lockout or tagout system.

- *c.* Affected employees shall be aware of lockout or tagout procedures used to prevent unexpected start-ups.
- *d.* Only authorized persons shall operate hazardous energy-isolating devices and place locks or tags on controls to prevent unexpected start-ups.
- *e.* Other employees who work in the area where lockout or tagout procedures are used shall be trained regarding their purpose and prohibited from attempting to restart machines or equipment that are locked or tagged out.
- B. System Utilization
 - 1. Preparation for Lockout or Tagout
 - *a.* All personnel affected by the intended lockout or tagout shall be notified by the supervisor or authorized employee before commencing any work.
 - *b.* A method shall be established to permit access to the equipment/process. This method should involve acknowledgement and release by the person(s) responsible for the equipment/process.
 - *c.* A pre-job plan shall be developed to insure appropriate lockout or tagout when the equipment/process complexity or nature and scope of work warrants (i.e., job objectives and involved equipment/process; estimated job duration; crafts involved; type, number and location of energy-isolating devices or methods, start-up provisions, etc.).
 - 2. Application of Lockout or Tagout
 - *a.* Use appropriate equipment/process shutdown procedure(s) to deactivate operating controls or return them to the neutral mode.
 - b. All involved energy-isolating devices or controls shall be operated/positioned in such a manner as to isolate the equipment/process from hazardous energy source(s).
 - *c.* Lock and tag shall be applied to each energy-isolating device or control by authorized employees.
 - 1) Lockout fixtures and locks shall be attached in such a manner as to hold the energy-isolating device(s) in an isolation position.
 - 2) Employee tags shall be completed by the applier and attached to the energy-isolating device(s) when required.
 - *d.* After lockout or tagout application and prior to commencement of work, one or more of the following actions shall be taken:
 - 1) Operate the equipment/process controls (push buttons, switches, etc.) to verify that energy isolation has been accomplished. Controls must be deactivated or returned to the neutral mode after test.
 - 2) Check the equipment/process by use of test instruments and/or visual inspection to verify that energy isolation has been accomplished.
 - *e.* The equipment/process shall be examined to detect any residual energy. If detected, action must be taken to relieve or restrain the hazardous stored energy.

- 3. Release from Lockout or Tagout
 - *a.* Each lock or tag shall be removed by the authorized person who applied it prior to leaving the job.
 - 1) A procedure shall be developed to deal with instances where employees have left the jobsite without clearing their personal lock or tag.
 - *b.* The person responsible for the equipment/process (affected employee) shall be notified when the work is complete and the overall lockout or tagout has been cleared.
 - 1) Before equipment/process energization, visual inspection of the work area should be made to insure that all personnel are in the clear and that all nonessential items, including tools, have been removed and components are operationally intact.
- 4. Specific Procedures

Each facility will develop specific hazardous energy isolation, de-energization and verification procedures for major machines/equipment/process components/utilities, etc. A "Lockout or Tagout Checklist for Energy Isolation or Job Safety Analysis" is suitable for this requirement.

- C. Special Lockout or Tagout Situations
 - 1. Lockout or Tagout Interruption (Energized Testing)

In situations where the energy-isolating device(s) is locked or tagged and there is a need for testing or positioning of the equipment/process, the following sequence shall apply:

- a. Clear equipment/process of tools and materials.
- b. Clear personnel.
- *c.* Clear the energy-isolating device(s) of locks or tags according to established procedure.
- d. Proceed with test.
- *e.* De-energize and relock or retag energy-isolating device(s)/methods to continue the work.
- f. Operate controls, etc., to verify energy isolation.
- 2. Exposure of Contractors
 - *a.* Company and outside employers (contractors, etc.) shall inform each other of their respective lockout or tagout procedures.
 - *b.* Each facility shall insure that its employees understand and comply with the requirements of the outside employer's or mutually agreed upon energy control procedures.
- 3. Multiple Personnel Protection

For major process/equipment overhaul, rebuilds, etc., which require crew, craft, department or other group lockout or tagout, a system is required that affords employees a level of protection equivalent to that provided by personal lockout or tagout.

4. High Voltage Work

Special written procedures shall be developed to describe the lockout or tagout measures necessary when employees are required to work on high voltage circuits or equipment (above 600 volts).

