

FCX Department of Occupational Health and Safety Policy	Policy #	FCX-04
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Lockout/Tagout/Tryout (LOTOTO) (Control of Hazardous Energy Sources)	Task Risk	X High
		Medium
		Low
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1. Policy

Purpose	<p>To establish minimum requirements for Lockout/Tagout/Tryout (LOTOTO) for all FCX operating sites to protect personnel where injury can occur as a result of the unexpected release of hazardous energy.</p> <p>The intent is not to proceed with work until action has been taken to eliminate or control all hazard/energy exposures to the extent that an incident will not occur.</p>
Hazardous Energy Sources	<p>The sources of hazardous energy to consider:</p> <ul style="list-style-type: none"> • atmospheric • chemical • electrical • electromagnetic • gravitational • hydraulic fluid • ionizing radiation • kinetic • mechanical • nuclear • pneumatic • potential • residual or stored energy • thermal <p>NOTE: More than one energy source may be involved.</p>
Scope	<p>This policy applies to all FCX employees and contractors working at FCX sites.</p> <p>The scope covers isolation from all sources of energy ensuring that each is locked, tagged, and tried before work begins where an individual could be exposed to these sources of energy. It establishes procedures for the protection of personnel from injury due to unexpected energization, start-up, recharge or release of stored energy in, on or around the equipment.</p> <p>This policy does not apply to work on cord and plug connected electric hand tools for which exposure to the hazards of unexpected energization or start-up of the equipment is controlled by the unplugging of the equipment from the energy source and by the plug being under the direct control of the individual performing the work.</p>
General	<p>LOTOTO is the primary method of hazardous energy control. When the tasks are routine, repetitive and integral to the production process, or traditional LOTOTO prohibits the completion of those tasks, alternative methods of control that are based on risk assessment and that provide equivalent effective personal protection shall be used according to Section 9 of this policy.</p>

2. Hazardous Energy Control Program

Policy	<p>Each FCX site shall establish a written program for hazardous energy control detailing the requirements for Lockout/Tagout/Tryout Program and Alternative Methods.</p>
LOTOTO Program Elements	<p>LOTOTO is a systematic program that shall consist of the following elements to provide effective protection of personnel:</p> <ul style="list-style-type: none"> • A survey of all hazardous energy (identify complex or multiple source energy devices) • Identification of energy isolating devices • The selection and procurement of protective materials and hardware • The assignment of duties and responsibilities • The determination of shutdown, de-energization and start-up sequences • Written procedures for machines, equipment and processes (complex or multiple source energy devices) • Training of personnel • Auditing of program elements
Hazardous Energy Control Procedures	<p>Each unique piece of equipment, system or process shall have detailed procedures developed and documented for the control of hazardous energy during servicing or maintenance activities. These procedures shall be posted or otherwise readily available for LOTOTO Authorized Individuals to review and use.</p> <p>Where a plant or facility has more than one piece of similar equipment or more than one identical system or process line, a single procedure may be applied to all.</p> <p>Where a machine, equipment or process has a single energy source that is readily identified and isolated, written procedures will not be required.</p> <p>Procedures shall clearly and specifically outline the requirements for effective isolation of machines, equipment or processes. The procedures shall include all of the following:</p> <ul style="list-style-type: none"> • Identification of the machine, equipment or process • Listing of all required energy isolating devices and their locations • Specific procedural steps for shutting down, isolating, blocking, securing and relieving stored or residual energy

- Specific procedural steps for the placement and removal of lockout/tagout devices
- Specific requirements for verifying that isolation and de-energization has been accomplished

In cases where energy isolating devices are not available on machines, equipment or processes, another effective control (device/guard) must be installed to which LOTOTO can be effectively applied.

Management of Change (MOC)	<p>Each site shall have a plan for developing or revising LOTOTO procedures to address:</p> <ul style="list-style-type: none"> • New machine, equipment or process acquisition • Changes to existing machines, equipment or processes • Correction of identified hazardous energy control improvements that may be generated
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3. Outside Service or Contractor

Responsibilities FCX operations personnel and outside service or contractor personnel shall each designate a representative responsible for determining their relationship, responsibilities and obligations regarding hazardous energy control prior to starting work or providing services.

