

Manual Section 7	Issue Date 02/16/12	Revision Date 01/01/24	Policy Number LLCP-085
	Isolation of Hazardous Energy (IHE)		

Purpose

This program establishes the requirements for isolation of both kinetic and potential electrical, chemical, thermal, hydraulic, pneumatic, and gravitational energy prior to equipment repair, adjustment or removal. Reference: OSHA Standard 29 CFR 1910.147, the control of hazardous energy.

Scope

All LLC Companies including, Blanchard Industrial, LLC, GIS Engineering, LLC, Grand Isle Shipyard, Inc., and GWIS, Mack Steel, NuWave, Sun Industries, Valvemax, Discovery Industries, Inc.; hereafter identified as “Company”.

Terms and Definitions

The following terms and definitions apply to the Safe Work Practice (SWP) – Isolation of Hazardous Energy Guideline.

Blind Flange – A flange used for isolation purposes rated to the design pressure of the piping system or equipment being isolated. **NOTE:** a blind flange shall be stamped with its rated pressure.

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

Block Valve – This normally implies ball, plug or gate valve. Butterfly valves are acceptable in non-hydrocarbon applications where the pressure is less than 150 psi.

Actuated Valves – Are Valves that have an assembly which will power the valve open or closed.

Blind Skillet – A solid metal plate cut to form isolation between the faces of two flanges. The skillet shall be rated to the maximum pressure that can be applied to the piping system or equipment being isolated, equipped with a handle that extends two inches beyond the flanges, and stamped with the MAWP. Skillet’s thickness shall meet the design requirements of Table 1 of this safe work practice.

Single Valve Isolation – A single, closed, locked and tagged, non-leaking block valve used to isolate pressure. For single valve isolation, refer to the Corporate IHE Isolation Flow Chart.

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

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

Stored Energy – Following the application of the lockout or tagout devices to the energy isolating devices, all potential or residual energy will be relieved, disconnected, restrained, and otherwise rendered safe.

Where the re-accumulation of stored energy to a hazardous energy level is possible, verification of isolation will be continued until the maintenance or servicing is complete.

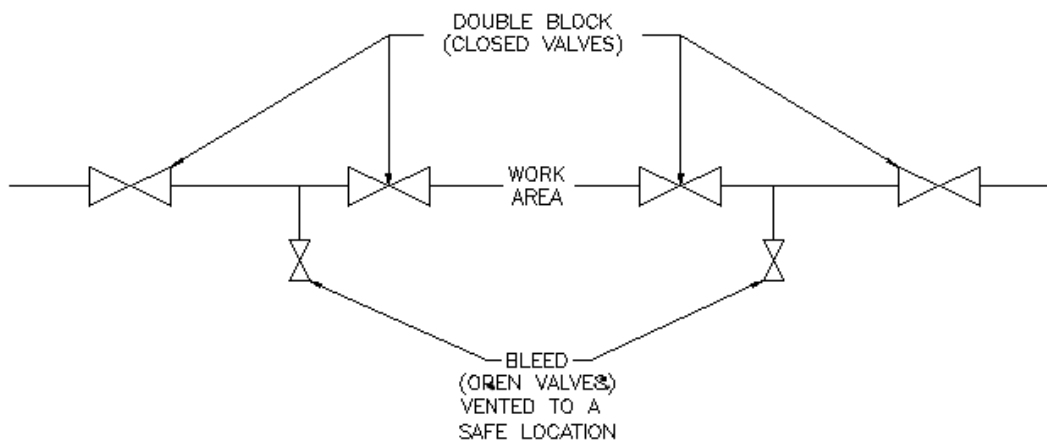
Release stored energy (capacitors, springs, elevated members, rotating fly wheels, and hydraulic/air/gas/steam systems) must be relieved or restrained by grounding, repositioning, blocking and/or bleeding the system.

Double Block – Two non-leaking valves in a series that are closed, locked, and tagged

Double block and Bleed – Two non-leaking valves in a series that are closed, locked, and tagged with the pressure between the valves bled through a locked open and tagged vent line directed to a safe location or with the utilization of pressure gauge. An example of double block and bleed isolation is given in **Figure 1** of this safe work practice.

