance with Electrical Safe Work Practices (RSP-1162-000) shall be established before an employee performs work. R. Any time a LOTO needs to be broken or modified, all locks including group locks (Transition locks) will come off the lock box, the STATUS CHANGE/TEMPORARY RELEASE FORM shall be utilized (Appendix F), and a new joint jobsite visit with LOTO walk will occur prior to installing locks back onto lock box.

3	**De-isolation:** A. **Servicing Group Representative (Maintenance/Engineering/Business Partner):** 1. 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. 2. Following the removal of a bolted slip blind, blind flange, plug, etc., – sign and date the appropriate blind list at each listed blind point for which they removed a blind. 3. After all work is completed, authorized employees remove their personal locks. 4. Servicing Group closes out permit with Owning Department. 5. Servicing Group Representatives remove Servicing Group locks (Transition locks). B. **Owning Department Personnel:** 1. Verifies work is completed by reviewing job location and through communication with the servicing representatives. 2. Prepares equipment and systems for the removal of blinds per Equipment Return to Service guidelines per D-30-003 Equipment Air Freeing and Equipment Return to Service guidelines (RRD-1323-000). 3. Prior to the removal of any personal locks, issues the servicing representatives a work permit for the removal of blinds/energy isolation devices and reconnection of electrical power, hydraulic/pneumatic lines and re-energization of breakers according to the isolation plan(s). 4. Prior to removing "Owning Department" locks, at a minimum, one of the following methods must be completed to verify that the equipment is fit for service following maintenance activities: i. **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. The completed and signed P&ID shall be turned into the Owning Department supervision for review. ii. **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 should be taken to ensure that equipment MAWP and MAWT is not exceeded and to avoid pulling a vacuum on the system. ▪ When liquid filling equipment, a review should 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. – Pressuring the system with nitrogen and complete a hold step: ▪ During the hold step, the system pressure should be monitored closely. Flanges parted and other connections made up during the maintenance work shall be checked for leaks using FLUKE ii910 Precision Acoustic Imager or a leak detection solution (e.g., Snoop). Caution should be taken to 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.

Stage	Activities
	▪ 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. **Note**: Refer to D-30-003 for Equipment Air Freeing requirements. **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: a. Equipment in utility service with an operating temperature below 140°F. b. Items considered as minor servicing activities or exclusive control. These are not subject to energy isolation. c. 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. 5. Verifies that all MOC's associated with the work are start-up approved. OMC, or designee, will check the "Ready for Startup" box, sign the MOC tag, and remove it from the lock box. 6. Removes any remaining Owning Department equipment isolation locks from valves, actuators, motor starters, circuit breakers, etc. **Note:** If used, complete the "*MPC Equipment Return to Service Checklist*" in Appendix I that is attached to the equipment master lock box. Attach this tag to the EIP along with other documentation for the job.

5.0 BLIND TYPES AND CLASSIFICATIONS

5.1 Classification of Blinds

All blinds or isolation devices are to be classified in the following manner:

A. Class 1 – (PIP) Isolation blinds or plugs falling in this classification are those which must be installed to isolate equipment or the unit from active incoming and outgoing process and utility lines, and are full pressure rated.

B. Class 2 – Personnel entry, hot work. Usually, thin blinds that are not full pressure rated.

C. Vented or Bleeder Blind – Used as an Isolation blind with the capabilities to de-pressure, hydrotest, steam through, etc.

Any Class 1 blinds that are installed will have all bolts installed and properly tightened with the required gasket. It is up to the Operating Department to indicate if the blind being installed will be a Class 1 blind by indicating a Class 1 on the Blind List, and by marking the location with a white tag with a diagonal red stripes. This will indicate that

full bolting is required. When this tag is used with numbered blind tag, both shall be secured at the blind location by the same wire.

When blinding a new gasket is required on both sides of all Class 1 blinds.

Always use proper gasket for temperature, pressure, and product.

Spacers are never to be used on Class 1 blinds. Also referred to as a blind and space

It shall be the primary responsibility of the zone planning the work to ensure that no line becomes hydrostatic because of the installation of a Class1 blind. This will require communication with affected zones to ensure that an adequate means of relief is provided on lines to be blinded. Consideration should also be given to any emergency relief connections that will be rendered inoperative due to the installation of a blind.

Old Gaskets can be used on both sides of Class 2 blinds if the old gaskets are intact. Except for the older Durable gaskets if they are found they must be removed by asbestos qualified personnel. If an old gasket is not intact or an additional gasket is needed, a CMG or equivalent should be used for installing the Class 2 blinds, during unblinding it shall be replaced with the correct gasket for the service. It's an acceptable practice to have a minimum of 4 evenly spaced bolts around the flange set when establishing a class 2 blind isolation. These bolts will be tightened with wrenches.

When turning blinds to the open position or removing blinds prior to startup; new gaskets shall be installed. Always use proper gasket for temperature, pressure, and product.

5.2 Custom Test Blinds

In situations where the flange requires an isolation (full pressure rated) blind but will not accommodate the thickness of a standard full pressure rated blind, a custom test blind can be designed and built using actual pressures, temperature and possibly a different metallurgy. Print out Appendix Q form (i.e., request to install a Custom Test Blind) from this procedure, fill out the information and complete the required signoffs.

Fabricate a custom test blind as per SP-50-39.

- Place with the Blind Lists (i.e., master and field) the completed Appendix Q form before installing the special blind.
- If there is a certified Operations Procedure with a completed and signed Appendix Q form, then print out the attachment from the procedure and place it with the Blind Lists (signatures do not need to be updated).
- An Appendix Q form that is included in an Operations Procedure will be reviewed and updated when applicable.

5.3 Blinding Protocols

The following rules and practices apply to any blinding:

A. Operations will generate a Blind List for all maintenance activities that involve installing blinds, removing blinds, or utilizing specialty isolation devices such as engineered plugs or stopple. Ultimate responsibility for maintenance of the Blind List remains with the Operator.

B. Prior to blinding, Operations will wire tie a numbered tag (blind tag) securely to lines nearest flanges to be blinded and all other isolation points. These tags must not be attached to flanges in a manner that would interfere with installing or removing blinds.

C. If the blind to be installed is a Class 1 blind, operations will mark the location with a white tag and diagonal red stripes.

D. Blind tags must be removed by Operators only - not by crafts persons.

E. Although blind tags serve to indicate location of a blind or other isolation device, the Operator is responsible for conducting a Joint Job Site Visit at the blind location to communicate work scope and to ensure equipment has been energy isolated.

F. Maintenance personnel who installed or removed blinds will initial the blind list indicating that they have completed the task.

G. After a blind or isolation device is removed (or installed), it will be the Operator's responsibility to verify visually that the actual installation or removal of all blinds or isolation devices has occurred, and record information immediately on the master and field Blind Lists.

H. Before returning to service, the Operator will strike flange bolts with a small hammer to ensure tightness, (ping and ding), check for the proper gasket, and look over the flange set for any misalignment or other visual indications that the flange has not been made up correctly.

I. Blind tags will remain until the blind is signed off on the Blind List. When the blind is removed or returned to its normal position, then the blind tags will be removed. Blind tag removal should occur at the same time as the visual verification of the blind change and signing off the Blind Lists.

J. Operations must be notified before any flanges are opened in a unit. If there is a delay in starting the work after the joint job site visit, operations must be re-notified prior to beginning the work.

K. An Operator with radio must be present when a Class 1 blind flange is opened or during any initial cutting of hydrocarbon/chemical lines.

L. An Operator may or may not be present when a Class 2 blind is turned, but a Joint Job Site Visit must be conducted so hazards such as draw trays or equipment with internal piping can be communicated so mitigation steps can be put in place for possible liquids escaping from the flange opening. Operations must then verify that the blind was put in the intended position.

