

BP Husky – TOLEDO REFINERY

	Refinery Wide	Procedure No.: SAF 037
Effective Date: June 20, 2011	Control of Hazardous Energy (Lock Out/Tag Out)	Rev. No.: 13 MOC#: M20113000-001
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SCOPE	This procedure describes Lock Out/Tag Out procedure and the energy control program. Energy sources shall be locked out or tagged out to prevent accidents by unintentional release of hazardous energy . Properly locked or tagged energy source isolation devices shall control the unexpected energization/start up of equipment or release of hazardous energy.
HEALTH Special PPE & Special Hazards	Any energy source that may cause unexpected movement of equipment or release of hazardous energy during maintenance.
SAFETY	Appropriate personal protective equipment needed to protect against exposures.
REFERENCE DOCUMENTS	OSHA 29 CFR 1910.147, OSHA 29 CFR 1910.333 OPNS 015 Draining of Process Equipment and/or lines NFPA 70E SAF-032 Confined Space Entry SAF-044 Hot Work, Hot Work Spark Potential and Vehicle Entry SAF-098 Electrical Distribution System Switching and Isolation SAF-102 Developing Isolation Plans SAF 103 Guidance on Preparations for Breaking Containment Toledo Control of Work Policy Toledo Isolation Policy
SPECIAL MATERIALS & EQUIPMENT	Locks and/or Tags
QUALITY	Annual Auditing of Program
ENVIRONMENTAL	N/A

OVERVIEW

All energy sources of a machine, equipment or system must be isolated, locked, and de-energized in a safe position before and while workers perform service or maintenance work.

This procedure applies to the disabling, locking and maintaining in a safe position all machinery, equipment or systems so that workers are not inadvertently exposed to energy sources while performing service or maintenance work. Energy sources that are governed by this procedure are mechanical, electrical, hydraulic, pneumatic, chemical, thermal, gravitational, stored, vacuum, and radiation energy.

Lockout is the preferred method of isolation. Tag out should only be used when locks cannot be installed. Tags are not a positive lockout device. Extreme caution must be exercised when they are used because they do not offer the same level of protection as locks. Prior to starting work, each authorized person shall verify isolation and de-energization have been achieved. Examples of verification **include but are not limited to:** (1) visual inspection, (2) blank list, (3) watching Isolating Authority push start button.

- 1.0 Definitions
- **Affected person** is the person working in the area where equipment is isolated or locked out who can be impacted by the work being conducted on the isolated equipment. A person whose job requires operation or use of equipment which is isolated or locked out. An affected person is not locked out.
 - **Authorized person** is anyone who performs service or maintenance, anyone who enters a confined space that is locked out, or anyone (like the operator) who prepares the equipment to enable someone else to perform the service/maintenance. May include: operators, the Isolating authority, or the primary performing authority.
 - **Breaking containment** is when the pressure containing boundary is physically opened (e.g. valve removal, breaking a joint, manway removal) or when that boundary is threatened (e.g. when reducing bolts on a flange to minimum required pressure containment).
 - **Blank list** is a term used to describe a listing of blank locations. It is typically on the Isolation Confirmation Certificate (ICC) Section B Isolating Authority Tracking Sheet, or it may be a separate list.
 - **Double Block and Bleed Isolation** is the closure of two block valves with reliable seals in series, with an intermediate bleed valve. The integrity of double valve isolation without an intermediate bleed is considered only the same as single valve isolation.
 - **Energy control program** is a combination of this procedure, the Isolation Plans, blank lists (Isolation Confirmation Certificates), and equipment-specific procedures which contain information on proper shut-down and start-up of equipment. Also included in the program are employee training and annual inspections.
 - **Energy source** is any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal or other energy.
 - **Envelope isolation** is when envelope blanks are installed.

Envelope blanks are used to isolate a unit.

— **Equipment blanks** are installed on one specific piece of equipment.

— **Identification tags** are used for informational purposes. They are used in conjunction with locks or are placed on the lockout board to communicate information.

— **Isolation device** is a mechanical device that physically prevents the transmission or release of energy, including items such as: manually operated circuit breaker, a disconnect switch, line valves, or other similar devices that block energy. Push buttons, selector switches and other control circuit type devices are not isolation devices. An isolation device is not necessarily positive isolation (see definition of positive isolation).

— **Isolating Authority** (Primary authorized person) is the authorized person who exercises overall responsibility for the lockout/tagout. The locks they apply are the first ones on and the last ones off. The Isolating Authority performs specific field isolation assurance functions such as: determining the level of isolation, construction of the Isolation Plan in accordance with operating procedures and/or specialized training, isolation verifications, isolation tracking, and equipment isolations. May be Unit Isolating Authority (Operator), Electrician, or Instrument Technician. For non-process related equipment, the Isolating Authority may be someone outside of operations, such as an electrician, mechanic, or project manager. They must have knowledge of the type and magnitude of energy, the hazards to be controlled, the method to control the energy.

— **Lockout device** is a device, like a lock, which prevents the opening of an energy isolating device (see definition of isolation device). A lockout device holds an energy isolating device in the safe position or prevents the machine or equipment from being energized. Included are blanks and blinds.

— **Managers or supervisors** refers to BP supervisory personnel such as asset coordinator, shift supervisor, or contracted personnel filling the identified roles and acting on behalf of BP.

— **Plant Preparation** work is plant/equipment preparation for isolation and task execution (e.g. depressurization, draining and flushing of vessels, purging, cleaning) prior to breaking containment.

— **Positive isolation** is defined as:

- Spool removal - removal of a pipework section or spool piece and blinding the live end, or
- Blank isolation - insertion between flanges of a blank (spade), the swinging of a spectacle blank (figure-8) or replacement of a spacer (slip-ring) with a line blank.