This schematic provides an example of the use of double block and bleed isolation

Figure 1



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Every case of isolation/deactivation will be somewhat different. An evaluation by Operations and Construction shall be made on a case-by-case (site-specific) basis to determine the desired end state of the equipment, pipeline, etc., and to develop associated action plans. The evaluation and procedures shall be reviewed with and approved by the appropriate operations representative prior to work commencing. ***Bleed port can be utilized by venting open valve to safe area or installation of a gauge.***

Hazardous Energy – Any of the following energy forms:

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

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

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

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

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

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

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

Positive Isolation – The isolation of process piping or equipment by one of the following:

- Disconnected pipe work with blind flange installed
- Full thickness blind skilnet with proper gasket on pressure side. The customer shall be contacted for information regarding skilnet usage and gasket requirements.
- Blind flange

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Positive Physical Isolation can be achieved by installing, at a minimum skillet, blind or spade at the closest practical connection to the vessel or equipment being isolated. The skillet, blind, or spade must be properly sized for fit and MAWP of the system that could be seen at that point in the system given the operating conditions present (and/or anticipated) at the time of isolation. In addition to this first physical isolation, there must be an additional physical block upstream/downstream, where the section in between must be able to be bled.

(Double block and bleed is not positive isolation)

Tag – A device used to identify an isolation point and to indicate the reason for the isolation. Tags warn personnel not to operate the tagged item. Each tag must indicate when it was fitted and who fitted it.

Tagout – The act of attaching a tag at each isolation point to warn personnel not to operate the tagged item. The means of attaching the tag must comply with requirements.

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

Roles, Responsibilities and Training Requirements

There must be clearly defined roles, and personnel must meet the training and competency requirements of this standard prior to starting work.

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

The following roles are specific to Isolation of Hazardous Energy:

Authorized (Qualified) Employees – Are the only employees qualified to perform IHE on equipment or machinery. Whether an employee is considered to be qualified will depend upon various circumstances in the workplace. It is likely for an individual to be considered "qualified" with regard to certain equipment in the workplace, but "unqualified" as to other equipment. An employee who is undergoing on-the-job training and who, in the course of such training, has demonstrated an ability to perform duties safely at his or her level of training and who is under the direct supervision of a qualified person, is considered to be "qualified" for the performance of those duties.

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All Employees will be trained to use the Lock and Tag Out Procedures. Trainers will conduct the training at time of initial hire. Retraining shall be held at least annually. All training must be documented, signed and certified. The training will consist of the following:

- Review of General Procedures
- Review of Specific Procedures for machinery, equipment and processes
- Location and use of Specific Procedures
- Procedures when questions arise

Affected Employees – Are employees who operate machinery or equipment upon which locking or tagging out (IHE) is required under this program. Training of these individuals will be less stringent in that it will include the purpose and use of the IHE procedures.

- Only trained and authorized Employees will repair, replace or adjust machinery, equipment or processes
- Affected Employees may not remove Locks, locking devices or tags from machinery, equipment or circuits.
- Purpose and use of the lockout procedures.

Other Employees – Are identified as those that do not fall into the authorized, affected or qualified employee category. Essentially, it will include all other employees. These employees will also be provided instruction about this the program.

- Only trained and authorized Employees will repair, replace or adjust machinery or Equipment.

Other Employees may not remove Locks, locking devices or tags from machinery, equipment or circuits

Assessing and Managing Hazards

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

Isolation

This section contains details of the requirements for isolating equipment to allow personnel to work safely during activities such as hot work, confined space entry or while performing maintenance activities. Requirements of this section shall be observed whenever it is necessary to isolate the equipment. Use this section in conjunction with the Lockout Tagout guideline whenever there is a need to lockout or tagout equipment.

Verification of Isolation

Prior to starting work on machines or equipment that have been locked or tagged out, the authorized employees will verify that isolation or de-energization of the machine or equipment have been accomplished.

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After assuring that no Employee will be placed in danger, test all lock and tag outs by following the normal start up procedures (depress start button, etc.).

Considerations

When work involves isolation, consider safer alternatives if possible. For example,

- Can the work be deferred until the process is shut down?
- Isolation systems may leak or fail, and installing isolation blinds is in itself a hazardous activity to be avoided if possible.
- Isolation of process streams, electrical systems, and some mechanical systems requires special consideration and shall only be performed by competent personnel who specialize in isolation of those systems.

