I. POLICY/SCOPE

A. It is the policy of the Quinnesec Mill to use lockout procedures as the preferred method of isolating machines or equipment from energy sources. Lockout shall be used for work on electrical or mechanical equipment that could start-up, move, or discharge chemicals, water, steam, or pressure (gas or fluid). This policy is applied throughout the mill by all affected members, contractors, and departments.

B. Lockout practices for fire system piping are covered by the Fire System Impairment Policy.

II. INTENT/PURPOSE

A. The purpose of this policy is to prevent injury from unexpected energizing, start-up, or release of stored energy. This policy establishes minimum requirements for the lockout of energy sources. It is used to ensure that the machine or equipment is isolated from all potentially hazardous energy, is locked out before any servicing or maintenance activities, and remains isolated until it can be safely returned to service.

III. DEFINITIONS

Affected Member: Any individual performing work requiring the control of hazardous energies in accordance with this policy.

Authorized Member: An individual who by training has acquired the skills and has been given the authority by a representative of the employer to perform a specific task or assignment related to this guideline.

Automated Isolation Valves: Any valve designed for the purpose of isolation and actuated by any means other than a hand wheel or handle.

Caution Tag: A yellow colored tag that indicates that the equipment or system has been re-energized.

Certified Radiation Safety Member: A Quinnesec Mill member that has successfully completed a radiation safety and training program and is responsible for locking out the source and performing a survey of the area.

Clearing: The process of preparing equipment for lockout. It involves de-energizing, draining, flushing of chemicals or removal of other hazards.

Closed Position: The position that an electrical breaker or switch is in to allow electrical current to pass through.

Control Room Operator's Lock: A red lock that is the first lock on and the last lock off a key lock box during a group lockout.

Control Valve: Any valve used in the process for control that may be actuated automatically in response to process changes.

Extended Lockout: The term Extended Lockout will be used to define, and is applied, in the following circumstances and situations:

- Equipment indefinitely removed from service with no known schedule for re-start up (i.e. fuel oil system, abandoned breaker).
  NOTE: Equipment must be tagged indicating current state and wiring must be properly terminated and tagged

- Lock out of equipment for seasonal purposes (Includes all equipment where hazards would exist if it were to remain energized).

- Whenever equipment cannot be operated or is partially dismantled with parts out for repair service and there are no individual personal safety locks in place (i.e. end of shift, reassignment, etc.), except within the scheduled duration of an outage.

- Any equipment lockout extending beyond the scheduled duration of an outage (woodyard, pulp mill, recovery/utilities, 41 machine, etc.). Outage duration ends when unlocking in the area begins (i.e. digester, recovery boiler, supercalendars, etc. - not Group A, B, C, etc.).

Extended Lockout Lock: A bronze colored lock, permanently identified and sequentially numbered for each of the following mill areas:

- **Woodyard - Wdyd**
- **Recovery & Utilities - R&U**
- **Pulp Mill - PM**
- **Lime Kiln/Chem Prep**
- **#40 Machine - #40**
- **#41 Machine Wet End - #41WE**
- **#41 Machine Dry End - #41DE**
- **Product Services - PS**

Group Lock: A safety lock that is issued to a department for use in group locking a piece of equipment or system.

Highly Hazardous Material: Any chemical referenced from the current version of MIOSHA Part 91. As of the effective date of this policy, this definition is applied only to the Chlorine and Chlorine Dioxide systems of the Quinnesec Mill.

Information Tag: A tag used in conjunction with a lockout, that indicates date, equipment, name of the person and reason that a piece of equipment is not ready to return to service. **Note: A tag is never to be substituted for a lock.**

Intermediate Energy State (IES): A state of energy of equipment or processes in which designated hazardous energy sources are at zero energy state (ZES) while maintaining other designated energies to perform minor tool changes and adjustments, or other minor, routine and repetitive servicing activities that are required to operate the equipment or process.

Key Lock Box: Is a metal box where all keys that control the group lockout locks are placed and where all individuals working under the group lockout system must attach their personal safety lock.

Lock-in: The process used in re-energizing or in putting equipment back in service.

Lockout: The term "lockout" means the locking of equipment, electrical or mechanical, in such a manner that it cannot be energized without the lock being removed. Examples include:

1. For equipment that is driven by electricity, a lockout can be performed by opening the circuit at a physical disconnect or breaker so that it is locked in an open position.