— **Servicing and/or maintenance** includes workplace activities such as constructing, installing, setting up, adjusting, inspecting,

modifying, and maintaining and/or servicing machines or equipment. These activities include lubrication, cleaning of machines, and making adjustments or tool changes, where personnel may be exposed to the **unexpected** energization or startup of the equipment or release of hazardous energy. Tasks performed during normal production operations may qualify as servicing or maintenance and be covered by this procedure if:

- a) a guard or other safety device needs to be removed or bypassed.
- b) the authorized person (ex. operator) is required to place any part of his/her body into an area on a machine or piece of equipment where work is actually performed upon the material being processed (point of operation) or where an associated danger zone exists. *Note:* minor tool changes and adjustments, and other minor servicing activities which take place during normal production operations are not covered by this procedure if they are routine, repetitive and integral to the use of the equipment for production, provided the work is performed using alternative measures which provide effective protection.

— **Single Valve Isolation** is the closure of a single block valve with a reliable seal and one vent or bleed valve downstream of the isolation valve used to check isolation integrity. Valves with no bleeds for checking their isolation integrity can not be considered as single valve isolation.

— **Tagout device** is a warning device, such as a tag and means of attachment, which can be securely fastened to an energy isolating device to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed. Tagout should only be used when locks cannot be installed since tags are not a positive lockout device.

— **Turnaround** is a planned, large scale maintenance event in which entire units or portions of units are brought offline and effectively isolated from the live process through positive isolation.

2.0 General Isolation Process

2.1 The general steps to follow for lockout/tagout include:

- a) notify affected personnel
- b) clear the area or ensure personnel in the area are safely positioned.
- c) shut down equipment using proper shutdown procedure
- d) refer to Isolation Plans (see section 14.0 for Isolation Plan requirements and exceptions).
- e) isolate energy sources
- f) apply lock and/or tag to isolation points
- g) relieve all potentially hazardous stored energy. Refer to SAF 103 Guidance on Preparations for Breaking Containment which includes information regarding depressurizing and draining of process systems
- h) try to start the equipment and/or verify depressurized

NOTE: A single block valve and double block and bleed are NOT positive isolation. See definition of positive isolation in section 1.0.

2.2 Before any servicing or maintenance work begins, the item must be isolated from the energy source and the energy source rendered inoperative. Containment cannot be broken until the potentially hazardous energy is removed and verified. Maintenance personnel are prohibited from opening lines under pressure unless they follow the risk assessment procedure defined in Control of Work. An example of when lines are opened under pressure is work on live flares or live process systems with unproven isolation. If the line is under pressure and there is no vent or drain valve, then as a last resort, proper pipe fitting practices can be used to safely crack the flange. This will be treated as a last resort; it is preferable to isolate a larger section of line/plant to include a vent or drain or use vented blanks.

2.3 Restoring Equipment to Service (lock removal and equipment start-up):

Once work is completed, all locks have been removed, and the equipment is ready to be restored to service, the following general steps apply:

- a) The Isolating Authority must ensure all non-essential equipment and material have been removed from the area or machine and that the area or machine is intact.
- b) Personnel working around or under equipment (Affected Persons) have been notified that the equipment is about to be restored into service and are safely positioned or removed from the area.
- c) Isolating Authority is responsible for the removal of all process locks/tags from equipment that they have verified to be safe to operate. Lock/tags are not to be removed until inspection of the work area has been completed.
- d) All bleeds or valves which were opened for lockout must be closed prior to startup.
- e) When locks/tags are removed, the operator initials and dates the "Lock/tag removed" column and returns the completed Isolation Plan to the Maintenance Coordinator for document retention(see section 14.0 for Isolation Plan requirements and exceptions).

3.0 Valved Isolation, Positive Isolation, and other isolation devices

3.1 A single block valve which is **locked closed** and has one bleed valve downstream of the isolation valve that is verified as **not passing** can be considered an isolation device. A valve which cannot accommodate a lock must be tagged out as closed. If the valve which is locked closed or tagged closed passes, additional methods of protection to assure that all potentially hazardous stored or residual energy are rendered safe shall be utilized. The following are some options to consider:

- Close additional valves.
- Reroute flow or pressure.
- Shut down the system.
- Install blinds or blanks

- 3.2 Double block and bleed isolation is closure of two block valves in series, with an intermediate bleed valve. Both the upstream and downstream valves shall be tested separately for integrity. If either valve fails the integrity test, then the isolation is only considered the same as single valve isolation.

NOTE: The integrity of a double valve isolation without an intermediate bleed is considered the same as a single valve isolation.

- 3.3 Where there is a double block and bleed used for isolation, the following conditions shall be met:
- a) The bleed must be capable of releasing the material. Checks shall be carried out to ensure the vent/drains are free from obstruction. See OPNS-015 Draining of Process Equipment and/or Lines. Tags will be used to identify open bleeds.
 - b) The amount released via the bleed through a passing valve shall not exceed the Permissible Exposure Limits for the material(s).
 - c) Periodic verification of amount of material leaking and the bleed's ability to release build up of material or energy.
 - d) If material is being released through the bleed, there must be verification of a leaking block valve. If the valve(s) pass, additional methods of protection are necessary to assure that all potentially hazardous stored or residual energy are rendered safe. The following are some options to consider:
 - Close additional valves.
 - Reroute flow or pressure.
 - Shut down the system.
 - Install blinds or blanks.
- 3.4 Positive isolation is required for Confined Space Entry and Hot Work (excluding hot tap, stoppling or clamping tasks). Refer to appropriate procedures (SAF-032 and SAF-044) and the Toledo Isolation Policy for required controls and approvals if positive isolation can not be achieved.
- 3.5 When breaking containment is required during task execution (excluding execution of positive isolation), positive isolation shall be used for the following process systems and equipment:
- Equipment in LPG service
 - Equipment in toxic service
 - Equipment in hydrogen service
 - Equipment which contains fluid with a flash point less than 100°F (38°C)
 - Equipment which contains fluid at or above its auto-ignition temperature
 - Equipment which contains nitrogen or other asphyxiant
 - Equipment (including piping) to be mothballed (long term shutdown >6 months)

NOTE: See the Toledo Isolation Policy for further details on positive

isolation, when it is required, and exceptions.

