



# Control of Hazardous Energy Policy

Health and Safety FCX-HS04 | Release Date 8/5/2019

## POTENTIAL FATAL RISKS

Uncontrolled Release of Energy

## CRITICAL CONTROLS

Blocking for Maintenance Work  
 Guards, Barriers and Barricades  
 Energy Isolation/LOTOTO  
 Pipe Management  
 Hose Coupling Locking Systems  
 Pipe/Hose/Equip. Mechanical Integrity  
 Relief Valves  
 Tensioned Lines Management  
 Tire Management

## POTENTIAL ENERGY SOURCES

Atmospheric	Chemical
Electrical	Electromagnetic
Gravitational	Hydraulic
Kinetic	Mechanical
Pneumatic	Residual
Stored	Thermal

## FORMS AND SUPPLEMENTS

LOTOTO Technical Supplement  
 ECC Form  
 Energized Work Permit  
 Non-Routine Lock Removal form

## TRAINING REQUIREMENTS

Initial  
 Annual Refresher  
 Task training to written procedures  
 New equipment/processes  
 Remedial as necessary

## POLICY

### OVERVIEW

Identify and isolate, eliminate or control all potential sources of energy when there is the possibility of exposure while performing work (i.e. inspection, installation, calibration, maintenance, etc.). Verify that controls are effective. This policy applies to all employees and contractors on FCX operating sites.

### ACTIONS TO STAY SAFE

1. Plan the activity to be performed
2. Identify the potential sources of hazardous energy
3. Eliminate, isolate or control each source
4. Dissipate residual energy
5. Verify controls are effective and tryout

Follow hazardous energy control procedures for each piece of equipment, system or process. Procedures must include steps for verification of control.

Stop the job when scope of work changes or controls are ineffective.

Isolate at the source whenever possible, or use other methods to ensure zero energy (i.e. double block/bleed, blind, air gap, blocking, etc.).

#### Plan:

- Understand the full scope of the work and all tasks associated.
- Identify all personnel roles and responsibilities, tools, hazards, isolation points, isolation devices, prior to starting work.
- Consult SOPs or JSAs prior to performing work.

#### Identify Sources:

- Use most recent drawings, prints, etc. for identifying sources of hazardous energy.
- Ensure lines/breakers/valves etc. are properly labeled/identified; contact responsible parties or consult relevant documentation.

#### Eliminate, Isolate and Control:

- Verify that the correct isolation points are isolated for each type of hazardous energy identified.
- Use appropriate devices for the source.
- Follow the de-energization procedures for the specific task or equipment for de-energization

#### Dissipate Residual Energy:

- When zero energy cannot be accomplished, install controls to reduce or eliminate exposure to the energy source. Complete Energized Work Permit.

#### Verify Controls and Tryout:

- Ensure zero energy and attempt to restart the equipment.
- Do not confuse process interlocks with energy isolation or use for tryout.
- ECC or Authorized Individual and Project Manager or delegate must visually confirm non-routine energy isolation prior to performing work in the absence of SOPs.

## **Energized Work (Commissioning, Testing, Calibrating, Troubleshooting, etc.)**

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- Hazardous energy control procedures may not apply, but complete a documented safety analysis/risk assessment.
- Understand the process for start-up and potential for exposure to self and others.
- Develop a communication plan for these activities.
- Evaluate new controls and verify existing controls.
- When guards and barriers are removed (or interlocks bypassed) for troubleshooting/testing and calibration, other controls must be in place to prevent exposure.
- When work is performed on energized equipment, follow specific documented guidelines and procedures.
- When other bypass devices are installed, and equipment is energized while performing work, follow specific documented guidelines and procedures for installation, use and removal of bypass devices.
- Conduct pre-operational inspections prior to start up.
- When testing or positioning machines or equipment:
  - Clear the area of unnecessary personnel, tools and materials
  - Install flagging or barricading, reference FCX-HS19
  - Remove energy control devices as specified in procedures
  - Energize and proceed with testing or positioning
- Prior to performing additional maintenance, de-energize, isolate from potential sources and reapply energy control devices

### **ENERGIZED WORK PERMIT**

- When possible exposure to hazardous energy exists, but the equipment must remain energized to perform work, complete an Energized Work Permit.
- For routine work, where an SOP exists, the Energized Work Permit is valid for one year, and should be kept with the SOP as a part of the record. The SOP must be reviewed prior to performing the work.
- Electrical troubleshooting and testing is excluded from the permit requirements, reference the Electrical Safety Policy TS for Energized Electrical Work.
- If there is no Superintendent on site, the delegate may authorize the work in his/her place.