5. Shift Change

Facilities shall develop specific written procedures to accommodate those situations where it is necessary to continue the current lockout or tagout of the equipment/process into subsequent shifts.

VI. Alternative Methods

Equipment/process tasks such as jogging, threading coil/stock, etc. may necessitate employee activity under energized conditions. Each such task must be assessed to determine what safeguarding techniques are effective to minimize the risk exposure to the hazards to an acceptable. (See V.A.3.b.)

VII. Education and Training

- A. Training shall be provided prior to assignment to insure that employees understand the purpose and function of the plant lockout or tagout program and that the knowledge and skills required for the safe application, use and removal of energy controls are acquired. The training shall include the essential elements of §1910.147 and the following:
 - 1. Each affected employee shall be instructed in the purpose and use of the energy control procedure.
 - 2. Each authorized employee shall receive training in the recognition of applicable hazardous energy sources; the type and magnitude of the energy available in the work place; the methods and means necessary for energy isolation and control; and the means of verification of control.
 - 3. Other employees whose work operations are or may be in an area where energy control procedures may be utilized shall be instructed about the procedure and about the prohibition relating to attempts to restart or re-energize machines or equipment which are locked out or tagged out.
- B. Retraining shall be provided annually to re-establish employee proficiency with control methods and procedures.
 - 1. Retraining shall be provided for all affected and authorized employees 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 the energy control procedures or revision of control methods.
 - 2. Additional retraining shall be conducted whenever periodic audits (see VIII, Management Controls) reveal or whenever supervisory observations give reason to believe that there are deviations from or inadequacies in the employee's knowledge or use of energy control procedures.
- C. Plant documentation shall certify that employee training has been accomplished and is being kept up-to-date. The certification shall contain each employee's name, clock number and dates of training.

VIII. Management Controls

A. Each facility shall develop and document a formal compliance audit of the lockout or

tagout energy control procedure semiannually as a minimum to insure that employees are knowledgeable and utilize the designated procedures. The documentation 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.

- 1. An authorized management employee shall perform annual audits.
- 2. The amount of lockout or tagout auditing should adequately represent the size of the plant and number of authorized employees.
- 3. The audits shall be designed to correct any deviations or inadequacies observed.
- 4. Where lockout is used for energy control, the audit shall include a review between the inspector and each authorized employee of that employee's responsibilities under the energy control procedure being audited.
- 5. Where tagout is used for energy control, the audit shall include a review, between the inspector and each authorized and affected employee, of that employee's responsibilities under the energy control procedure being audited to insure that employees understand the limitations of a tagout system and their purpose in the energy control program.
- 6. Where tagout procedures are used, other employees whose work operations are or may be in the area shall be contacted by supervision to insure that they are aware of and understand the purpose of the procedures.

NOTE: If compliance with any element of this procedure is not practicable, effective protection shall be provided by an alternative method approved by the safety department.

Annex D Sample of a Lockout or Tagout Application Inspection Form

(from clause 6.5.2)

(Informative)

	LOCK/TAG/VERIFY PERIODIC INSPECTION					
Da	te:	Area	:			
Ins	Inspector(s):					
[]	[] Contractor	Crev	v/Team/Shift:			
Eq	uipment:					
Та	sk:					
Lo	ckout Task ID:	Lock	out Task Date:			
Au	thorized Employees: (Maintenance/Production	who v	works on the equipment)			
1.		Job	Position:			
2.		Job	Position:			
3.		Job	Position:			
4.		Job	Position:			
Aff	ected Employees: (Operators who work with th	ie equ	ipment)			
1.		Job	Position:			
2.	2. Job Position:					
3. Job Position:						
4. Job Position:						
En	Energy-Isolating Device (Check all that apply):					
	Electrical – Disconnect – Lock		Hydraulic – Stored Energy	/ – Lock		
	Electrical – Breaker Switch – Switch Device		Pneumatic – Ball valve.			
	Electrical – PLC – Lock		Process – Line - Break in	Line. Block in Line.		
	Mobile Equipment – Battery – Key Control		Mechanical – Mobile Equi	ipment – Blocking device		
1.	Was the location (affected personnel) notified	of wo	rk to be performed?	Y	N	NA
2.	. Have authorized employee's responsibilities been reviewed with them?			Y	N	NA
3.	3. Does a written Lockout Task Procedure exist for the task?			Y	Ν	NA
4.	If "Yes," was it followed?			Y	Ν	NA
5.	5. If "No" explain how it was determined what to lock out.		Y	Ν	NA	
6.	. Do authorized employees know where to find the Lockout Procedure?			Y	Ν	NA
7.	Is all necessary hardware available to operators? (locks/tags/lockboxes/)			Y	N	NA
8.	8. For equipment with a single isolation device: Was the isolation device properly identified?			Y	N	NA