- 3.6 Where positive isolation is required and the operating pressure is >725 psig (50 barg) then double block and bleed valve isolation shall be used for the valve isolation in order to put the positive isolation in place. See the Toledo Isolation Policy for more information and required approvals if proven isolation with double block and bleed can not be achieved.
- 3.7 In some cases, long piping runs or complex systems cannot be adequately cleared of hazardous or flammable material. When purging and/or washing do not sufficiently clear piping, a hydraulic isolation tool or mechanically expanded plug may be installed at the point of work to supplement the positive isolation. Such devices shall only be used downstream of positive isolation as a vapor or liquid seal to contain and direct to vent any small amounts of fluid which would otherwise be released at the job site. A Level 2 risk assessment is required to use these devices. Approvals required are documented in the Task Risk Category Table.
- Plumbers' plugs or inflatable bladders can only be used for sewer work.
 - Hydraulic isolation tools (e.g. Carbor Tool) must be installed by a trained technician from an approved specialty contractor using the contractor's installation procedures. The technician must be present at the immediate area at all times during Hot Work. Gas testing results at the point of work must be 0% LEL.
- 3.8 If any of the mandatory isolations cannot be met, approval is required as defined in the Toledo Isolation Policy.
- 4.0 Responsibility - Affected Person
- 4.1 Only an Authorized Person can perform lockout/tagout.
- 4.2 The Affected Person is prohibited from attempting to re-energize or restart anything which has been locked out. It is permissible for the Isolating Authority to verify isolation by pressing the start button.
- 4.3 Do not operate any valves or tamper with controls unless you are specifically authorized to do so. Do not turn on or off any electricity, gas, steam, air, acid, water, etc., or set in motion any machinery or electrical apparatus without proper permission from operator in charge.
- 4.4 Must not remove, ignore, bypass or defeat any tags used for tagout.
- 5.0 Responsibility – Isolating Authority (e.g. Operator)
- 5.1 The Isolating Authority exercises overall responsibility for adherence to the company lockout/tagout procedure for the equipment they lock out. When more than one craft is working on a system, the Isolating Authority is responsible for coordinating the workforces to ensure continuity of protection.
- 5.2 The Isolating Authority is responsible for the shutdown and lock out/tag out of the equipment in their charge whenever work is to be done on the equipment. The Isolating Authority locks energy sources (or tags if locks cannot be used) and tags all open bleeds that are associated with the LOTO. They shall notify all Affected Personnel of the intended lock

out/tag out, shutdown equipment according to proper procedures, isolate the energy sources, and place a lock on each isolation point.

- 5.3 The Isolating Authority's lock/tag shall be the first lock/tag on and the last lock/tag off.
- 5.4 The Isolating Authority must use the Isolation Plan, unless the exemption as described in 14.10 is met.
- 5.5 Isolating Authority is responsible for the removal of all process locks/tags from equipment that they have verified to be safe to operate. Lock/tags are not to be removed until inspection of the work area has been completed for the following:
 - a) All non-essential equipment and material have been removed from the area or machine and that the area or machine is intact.
 - b) Personnel are safely positioned or removed from the area.
 - c) All Affected Personnel have been notified of the removal.
- 5.6 Toledo Edison will conduct isolation of the 69 KV distribution system. Toledo Edison will follow their procedure for isolation, tagging and identification. The BP-Husky Electrical Department may also isolate this system. The Electrical Department will follow SAF-098 Electrical Distribution System Switching.
- 5.7 The BP Husky Electrical Department will be responsible for isolation of the electrical distribution system. This shall include such items as substations, transformers or feeder cables. The Electrical Department may direct the individual exposed to potential hazards to install his/her personal lockout device directly on the isolation device. The Electrical Department will follow SAF-098 Electrical Distribution System Switching.

6.0 Personal Isolation

- 6.1 Personal isolations are permitted under the following circumstances:
 - The isolation shall be in place for no more than one shift and shall not be handed over to another person.
 - The person completing the personal isolation shall be present at all times while the isolation is in place.
 - The isolation and LOTO standards apply, except personal yellow locks are used rather than gray locks.
 - The personal isolation is performed by an Isolating Authority.
 - When the isolation requires competency in more than one discipline (e.g. electrical, process, etc) than personal isolation is only allowed if the person performing the isolation is competent for all energy sources.
- 6.2 An Isolation Plan is not required unless more than one lock is used. See section 14.10 for exemptions from an Isolation Plan.
- 6.3 For steam trap/tracing, maintenance personnel may be delegated the responsibility as Isolating Authority to control and operate a single valve for LO/TO. The operator in charge must give approval to the maintenance personnel to become the Isolating Authority on a specific

valve. The single valve must be located at (within visual sight), and dedicated solely for, the steam trap/tracing being worked on. Responsibilities for the Isolating Authority and lockout/tagout still apply, these responsibilities simply fall with the maintenance personnel rather than the operator for this one valve.