Communication Protection for all individuals who could be exposed to hazardous energy within the facility must be mutually understood, communicated and agreed upon between the parties.

Coordination External service organizations and contractor programs shall be coordinated with the site hazardous energy control program when there is integration of job tasks.

4. Energy Isolation

Each operating site shall establish a written program for hazardous energy control detailing the requirements for Lockout/Tagout/Tryout.

Elements of Energy Control

	Shall include actions in the following sequence:
1	Authorized Individuals shall understand the applicable procedures, acquire the necessary protective materials, identify notification requirements and assess consequences of the shutdown.
2	Personnel affected by the shutdown of the machine, equipment or process shall be notified prior to the application and after the removal of lockout/tagout devices.
3	The machine, equipment or process shall be de-energized or shut down using the established hazardous energy control procedures.
4	A Qualified Individual(s) shall operate the switch, valve or other energy isolating devices so the energy source(s) (electrical, mechanical, hydraulic, and other) is disconnected or isolated from the equipment.
5	Each Authorized Individual or Energy Control Coordinator (ECC) shall place their personal lock and tag on each energy isolating device or the multiple lockout devices, which controls the energy source(s) to the area in which the individual is working. Each lock will be accompanied by an approved tag.
6	All potentially hazardous stored, residual or potential energy will be relieved, disconnected, restrained or otherwise controlled.
7	Prior to work on machines, equipment or processes, the Authorized Individual or ECC shall verify all hazardous energy source are isolated or de-energized.
8	When a multiple lockout device is in use the Authorized Individual shall make contact with the ECC prior to performing work to verify lockout points and tryout.

Restoring Equipment to Service

1	Prior to returning to service, the work area will be inspected by the Authorized Individual or ECC to ensure that nonessential items have been removed, that the machine, equipment or process is operationally intact, all safety equipment is properly installed, and all personnel are in a safe location.
2	After the inspection is complete, each individual will remove their lock(s).
3	The ECC shall remove their lock(s) from the isolation device(s) and the Authorized Individual or ECC will notify operations the equipment is released for service.
4	A Qualified Individual shall restore energy to the equipment.

5. Lock and Tag the Energy Source(s)

General Requirements	Each individual shall place their personal lock and tag on all energy isolating devices or the multiple lockout device(s), which controls the energy source(s) to the area in which the individual is working. Each lock will be accompanied by an approved tag.
Equipment Design Requirements	<p>Machines, equipment or processes shall be designed, manufactured, supplied and installed with energy isolating devices. Energy isolating devices shall be accessible and, when practical, be conveniently located to facilitate the application of lockout devices during servicing and maintenance.</p> <p>Note: Energy isolating devices should be at the primary source, such as the main breaker.</p> <p>All energy isolating devices shall be adequately labeled or marked unless they are located and arranged so that their purpose is clearly evident. Identification shall include the following:</p> <ul style="list-style-type: none"> • Machine, equipment or process supplied • Energy type and magnitude
Procedures Involving More Than One Person	<p>If more than one individual is required to lockout/ tagout/tryout equipment, each person shall place his/her own personal lockout device on the energy isolating device(s). When an energy isolating device cannot accept multiple locks, a multiple locking device or lockbox may be used.</p> <p>When multiple locking devices are required, the shank of the lock shall not be attached to the shank of another lock.</p>
Complex/ Group LOTOTO (ECC Utilization)	<p>An Energy Control Coordinator (ECC) can be used when the Authorized Individuals are not able to apply their lock and tag directly to the energy isolating device(s). Examples include but are not limited to when:</p> <ul style="list-style-type: none"> • Multiple energy isolating devices are in use • Multiple Authorized Individuals are involved • The period of energy isolation is extended • The energy isolating device(s) is relatively inaccessible • There is interdependence and interrelationship of the system components

The ECC shall be an Authorized Individual selected by supervision having technical and working knowledge of the equipment being isolated, and will be responsible for:

- Ensuring personal protection for all Affected Individuals
- The lockout/tagout of each energy isolating device through the use of ECC lock(s)/tag(s)
- Providing a single location or device that allows each member of the group to apply his/her individually controlled lock or tag.
- Providing verification of energy isolation (tryout)

**Shift or
Personnel
Change**

Specific procedures must be utilized during shift or personnel changes to ensure the continuity of lockout/tagout protection, including a provision for the orderly transfer of lockout/tagout device protection between off going and oncoming Authorized Individuals.