Positive Isolation

Positive isolation is required when the absence of flammable or toxic material is critical to conducting a safe operation (i.e., **Hot Work, Confined Space Entry, Unattended open ended piping, etc...**). Positive isolation may also be required when containing hazardous materials, which are not under pressure. A job specific blind list, which contains entries of each time a blind is installed, should be **maintained. If a blind, which was installed to satisfy hot work or confined space entry**, permit must be removed, and the permit shall be cancelled prior to removal.

Table 1 This table provides the minimum thickness for skillets based on ANSI/ASME B31.3, 1984 Edition

SKILLET THICKNESS IN INCHES											
PIPE SIZE	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/4	1 1/2	1 3/4	2
1	3000	8700									
1 1/2	1800	4200	7400								
2	1100	2600	4700	7400	10700	14600	19100				
2 1/2	800	1800	3200	5100	7300	10000	13000				
3	550	1200	2200	3400	4900	6700	8800	13700	19800		
4	325	750	1300	2000	3000	4000	5300	8300	12080	16300	
6	150	325	600	850	1300	1800	2400	3800	5500	7500	9800
8	90	200	350	550	800	1100	1400	2200	3200	4400	5800
10	55	130	225	350	500	700	900	1400	2100	2800	3700
12	40	50	160	275	350	500	650	1000	1400	2000	2600
pressure rating in psi											
Thickness above are based on ASTM A-36 Carbon Steel											

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Policy & Procedures

Policy

It is Company policy, that Isolation of Hazardous Energy (IHE) on any production equipment by a Company employee shall **ONLY** be performed as directed by the Owner/Operator **AND** while in his/her direct view. All production IHE shall be initiated by the Owner/Operator and **shall be** verified by our Company Supervisor. Once verified, our Company Supervisor shall follow this IHE policy. This process shall remain in effect until the completion of work or transfer of responsibility to another Company Supervisor who is also qualified in Corporate IHE procedures.

Electrical IHE shall also be initiated by the owner/operator, (unless performed on newly installed equipment), and shall follow the same process as mentioned above for owner/operator production equipment.

During the installation of new electrical equipment, a qualified Company Supervisor shall initiate the Corporate IHE process. IHE shall remain in effect until the completion of work or the transfer of responsibility to another Company Supervisor who is also qualified in the Corporate IHE process. At the completion of installation, it is the responsibility of the Supervisor to ensure that all tools, equipment, personnel, etc. is cleared so that IHE equipment can be safely removed for the purpose of energizing equipment.

Responsibility Changes

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

Guidelines

Ensure that isolation of hazardous energy and/or opening of equipment are performed in a safe and controlled manner.

1. Personnel performing isolation of hazardous energy must be trained and competent in the roles for which they are responsible.
2. Hazards associated with isolation of hazardous energy shall be identified and mitigated prior to beginning work.
3. Positive physical isolation is required for (i.e., **Hot Work, Confined Space Entry, Unattended open ended piping, etc...**).
4. Isolation points shall be locked, tagged and documented.
5. Equipment involved in isolation of hazardous energy shall meet industry specification standards or applicable regulatory requirements.
6. Each personal lock/tag used for energy control will only identify and be used by a single individual. Group locks are discouraged but may be used if: (a) an authorized individual who is responsible and accountable for the group lock is identified on the permit, and (b) a method is in place for the responsible person to account for all of the individuals covered by the group lock prior to placing or removing the group lock.

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The first lock to be installed and the last lock to be removed shall be fitted by operating personnel or their designee.

7. A suitable means of communication shall exist to advise different work crews that the equipment is out of service and to provide details of any safety or operational precautions to be undertaken.
8. The employer shall conduct a periodic inspection of the energy control procedure at least annually to ensure that the procedure and the requirements of this standard are being followed.
9. The periodic inspection shall be performed by an authorized employee other than the one(s) utilizing the energy control procedure being inspected.

The employer shall certify that the periodic inspections have been performed. The certification shall identify the machine or equipment on which the energy control procedure was being utilized, the date of the inspection, the employees included in the inspection, and the person performing the inspection.

The Equipment Specific Procedure will be attached to the WP/SEA and the IHE Worksheet, and will be included in the review.