- 6.4 For non-process related equipment (i.e. trailers, office buildings, street lighting, garage doors, HVAC, elevators), a knowledgeable mechanic may be the Isolating Authority. (See Section 19.0) The knowledgeable mechanic is responsible for verification of isolation prior to servicing equipment.
- 7.0 Responsibility – Supervisor for group lockout (e.g. pusher/foreman)
 - 7.1 The pusher/foreman/supervisor has responsibility for the employees working under the protection of his/her group lockout. This supervisor is responsible for maintaining accountability and ascertaining the exposure status of all individual group members working under that group lock. The supervisor must verify the isolation and the removal of hazardous energy.
 - 7.2 The supervisor places a group lock onto the lockout board u-bolt or main lockbox. This group lock must be identified with the company name, a description of the group they are representing, and the location and number of the satellite lockbox or U-bolt. See section 17.0 for a full description of group locks.
 - 7.3 The supervisor places the key to the group lock into a satellite lockbox. The supervisor is responsible for ensuring that each Authorized Person working on the job places a personal lock onto the satellite lockbox. The supervisor has responsibility for the security of the group/satellite lockbox.
 - 7.4 The supervisor at the end and beginning of each shift shall transfer authority of the group lock to the next shift through either written or verbal communication between foremen.
 - 7.5 The supervisor must install a personal lock if working on the equipment and exposed to the potentially hazardous energy, per the requirements of section 16.0.

- 8.0 Responsibility – Authorized person (anyone applying a personal lock)
- 8.1 Each individual exposed to potential hazards must install a personal lock to verify positive isolation either on the u-bolt or a satellite lockbox. This personal lock shall be removed when the individual is no longer exposed to the hazards or potential hazard. Each individual involved shall remove his/her lock or tag when his/her portion of the work has been completed, or when he/she is leaving the job site. It need not be removed during breaks, lunch, or parts procurement.
 - 8.2 The last individual to remove his/her lock/tag must notify the Isolating Authority regarding the status of the equipment and if it is ready to be tested for resumption of service.
 - 8.3 No person can attach or remove another person's lockout device unless the provisions of section 9.0 Lock Removal are met.
 - 8.4 Each Authorized Person has a right to verify individually that the hazardous energy has been isolated and de-energized/de-pressurized. At least one Authorized Person must verify the isolation and removal of hazardous energy. If a crew is working on the equipment, one representative from the crew may perform this verification for the entire crew after the first day.

9.0 Lock removal

NOTE: Process locks may be removed by the Isolating Authority without requiring a Removal of Lock form being filled out.

- 9.1 The Isolating Authority on duty shall remove the process locks/tags only when notified that the job is complete or when Maintenance requests testing of equipment. Before removal of the locks/tags, the Isolating Authority must verify the equipment is safe to operate and complete the steps in 2.3 for Restoring Equipment to Service. The Isolating Authority at the end and beginning of each shift shall transfer authority of the lockout through the operator log review (Read Orders, Logs, Every Shift Since - ROLESS), and/or review of the WCCs and Permits.
- 9.2 In the event conditions change or emergency removal of lock(s)/tag(s) necessitate the use of equipment that is locked/tagged out, verification of safe operating conditions shall be achieved by the Isolating Authority checking with Maintenance personnel or with verification through the permit system. The Isolating Authority, Supervisor and Maintenance must all agree to the removal before the lock is actually removed. All locks/tags that are removed for this purpose will be reinstalled when equipment is again shut down. In this event, a Removal of Lock form must be filled out prior to removal of locks and filed within 48 hours.
- 9.3 Removal of devices and re-energization of equipment is allowed **only** during the limited time necessary for the testing or positioning of machines, equipment, or components. During energization, the steps detailed in 2.3 Restoring Equipment to Service need to be followed. The Isolation Confirmation Certificate (ICC) needs to be completed, under the Certificate To Test field. Once testing or positioning is complete, the system must be shut down and locked out again.

- 9.4 Personal locks shall be removed by the person who applied the device. When this person is not available to remove it, the lock can be removed by BP Husky or by the contractor company with a BP Husky representative as a witness. All sections except the signatures section at the bottom of the Removal of Lock form must be completed before the lock is removed. The steps required before the lock is removed include:
- verification that the person who applied the device is not at the facility,
 - making all reasonable efforts to contact the person
- 9.5 Once the lock has been removed, the signatures must be obtained and the completed form returned to the safety group within 48 hours.
- 9.6 If a personal lock is removed, the person responsible for the Authorized Person whose lock was removed must ensure that person has knowledge that his/her lock has been removed before he/she resumes work.
- 9.7 If a group lock is removed, the pusher/foreman must be notified before the crew protected by that group locks resumes work.

10.0 Locks

- 10.1 Locks will be standardized by color according to the list below. Locks must be American Lock ® brand or a brand of similar quality.

<u>Craft or Job</u>	<u>Color</u>
Process Locks	Light Gray
Personal Locks	Yellow
Group Locks	Blue
Electrical Craft Locks	Red
Radiation Locks	Purple

- 10.2 Locks used for lockout/tagout shall not be used for any other purpose.
- 10.3 Electrical Craft locks are all keyed alike and qualified people have keys to these locks. Craft locks are used to prevent equipment from being re-energized by unauthorized personnel. People working on equipment still need a personal lock even if a craft lock is installed.
- 10.4 Radiation locks are all keyed alike in sets, typically sets of 6 locks. Radiation sources must be locked out by a qualified individual in accordance with SAF-067 Radiation Safety Program and Procedure.
- 10.5 Personal locks and group locks shall be individually keyed

11.0 Tags

- 11.1 Bleeds that are left open for removing energy during isolation must be tagged with an information tag containing text such as: Do Not Close.
- 11.2 Information tags used for notification, for example that a valve was left open, should contain at a minimum the reason for the tag and the date applied. These tags do not need to meet the 50 pound attachment requirement.