During a shift or personnel change an “ECC” lock may be used to maintain the integrity of the lockout between Authorized Individuals.

**Non-Routine
Lockout/
Tagout Device
Removal**

When the Authorized Individual is not available to remove the lockout device, or the owner of a lockout device that has been placed cannot be identified, then that device may be removed provided the site’s energy control program has specific procedures and training for such removal.

The non-routine lock removal process shall ensure that:

- All reasonable efforts have been made by a member of management to contact the individual of the pending lock removal and determine why the equipment was locked out
- If the lock’s owner cannot be notified or identified, the Area Supervisor, a Qualified Individual and a Safety Representative shall verify that a thorough inspection has been completed ensuring that the machine and/or equipment is safe to re-energize
- A Non-Routine Lock Removal Authorization Form is completed and signed by the Area Supervisor requesting the lock removal (An example of a Non-Routine Lock Removal Authorization Form is located in Appendix A.)
- The individual has been informed, prior to resuming work at that facility, that his/her lockout/ tagout device has been removed

6. Protective Materials and Hardware

Lockout Tags	<p>Lockout Tags shall:</p> <ul style="list-style-type: none"> • Be capable of withstanding the environment they are exposed to and remain legible • Be standardized in at least color, shape, size or specific markings, as well as print and format • Warn against hazardous conditions if the machine or equipment is energized and shall include a “Danger” warning and legend such as: “Do Not Start; Open, Close, Energize or Operate” • Have a means of attachment that is substantial enough to prevent inadvertent or accidental removal and must withstand a 50 lb. pulling force • Include a method of identifying the individual who installed the lockout device
Personal Lockout Locks	<p>Employees will be provided with a personal lock(s), which will only be used to lock out equipment, or processes to control energy. When these lock(s) are placed, the single key(s) must be under the exclusive control of the employee performing servicing and/or maintenance.</p> <p>Each individual shall remove his/her own lock and tag. Personal locks shall be removed when the Authorized Individual is assigned to another task, leaves at the end of the shift, or the work is completed unless the removal of the lock exposes others to a hazard.</p> <p>Note: The only exception to this is that the ECC’s personal lock shall be allowed to remain in place on the lockbox until the job is completed.</p> <p>Before commencing work at the beginning of each shift each authorized individual has the right to verify that all energy sources are safely controlled.</p> <p>Each lock shall be accompanied by an approved tag and be standardized within the facility in at least one of the following criteria: color, shape or size.</p>
Out of Service Locks and Tags	<p>Out of Service locks and tags are applied when equipment is deemed unsafe and placed in an out of service status for business or production purposes.</p> <p>Out of Service locks and/or tags shall be visibly different from LOTOTO locks and/or tags.</p> <p>Out of Service lock(s) will NOT be used during service or maintenance of equipment (i.e., LOTOTO applications).</p>

ECC Locks/Tags ECC locks and tags are applied to energy isolation devices by the ECC to prevent energization when the equipment is not ready or will be out of service for an extended duration.

This lock or set of lock(s) will be single keyed and will be placed, transferred, or removed by the designated ECC.

Each lock shall be accompanied by an approved tag and be standardized within the facility in at least one of the following criteria: color, shape or size.

Tags shall also be standardized as follows:

- Print and format
- Labeled “ECC” and be secured to the ECC lock
- Identification of the individual who installed the lockout device

7. LOTOTO Auditing and Training Requirement

Training Requirements	<p>Each FCX operating site shall be responsible for informing all personnel regarding the provisions of the hazardous energy control program to an appropriate level.</p> <p>Each site shall provide initial training for all employees that defines the purpose and function of the energy control program. Retraining will be provided whenever there is a change in job assignments, a change in machines, equipment or processes that present a new hazard, or when there is a change in energy control procedures.</p> <p>Each site shall ensure individuals performing LOTOTO receive appropriate training that includes:</p> <ul style="list-style-type: none"> • Changes in the program • Review of LOTOTO incidents • LOTOTO auditing results <p>Each FCX operating site shall evaluate employees understanding for the level of hazard exposures they may encounter, through written or oral evaluation. An assessment of the effectiveness of the training shall be conducted periodically.</p>
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Auditing Requirements	<p>A documented audit shall be conducted at least annually by a Qualified Individual and shall cover at least one LOTOTO in progress along with the procedural details.</p> <p>The audit shall be designed to correct deficiencies in the established LOTOTO procedure or in employee understanding through retraining</p>
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8. Remote/Noncontiguous Locations

If this method is utilized, the requirements in this section must be met and an exemption form must be completed as outlined in Section 10.