M. When installing Class 1 isolation blinds, do not work immediately above or below where others are working while opening flanges. This does not apply for Class 2 blinds unless Operations suspects potential hazards (such as liquid from draw trays, liquid present in bottom of equipment, etc.) where personnel exposure or significant releases may be present.

N. Whenever working in supplied air respiratory equipment in an elevated area, a scaffold or equivalent safe access shall be provided. The workers should not be working in a situation where fall protection is needed.

O. A Joint Job Site Visit will be repeated any time isolation points change or when the key personnel about to perform the task have not participated in the previous Joint Job Site Visit, due to shift change or crew reassignment.

P. Prior to inventorying and/or starting up a unit/equipment, Operations will personally audit Blind Lists. Blind Lists should be reviewed to ensure blinds are in proper position for operation. A careful inspection of the unit is to be made if there is any doubt regarding a blind as indicated by either the tag system or Blind List.

Q. Blind tag numbers are to correspond with the blind number on Blind Lists in all cases.

R. All blind types listed on the Blind List form will have a blind tag installed and tracked on both the Field and Master Blind Lists.

S. Where possible, blinds or plugs (other than Class 1) should be removed as early as possible. For example, blinds used for hydro testing, entry, or hot work can be removed when no longer required. This shall be coordinated by Operations personnel to ensure control.

T. When piping that includes a blinding location is removed during a turnaround, special care must be taken to maintain controls. If piping is to be permanently demolished, notify Operations and the blind tag should be removed and returned to the blind board and the Blind List should be so annotated. If a set of spools including a blinding location is to be replaced, the blind and blind tag should be reinstalled with the new spools.

5.4 Hydrogen Service

If the equipment has contained hydrogen or has been in hydrogen service, greater caution is required when turning isolation blinds, due to the low energy required to ignite hydrogen. Always assume hydrogen is present. Hand tools or non-sparking tools (i.e., no hammering on a slugging wrench unless using a non-sparking hammer) shall be used to remove or loosen the final four bolts when blinding or un-blinding. When studs are galled or difficult to remove because of high temperature service, hot bolting (single stud replacement) procedures in R-50-015 shall be followed.

A. Put pipe dope on the studs and reinstall or replace with new studs. If there is a stud, which runs throughout the connecting web of a spectacle blind, that stud should be removed first. When closing a flange, hand tools or non-sparking tools (i.e., no hammering on a slugging wrench unless using a non-sparking hammer) will be used to completely tighten every other bolt on the flange. Air ratchet guns may be used to tighten the rest of the bolts after they have been tightened with hand tools or non-sparking tools. If any bolts are galled or hard to tighten, replace with new.

B. Open the flange by loosening nuts and applying non-sparking wedges to the bottom or opposite side away from the craftsperson. If any signs of pressure are encountered, or if excessive volumes of vapors or liquid drain out, either:

- Remove wedges and re-tighten the bolts, or
- Evacuate the area.

6.0 MISCELLANEOUS REQUIREMENTS

6.1 Blinding Open Ended Lines or Equipment

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

Notes:

1. For Heavy Oil Service single valve isolation refer to Section 22.0 Appendix M – Heavy Oil Single Point Isolation Checklist R-11-032-F05.
2. Double block and bleed may be used in place of a blind in accordance with Section 6.8 if the work does not involve hot work or confined space entry.
3. Safe Work Permit can only be extended one time. If work will take longer than 24 hours, blinds should be installed.
4. Equipment must be verified energy free (zero energy).
5. Radio must be at jobsite for duration of work while single valve isolation is used.

This requirement only applies to the following services:

- hydrocarbons
- High Pressure Steam (600+)
- corrosives
- toxics

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

Bleeders and valves that are locked or tagged open as part of the energy isolation process (e.g., to verify equipment is de-energized/de-pressured) are not subject to this requirement.

If a blind is installed, it must be located between the isolated valves and the equipment being worked on. If the verification point is between the isolation point and the blind it shall be closed after the blind has been installed and noted on the EIP section designated "Verification of Isolation".

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 de-pressured. This valve only needs to remain open and tagged if continuous bleed is needed to facilitate the blind installation/removal.

Continuous Work - Work that is performed until the task is completed. This includes tool to tool handoff between workers. A craft person must remain at the job site until the assigned task is completed.

6.2 Hot Work and Blinding

Blinds shall be installed according to the Process/Energy Isolation Matrices (Appendix A) 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 Foremen as well as a Safety Department Representative.

The area between the blind and the hot work shall be cleaned, and gas freed and tested per the requirements in R-11-030.

Note: Testing should be done near 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. to verify no hazards are present. This is especially important on long piping runs or complex systems.

6.3 Confined Space Binding

Blinds shall be installed according to the Process/Energy Isolation Matrices (Appendix A).

The isolation blind for a confined space must be tagged with a "Confined Space Isolation Point - Do Not Remove" tag (Appendix I) listing the Owning Department and blind number. This isolation point (blind, plug, physical separation, etc.) cannot be removed/ reconnected until the 'approved for removal' box has been signed by an Owning Department representative.

Vessel appendages (e.g., sight glasses, level bridles) must be properly decontaminated and, if required, blinded/disconnected prior to entry. Alternative, equally effective measures may be utilized in lieu of blinding and must be included on the Energy Isolation and Blind Lists.

Blinds shall be installed at the closest flange to the confined space. Where this is not feasible, the following procedure shall be followed:

A. Operations, Maintenance, and Safety must agree to the alternate location.

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 (#2 blinds only), unless there is another means (bleeder) proximal to the blind which allows proper piping preparation and internal gas detection.

D. The permit writer 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.

6.4 Energy Isolation Verification Inspection

Energy isolation plans shall be walked down by Owning Department and Servicing Group representatives on the first day and night shift (if applicable), prior to working on equipment to verify that energy isolation is accurate and complete.

Isolation verification should occur as part of the Joint Job Site Visit (JJSV). The Owning Department is responsible for removing the coupons during the JJSV. Documentation of this verification will be either on the work permit or the isolation plan(s) for the work.

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

- Removing a lock to exercise a valve or breaker, or
- Opening a lockbox.

During Turnaround activities, once initial LOTO walk has been conducted, verification of LOTO and installed blinds will be conducted by a LOTO inspector.

An authorized LOTO Inspector must visually verify the proper installation of all energy isolation devices (blinds and break & plug locations) on the Maintenance Isolation Device List (Appendix N) attaches a LOTO Inspector Danger Tag on each device, make appropriate entries on the Maintenance Isolation Device List sheet and mark the date of installation.

Once all energy isolation devices have been installed and confirmed for the process system, the LOTO Inspector will initiate the process system Master Board (Appendix O).

The process system energy free condition enables #2 blind installations to initiate a secondary Master Board(s) for specific equipment isolated by the process system Master Board.

The LOTO inspector visually verifies the proper installation of #2 blinds specified on the equipment Maintenance Isolation Device List (Appendix N) attaches a Confined Space Isolation Point Tag on each #2 blind location, make appropriate entries on the Maintenance Isolation Device List sheet and mark the date of installation.

When all #2 blinds have been installed and confirmed, the LOTO Inspector will initiate the equipment Master Board for the specified equipment.

The LOTO Inspector's job shall be to monitor the safe energy state of the LOTO system and visually verify the condition of all energy isolation devices prior to the start of each new shift, then initial and date the Maintenance Isolation Device List and update the process system or equipment Master Board (Appendix O).

The LOTO Inspector must immediately notify the Operations Manager if any energy isolation device is not in place and revoke all Permits affected by the missing device until it is reinstalled, and a new Master Board is filled out.