- 11.3 Information tags used on the u-bolt or main lockbox should contain, at a minimum, the name of the operator who applied the process locks, the date, the equipment locked out, and the lock/key numbers.
- 11.4 Tagout devices should only be used when it is physically impossible to put a lock on the isolation point.

NOTE: Tags are warning devices attached to the energy isolating device and they do not provide physical restraint the way a lock does. They may evoke a false sense of security.

- 11.5 Tags must be attached to the same point a lock would go, or as close to that point as feasible. Print and format of tagout devices must be standardized.
- 11.6 Tagout devices used where a lock cannot be physically applied must include at least the name of the person attaching the device and the date applied. Tags shall be used on blanks/blinds.
- 11.7 Tagout devices shall be standardized in print and format, warn against hazardous conditions if the equipment is energized, and include text such as: Do Not Start, Do Not Open, Do Not Close, Do Not Energize, Do Not Operate, etc.
- 11.8 Tagout devices, including their means of attachment, must be substantial enough to prevent accidental removal. Tagout device attachments shall be non-reusable, attachable by hand, self-locking, and non-releasable with a minimum unlocking strength of no less than 50 pounds. A one-piece, all environment-tolerant nylon cable tie is the desired device.
- 11.9 When using a tag to isolate the source:
 - 1. De-energize the source according to proper shutdown procedures. Isolate the source.
 - 2. Place a LOTO tag on the source. The tag must say something like "Do Not Operate" and be applied with a sturdy zip tie (or a similar device that is non-reusable, self-locking, and non-releasable with a minimum unlocking strength of no less than 50 pounds.)
 - 3. The LOTO tag needs to have the name of the person applying it and the date.
 - 4. A second tag is hung on a u-bolt with a carseal as an information tag. Write on this information tag a reference to the original isolation point. You can use a "Do Not Operate" tag for this since there is space on the back to write the information. This information tag should have a keychain similar to the keychain used for gray LOTO locks.
 - 5. Anyone working on the equipment needs to hang a personal yellow lock on the u-bolt. The lock must pass through the keychain on the information tag and the u-bolt.
 - 6. If there are several different isolation points for one system, all the keys and information tags can be hung on one u-bolt.

7. All of the personal locks must be removed before the information tag can be taken off the u-bolt. Only at this point can the LOTO tag be removed from the source and the source re-energized. The LOTO tag must be removed by a authorized person, but it does not need to be the same person who applied the LOTO tag in the first place.

12.0 Lockout and tagout devices

- 12.1 All devices necessary for lockout/tagout will be provided by the employer.
- 12.2 Devices shall be capable of withstanding the environment to which they are exposed. Tags must be constructed of a material so they do not become illegible in the environments to which they are exposed.
- 12.3 Lockout devices must be substantial enough to prevent removal without the use of excessive force, such as with bolt cutters.

13.0 Blanks and blinds

NOTE: Refer to SAF 102 Developing Isolation Plans for specific information on blank lists and Isolation Plans.

- 13.1 Blanks and blinds are considered a lockout device. Lockout/tagout must be used to close and lock valves when installing blanks. Once the blanks are installed, they become the isolation point.

WARNING

When Orifice flanges are used for blanking, the tap valve must be closed and the tubing parted to prevent material leaking into the blanked area causing potential personal exposure and/or explosion hazard. Tag Orifice flange tap valves with a Do Not Open tag.

- 13.2 Before blanks are installed, an Isolation Confirmation Certificate (ICC) must be developed listing the location of the blank, the blank size, flange rating and type.
- 13.3 Supervisors shall identify locations where blanks and/or blinds are to be installed by use of blanking lists and drawings. If the list is developed by an operator, it must be approved by supervision.
- 13.4 The blank list must be initialed by operations as OK to install before blanks are installed. Maintenance initials the blank list when they have installed the blanks. Process then verifies that the blanks have been installed and initials and dates the blank list.
- 13.5 When blanks are installed, they must be tagged with a tag such as "Energy Isolation – Do Not Remove."
- 13.6 Once blanks are installed and the blank list has been signed-off that all blanks are installed and verified installed, the blank list needs to be kept in an accessible location so the person removing the blanks can sign-off of the same blank list.
- 13.7 When all work is verified as complete, the blank list can then be signed-

off by operations saying the blanks are OK to remove. A maintenance representative initials and dates the blank list when they remove the blank. An operations representative initials and dates the blank list upon verification that the blanks have been removed.

- 13.8 For specific information regarding the location of blanks and blinds for confined space entry, see SAF-032 Confined Space Entry. For information on blanking for Hot Work, see SAF-044 Hot Work, Hot Work Spark Potential, and Vehicle Entry Procedure.

14.0 Isolation Plans

NOTE: Refer to SAF 102 Developing Isolation Plans for specific information on Isolation Plans.

- 14.1 An Isolation Plan must be used to perform the isolation, unless the conditions described at the end of this section are met. If the Isolation Plan does not exist, it must be developed and approved before the lockout/tagout is performed.
- 14.2 The Isolation Plan must contain, at a minimum, the energy type, location of lock or tag, action performed to remove energy (i.e. close valve, lock and tag), how to verify energy is removed (i.e. rod out bleed), a sketch/drawing, and the initials and date of the person installing and removing the locks.
- 14.3 Approved Isolation Plans can be accessed through the BP-Husky Toledo Intranet under Operations. Before the approved version is posted, it must be approved by the Operator and a BP-Husky Supervisor (typically the Shift Supervisor and Asset Coordinator).
- 14.4 If the Isolation Plan does not exist, it must be developed and approved before the lock out/tag out is performed. When Isolation Plans are developed, they must be approved by the Operator and Asset Coordinator, or designee before use.
- 14.5 The Isolation Plan Form shall be used to develop the LOTO checklist or blank list. When electrical distribution switching is done according to SAF-098, the form in SAF-098 will be used rather than the Isolation Plan Form.
- 14.6 When locks/tags are installed, the operator initials and dates the "Lock/tag installed" column on the Isolation Plan.
- 14.7 Once locks/tags are installed, the Isolation Plan needs to be kept in an accessible location so the person removing the locks can sign-off of the same checklist. For example, the Isolation Plan may be kept with the work permit, operations folder, on the u-bolt or main lockbox, or in a binder in the control house.
- 14.8 When locks/tags are removed, the operator initials and dates the "Lock/tag removed" column and returns the completed Isolation Plan to the work packet for document retention.
- 14.9 For non-process areas, the Isolation Plan can be developed by the