9. Were the isolation devices properly identified on the Lockout Task Procedure?	Y	Ν	NA
10. Were equipment locks attached to the proper isolation device?	Y	Ν	NA
11. Were the correct number of equipment locks applied?	Y	Ν	NA
12. Did each authorized employee on the job have his or her personal lock and tag attached to the equipment or lockbox?	Y	Ν	NA
13. Was the proper information on the personal tag?	Y	Ν	NA
14. Was the Stop/Verification Tag* properly filled out and legible?	Y	Ν	NA
15. Was the bottom portion of the tag retained by the authorized person controlling the lockout?	Y	Ν	NA
16. Were the isolation device(s) tested to be sure they could not be moved to the unsafe or on position?	Y	Ν	NA
17. Were the machine start controls tested to be sure the machine or equipment could not start? (The location could be the control panel, start button, toggle, etc.)	Y	N	NA
18. Was the on/off switch returned to the off or safe position following the test?	Y	Ν	NA
19. Were the proper number of keys retained in the lock box?	Y	Ν	NA
20. Are all personal lock keys in possession (control) of everyone who locked out?	Y	Ν	NA
 21. Inspector's overall assessment: Did authorized employees understand their responsibilities under the energy control procedure being inspected? <i>Comments:</i> 	Y	N	NA
22. Were any deficiencies identified?	Y	N	NA
If Yes, were the identified deficiencies reviewed with all affected employees?	Y	Ν	NA
If Yes, signature of employees required below after the deficiencies and temporary control actions are resolved with employees.			
Signature of Inspector(s): Signature of Employees			
Temporary Control Actions:			

66

Place a copy of this form in the identified box in the process area or return to a member of the lock/tag/verify (LTV) committee or LTV champion. Copies of this inspection form must be retained for one year.

* If all four of the following conditions are met, a stop/verification tag is not required for a lockout. If any one of the four conditions change during the lockout, the requirements of stop/verification tag requirements apply.

- No more than two persons are being protected by the lockout.
- The person(s) being protected by the lockout do not leave the area while the lockout is in effect.
- The person(s) being protected by the lockout also perform the lockout.
- The duration of the lockout will not extend past the end of the current shift.

MOC Number:

Annex E Sample Management of Change Form

(from clause 6.6)

(Informative)

Machinery Management of Change

Facility Information (Osisin to sector this sector)

Facility information (Originator complete this section)					
Machine Name / ID#:	Location:				
Originator of this MOC:	Date:				

Reason for Request (check all that apply)

MOC Form

Modification of existing machine or system	Installation of new machine or system
Improved machine component isolation capability	Expansion / Renovation of Facility or Systems
Accident /Incident Investigation recommendation	Safety improvement suggestion

Description of requested Change(s): (attach additional pages if needed)

Safety Design Review (Safety management representative completes this section).

Technical Basis	Assessment	Next Action	
Are the changes consistent with company LOTO program and procedures? Is the change needed?	 Yes to both questions No to either question 	Yes- issue MOC # and forward MOC for preliminary engineering design. No – Attach explanation why this change should not be implemented and the basis for this decision.	
Is the change permanent or temporary?	Change is permanent	If change is temporary specify the start and end date for the change. If change lasts longer than two week a permanent MOC must be authorized. Start Date: End Date:	

Impact of Change on Safety and Health (Safety management representative completes this section)

Machine guarding	Provision of lockable control points	Emergency STOP accessibility
Personal Protective Gear	Access to control points	Other (list)

Technical Review and Management Approval

Does the proposed change(s) meet the requirements of the company LOTO compliance program and procedures and industry best practices for preventing the release of sources of hazardous energy?	Yes	If yes, proceed to design and implementation phase. If no, repeat the safety design review process.
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Date:

Safety Management or Plant Management signature indicates the Safety Design Review was completed and all recommendations resolved.