Operations generate Permit(s) and the maintenance craft will complete JSA(s) for specified Maintenance work to be performed within the TAR Isolation Plan area for an individual piece of equipment or the process system Master Board (Appendix O).

The Authorized Employee shall confirm an equipment or process system Master Board exists and has been signed by the LOTO Inspector. The Authorized Employee enters the Safe Work Permit number, the job description, and signs in (initials) on the appropriate shift of the Master Board.

The Authorized Employee approves the Permit by signing the Permit, signifying the energy isolation for the specified work is current and has been performed. All authorized employees must sign the Servicing Group Acknowledgment log on the rear of the JSA.

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

During Equipment Turnaround shift changes, the oncoming (Maintenance Supervision) Authorized Person in Charge will review the active Permit(s) logged in on equipment or process system Master Boards, with the off going Authorized Person in Charge. The off going Authorized Person in Charge will sign out (initials) on the active Master Board(s) and the incoming Authorized Person in Charge signs in (initials) the Master Board(s) after any Permit(s) are revalidated or new Permits have been authorized, and corresponding JSA(s) have been created for the new shift.

The oncoming Authorized Person in Charge shall sign as the Authorized Person in Charge on the Permit(s), ensures the JSA(s) are completed, and assumes responsibility for the active work on the Master Board(s).

All authorized employees will attach their personal lock and tag to the designated Lock Box and sign the Servicing Group Acknowledgment log prior to starting work. When a job has been completed, upon work reassignment, or at the end of their scheduled work shift Authorized Employee(s) and remove their personal lock and tag from the Lock Box before leaving the work area.

The Authorized Person in Charge confirms the completion of a particular permitted task and returns the properly closed out documents to operations. The Authorized Person in Charge signs out (initials) on the Master Board for the corresponding Permit number.

6.5 Status Change/Temporary Release of LOTO (Appendix F)

A Status Change/Temporary Release Log shall be used when an Energy Isolation Device must be inspected, repaired, removed, replaced, etc., and results in a change to the Energy Isolation List. The transferring of LOTO hardware from that Energy Isolation Device to the other Energy Isolation Device(s) must ensure the same integrity of the LOTO system is maintained.

Exceptions:

1. Temporary release requirements do not apply to the hot alignment of pumps when the warmup lines are used and all other energy sources for the pump remain isolated.
2. 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:

   A. 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.

B. 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.

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.).

6.5.1 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 (transition) locks/tags are removed from all the applicable lockboxes, and

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

6.5.2 The Owning Department Representative shall:

A. Complete a Temporary Release Form (Appendix F) and assign a temporary release number and document the reason for the Temporary Release on the Status Change/Temporary Release Log,

Note: The Status Change/Temporary Release Log shall be maintained with the Energy Isolation Plan.

B. OMC to remove MOC tag from lockbox.

C. Remove department locks, tags, and keys from master lockbox,

D. Remove equipment isolation locks/tags from those devices necessary for re-energization,

E. Note the Temporary Release number for each EID on the Energy Isolation Plan,

F. Sign and date the Equipment Safe for Temporary Release section of the Status Change/Temporary Release Log to indicate re-energization is ready to commence,

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 master lockbox with Owning Department lock and tag, and

J. Sign and date the Isolation Restored section of the Status Change/Temporary Release Log.

K. Remove LOTO equipment from the Energy Isolation Device that is now part of the work scope, and

L. Review the change with the Servicing Group Representatives associated with the job.

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

A. Verify that equipment is isolated and de-energized, and

B. Install required servicing group (transition) and personal locks and tags on the appropriate lockboxes.

C. OMC to re-install MOC tag.

6.6 Engineered Isolation Plugs

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 G must be completed prior to utilizing an engineered isolation plug.

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

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 G.

To use engineered isolation plugs as the only isolation for Hot Work:

A. Hot Work Isolation by Engineered Plug Approval Form in Appendix G 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/plumber's plugs shall not be used for hot work.

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.

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 G.

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 into 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 (work will continue until completed and system is sealed or blinded).

6.7 Isolation Using Freeze Plug

A safety variance (R-11-005-F01) 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.

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.

6.8 Alternate Use of Locked Double Block and Bleed Valves

The use of locked double block and bleed valve alternatives in place of blinding equipment with a blank, slip plate, blind flange, threaded cap/plug and/or physical disconnect is only allowed in those situations listed in the Process/Energy Isolation Matrices (see Appendix A) and for isolating opened ended lines not involved in hot work or confined space entry if the following precautionary measures are taken to ensure continued isolation and protect against a hazardous atmosphere from developing:

A. block valves are verified closed and tight,

B. bleed valves and piping are verified open and clear, and

C. block valves are locked closed, and the bleed valve is locked open.

6.9 Permanent Blinds

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 should be in place to ensure proper management of the permanent blinds. The system shall include the following requirements:

A. The permanent blind shall be identified with a tag.

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 an 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, all blinds are tracked on the blind list. Re-installation shall be verified when blinds are "signed in".

E. Permanent blind installation shall be verified 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 management program and ensure the permanent blind list is kept accurate.

6.10 Electrical LOTO Procedures for TAR

The refinery Electrical Department will work with the Owning Department to coordinate all work and energy isolation within substations. Follow guidelines in R-53-850 and R-53-851.

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

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 caution must be exercised to ensure that electrical power is not being supplied to isolated equipment.

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 always remains isolated protecting the persons performing work in the field.

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.

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.

6.11 Bleeder Blind Guidelines

Where feasible, bleeder blinds should be used in situations where:

- bleeders are 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.

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

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

6.12 Exclusive Control

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.

6.13 Minor Servicing Activities

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

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

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

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

6.14 Criteria for Using a Relief Valve as an Energy Isolation Device (EID)

A relief valve may only be utilized as an 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-decontamination 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 should be installed using supplied air until the flare is isolated from equipment by blinds.

C. Using an EID as an isolation point requires the Owning Department shift supervision (Day Foreman or Shift Foreman), Maintenance supervision (foreman), and Safety Department Representative to sign the work permit to designate their approval to proceed with the work.

D. Process operation must be monitored continuously during the installation of blinds to warn workers of any process upsets.

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

6.15 Unremoved Lockout Device or Danger Tag

Every effort must be made to ensure that Lockout devices and Danger Tags are removed in accordance with section 3 stage 3 (De-Isolation) of this procedure.

When the completed job status for a particular piece of equipment, machine or process has been communicated or is evident, but a Personal lock or transition lock is still affixed at the lock box and the authorized employee who applied their lock is not at the facility to remove it, that device may be removed provided specific procedural steps are followed.

A. Notify the appropriate Maintenance Manager, Duty Person, or Maintenance Superintendent that a Lockout device and or Danger Tag have been left in place.

B. The Maintenance Manager, Duty Person, or Maintenance Superintendent must:

- Make all reasonable efforts to contact and inform the authorized employee.
- Ensure that maintenance is complete or that removal of the lock will not present a hazard.

C. The lock is removed by a manager of the worker's craft and removal shall be witnessed by at least one other manager or a Marathon Health & Safety Dept. representative.

D. The Operations Manager shall record the incident in the turnover log.

E. The Maintenance Manager, Duty Person, Maintenance Superintendent, (or contractor supervision for contractor personnel) must notify the authorized employee that the lock has been removed when the authorized employee returns and before work resumes.