Isolating Authority, Primary Performing Authority, or Authorized Person. They must be approved by the BP-Husky Employee supervising the work. The Isolating Authority signs and dates when locks are installed and removed.

- 14.10 The Isolation Plan does not need to be developed provided all of the following are true:
- the work does not extend beyond one shift.
 - the equipment and all exposed conductors and parts are isolated by a single isolation device.
 - the lockout device is under the exclusive control of the person performing the maintenance.
 - the maintenance does not create a hazard for others.
 - there is no potential for stored or residual energy, or re-accumulation of stored energy, after shut down.
 - the isolation and locking out of the energy source will completely de-energize and deactivate the equipment.

15.0 Process Locks

- 15.1 Process Locks shall be purchased in groups of keyed-alike locks. There shall be one (1) key per group. The Isolating Authority shall be responsible for the security of this key when not in use.
- 15.2 Process locks will be engraved with a serial number to identify the series. Process locks can be partially spray-painted to help with ease of identification. If locks are spray-painted, a portion of the gray color must still be visible.
- 15.3 When Process locks are used to isolate an energy source, and that isolation location is "outside" the battery limits of the unit or area that is placing the lock, that lock must have an "*identification tag*" affixed to it that identifies the unit or area that the device is from.
- 15.4 The Isolating Authority shuts down equipment according to proper methods and applies the process locks. The key to the process locks goes into a lockbox, called the main lockbox, or onto the u-bolt. That u-bolt/lockbox is tagged with an informational tag containing the name of the equipment locked out, the lock numbers, the name of the operator who applied the process locks, and the date the locks were applied. The Isolating Authority applies a carseal to the lockbox. If using u-bolts, the Isolating Authority attaches the key to the u-bolt with a carseal.

16.0 Personal Locks

- 16.1 Every individual that could be exposed to potential hazards must install a personal lock. Personal locks can be installed on the u-bolt or on a satellite lockbox if a group lock (as described in section 17.0) is installed on the u-bolt.
- 16.2 Personal locks shall each be keyed differently and each marked for personal identity. There will be no spare keys to any personal locks. If the key is lost or damaged, the lock shall be removed with bolt cutters by the lock owner. In the event an individual's lock is removed by someone other than the owner, emergency or otherwise, a Removal of Lock form must be completed, signed, and filed with the safety department and that person must be notified of the lock removal prior to

resuming work. (see section 9.0).

16.3 Personal locks must be identified with the person's name and company.

16.4 This personal lock shall be removed when the individual is no longer exposed to the hazards or potential hazard. Each individual involved shall remove his/her lock when his/her portion of the work has been completed, or when he/she is leaving the job site. It need not be removed during breaks, lunch, or parts procurement

17.0 Group Locks

17.1 Group locks may be installed onto the u-bolt or main lockbox by a foreman, pusher, or supervisor. The decision on whether to use group locks must be an agreement between the Isolating Authority (operator) and foreman/pusher.

NOTE: Group locks still require personal locks to be used. The difference is that personal locks can be placed on a satellite lockbox rather than the u-bolt or main lockbox.

17.2 One group lock covers one craft.

17.3 Group locks can be left on the main lockbox/u-bolt until the craft it protects is completely finished with the job. These blue group locks do not need to be removed at the end of each shift the way personal locks do.

17.4 The supervisor places a blue group lock onto the u-bolt or main lockbox. The lock needs to be identified with the company name, craft name, and the number and location of the satellite lockbox. A tag may be used that contains this information. The key to the blue group lock shall be placed into a satellite lockbox and the supervisor places a carseal on this lockbox to secure it closed.

17.5 Each individual that could be exposed to hazardous energy must place a personal yellow lock onto the satellite lockbox. The personal locks shall be removed as individuals leave the job site.

17.6 When no personal locks are on the satellite lockbox, the supervisor is responsible for maintaining control of the satellite lockbox. For example, the satellite lockbox can be passed along to the pusher/foreman coming on shift or it can be stored in an office or other secure location.

17.7 Everyone hanging a personal lock has the right to hang their personal lock onto the u-bolt or main lockbox rather than the satellite lockbox. If this is done, it must be communicated to the supervisor and the Isolating Authority.

18.0 Craft Locks

18.1 Electrical Craft Locks are used by qualified electricians for lockout of

4160 volt motors for operations. All qualified electricians have a key to these red electrical craft locks. When electricians are working on equipment, they apply a personal yellow lock per the requirements of section 16.0. A gray process lock is put on the energy source along with the red lock, and the key to the gray lock is put on the main lockbox or u-bolt.