## **Shift Change**

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- Procedures for shift change must be documented.
- Ensure integrity of isolation devices prior to turn-over.
- Use ECC procedures if necessary.
- Remove personal locks and tags if work is complete and equipment is in a safe condition.

## **Access and Verification**

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- If an Authorized Individual joins after verification of isolation has taken place, they must contact the other Authorized Individuals or ECC (if used) to confirm equipment is isolated and has been verified/tested.
- All Authorized Individuals retain the right to verify isolation by clearing the area and attempting to start the equipment.
- When access to isolation devices is limited (e.g. inside a restricted area), Authorized Individuals will be escorted by a Qualified Individual, or the ECC process will be used.

## **Non-Routine/Emergency Work**

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- During emergency work and when an SOP is not available, planning for energy control must include:
  - an inventory of identified hazardous energy sources,
  - determination of isolation/control devices,
  - assignment of responsible persons, including Qualified Individuals and ECC if necessary,
  - field verification of the application of the control devices.
- Document this information and evidence of the verification. *Documentation may be a JSA if there is not existing documentation in place.*



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**FREEPORT-**  
**McMORAN**

# Energy Control Coordinator (ECC) Form

## Control of Hazardous Energy | FCX-HS04

This form must stay with the job for the duration of the job and can only be removed during ECC transfer or after the job is complete. Replace only the **Individual Lockout Roster** after each shift.

ECC NAME	PRIMARY SYSTEM	
ECC CONTACT INFO	START DATE	END DATE
ECC SUPERVISOR	LOCK BOX IDENTIFIER	
REASON FOR LOTOTO		

**\*\*\*\*\* WARNING: If the equipment is NOT listed here, it is not locked out! \*\*\*\*\***

EQUIPMENT					
List all Equipment Secured by the ECC device(s) including ID numbers	Isolated & Verified (ECC Initials)	Name of the Qualified Individual who ISOLATED the energy source(s)	Date Lock APPLIED	Name of the Qualified Individual who RELEASED/DISSIPATED the energy source(s)	Date Lock REMOVED
			/ /		/ /
			/ /		/ /
			/ /		/ /
			/ /		/ /
			/ /		/ /
			/ /		/ /
			/ /		/ /
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			/ /		/ /
			/ /		/ /

ECC TRANSFER (IF APPLICABLE. SEE PAGE 2 FOR DETAILS)						
ECC Name	Shift	Date		ECC Name	Shift	Date
1.		/ /		6.		/ /
2.		/ /		7.		/ /
3.		/ /		8.		/ /
4.		/ /		9.		/ /
5.		/ /		10.		/ /

ECC LOCKOUT RESPONSIBILITIES	
When utilizing an ECC/lock box each step below must be completed and initialed by the original ECC during the equipment lockout process. Initial below.	
	Does the ECC understand the scope of work to be completed?
	Have all of the hazardous energy sources, related to the work being conducted, been identified and isolated or controlled according to proper procedures?
	Has a lock and ECC tag been placed on all the energy isolation points and is there a legible name printed on each one?
	Has all stored/residual energy been released?
	Has the Qualified Individual/ECC verified the effectiveness of controls (Try Out) on the equipment and ensured all stored energy is released?
	Have ALL the energy isolation keys been placed in the lock box?
	Has the ECC placed a lock and tag indicating their name and labeled as ECC on the lock box?

INDIVIDUAL LOCKOUT RESPONSIBILITIES
Only after the above steps have been completed shall any individual attempt to join the LOTOTO. This includes the ECC's personal lock if the ECC is going to perform work. An individual must apply their personal lock and tag to the group lockout device and read and understand the ECC form. Make contact with the ECC or project supervisor/lead before placing locks. Before signing read the form to ensure that the equipment you are working on is identified.