6.16 Hot Tap Sequence and Transition to Stopple Energy Isolation

Appendix P illustrates the Hot Tap procedural steps generally used to initiate a Hot Tap weldment installation and then subsequently transition to a Stopple installation, (illustration 9) for use as an energy isolation device. This signifies a distinct changing point from the LOTO Hot Tap exemption (E.), which requires working on a pressurized pipe system, to the Stopple installation becoming an integral element for energy isolation control. (Refer to R-53-457 - See Appendix P Hot Tap/Stopple Illustration.)

Note: As shown on the Appendix P illustration 9, the Line Stopping Machine is used to insert the Stopple plug through the opening created during the Hot Tap process and shut off the line flow to permit its use as a primary isolation device for downstream maintenance activities. Upon proper installation of the Stopple plug, and verification of zero energy, also 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. An atmospheric test of the affected area shall be conducted to verify zero LEL. Once complete the Stopple plug will be recorded as a #1 (PIP) Isolation on the Operations Blind List

for the duration of the energy isolation. When the safe isolation of the line has been established and the line de-pressures, coordination of the work can ensue for the affected area. The Operations and Maintenance authorized employees institute any remaining EIP/LOTO requirements prior to proceeding with the downstream work.

7.0 TRAINING

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:

A. 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.

B. 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.

C. 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.

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

8.0 LOTO AUDITS

8.1 Audit Requirements

Apply the following requirements for audits:

A. Each site shall conduct audits of their energy control procedure at least annually to ensure that the procedure and the requirements of this document and the OSHA standard are being followed.

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

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

D. The periodic audit shall be conducted to correct any deviations or inadequacies identified.

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

F. The employer shall certify that the periodic audits have been performed utilizing the Blinding and Energy Isolation Audit Form (or equivalent) in Appendix J. The

certification shall identify the machine or equipment on which the energy control procedure was being utilized, the date of the audit, the employees included in the audit, and the person performing the audit.

9.0 REVIEW AND REVISION HISTORY

Revision #	Preparer	Date	Description
4	Zoe Quinn	12/5/2025	Updates made per Finding #435622 - 2024 Anacortes Personal Safety Collaborative Audit and Intelex Recommendation #351482. In Section 2.1, added reference to RSP-1162-000, Electrical Safe Work Practices. In Section 3.0, added definition of Electrically Safe Work Condition (ESWC) directly copied from RSP-1162-000, Revision #8. In Section 4.1, added verbiage to include reference to RSP-1162-000 and establishing an ESWC.
5	Chris Swenson	02/04/2026	Updated definitions. Standarized terms. "FAQ" document added into policy in appropriate sections. Added new diagram in appendix for clarification around verification path and points. Minor updates to form F01 (EIP). Updated Content Custodian to Andrew Johnson and Approver to Amber Larsen.
6	Adam Avery	09/08/2026	Line by line review and updated section 4.1 to comply with RSP 1121-010, Unified Permitting and E-Permitting.

10.0 APPENDIX A – PROCESS/ENERGY ISOLATION MATRICES

10.1 Minimum Process Isolation Requirements

The table below describes minimum process isolation requirements.

Notes:

1. Where (1) is located in the table, see Section 6.8 for additional information.
2. Where (2) is located in the table, 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 particular 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).
3. 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. 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. 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 Managers. 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.
5. Isolation requirements do not apply to gases utilized for inerting equipment and vessels.
6. Lockout/Tagout is acceptable for confined space entry above the roof on internal and external floating roof tanks.

Stream Type	Examples	Cold Work	Hot Work	Confined Space Entry
Corrosive	Hydrofluoric, Sulfuric, Phosphoric, Spent or Fresh Caustics	Lockout	Blind	Blind
Hazardous Waste	API, DAF, Wastewater Liquids & Solids	Lockout	Blind	Blind
Hydrocarbon	Hydrogen, Fuel Gas, LPG, Lube Oil, Naphtha, Crude, Slurry, Flue Gas	Lockout	Blind	Blind
Toxics	Antimony, Ammonia, Hydrogen Sulfide, Amine, Chlorine, Benzene, Nitrogen	Lockout	Blind	Blind
Non-Flammable	Cooling Water, Fresh Glycol, Boiler Feedwater, Steam	Lockout	Lockout	Blind
Utilities	Instrument Air, Plant Air, Utility Water, Firewater	Lockout (2)	Lockout (2)	Blind (1)
Other	Miscellaneous Additives	Lockout	Blind	Blind

11.0 APPENDIX B – ENERGY ISOLATION PLAN FORM SAMPLE (R-11-032-F01)

The following is the Energy Isolation Plan Form sample.

Marathon Petroleum Company LP, Anacortes Refinery — Refinery-Wide — R-11-032-F01

MPC Energy Isolation Plan

Unit:	Equipment No:	Equipment Description:	Sheet # ___ of ___
Job Description:			
Lockbox No. / Location:			

Energy Sources Locked/Tagged

Process/Hydrocarbon ☐ Gas/Vapor ☐ Liquid ☐ Heavy Materials/Solids Chemicals: ☐ Corrosive/Toxic ☐ Electrical ☐ Steam ☐ Water ☐ Air ☐ Nitrogen ☐ Radiation ☐ Hydraulic ☐ Other:

Energy Isolation Device Identification

ID Number	Tag Number	Status Open/Closed On/Off	Location / Description of Isolation Point	ISO VER	Normal Position	Installation			Removal		Status Change / Temporary Release	
						Ops Initials	Maint. Initials	Date	Ops Initials	Date	Number	Initials
1												
2												
3												
4												
5												
6												
7												
8												
9												

Verification of Isolation Used in Preparation of Equipment

For Example: • Verification of bleed between the isolation and blind point which will be closed after blinding and opened again prior to blind removal.
• Electrical equipment that needs to be tested at the start/stop button to verify electrical isolation.

ID Number	Tag Number	Status Open/Closed On/Off	Location / Description of Isolation Point and Means Used to Verify Control of Hazardous Energy	Normal Position	Initial Verification					Final Verification				
					Open			Closed		Open			Closed	
					Ops Initials	Maint. Initials	Date	Ops Initials	Date	Ops Initials	Maint. Initials	Date	Ops Initials	Date

Note: If there are not adequate means to verify that the equipment is isolated, requirements in R-11-032, Section 4.1 (j), must be followed.

Owning Department Supervision Approval of Isolation and Verification of Isolation Plan

By signing below, owning department supervision is approving the plan documented on this isolation list that will be used to isolate the equipment and to verify the equipment is de-energized following isolation

Date		Time		Owning Department Supervision Signature:	

Owning Department Verification of Isolation

By signing below, the owning department representative is confirming that the equipment has been isolated and de-energized according to the plan documented on this isolation plan

Date		Time		Owning Department Representative Signature:	

Servicing Group Verification of Isolation (Verification signatures may be documented on work permit if allowed by site)

Date		Time		Signature/Company:	Date		Time		Signature/Company:
Date		Time		Signature/Company:	Date		Time		Signature/Company:
Date		Time		Signature/Company:	Date		Time		Signature/Company:

Safety Comments: | Owning Dept. Fit for service verification type: ☐ P&ID Walkdown ☐ Pressure Test Date:_____ Initials:_____

SAMPLE

12.0 APPENDIX C – SUPPLEMENTAL ENERGY ISOLATION PLAN FORM SAMPLE (R-11-032-F02)

The following is the Energy Isolation Supplemental Plan Form sample.

Marathon Petroleum Company LP, Anacortes Refinery | Refinery-Wide | R-11-032-F02

MPC Supplemental Energy Isolation List

Unit:	Equipment No:	Equipment Description:	Sheet # ___ of ___
Job Description:			
Lockbox No. / Location:			

Energy Isolation Device Identification

ID Number	Tag Number	Status Open/Closed On/Off	Location / Description of Isolation Point	ISO VER	Normal Position	Installation			Removal		Status Change / Temporary Release	
						Ops Initials	Maint. Initials	Date	Ops Initials	Date	Number	Initials

SAMPLE

Verification of Isolation Used in Preparation of Equipment

For Example: • A verification opened between the isolation and blind point which will be closed after blinding and opened again prior to blind removal.
• Electrical equipment that needs to be tested at the start/stop button to verify electrical isolation.