- 18.2 Radiation sources can only be locked out by a Radiation Safety Officers (RSO) or designee, in accordance with SAF-067 Radiation Safety Program and procedure. The RSO isolates the radiation source and places a lock onto it. The key to that lock goes into the u-bolt or main lockbox. The RSO places a purple lock onto the u-bolt/lockbox.
- 19.0 Non-process isolation and locks
 - 19.1 For non-process isolation, a specific individual or job role needs to be assigned responsibility as the Isolating Authority. An example of non-process isolation may include new construction. The Isolating Authority is responsible for assessing the lockout required to keep workers safe and for verifying the hazardous energy has been removed from the system prior to work.
 - 19.2 When work will be performed by one crew, takes less than one shift, and the lockout involves only one isolation point, lockboxes and gray locks do not need to be used. Since the lockout involves only one isolation point, each person can place a properly labeled personal lock onto that isolation point. The personal lock is kept on until they are finished with their work or leave the job. This exception only applies to non-process equipment, such as HVAC, elevators or garage door repairs.
 - 19.3 For non-process isolation with multiple isolation points, a set of gray locks should be used for the lockout. The key to these gray locks is placed into a lockbox. Personal or group locks are then put onto the lockbox, as defined in sections 16.0 and 17.0.
 - 19.4 Isolation Plans are required unless all of the exemptions are met, as described in 14.10.
- 20.0 Valve Lockout Methods
 - 20.1 Suitable lengths of a small-sized chain can be used to secure most valves. Handwheels and valve handles shall be secured, for example, with a chain, ball valve lockout device, or other lockout device. Fire water system valves shall be locked by locking the handle to the dog ear on the shaft cover.
 - 20.2 Chain operated valves must be secured with chain so the valve cannot be opened.
 - 20.3 Multiple hand wheels may be secured by passing a single length of chain through them and installing a single lock. Individually chained valves are the preferred method of isolation.

CAUTION

Multiple handwheels secured together with a chain may cause additional hazards.

- 20.4 Proper lockout of MOV's (Motor Operated Valves):
 - a) MOV must be locked and tagged out at the 480 volt breaker and the manual handwheel must also be locked out.
 - b) When applicable, verify lockout by pressing open/close push button for valve.

- 21.0 Exceptions
 - 21.1 Turnarounds, special projects, Greenfield or Brownfield work may deviate from this procedure provided they have a written plan in place that addresses energy isolation. The plan must be approved by the Site Operations Manager, HSSE Manager, and Maintenance & Projects Manager.

- 22.0 Rotating and Reciprocating Drivers, Pumps and Compressors
 - 22.1 Shut down by appropriate steps.
 - 22.2 Refer to Isolation Plans.
 - 22.3 Tightly close inlet throttle or block valves nearest the equipment. Install lockout chain and lock.
 - 22.4 Close discharge valves; install lockout chain and lock.
 - 22.5 Open bleeder valves and vent residual pressure from steam turbine or engine cylinders.
 - 22.6 Close and lockout discharge valves, suction valves and other energy sources. Open and tag pump drains and bleeds. Verify drain valves/bleeds are open and not plugged and capable of releasing the energy.
 - 22.7 Isolate any further energy source.

- 23.0 Electrical Precautions
 - 23.1 Do not lock out a push button or control switch at the motor unless a nameplate identifies it as an acceptable lockout location. Always install locks on the main disconnect switch or breaker of the motor or equipment.

NOTE: If only mechanical work is being done, always check to make sure the circuit is de-energized by operating the push button or control switch at the motor after the circuit has been locked out. For electrical work, the equipment must be tested with an approved volt meter to verify that it is in an Electrically Safe Work Condition (De-energized).

- 23.2 No person will enter an electrical enclosure unless they are trained and qualified to perform duties within such areas and are aware of the potential hazard.
- 23.3 Only qualified electricians can rack out a 4000 volt breaker. Refer to Attachment A for specific steps on isolating 4000 volt equipment.
- 23.4 The following will occur when the Electrical Department must perform work which will make the Authorized Person's lockout ineffective. **This should be a last resort** and only performed when it is necessary for the electricians to work on the lockout source at the same time

Authorized Persons are working under the lockout.

- 1) The electricians will contact the Isolating Authority that the lockout will be made ineffective. All other crafts associated with the lockout will be made aware of the situation by the Isolating Authority. The Isolating Authority will place a danger tag on the lockbox or u-bolt for notification of on-going work.
- 2) The electricians will immediately provide a second point of isolation after they make the original lockout ineffective. This may include disconnecting the motor wires or removing the contactor or breaker.
- 3) The electricians will contact the Isolating Authority that the second point of isolation is complete. The Isolating Authority will verify this isolation and notify the other crafts as appropriate.
- 4) When electrical work is complete, the electricians will notify the Isolating Authority that the second point of isolation will be removed and the original lockout will be made effective. Other crafts will be informed by the Isolating Authority that this will occur.
- 5) The Isolating Authority will verify proper lockout after the electricians have restored the original lockout condition. This will include testing the motor by pressing the start button.
- 6) The danger tag will be removed from the lockout board U-bolt.

24.0 Specific Electrical Lockout Method

- 24.1 For 110 and 220 volt circuits only: The following lockout method is permissible:
- a) Turn switch or breaker handle to its "off" position.
 - b) Verify that equipment has stopped to ensure that the correct equipment has been de-energized.
 - c) Place lockout device through locking lugs so that handle cannot be moved and install lock.
 - d) Nameplates will be attached to specific switches to identify approved lockout points.
- 24.2 For 480 breakers or combination motor starter:
- a) Shut off motor at pump.
 - b) If motor does not shutdown, the breaker on 480 volt motors can be used (to shutdown), but the electrical department must be notified that there is a problem.
 - c) Turn handle on door to "off" position.
 - d) Place lockout device in the handle lug stop and install lock.
 - e) Verify lockout by pushing START button at motor.