2. For equipment that is driven by such energizing sources as water, air, steam, or hydraulic fluid, the lockout can be obtained by chaining off the source valve and placing a lock on it.

3. If any suspended mechanism or parts might possibly drop or cycle to another position, the equipment must be moved to a safe position, or if necessary, blocked, clamped, or chained in place (hydraulic press or scissors lift). For suspended mechanisms, pin or locking mechanism must be adequately rated for the load it will be supporting.

Lockout Coordinator (LOC): Individual assigned by the operating department who is responsible for coordinating lockout for specific outage or maintenance activities.

Lockout Sheet: ZES or IES form describing the work to be done and the equipment required to be locked out for that work. See Appendix D.

Lock Board: A lock board is located in the operating department. Locks used for group lockout, multiple locking device, and chains are stored on the lock board.

Main Disconnect: A device that interrupts the main line voltage to a piece of equipment.

Multiple Locking Device: A locking device that is capable of accepting many locks.

Open Position: The position that an electrical breaker or switch is in to prevent electrical current to pass through.

Personal Safety Lock: A safety lock that has been issued to a member. Personal safety locks must be marked with clear identification of the individual's name, and are not to be used for any function other than lockout.

Proprietor: The Operating department is responsible for the equipment or systems in the manufacturing area designated for locking out. Maintenance or Engineering has clearing responsibility for Overhead Cranes, Shop Equipment, Elevators, and Lighting Panels.

Qualified Mill Member: Operations, maintenance or other mill member trained in the operation and lockout of power circuit breakers and disconnect switches.

Radiation Lockout Permit: Is a form which identifies that all safety precautions have been taken to reduce the potential exposure to radioactive sources in the mill.

Radiation Locks: Locks that have been assigned to each radiation source in the mill and are to be used to secure the lockout of the radiation source. These locks can only be opened by a Certified Radiation Safety Member.

Red Tag Permit: Lockout practice followed when conducting work on fire system piping. (see Fire System Impairment Policy).

Source: Is the radioactive element found in certain pieces of equipment in the mill and must be locked out prior to performing work on the equipment.

Zero Energy State (ZES): A state of a piece of equipment or a process in which the possibility of unexpected or unwanted activation or movement has been eliminated.

IV. TRAINING/INSPECTIONS

A. Training

1. New Members receive training on the general requirements of the Lockout Policy during new member orientation. Training on specific lockout requirements is part of the operating department's new member orientation. This training occurs prior to a member taking part in any lockout activity.
2. All affected members receive annual refresher training on the general procedures of lockout. Successful completion of training shall include a test or exam.
3. Affected members are required to demonstrate proficiency in lockout on an annual basis. Proficiency will be certified by a mill member who has been trained and authorized by Health and Safety. This demonstration of proficiency must be documented (see Appendix B).
4. Members transferred to another department will receive training on specific lockout procedures for that department prior to the member taking part in lockout activity on the specific equipment.
5. Retraining will be provided when equipment modifications change procedures or a new hazard is presented.
6. Retraining will occur when inspection, incident investigation or periodic review reveals deficiencies in use of the procedure.
7. Training provided as required above will be documented. All training documentation (dates, signatures, content, etc.) are maintained on file in Health and Safety for the current year plus two previous years.

B. Periodic Inspections

1. The use of lockout procedures is evaluated to assure they are being properly implemented, determine whether the members understand their responsibilities, and whether the procedures are effective. The field inspection is performed by a member of Health and Safety or someone other than the affected member utilizing the lockout procedures.
2. Periodic inspections are conducted on an annual basis at a minimum.
3. Periodic inspections are documented using the form shown in Appendix C. Inspection records certify the date of the inspection, identification of the procedure being used, the member who conducted it, the members included, the machine or equipment inspected, and findings and corrective actions. Any observed deviations or deficiencies will be corrected. Documentation will be retained in Health and Safety for current year plus two previous years.

C. Annual Review

1. All lockouts that are housed in the DMS or elsewhere that members can access, print and immediately lockout out without any alterations must be reviewed at least annually for accuracy.

2. Any lockouts that are considered "one-time lockouts" or lockouts that are modified each time they are used do not need to be reviewed annually, as they will be verified by 2 members prior to being used.