**ECC TRANSFER (IF APPLICABLE)**

ECC Transfer signature area is on page 1.

The incoming ECC will place their name on the ECC Transfer only after Outgoing and Incoming ECC have verbally confirm details of the work and lockout, and conduct a walk-down of the lockout devices in use if necessary.

Incoming ECC will assume responsibility for the lockout process once they take possession of the key and put their correct information on the form. The Outgoing ECC will remove their personal lock from the group lockout device before leaving the area.

The ECC form will be kept at the lock box unless ECC is actively being transferred. No new Authorized Individuals will join the LOTOTO in process until the ECC transfer is complete and form has been returned.

Work can continue by Authorized Individuals who have already signed the Individual Lockout Roster while ECC transfer is in process.

**ECC RETURN TO SERVICE RESPONSIBILITIES**

When utilizing an ECC each step below must be completed and initialed by the current ECC during the equipment release process. Initial below.

	Prior to returning to service, inspect the area for persons, tools and equipment that must be removed. Ensure all guards and safety devices have been installed and equipment is operationally intact.
	All personal lock(s) have been removed from the lockbox.
	Operations and Affected Individuals have been notified by the ECC that the equipment is to be released for service.
	The ECC locks removed and Qualified Individuals have restored energy to the equipment.

**INDIVIDUAL LOCKOUT ROSTER**

**WARNING: If the equipment is NOT listed on the first page of the ECC Form, it is not locked out!**

Printed Name	Date	Time Personal Lock APPLIED	Signature (upon lock REMOVAL)	Time Personal Lock REMOVED
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
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	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm

INDIVIDUAL LOCKOUT ROSTER CONTINUANCE SHEET

**WARNING: If the equipment is NOT listed on the first page of the ECC Form, it is not locked out!**

Printed Name	Date	Time Personal Lock APPLIED	Signature (upon lock REMOVAL)	Time Personal Lock REMOVED
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
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	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm
	/ /	: am/pm		: am/pm





# Technical Supplement

Control of Hazardous Energy – LOTOTO | FCX-HSX04 | Release Date 08/05/2019

## OVERVIEW

Lockout Tagout Tryout (LOTOTO) is the preferred method of energy control in most situations. Only Qualified Individuals may perform hazardous energy isolation. Each Authorized Individual will place their personal lock on each energy isolation device or group lockout device. When Authorized Individuals are not able to apply locks and tag to the energy-isolating device, an (Energy Control Coordinator/Process) ECC will be used. Cord and plug equipment is excluded if plug is under direct control. Follow non-routine lock removal procedures for abandoned locks. Reference FCX-HS03 Electrical Safety, for de-energization and grounding information.

## EFFECTIVE LOTOTO

### LOTOTO Process

1. Plan the work
  - Understand the scope of work
  - Identify sources of hazardous energy
  - Identify Qualified Individuals
  - Select appropriate controls
2. Notify
  - Equipment/system owner
  - Affected individuals
3. Qualified Individual shutdown equipment/systems
4. Isolate/Eliminate hazardous energy sources
5. Lock and Tag
  - Individual/Group
  - ECC process
6. Release stored/residual energy
7. Verify effectiveness of controls
  - Verify zero energy from all sources **and**
  - Tryout- attempt to restart all locked aspects of the equipment

### Restarting Equipment/Systems

1. Inspect the area
  - Persons, tools and equipment have been removed
  - Guards and other safety devices have been reinstalled
  - Equipment is operationally intact
2. Remove all locks
3. Notify
  - Equipment/system owner
  - Affected individuals
4. Qualified Individual restore energy according to procedures

## LOCKS AND TAGS

### Locks (LOTOTO)

- Uniquely identifiable for energy control
- Single keyed
- Only used for energy control
- Standardized within the facility
- Not easily defeated
- ECC locks will be single keyed