Remote/ Noncontiguous Locations

Where isolation devices are in a remote or noncontiguous location, written procedures shall be used in conjunction with written authorizations.

Authorized Individuals performing the work shall verify the isolation and de-energization through direct communication with personnel designated in the procedure to perform the LOTOTO.

Equivalent protection shall be provided to all Affected Individuals that meets the intent of this policy.

Examples of where this may apply: a pipeline with widely spaced pump stations or electric power transmission and distribution stations.

9. Alternative Methods of Control

If this method is utilized, the requirements in this section must be met and an exemption form must be completed as outlined in Section 10.

Minor Servicing Work

This policy does not cover minor tool changes, adjustments and other minor servicing activities as long as:

- Alternative measures are used which provide effective protection
- Work takes place during normal production operations
- Work is routine and repetitive
- Work is integral to the use of the equipment for production

Risk Assessment Of Controls

An alternative method of control shall be used with the selection of control methods based on a risk assessment of the machine, equipment, or process. The alternative method shall have detailed procedures developed and documented for the control of hazardous energy.

Risk assessment for the alternative method chosen shall include the following:

- Identification of the tasks (including foreseeable misuse) and related hazards
- Qualitative estimation of exposure and severity to determine the level of risk
- Assessment and evaluation of the risk

- Identification of potential control actions considered to reduce the risk of each hazard
- Identification of control actions selected as the best protective alternative
- Verification of the effectiveness of the selected alternative
- Documentation of the risk assessment process

Process of Selection

A hierarchical process shall be employed in the selection of alternative control methodologies in the following order of preference:

- Elimination of the hazard through design
- Engineered safeguards
- Warning and alerting techniques
- Administrative controls (such as safe work procedures, practices, and training)
- Personal protective equipment

10. Exemption Process

Periodically there may be special circumstances that do not allow all aspects of this policy to be completely followed.

Exemption Policy	Where this policy cannot be followed, for both routine and non-routine work, an Exemption Form must be completed, approved and kept on file with an SOP or other work procedure established for future work.
Exemption Form	The Exemption Form is found in the FCX-Global Significant Risk Exemption Process and must be completed by the area supervisor or employees.
Justification and Safety Controls	An engineer or other Qualified Individual must review the work to be performed, provide justification for the exemption and give alternate safety controls to minimize or eliminate the risk.
Exemption Approval	The Division or Area Manager must then approve the exemption before the work can be completed.

11. Definitions

Affected Individual	An employee whose job requires them to operate or use a machine or piece of equipment on which servicing or maintenance being performed under lockout/tagout/tryout (LOTOTO) , or whose job requires them to work in an area in which such servicing or maintenance is being performed.
Authorized Individual	An employee who locks and tags out on an isolation device for machines or equipment in order to perform servicing or maintenance on that machine or equipment. An Affected Individual becomes an Authorized Individual when that employee’s duties include performing servicing or maintenance.
Energy Control Coordinator (ECC)	An Authorized Individual selected by supervision having technical and working knowledge of the equipment being isolated. The ECC requests the qualified craft representatives necessary to isolate energy sources. The ECC is charged with the overall responsibility of the energy isolation to ensure that all energy sources are identified, controlled, locked, tagged and tried out with the assistance of the Qualified Individual. An ECC may be a Qualified Individual.
Energy Isolating Device	A mechanical device that physically prevents the transmission or release of energy, including but not limited to the following: A manually operated circuit breaker; a disconnect switch; a manually operated switch by which conductors of a circuit can be disconnected from all ungrounded supply conductors; a line valve; a block; and any similar device used to block or isolate energy. Push buttons, emergency stop buttons, selector switches, control circuit type devices, and disconnect switches where poles can be operated independently are not energy isolating devices.
Energy Source	Requires LOTOTO application for its control. Including electrical (residual), mechanical, hydraulic, pneumatic, chemical, thermal, or other potential energies capable of causing harm to employees, damage to property, and process loss.
Hazardous Energy	Any electrical, mechanical, hydraulic, pneumatic, chemical, nuclear, thermal, gravity or other energy that could cause injury to personnel.
Lockout, Tagout, Tryout (LOTOTO)	An approved method of isolating potentially hazardous energy sources required whenever servicing, maintenance, modification, or installation activities are to be performed on de-energized equipment, machines or processes in which unexpected energizing, start-up or release of stored energy has the potential of causing injury to people, damage to property, or loss to process.