Safeguards

- Empty any equipment being prepared for opening of any noxious, toxic, or flammable liquid or vapors in a controlled manner.
- Depressurized lines containing liquids must be drained into a bonded form of containment to prevent static ignition.
- Adequately isolate and check the opened equipment, which must be found free of potential hazardous materials and/or conditions. If previously unidentified hazards exist or previous safeguards are determined to be inadequate, equipment must be closed until safeguards are taken.
- Isolate (blind or air gap) the process equipment whenever possible at the first flange nearest the equipment to be opened. Valves will be locked and tagged, and blinds must be listed on an equipment isolation checklist.
- Lock out or otherwise secure prime mover energy sources associated with the equipment to be opened.
- Blind or air gap any pressurized connection to a vessel or system before the equipment is opened.
- Double block and bleed may also be used to isolate equipment from process lines. Bleed lines should be carefully checked to ensure they are not plugged.

(Double block and bleed is not positive isolation)

- Any pressurized connecting points to equipment being opened will be blind flanged before being left unattended. Air gapping alone is not adequate.
- Depressurize and drain process equipment to be opened to a safe area such as a flare system or recovered oil system. Depressurizing and draining into a closed system is the best practice.

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- Do not allow hot work in the immediate area during draining or depressurizing of process equipment if there is a possibility of flammable vapor release. Refer to the Hot Work Guidelines.
- Adequately purge, steam, or wash opened equipment to ensure removal of toxic or flammable commodities to safe levels. Purged equipment shall be vented to a safe area where potential ignition sources are not present. Appropriate flammability and toxic chemical monitoring will be conducted on the equipment before it is declared safe for work. The potential for pyrophoric material such as iron sulfide in sour plants shall be considered and mitigation measures implemented.
- Isolate and/or drain gauge glass columns before equipment is declared safe for work.
- Take appropriate precautions with process equipment contaminated with Naturally Occurring Radioactive Material.

For Company Production Operators Only

Single Valve Isolation

Single valve isolation shall be limited to the following operations:

- The work being performed is not left unattended and is not hot work or confined space entry work.
- Operations where the use of single valve isolation is appropriate are changing pressure gauges, cleaning sight glasses, replacing needle valves, pig launching and receiving, replacing well chokes, replacing control valve trim and seats, When possible, skillets will be installed on the downstream side of the valve in order to completely isolate the system.

Subsurface Isolation

Isolation of subsurface pressure for the purpose of accessing and repairing of wellhead valves require the following means of isolation:

- Bottom master valve – In order for employees to assist anyone in repairs to well head valves, a minimum of two methods shall be required for isolation purposes (i.e., back pressure valve, and/or sub-surface valve, and/or a plug).
- Upper master valve – a locked, tagged, non-leaking bottom master valve, as a minimum, shall be required for isolation purposes.

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Confined Space Entry

Spaces that can be exposed to hydrocarbons requires:

- CSE Permit
- Vessel diagram
- Positive Isolation
- LIFE Representation

SOP: Isolating Hazardous Energy Procedures for Working with Vessels

Positive isolation is required on all vessel flanges when performing hot work, confined space entry. Isolation is to remain until the job is completed.

Environmental Crew's will follow Procedures below when job task requires a flange to be opened.

- A diagram of the vessel will be drawn showing the isolations. This diagram will then be submitted to your manager.
- The supervisor will then contact the customer field supervisor and together verify positive isolation to the vessel.
- Once verified, supervisor will contact manager to complete the process and start the job.

Onsite LIFE Representation will be decided by the Operations Safety Manager and the Environmental Manager.

The following Procedures below will be followed when a job task requires a flange/vessel to be opened and Hot Work is to be performed.

- A diagram of the vessel will be drawn showing the isolations. This diagram will then be submitted to your manager.
- The supervisor will then contact the customer field supervisor and together verify positive isolation to the vessel.
- Company Supervisor & Customer Representative will verify that the vessel was properly cleaned (pressure washed and steamed) before hot work permit is issued.
- Once verified, supervisor will contact manager to complete the process and start the job.
- LIFE Representative will be on site, at a minimum, to verify positive Isolation. When and if the job scope complexity dictates a higher standard of safety, the LIFE Representative may be directed to stay for the entirety of the job. (**i.e. Hot Work inside a Vessel**)