### Tags

- Withstand 50lbs (23 kg) of force
- Identify the individual by first and last name
- Include appropriate contact info/method
- ECC tags will say ECC
- Legible
- Withstand exposure to conditions (acid, weather, etc.)
- Include a warning statement
- Standardized within the facility

### Out of Service Locks and Tags

- Never used for the control of hazardous energy
- Applied when equipment is deemed unsafe
- Used to protect machines and equipment from damage due to accidental start-up
- Visibly different from LOTOTO
- Tags will have “out of service” or similar message

## ROLES AND RESPONSIBILITIES

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<b>Authorized Individual</b>	<b>Affected Individual</b>	<b>Qualified Individual</b>
<ul style="list-style-type: none"> <li>• Individual who locks and tags isolation devices for equipment to perform service or maintenance.</li> <li>• Performs work on the equipment that is locked out.</li> <li>• Must place their own locks and tags.</li> <li>• Must maintain control of the key to their lock.</li> <li>• Responsible for returning equipment to serviceable condition prior to removing any energy isolation device or lock.</li> <li>• Support ECC as needed.</li> </ul>	<ul style="list-style-type: none"> <li>• Individual whose job requires them to use equipment that is being serviced or maintained under LOTOTO.</li> <li>• Do not perform work on the equipment that is locked out.</li> <li>• Includes personnel in the area who are not performing work on the equipment.</li> </ul>	<ul style="list-style-type: none"> <li>• Individual who may or may not be working on the lock out, but has the qualifications to perform energy isolation for the specific system being de-energized.</li> <li>• Ensure safe procedures for shutdown, isolation, and energy release are followed.</li> <li>• Responsible for verifying effectiveness of energy isolation and conducting tryout.</li> <li>• Support ECC as needed.</li> </ul>

**Energy Control Coordinator (ECC) Process**

Each person has the right and responsibility to verify control of hazardous energy with ECC, Qualified Individuals or supervision. When an Authorized Individual joins a group lockout in process, they must apply their personal locks and tags to the group lockout device and read and understand the ECC form and make contact with the ECC. The ECC, along with the Qualified Individual isolates and locks all hazardous energy sources using ECC locks and tags. ECC keys are placed in a group lockout device, along with another ECC lock and tag. Only the ECC key for the group lockout device may be handed over using specific procedures for shift changes. The ECC lock is not the same as the personal lock and the ECC must still apply their personal lock and tag to the group lockout device if they are performing work on the system/equipment. Multiple ECCs may be necessary for complex work.

**Energy Control Coordinator Will:**

Be assigned by supervision and have full responsibility for the lockout process.  
 Be trained and competent in the ECC process and have a working knowledge of the system being isolated.  
 Lead hazardous energy source identification process with support from Qualified and Authorized Individuals.  
 Understand the plan for the shutdown and hazardous energy control.  
 Manage interactions with other affected groups/individuals.  
 Identify Qualified Individuals to conduct Control of Hazardous Energy, and understand the role of the ECC and others.  
 Maintain a list of energy control points and responsible parties, Qualified and Authorized Individuals.  
 Maintain integrity of hazardous energy control with support from Qualified and Authorized Individuals  
 Manage shift changes using specific, documented procedures.  
 Release system back to operations with support from Qualified and Authorized Individuals.  
 Place the first lock on, and remove the last lock from the group lockout device.

**Energy Control Coordinator Transfers:**

Incoming ECC will add their information to the ECC form.  
 Outgoing and Incoming ECC will verbally confirm details of the work and lockout, and may visually confirm lockout devices in use.  
 Incoming ECC will assume responsibility of the lockout process once they take possession of the key, and put their contact information on the ECC tag.  
 Outgoing ECC will remove their personal lock from the group lockout device before leaving the area.  
 The ECC form will be kept with the lockbox unless ECC is actively being transferred.  
 No new Authorized individuals will join the LOTOTO in process until the ECC transfer is complete and form has been returned.  
 Work can continue by Authorized Individuals who have already signed the Individual Lockout Roster while ECC transfer is in process.

**Non-Routine Lock Removal**

When the Authorized Individual is not available to remove a device or the owner of a lock out device cannot be identified, that device may be removed. Always follow the non-routine lock removal form.