Title and Signature:

Page 1 of 2

Applicable		Document(s) and / or Safety Element(s)	Responsible Person	Date Completed	Document reference
🗌 Yes	🗌 No	Risk Assessment			
🗌 Yes	🗌 No	Training – normal operations			
🗌 Yes	🗌 No	Machine Specific LOTO Procedure			
🗌 Yes	🗌 No	Task specific LOTO sub-procedures			
🗌 Yes	🗌 No	Training – LOTO authorized personnel			
🚺 Yes	📃 No	Machine guarding evaluation			
🗌 Yes	🗌 No	Specialized LOTO devices needed			
🗌 Yes	No 🗌	Interlock or presence sensing device design validation			
🗌 Yes	🗌 No	Critical settings preservation considerations			
🗌 Yes	No No	Updating LOTO MOC Log book			
C Yes	🗌 No	Other Programs or Procedures:			

Machinery Management of Change

Ocumentation origination or updating requirements (Engineering completes this section)

Completed Safety Requirements (Safety management representative completes this section)

Applicable		Requirement	Responsible Person	Date Completed
🗌 Yes	🗌 No	Safety Design Review		
🗌 Yes	🗌 No	Pre-Startup Safety Review		
🗌 Yes	🗌 No	Operator Training (Operating Procedures)		
🗌 Yes	🗌 No	Authorized LOTO Training (Servicing and maintenance procedures)		
🗌 Yes	🔲 No	Specialized lock out devices on hand		
🗌 Yes	🚺 No	Electrical Safe Work Permit Required?		
🗌 Yes	🗌 No	Line Break Permit Required?		
Yes	📃 No	Confined Space Entry Required?		

Acknowledgement this Management of Change is Correct and Complete (Sign and Date)

Title:	Signature:	Date:
Facility Management		
Engineering/Maintenance		
Safety Management		
Other:		

Annex F General Lockout or Tagout Procedure

(from clause 7.2)

(Informative)

Purpose

The purpose of this procedure is to prevent harm to employees from unexpected start-up, energization or release of stored energy from machinery or processing during servicing or maintenance of equipment.

Scope

This standard specifies the minimum locking, tagging, clearing and verifying procedures required to prevent harm from start-up or release of hazardous energy.

Steps to Follow:

- **Step 1.** <u>Preparation For Shutdown</u> Employees authorized to lockout or tagout equipment shall identify the type and magnitude of the energy to be controlled, all hazards (including stored energy) and the method or means of controlling the energy. They shall also notify all affected persons in the area that the equipment will be locked or tagged out.
- **Step 2.** <u>Equipment Shutdown</u> The equipment shall be shut down by following established shutdown procedures.
- **Step 3.** Equipment Isolation Use of disconnect switches, line valves, blocks, blinds, removal of spools and capping of lines, etc. shall be used.
- **Step 4.** <u>Application of Lockout or Tagout Devices</u> Locks or tags shall be applied to the isolation device. Each employee working on the equipment shall be responsible for attaching their personal locks without exception.
- **Step 5.** <u>Stored Energy</u> After applying locks or tags to the energy isolation devices, all potentially hazardous stored or residual energy must be relieved, blocked, bled, restrained or rendered safe.
- **Step 6.** <u>Verification of Isolation</u> Prior to starting work, after isolation and locking or tagging energy sources, turn on (try) all start buttons and other activating controls on the equipment to make sure the equipment has been de-energized. Be sure to return all controls to the off or neutral position after trying to start.
- **Step 7.** <u>Release From Lockout or Tagout Control</u> Prior to restoring energy to the equipment, remove all tools, ensure all affected employees are clear and informed that energy to the equipment will be restored and guards are in place. Then all locks or tags can be removed and energy restored.

Specific Instructions:

- 1. No changes, adjustments or repairs that require shutting down the equipment will be made without proper authorization.
- 2. If more than one employee works on the same equipment, each person must attach their lock and tag.
- 3. When an employee is reassigned from a job, which is incomplete, and the equipment must of necessity remain locked out, the employee involved will notify their supervisor before removing their lock or tag. The supervisor will then lockout or tagout the