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Vessel Diagram Form

Supervisor: _____

Date: _____

Customer Rep: _____

Customer & Location: _____



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Lockout Tagout

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

Lockout and Tagout Requirements

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

Lock Specifications

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

- Each personal lock/tag used for energy control will identify and be used by a single individual when not using group lock process.
- Locks used for hazardous energy isolation should be used only for hazardous energy isolation.
- Personal locks and keys must be under one person’s control at any given time. This is accomplished by keying each lock differently so that only the employee placing the lock can remove it.
- Locks and tags must withstand their environment for the maximum period of time that exposure is expected.
- Keys and equipment locks must be under the exclusive control of supervision.
- Locks must be strong enough to prevent removal without using excessive force or unusual techniques.

Tag Specifications

Tags shall be of a suitably durable material for the environment in which they are used. Tags must contain at least the minimum information:

Tags must be legibly signed and dated by the installer of the tag. The tags shall be securely fastened to isolation points using the shackle of the lock or a self-locking nylon cable tie with a breaking strength of at least 22 kilograms of force (50 pounds of force). All information required on the form must be filled out.

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

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

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Where it is determined that it is not possible to apply a lock, it may be acceptable to fit a tag, provided that additional measures are taken to ensure that the tagged item is not inadvertently operated.

The additional measures that are required shall be determined by a hazard analysis and an assessment of the degree of harm that may occur if the equipment is operated. At a minimum, personnel working in the area of the tagged equipment must be briefed on the reason why the item is tagged out and the implications of operating the equipment.

Using Group Locks

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

Installing Locks

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

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

Further Isolation

If the equipment requires further isolation after the work has started, all work will stop immediately. No work will take place until the required isolation is complete, Properly locked/tagged and noted on the LO/TO Worksheet. Personnel involved in the work must be made aware of the further isolation methods/points.

Operations requires each isolation point to be recorded on the LO/TO worksheet

Preparation for Lock and Tag Out Procedures

A Lockout - Tagout survey has been conducted to locate and identify all energy sources to verify which switches or valves supply energy to machinery and equipment. Dual or redundant controls have been removed.

Locks, Hasps and Tags

All Qualified Maintenance Personnel will be assigned a lock with one key, hasp and tag. All locks will be keyed differently, except when a specific individual is issued a series of locks for complex lockout-tagout tasks. Each authorized employee must place their personal lock on the hasp prior to starting any maintenance operation. The supervisor responsible for the

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task shall always be the first to apply their lock and is forbidden to remove the device until each authorized employee in the group has removed their personal lockout device. In some cases, more than one lock, hasp and tag are needed to completely de-energize equipment and machinery. Additional locks may be checked out from the Department or Supervisor on a shift-by-shift basis. All locks and hasps shall be uniquely identifiable to a specific employee.

Returning Equipment to Service

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

Record Lock and Tag Removal

Final removal of locks, tags, and isolation points shall be recorded on the Equipment Isolation Checklist. Removal of locks, tags and any other isolation equipment must be recorded on the LO/TO Worksheet.

SOP: Management's Removal of Lock and Tag Out

Only the Employee that locks and tags out machinery, equipment or processes may remove his/her lock and tag. However, should the Employee leave the facility before removing his/her lock and tag, the Manager/person in charge may remove the lock and tag. The Manager/person in charge must be assured that all tools have been removed, all guards have been replaced and all Employees are free from any hazard before the lock and tag are removed and the machinery, equipment or process are returned to service. Notification of the employee who placed the lock is required prior to lock removal.

SOP: General Isolating Hazardous Energy Procedures

Before working on, repairing, adjusting or replacing machinery and equipment, the following procedures will be utilized to place the machinery and equipment in a neutral or zero mechanical state.

Preparation for Shutdown

Before authorized or affected employees turn off a machine or piece of equipment, the authorized employee will have knowledge of the type and magnitude of the energy, the hazards of the energy to be controlled, and the means to control the energy.

Notify all affected Employees that the machinery, equipment or process will be out of service

Machine or Equipment Shutdown

The machine or equipment will be turned or shut down using the specific procedures for that specific machine. An orderly shutdown will be utilized to avoid any additional or increased hazards to employees as a result of equipment de-energization.

If the machinery, equipment or process is in operation, follow normal stopping procedures (depress stop button, open toggle switch, etc.).