ID Number	Tag Number	Status Open/Closed On/Off	Location / Description of Isolation Point and Means Used to Verify Control of Hazardous Energy	Normal Position	Initial Verification					Final Verification				
					Open			Closed		Open			Closed	
					Ops Initials	Maint. Initials	Date	Ops Initials	Date	Ops Initials	Maint. Initials	Date	Ops Initials	Date

Note: If there are not adequate means to verify that the equipment is isolated, requirements in R-11-032, Section 4.1 (j), must be followed.

13.0 APPENDIX D – ISOLATION BLIND LIST FORM SAMPLE (R-11-032-F03)

The following is the Isolation Blind List Form sample.

Marathon Petroleum Company LP, Anacortes Refinery | Refinery-Wide | R-11-032-F03

Isolation Blind List

Unit: | Equipment No: | Equipment Description: | Sheet # __ of ___

Associated Isolation ( ) Yes (•) No | Lockbox No. / Location:

Owning Department Approval of Blind List

Date: | Time: | Owning Department Supervision Approval Signature:

Blind Isolation Identification

Blind Tag No.	Description of Blind Location	Class Blind	Type of Blind	Size	Rating	Gasket Type	Operating Position	Fresh Air Possibly Required (Refer to Permit)	Tag Staged Initial / Date	Installation		Removal		Change Log/ Temporary Release	
										Servicing Initial / Date	Owner Initial / Date	Servicing Initial / Date	Owner Initial / Date	Number	Initials
								(•) Yes ( ) No							
								( ) Yes ( ) No							
								( ) Yes ( ) No							
								( ) Yes ( ) No							
								( ) Yes ( ) No							
								( ) Yes ( ) No							
								( ) Yes ( ) No							
								( ) Yes ( ) No							
								( ) Yes ( ) No							
								( ) Yes ( ) No							
								( ) Yes ( ) No							
								( ) Yes ( ) No							
								( ) Yes ( ) No							
								( ) Yes ( ) No							
								( ) Yes ( ) No							
								( ) Yes ( ) No							

SAMPLE

Owning Department Verification of Blind Installation

Date: | Time: | Owning Department Representative Signature:

Notes
1. No blind or plug to be installed without a tag.
2. Tags to be installed and removed by operators only.
3. Tags to be installed to indicate intended flange or plug locations but not to interfere with blind or plug installation.
4. "Blind or plug in" and "Blind or plug out" are not to be initialed until operator has personally inspected location.
5. Thin blinds can be used on Alky Reactors and Alky Acid Settlers.

Blind Type
SP - Spec Blind
SL - Slip Blind
BIP - Break and Plug
B - Break Open
BF - Blind Flange
SPCR - Spacer Blind
VB - Vented Blind
SPCL - Special Blind
TB - Thin Blind
DEB - Dog Ear Blind
BAB - Babine Blind
DBB - Double Block and Bleed
MG - Mechanical Gag
ES - Electrical Switch Gear
HMR - Hammer Blind

Gaskets
SSIR - Graphoil Filled 316SS Spiral Wound with Inner Ring
321SSIR - Graphoil Filled 321SS Spiral Wound with Inner Ring
347SSIR - Graphoil Filled 347SS Spiral Wound with Inner Ring
MONEL IR - Graphoil Filled Monel Spiral Wound with Inner Ring
A20 IR - Graphoil Filled Alloy 20 Spiral Wound with Inner Ring
APX2 - Service above 850 Degrees

Class Blind
1 - Isolation
2 - CSEntry, Hot Work or Line Break

Operating Position
I - Blind or Plug In
O - Blind or Plug Out

14.0 APPENDIX E – ISOLATION BLIND LIST SUPPLEMENTAL FORM SAMPLE (R-11-032-F04)

The following is the Isolation Blind List Supplemental Form sample.

Marathon Petroleum Company LP, Anacortes Refinery | Refinery-Wide | R-11-032-F04

Isolation Blind List (Supplemental)

Unit: | Equipment No: | Equipment Description: | Sheet # ___ of ___

Lockbox No. / Location:

Blind Isolation Identification

Blind Tag No.	Description of Blind Location	Class Blind	Type of Blind	Size	Rating	Gasket Type	Operating Position	Fresh Air Possibly Required (Refer to Permit)	Tag Staged Initial / Date	Installation		Removal		Change Log/ Temporary Release	
										Servicing Initial / Date	Owner Initial / Date	Servicing Initial / Date	Owner Initial / Date	Number	Initials
								* YES ○ NO							
								○ YES ○ NO							
								○ YES ○ NO							
								○ YES ○ NO							
								○ YES ○ NO							
								○ YES ○ NO							
								○ YES ○ NO							
								○ YES ○ NO							
								○ YES ○ NO							
								○ YES ○ NO							
								○ YES ○ NO							
								○ YES ○ NO							
								○ YES ○ NO							
								○ YES ○ NO							
								○ YES ○ NO							
								○ YES ○ NO							
								○ YES ○ NO							
								○ YES ○ NO							
								○ YES ○ NO							
								○ YES ○ NO							
								○ YES ○ NO							
								○ YES ○ NO							
								○ YES ○ NO							
								○ YES ○ NO							
								○ YES ○ NO							
								○ YES ○ NO							
								○ YES ○ NO							
								○ YES ○ NO							
								○ YES ○ NO							

SAMPLE

Notes
1. No blind or plug to be installed without a tag.
2. Tags to be installed and removed by operators only.
3. Tags to be installed to indicate intended flange or plug locations but not to interfere with blind or plug installation.
4. "Blind or plug in" and "Blind or plug out" are not to be initialed until operator has personally inspected location.
5. Thin blinds can be used on Alky Reactors and Alky Acid Settlers.

Blind Type
SP - Spec Blind
SL - Slip Blind
BIP - Break and Plug
B - Break Open
BF - Blind Flange
SPCR - Spacer Blind
VB - Vented Blind
SPCL - Special Blind
TB - Thin Blind
DEB - Dog Ear Blind
BAB - Babine Blind
DBB - Double Block and Bleed
MG - Mechanical Gag
ES - Electrical Switch Gear
HMR - Hammer Blind

Gaskets
SSIR - Graphoil Filled 316SS Spiral Wound with Inner Ring
321SSIR - Graphoil Filled 321SS Spiral Wound with Inner Ring
347SSIR - Graphoil Filled 347SS Spiral Wound with Inner Ring
MONEL IR - Graphoil Filled Monel Spiral Wound with Inner Ring
A20 IR - Graphoil Filled Alloy 20 Spiral Wound with Inner Ring
APX2 - Service above 850 Degrees

Class Blind
1 - Isolation
2 - CSEntry, Hot Work or Line Break

Operating Position
I - Blind or Plug In
O - Blind or Plug Out

15.0 APPENDIX F – STATUS CHANGE/TEMPORARY RELEASE LOG SAMPLE (RSP-1121-010-FORM04)

The following is the Status Change/Temporary Release Form sample (RSP-1121-010-FORM04).