V. PROCEDURE/PRACTICE

A. Energy Control Procedures

1. Written energy control procedures (ZES or IES) are in place to bring all equipment and processes to zero energy state except when all of the following conditions are met:

- Energy is controlled by a single, readily identifiable energy source;
- This energy source can be locked out by a single lockout device; and
- There is no potential for stored or residual energy.

2. Zero energy and intermediate energy procedures have been developed, as appropriate for each process, system or piece of equipment. The procedures identify all energy sources, methods for controlling energy to zero and intermediate levels, and methods to verify isolation and control. (See Appendix D for the ZES format used by the Quinnesec Mill, and Appendix E for applicable guidelines for developing and using mill ZES procedures.)

3. ZES procedure development and update must be made by the operating department owning the process or equipment, and be reviewed by at least two authorized persons. Approved procedures are to be posted such that they are accessible to all authorized and affected personnel.

4. In the event that a specific ZES or IES procedure must be developed at the time of lockout, a minimum of two authorized persons must be involved in the review and issuance of the procedure. If a worker is added to a task covered by an IES procedure after work has begun, one of the workers already involved must review the IES procedures with the new worker.

5. In the event that an existing ZES or IES procedure must be modified (i.e. adding locks) after initially being issued, a minimum of two authorized persons must be involved with review and update of the procedure.

6. If the ZES or IES procedure (lockout sheet) has been changed during the job to remove or relocate a portion of the lockout, the owning department will post a “revised lockout” notice (orange card – Appendix G) on the procedure advising all parties as to the modification. The notice should list the locks and jobs that have been removed or relocated due the revision.

7. Intermediate energy state (IES) procedures are permissible as alternate methods of protection for tasks that require the operation of the equipment or process and the task is minor, repetitive or routine. Under no circumstances may IES procedures be used to permit exposure to point of operation or power transmissions hazards.

8. Written IES procedures will incorporate the same criteria as ZES procedures, and will be developed by the department that will be performing the task.

9. If an IES procedure is used, a person performing the task must have full control of all power to prevent any unauthorized operation of equipment that could affect the safety of person(s).

10. For tasks that are performed under normal operations with energy present, refer to the Quinnesec Mill Moving Equipment Policy. The relationship between ZES, IES and moving equipment procedures is shown as Appendix F.

B. Clearing and Lockout - Responsibilities/Ownership

Before work is started on any equipment or process system, the proprietor of the equipment is responsible for clearing the equipment.

1. Production is the clearing group for all jobs in the manufacturing area.
2. Supervisors of the clearing group are responsible for clearing and lockout of the equipment. This includes when specialty contractors are brought in to perform work (chillers, drives, welders, overhead doors, filters, etc.). This clearing typically occurs at a local disconnect/breaker (not a breaker/disconnect in a MCC).
3. The supervisor may delegate the clearing or lockout tasks to an authorized member (or specialty contractor) when the equipment is within the person's area of job responsibility.

C. Conducting Clearing Process

The authorized member conducting the clearing process shall isolate all devices to eliminate the potential for unexpected activation or movement of energy sources. All information covering the clearing process of equipment shall be entered on the appropriate lock-out sheets and/or procedures.

Control valves, in general, are not designed, and should not be used, for isolation purposes in lockout.

When considering the use of automated isolation valves (or certain control valves designed for isolation) as part of the clearing process, a member knowledgeable in the actuation characteristics of a specific valve application must be involved when evaluating the potential hazards and acceptable isolation steps taken.

1. Mechanical Clearing

   a) All pipes, ducts, conveyors, and associated equipment that could introduce material, steam, or energy to the equipment or system to be worked on must be closed.

   b) Be alert to sources of stored energy: springs, fly wheels, loads suspended by hydraulic pressure, etc. Equipment must be secure from unexpected start up, movement, or discharge of chemicals, water or pressure release.

   c) Appropriate drain valves and vents are to be in the open position.

   d) Drain and flush all lines and valves to remove hazards.

   e) Processes or equipment handling highly hazardous materials shall be isolated by one of the following methods:

      (i) Locking double valves in the closed position with a bleed line between the two valves, or

      (ii) Physically separating the system, or

      (iii) Inserting a blank or blind flange in the line.

      When the above-mentioned requirements cannot be met for chlorine and chlorine dioxide, written procedures must be in place, or a thorough review of the specific circumstances evaluated, to ensure an equivalent level of safety.