Move switch or panel arms to "Off" or "Open" positions and close all valves or other energy isolating devices so that the energy source(s) is disconnected or isolated from the machinery or equipment.

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Machine or Equipment Isolation

All energy control devices that are needed to control the energy to the machine or equipment will be physically located and operated in such a manner as to isolate the machine or equipment from the energy source.

Lockout or Tagout Device Application

All affected employees shall be notified of the lockout/isolation prior to application. Lockout or tagout devices will be affixed to energy isolating devices by authorized employees. Lockout devices will be affixed in a manner that will hold the energy isolating devices from the "safe" or "off" position.

Where tagout devices are used they will be affixed in such a manner that will clearly state that the operation or the movement of energy isolating devices from the "safe" or "off" positions is prohibited.

The tagout devices will be attached to the same point a lock would be attached. If the tag cannot be affixed at that point, the tag will be located as close as possible to the device in a position that will be immediately obvious to anyone attempting to operate the device. Lock and tag out all energy devices by use of hasps, chains and valve covers with an assigned individual locks.

Extended Lockout - Tagout

Should the shift change before the machinery or equipment can be restored to service, the lock and tag out must remain. If the task is reassigned to the next shift, those Employees must lock and tag out before the previous shift may remove their lock and tag.

SOP: Release from Isolating Hazardous Energy

Before lockout or tagout devices are removed and the energy restored to the machine or equipment, the following actions will be taken:

- The work area will be thoroughly inspected to ensure that nonessential items have been removed and that machine or equipment components are operational.
- The work area will be checked to ensure that all employees have been safely positioned or removed. Before the lockout or tagout devices are removed, the affected employees will be notified that the lockout or tagout devices are being removed.
- Each lockout or tagout device will be removed from each energy isolating device by the employee who applied the device.

SOP: Isolating Hazardous Energy Procedure for Electrical Plug-Type Equipment

This procedure covers all Electrical Plug-Type Equipment such as Battery Chargers, some Product Pumps, Office Equipment, Powered Hand Tools, Powered Bench Tools, Lathes, Fans, etc.

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When working on, repairing, or adjusting the above equipment, the following procedures must be utilized to prevent accidental or sudden startup: *An exception is granted to not lock & tag the plug if the cord & plug remain in the exclusive control of the Employee working on, adjusting or inspecting the equipment.*

- Unplug Electrical Equipment from wall socket or in-line socket.
- Attach "Do Not Operate" Tag and Plug Box & Lock on end of power cord.
- Test Equipment to assure power source has been removed by depressing the "Start" or "On" Switch.
- Perform required operations.
- Replace all guards removed.
- Remove Lock & Plug Box and Tag.
- Inspect power cord and socket before plugging equipment into power source. Any defects must be repaired before placing the equipment back in service.

NOTE: Occasionally used equipment may be unplugged from power source when not in use.

SOP: Isolating Hazardous Energy Procedures Involving More Than One Employee

In the preceding SOPs, if more than one Employee is assigned to a task requiring a lock and tag out, each must also place his or her own lock and tag on the energy isolating device(s).

SOP: Management's Removal of Lock and Tag Out

Only the Employee that locks and tags out machinery, equipment or processes may remove his/her lock and tag. However, should the Employee leave the facility before removing his/her lock and tag, the Manager/person in charge may remove the lock and tag. The Manager/person in charge must be assured that all tools have been removed, all guards have been replaced and all Employees are free from any hazard before the lock and tag are removed and the machinery, equipment or process are returned to service. Notification of the employee who placed the lock is required prior to lock removal.

SOP: Temporary Removal for Testing

- Temporary removal of lockout/tagout devices for safety testing purposes must be documented and follow the below steps:
- The work area will be thoroughly inspected to ensure that tools and other nonessential items have been removed
- The work area will be checked to ensure that all employees have been safely positioned or removed. Before the lockout or tagout devices are removed, the affected employees will be notified that the lockout or tagout devices are being removed.
- Each lockout or tagout device will be removed from each energy isolating device by the employee who applied the device.
- Test equipment according to normal testing procedures
- Once testing is complete, de-energize and reapply control measures following formal isolation procedures outlined previously in this document.

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Contractors

- Contractors, working on company property and equipment must use this Lockout - Tagout oprocedure while servicing or maintaining equipment, machinery or processes.