Reference: For the most up to date, working copy of this form, go to:
http://cbgrs20/red/copyout.aspx?lib_no=32&doc_no=3448

Note: For instructions to complete the Status Change / Temporary Release Form, see RSP-1121-010-ATT2 at the following link:
http://cbgrs20/red/copyout.aspx?lib_no=32&doc_no=3444

MPC Status Change / Temporary Release Log
(RSP-1121-010-FORM04)

Equipment No. / Description | Sheet # ____ of ____

Job Description:

Lockbox No. / Location

Temporary Release

Temporary Release Number	Reason for Temporary Release	Equipment/Area Safe For Temporary Release			Isolation Restored		
		Date	Time	Owning Department	Date	Time	Owning Department

SAMPLE

Status Change

Status Change Number	Reason for Status Change	Energy Isolation Verification Complete			Status Change Complete		
		Date	Time	Owning Department Approval Supervision	Date	Time	Owning Department

16.0 APPENDIX G – HOT WORK ISOLATION BY ENGINEERED PLUG APPROVAL FORM SAMPLE (RSP-1121-010-FORM05)

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

For the most up to date, working copy of this form, go to: RSP-1121-010-FORM05.DOCX

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 reading, 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

SAMPLE

17.0 APPENDIX H – APPROVED MINOR SERVICING ACTIVITIES 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 Installing and removing bleeder cleaner tools Gauge catalyst hopper, salt drier, tank, etc.	• 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.
Removing blind flange to back flush a cooling water exchanger Remove coupon holder in cooling water circuit PM pH probes in cooling water circuits	• 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	--
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.

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.	--

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 permit • Ensure not in line of fire

18.0 APPENDIX I – LOTO/CONFINED SPACE BLIND/BLEEDER/RETURN TO SERVICE TAGS

The following are LOTO/Confined Space Blind/Bleeder/Return to Service Tags examples.



Bleeder Tag - Refineries may use a similar Bleeder Tag.
Beaed Corporation • 800-899-1047 • ACEW16



MPC EQUIPMENT

RETURN TO SERVICE CHECKLIST

Equipment Name/Number: _____

1.	Review job location, area housekeeping acceptable. If "NO", notify supervisor.	☐ YES	☐ NO
2.	Rotating equipment guards and insulation are in place for personnel protection.	☐ YES	☐ N/A
3.	Temporary piping or tubing has been removed from the equipment.	☐ YES	☐ N/A
4.	Verify blinds are removed and/or permanent blinds are reinstalled.	☐ YES	☐ N/A
5.	Verify gaskets are installed.	☐ YES	☐ N/A
6.	Bolts verified tight.	☐ YES	☐ N/A
7.	Complete system P&ID walk down has been completed (print, sign and attach to this checklist).	☐ YES	☐ N/A
8.	Final leak testing has been completed and any leaks found have been repaired.	☐ YES	☐ N/A
9.	Verify all bleeders/vents are closed, plugs and caps installed.	☐ YES	☐ N/A
10.	Relief paths including PSV's are open and secured.	☐ YES	☐ N/A
11.	Has MOC been approved for start-up?	☐ YES	☐ N/A


N/C
N/O
LOCKOUT TAG
EQUIPMENT OUT OF SERVICE
DO NOT OPEN VALVE
DO NOT CLOSE VALVE
DO NOT REMOVE BLIND
DO NOT CONNECT
DO NOT START
DO NOT ENERGIZE
DO NOT OPERATE
EQUIPMENT ISOLATION LIST #
TAG # 2201
INSTALLED BY:
DATE INSTALLED:
EQUIPMENT ISOLATION LIST #
TAG # 2201


DANGER
HAZARDOUS ENERGY CONTROL
EQUIPMENT OUT OF SERVICE
THIS TAG TO BE REMOVED BY AUTHORIZED OPERATIONS REPRESENTATIVE ONLY
INSTRUCTIONS:
AFTER LOCKOUT DEVICE HAS BEEN INSTALLED AND TRIED, TEAR OFF THIS STUB AND LOCK INSIDE THE LOCK BOX. LOCKOUT DEVICE MAY BE REMOVED ONLY WHEN AUTHORIZED PERSON PROVIDES THIS STUB.



Beaed Corporation • 800-899-1047 • ABEW16

19.0 APPENDIX J – BLINDING AND ENERGY ISOLATION INSPECTION FORM SAMPLE (RSP-1121-010-FORM06)

The following is the Blinding and Energy Isolation Inspection Form sample (RSP-1121-010-FORM06).

Reference: For the most up to date, working copy of this form, go to: http://cbgrs20/red/copyout.aspx?lib_no=32&doc_no=3450

Blinding and Energy Isolation Inspection
(RSP-1121-010-FORM06)

Equipment Type: _____ Equipment Name: _____ Date: _____

Equipment Number: _____ Work Permit Number: _____

Attach the appropriate Energy Isolation List used during the inspection.

This equipment, its energy isolating devices, involved personnel and applicable energy control procedure (isolation list) have been inspected and evaluated. The conclusions are:

	Yes	No	NA
Did the authorized employee performing the inspection walk down the job to verify each energy isolation device (i.e. valve, disconnect, etc.) is de-energized and locked / tagged properly?	☐	☐	
Were appropriate isolation locks used on the energy isolation devices?	☐	☐	
Did each individual apply a personal lock on the lock box?	☐	☐	
If contractors were involved, were locks/tags appropriate (identified owner)?	☐	☐	☐
Did all involved employees and contractors (authorized and affected) understand their responsibilities?	☐	☐	
Was the Blinding and Energy Isolation Procedure(s) properly followed by everyone involved?	☐	☐	
Were all the energy sources properly isolated and is the equipment specific energy control procedure adequate?	☐	☐	

SAMPLE

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

_____

_____

List the names of the Authorized Personnel performing the lockout/ tagout:

_____

CERTIFICATION OF ENERGY ISOLATION INSPECTION

Authorized Employee Signature: _____ Date: _____

20.0 APPENDIX K – ALTERNATIVE GROUP LOCKOUT/TAGOUT PROCEDURES

20.1 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.

20.2 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.

20.3 Acceptable Approach to Personal Locks

The alternative system, comprised of the work permit, company lock and signature log, 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.

20.4 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 master lock box and satellite lock box system.

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

B. 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 20.4.A and 20.4.B above must be documented on the work permit.

C. 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.

D. Following successful completion of the verification, the SGR will apply a company lock to the Master Lock Box.

E. Each authorized employee must sign in on the work permit (or other equivalent form) at the time of arrival at the job and sign out at departure.

F. As the work is completed, the work permit and signature logs must be reconciled jointly by the SGR and the owning department representative. This is required to ensure that all authorized employees who were assigned to the job are accounted for and verified to be clear from the equipment area.

G. The signature logs must be attached to the appropriate work permits so that the accountability of exposed employees is maintained.

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

21.0 APPENDIX L – ISOLATION OF EQUIPMENT CONTAINING HEAVY MATERIALS/SOLIDS

Energy isolation of heavy materials/solids (see definition in Section 3) shall be accomplished following the steps outlined below.

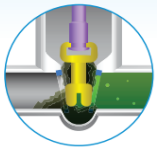
A. A "double block" isolation method shall be utilized whenever practical.

B. When chain operated valves are used as the single point of isolation 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.

C. 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.

Heavy Material

- For process fluids that solidify at or above ambient temperature (sulfur, heavy oil), heat tracing should remain on until it's verified the isolation valves are holding. Otherwise, a valve could have an undetected leak because the process material has solidified in the seat and the obstruction may be at-risk for "blowing out" if the pressure or temperature of the system increases.



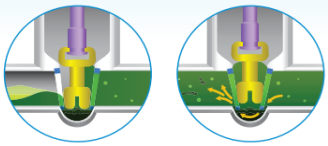
D. When isolating equipment with materials containing a large amount of solids (e.g., coke, catalyst, etc.), special care should be taken to ensure the isolation valves don't have solids built up in the gate valve seat. Before removing the plug or cap, or breaking the line, check the gate valve stem to determine if an abnormal number of threads are showing while the valve is in the closed position – this could indicate the valve gate is not fully seated. Refer to the Troubleshooting Valve Isolation Poster (RSP-1121-010-ATT3).