Exception: Some 480 volt motors may require two qualified electricians to perform LOTO per the 4160 volt motor procedure due to increased electrical hazards. The circuit breaker will be clearly labeled to indicate the requirement.

- 24.3 For 480 volt electrically actuated breaker controllers:
- a) Shut down motor at STOP button.
 - b) Depress the trip button to the "open" position shown in the indicator window.

- c) Place lockout device in the locking slot below the indicator window and install lock.
 - d) Verify lockout by pushing START button at motor.
- 25.0 4000 volt isolation
 - 25.1 Two qualified electricians are required to perform lockout of all 4160 volt motors in the refinery. This is because of the electrical hazards associated with the high voltage switchgear. The hazards include shock, arc flash and blast. The electricians will be using PPE such as high voltage gloves and electrical flash suits.
 - 25.2 Only qualified electricians can rack out a 4000 volt breaker. Refer to Attachment A for specific steps on isolating 4000 volt equipment.
 - 25.3 All personnel, including the Isolating Authority (operator), should remain at least 20 feet from the switchgear or outside the substation when the electricians complete the switching action for LOTO. The Isolating Authority can approach the switchgear after the switching action is complete to place the lock on the breaker.
 - 25.4 The specific steps required to complete the lockout include:
 - a) 4160 volt lockout shall be planned as part of the Control of Work process with the associated Work Control Certificates and Permits. Two electricians are required for 4160 volt lockout.
 - b) Isolating Authority and electricians verify correct breaker.
 - c) Electricians complete isolation of equipment.
 - d) Isolating Authority places gray process lock on breaker as usual. If the lockout location is inside electrical switchgear, hand the lock to the electricians and they will install it. Key is placed on U-bolt or main lockbox as usual.
 - e) Electricians place red electrical craft and tag on circuit breaker. This stays on for the duration of the job.
 - f) Isolating Authority will test push button as usual.
 - g) All other crafts lock out key on lockbox or u-bolt as usual. Electricians lock out on lockbox or u-bolt with personal lock if they are completing maintenance work on the job.
 - h) Maintenance work is performed.
 - 25.5 The specific steps required for removal of lockout include:
 - a) Operations notify I & E or Maintenance foreman that electricians are required to de-loto the breaker. It can be different electricians than completed original lockout. Two electricians will be called out if this occurs off shift.
 - b) Electricians sign on the appropriate Permit.
 - c) Isolating Authority removes lock from breaker.
 - d) Electricians remove electrical craft lock from breaker.
 - e) Electricians will rack in breaker for motor and verify motor is ready to start.
 - f) Operations place equipment into service.
 - 25.6 Operators (Isolating Authorities) are permitted to:
 - a) Investigate a relay or meter on the front of the switchgear panel.
 - b) During an emergency, when the field pushbutton is not

accessible, shutdown the motor using the stop button or switch on the front of the switchgear.

- c) Reset an overload relay such as was permitted in the past. Do not reset any item labeled "Do not reset".
- d) On outdoor switchgear, open the small weather protection door to verify if the equipment has been locked out. Properly re-close the weather protection door when complete.

- 25.7 Operators (Isolating Authorities) are NOT permitted to:
 - a. Operate the isolation switch used for Lockout/Tagout.
 - b. Open the switchgear door exposing the inside components.
 - c. Reach inside an open switchgear section. If the lock is to be placed inside the switchgear, hand it to the electrician to install.

26.0 Railcar Movement /
Railroad Track
Isolation

26.1 Anytime work is to be conducted on railcars, railroad tracks or within ten feet (10') of railroad tracks within the BP Husky Toledo Refinery, a blue flag shall be placed on the track to indicate that nothing on the protected tracks shall be moved.

26.2 A blue flag shall be placed on the track to indicate that nothing on the protected tracks shall be moved when any other condition that precludes the use of the railroad tracks exists.

26.3 The blue flag shall be applied by the transportation supervisor or their designee in compliance with applicable maintenance procedures.

26.4 The blue flag will be tagged with a "Do Not Operate" tag in accordance with section 9.0 of this procedure. The tag will indicate the Isolating Authority responsible for the energy isolation.

27.0 Exclusive Use

27.1 All devices used for lockout/tagout shall not be used for any other purpose.

28.0 Outside personnel
(contractors)

28.1 If outside personnel (contractors) have an energy control procedure that would require their employees to perform lockout/tagout in a more restrictive manner than described in this procedure, they will inform BP Husky personnel of their procedure. The BP Husky contract manager shall ensure that BP Husky employees understand and comply with the restrictions and prohibitions of the contractor's energy control program.

29.0 Training

29.1 Training of personnel shall be done as required by OSHA 29 CFR 1910.147 and 1910.333. Instances of retraining may be job change, equipment changes, deficiencies or defects in the procedure as shown by periodic inspections, or changes to this procedure.

30.0 Periodic Inspections

30.1 An annual inspection of this procedure shall be conducted to assure that the procedure is being followed. The inspection is designed to correct any deficiencies or inadequacies observed.

30.2 The inspection will be conducted by authorized persons. The inspector cannot be the same person performing the lockout/tagout.

30.3 The annual inspection will include a review between the inspector and

authorized and affected people of that person's responsibilities and the elements of a tagout system as outlined in this procedure.

- 30.4 Documentation of this annual inspection includes:
 - a. Identification of the machine and/or equipment observed.
 - b. Inspection date.
 - c. The employees included in the inspection.
 - d. The person performing the inspection.
 - e. Any deficiencies noted during the inspection.
- 30.5 Deficiencies found during the annual inspection shall be communicated to all appropriate personnel

- 31.0 Equipment updates
 - 31.1 Whenever replacement, major repair or modification of equipment is performed, the equipment shall be designed to accept a lockout device. This also applies to any new equipment installed.

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