Lockout Device	A device that utilizes a positive means such as a lock that secures an energy isolating device in a safe position that prevents the energization of a machine, equipment or process.
Lockout/Tagout	The placement of a lock and tag on the energy isolating device in accordance with an established procedure, indicating that the energy isolating device shall not be operated until the removal of the lock/tag in accordance with an established procedure.
Qualified Individual	<p>An employee that through training and experience is familiar with the operation and safety hazards of the machinery or equipment being worked on.</p> <p>A Qualified Individual also:</p> <ul style="list-style-type: none">• Is capable of recognizing hazards associated with the work• Is capable of avoiding hazards associated with the work• Is approved to perform energy isolation and dissipation• Is approved to perform energy measurement/testing and/or tryout
Servicing and/or Maintenance	Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines or equipment. These activities include lubrication, cleaning or unjamming of machines or equipment and making adjustments or tool changes, where the employee may be exposed to the unexpected energization or startup of the equipment or release of hazardous energy.

12. References

References	MSHA 30 CFR 56.12016 and 12017 OSHA 29 CFR 1910.147 ANSI/ASSE Z244.1-2003 (R2008) 2012 NFPA 70E
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13. Revision History

2009 Rev 1	Initial Release	
2014 Rev 2	This update includes	Changes to formatting Section 2: Added Management of Change (MOC) Section 4: Added the term Energy Control Coordinator (ECC) Section 5: Added Non-Routine Lock Removal Process Section 6: Added Out of Service Locks and Tags Section 6: Added Note: Locks and tags shall be standardized within the facility in at least one of the following criteria: color, shape or size Section 6: Added Note: Tags, print and format shall be standardized Section 7: Changed Auditing Requirements Section 10: Added Exemption Process Section 11: Added more definitions Section 11: Added statement which prohibits push buttons, e-stops and other control circuit type devices from being used as Energy Isolating Devices. Attached Appendix A: Non Routine Lock Removal Sample Form

Appendix A – Example of a Non-Routine Lock Removal Form

Non-Routine Lock Removal Form

Equipment:		Date:		Time:	
Individual Contacted					
Check list					
<input type="checkbox"/>	Check the Energy Control Coordinator Form, lock and tags for information				
<input type="checkbox"/>	Perform a thorough inspection of the equipment				
<input type="checkbox"/>	Verify that all grounds and blocking devices have been removed				
<input type="checkbox"/>	Verify that tools and material are clear				
<input type="checkbox"/>	Verify that the equipment is operable				
<input type="checkbox"/>	Verify that all guards have been re-installed				
<input type="checkbox"/>	Verify that all personnel are clear				
Summary					
Cause:					
Steps:					
Approved By					
Supervisor					
Individual Not Contacted or Lock Not Identified					
Check List					
<input type="checkbox"/>	Check the Energy Control Coordinator Form, lock and tags for information				
<input type="checkbox"/>	Perform a thorough inspection of the equipment				
<input type="checkbox"/>	Verify that all grounds and blocking devices have been removed				
<input type="checkbox"/>	Verify that tools and material are clear				
<input type="checkbox"/>	Verify that the equipment is operable				
<input type="checkbox"/>	Verify that all guards have been re-installed				
<input type="checkbox"/>	Verify that all personnel are clear				
Summary					
Cause:					
Steps:					
Investigators					
Safety Representative					
Area Supervisor(s)					
Qualified Individual					
Energy Control Coordinator					
Notification					
<input type="checkbox"/>	Employee has been notified of the removal of their lockout/tag-out device before returning to work				
Provide document to area superintendent					