Scale/Solids Buildup

- Scale/solids can accumulate in the bottom of the valve seat and obstruct the gate from fully closing.

Clearing Scale/Solids from a Valve Seat

- From the closed position, open the valve slightly to let material flow under the gate at high velocity.
- Lightly tapping the bottom of the valve body while doing this can help loosen scale/solids (care must be taken to not damage the valve).
- Repeating this sequence a few times may be necessary.



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

1. 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.
2. If a valve is leaking on a pump/compressor, the pressure will increase to either suction or discharge pressure.

22.0 APPENDIX M – HEAVY OIL SERVICE SINGLE POINT ISOLATION CHECKLIST SAMPLE (R-11-032-F05)

Marathon Petroleum Company LP	REFINERY-WIDE	R-11-032-F05
ANACORTES REFINERY	Heavy Oil Service Single Point Isolation Checklist	Page 1 of 1
		REVISION: 6

PURPOSE: Prior to isolating any heavy oil system (Vacuum Reside, Asphalt, Slurry, Coker/ROSE feed, Pitch, Coker Gas Oil), a thorough review of the planned isolation shall be conducted to evaluate the possibility of double blocking the equipment or removing the equipment from service. If a double block is not achievable, then this form must be completed.

Equipment Name/Number:

Process Fluid: **Temperature:** **Pressure:**

Description of Work:

If answering "NO" to any of the following questions, Area Team Leader 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?		
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, 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.		

SAMPLE

	Name (Print)	Name (Sign)	Date
Ops. Maintenance Spec/Unit Operator			
Shift Foreman			
Day Supervisor			
Maintenance Planner (scheduled work only)			
Area Team Leader (If required)			

This completed form must be utilized during the JJSV and should be stored in the Day Supervisor's office until the completion of the workscope.

Reviewing Comments:

ATTENTION: Printed copies should be used with caution.
The user of this document must ensure the current approved version of the document is being used.
R-11-032-F05.DOCX This copy was printed on 9/11/2026

23.0 APPENDIX N – MAINTENANCE ISOLATION DEVICE LIST SAMPLE R-11-032-F06)

Marathon Petroleum Company LP	REFINERY-WIDE	R-11-032-F06
ANACORTES REFINERY	Maintenance Isolation Device List	Page 1 of 1
		REVISION: 6

Unit: _____

Equipment: _____

This Sheet is for LOTO Inspector Only

Number	Line Service and Location (One Blind Per Line)	Date Tag Installed / Type Blind	Device Verified (Initial Each Device Below with Date Across Top)														Date Tag Removed
			AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	

SAMPLE

Isolation Device

SP - Spec Blind	BF - Blind Flange	TB - Thin Blind	MG - Mechanical Gag
SL - Slip Blind	SPCR - Spacer Blind	DEB - Dog Ear Blind	ES - Electrical Switch Gear
B/P - Break and Plug	BV - Vented Blind	BAB - Babine Blind	HMR - Hammer Blind

ATTENTION: Printed copies should be used with caution.
The user of this document must ensure the current approved version of the document is being used.
R-11-032-F06 This copy was printed on 9/11/2026

24.0 APPENDIX O – MASTER BOARD SAMPLE (R-11-032-F07)

Marathon Petroleum Company LP	REFINERY-WIDE	R-11-032-F07
ANACORTES REFINERY	Master Board	Page 1 of 2
		REVISION: 6

Equipment _____

	TIME	DATE	LO/TO INSPECTOR SIGNATURE
SHIFT 1			
SHIFT 2			

LO/TO Inspector MUST sign this sheet after completing unit isolation and enter blind checks.

Authorized Person in charge of work must check for updated signature prior to signing this sheet. (This sheet must be changed every 24 hours). For energy isolation, verification MUST be made PRIOR to shift change.

INITIAL OF AUTHORIZED PERSON IN CHARGE OF WORK				Job Description	Part A Number	Part B Number
SHIFT 1		SHIFT 2				
IN	OUT	IN	OUT			

SAMPLE

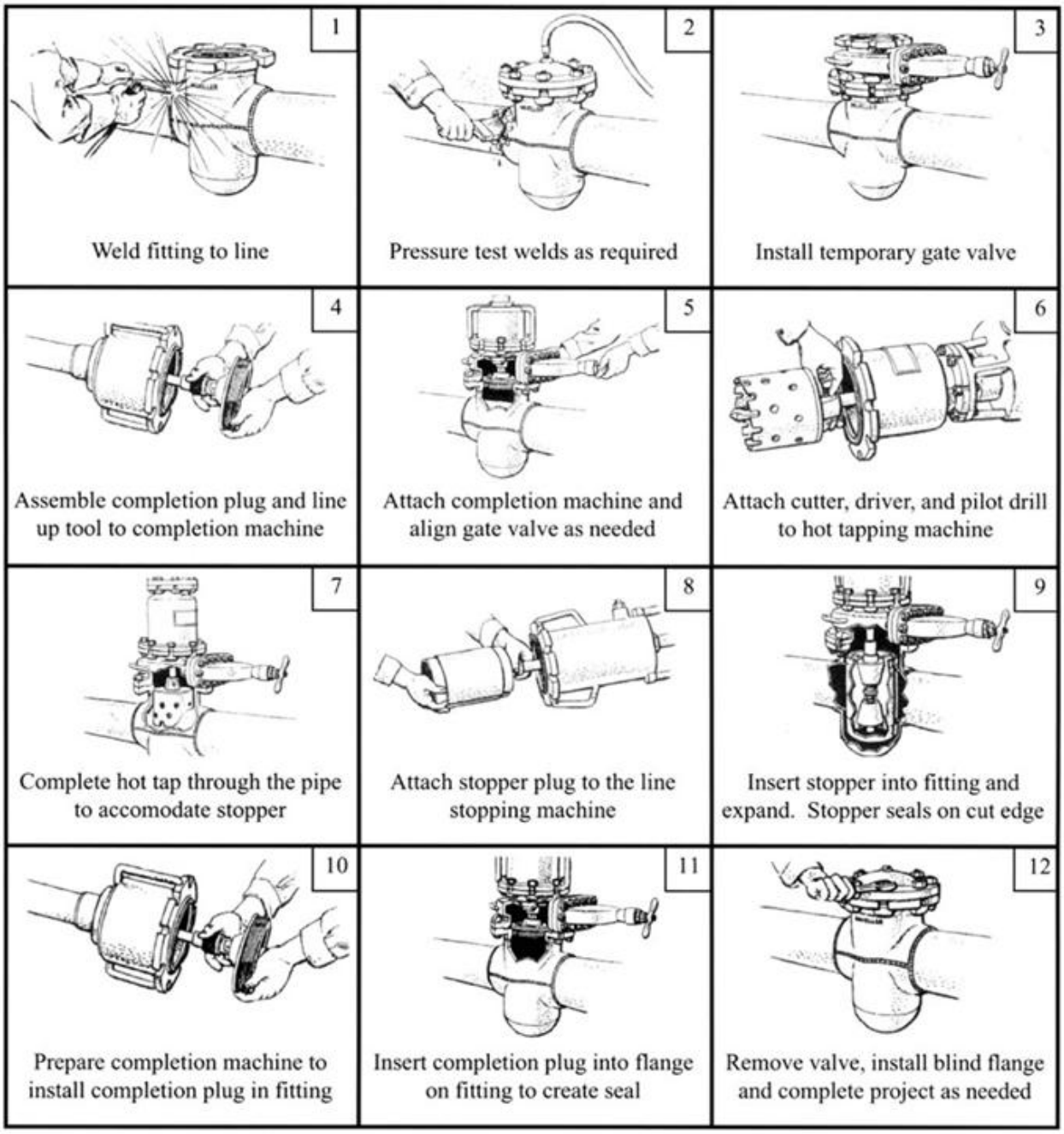
ATTENTION: Printed copies should be used with caution.
The user of this document must ensure the current approved version of the document is being used.
R-11-032-F07.docx This copy was printed on 9/11/2026

Marathon Petroleum Company LP	REFINERY-WIDE	R-11-032-F07
ANACORTES REFINERY	Master Board	Page 2 of 2
		REVISION: 6

INITIAL OF AUTHORIZED PERSON IN CHARGE OF WORK				Job Description	Part A Number	Part B Number
SHIFT 1		SHIFT 2				
IN	OUT	IN	OUT			

SAMPLE

25.0 APPENDIX P – HOT TAP/STOPPLE ILLUSTRATION



26.0 APPENDIX Q – CUSTOM TEST BLIND REQUEST FORM SAMPLE (R-11-032-F08)

Marathon Petroleum Company LP	REFINERY-WIDE	R-11-032-F08
ANACORTES REFINERY	Custom Test Blind Request	Page 1 of 1
		REVISION: 6

Filled out by the Operations Representative:

Requested by: _____

Reason for: _____

_____

Equipment or Piping Name and Number (attach P&ID or Sketch): _____

Normal Operating Pressure: _____

Normal Operating Temperature: _____

Line size: _____

Line Pressure Rating: (e.g., 150#, 300#, etc.) _____

Normal Operating Process: (i.e., caustic, acid, distillate, slurry, etc.) _____

Filled out by Pressure Equipment or Reliability Engineer:

	Line Size	Flange Rating	Blind Thickness	Design Pressure	Design Temperature	Metal to be used	ANR Std Dwg
1							
2							
3							
4							
5							
6							
7							
8							

SAMPLE

Date: _____ Signature: _____

Filled out by Maintenance or Shop 2 Supervisor:

Date of Fabrication: _____

Labeling Correct / Verified: ☐ Yes ☐ No

Maintenance or Shop 2 Supervisor initials: _____

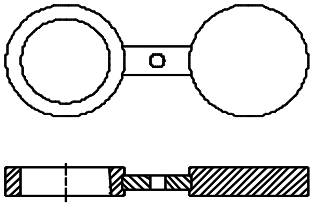
When the above information is complete:

Signed and Dated by:

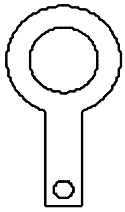
Operations Representative: Date: _____ Signature: _____

ATTENTION: Printed copies should be used with caution.
The user of this document must ensure the current approved version of the document is being used.
R-11-032-F08 This copy was printed on 9/11/2026

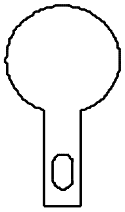
27.0 APPENDIX R – BLIND TYPES



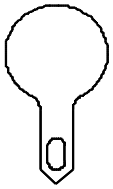
SPEC BLIND



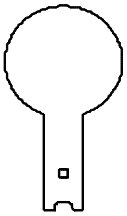
SPACER



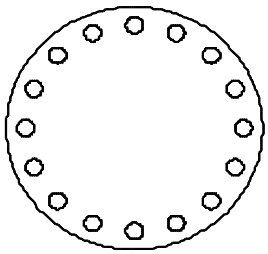
SLIP BLIND



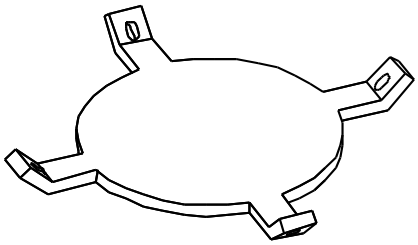
THIN BLIND



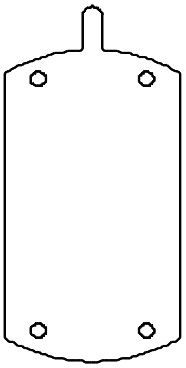
SPECIAL BLIND



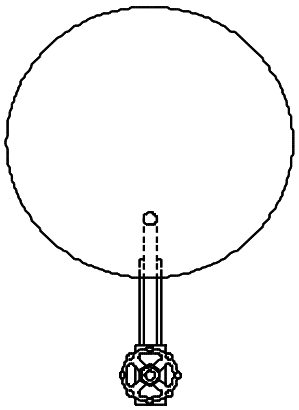
BLIND FLANGE



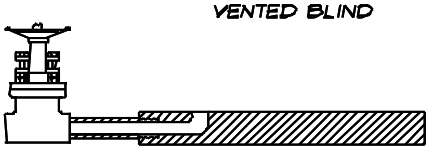
DOC-EARED BLIND



BABINE BLIND

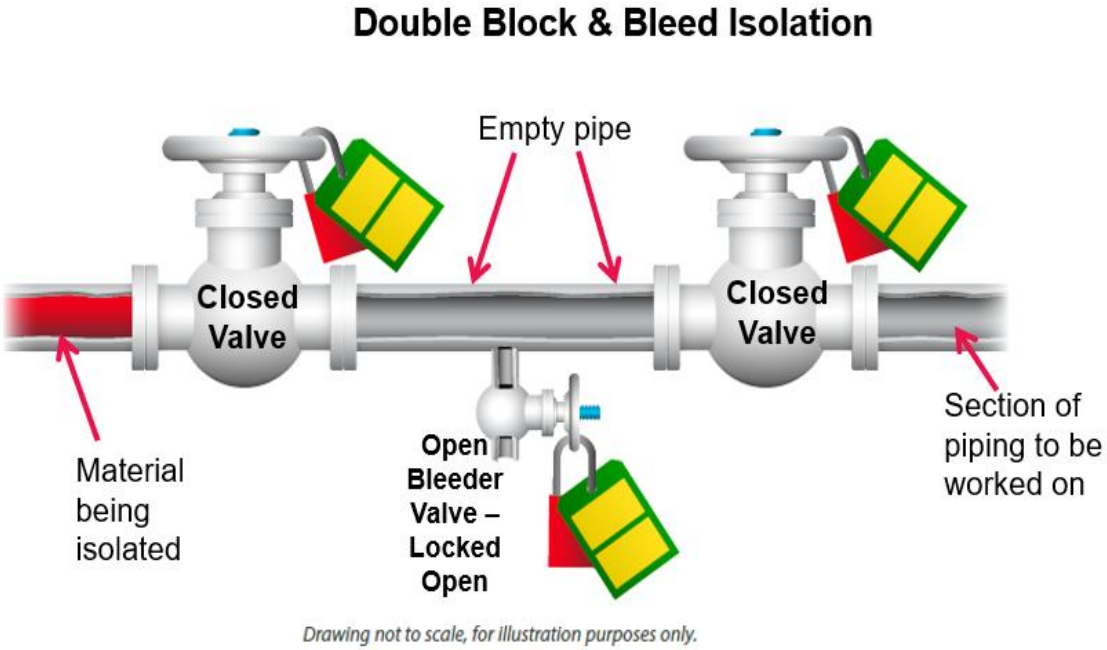


VENTED BLIND



DOUBLE BLOCK & BLEED

28.0 APPENDIX S – DOUBLE BLOCK AND BLEED ISOLATION



29.0 APPENDIX T – VERIFICATION PATH EXAMPLE