2. Electrical Clearing

   a) Verify that the equipment to be locked out is not in operation.

   b) The authorized E&I Technician or qualified mill member shall go to the location of the main disconnect which distributes electrical energy to the equipment or system to be worked on.

   c) On electrically powered equipment or electrical systems operated by 480 volts or less (i.e. 110 volt), the main disconnect or local main disconnect which directly feeds and physically interrupts the power supply must be placed in the open position. (A local control switch is not considered a main disconnect).

   d) For 480 volts, with the exception of local disconnects* (not in an MCC), the following clearing process shall be used:

(i) This task requires all members to wear PPE as defined in the table on the Lockout Proficiency form. (Appendix B) Ensure no one is within 10 feet of clearing process if they are not wearing PPE.

(ii) Any Electrical Equipment that has been tagged with a deficiency requires E&I assistance for all servicing including Lockout. (Sample tag shown on proficiency form)

(iii) Properly identify the main switch controlling the 480 volt service to the equipment to be worked on (using the motor number permanently attached to cabinet door) and verify the door mounted OFF-AUTO switch (if available) is in the OFF position.

(iv) Ensure door for service has all fasteners in place and securely latched. Call E&I for assistance if door is not properly secured.

(v) The E&I Technician or qualified mill member, standing to either side of the door, shall then throw the main switch (into the down position), opening the main 480 volt circuit controlling the equipment.

Local Disconnects are exempted because they are provided with low peak fuse protection. Some examples are welding outlets, cranes, motors, guillotines, IK's and specialty chemicals pumps. Standard PPE is required to throw the breaker.

e) Electrical clearing and lockout for equipment powered by more than 480 volts must be performed with the assistance of an E&I Technician or a 'Qualified Mill Member' (2300 motor starters). The following clearing process shall be used:

(i) Operations to contact an E&I or qualified mill member for assistance on the lockout.

(ii) Operations and E&I (qualified mill member) to identify the equipment to be locked out by name and equipment number by reviewing the lockout sheet and viewing the equipment number on the front of the motor starter cabinet door.

(iii) Operations will assign the lock number to the lockout sheet.

(iv) E&I will make sure the equipment is down and open the disconnect switch. Operations needs to be the minimum distance (stated on the NFPA cabinet label and is in some cases 20 feet) from the motor starter cabinet while the E&I opens the disconnect switch. Note that some woodyard operations members are qualified mill members for throwing 2300 disconnects in the woodyard.

(v) The operations member will then place the lock on the locking mechanism and verify the proper piece of equipment was locked out and initial the lockout sheet.

f) Electrical clearing and lockout for some variable frequency drives and DC drives may require assistance of an E&I Technician. When an E&I is required to place a lock on a locking mechanism for NFPA 70E compliance, the following clearing process shall be used:

(i) Operations to contact an E&I or qualified mill member for assistance on the lockout.

(ii) Operations and E&I (qualified mill member) to identify the equipment to be locked out by name and equipment number by reviewing the lockout sheet and viewing the equipment through the Plexiglas door windows (or cabinet face).

(iii) Operations will assign the lock number to the sheet and hand the lock to the E&I.

(iv) E&I will make sure the equipment is down and open the knife switch and place lock on the locking mechanism. Operations needs to be the minimum distance from the DC drive cabinet while the E&I opens the knife gate. This distance is 10 feet for DC drives and variable frequency drives.

(v) E&I will verbally communicate what lock was placed on the equipment. Again, this will be done via name of equipment and the equipment number.

(vi) E&I will initial the lockout sheet indicating a lock was placed on the correct equipment based on the **equipment number** listed on the lockout sheet provided by the operations member. The E&I will assure the drive is electrically isolated.

(vii) The operations member will initial the lockout sheet indicating verification that the group lock was placed on the correct equipment based on the **equipment number** listed on the lockout sheet.

D. Lockout

After clearing has been completed, the equipment is ready to be locked out. When one or more persons are working on a piece of equipment or system, each individual shall place his or her personal safety lock on the valves, switches or other locking devices. This may require the use of a multiple locking device. [Exceptions - Group Lockout (Section V.D.4.) and Outside Contractors (Section V.J.3.)].

1. Mechanical Lockout

a) Each individual who will work on the equipment shall review the clearing process and locate each valve that controls materials or steam to the equipment or system, discharge lines and vent lines for the equipment or system being worked on.

b) Each valve shall be locked and immobilized in the appropriate position (open or closed) by using a chain and multiple lockout device, or any method that meets MIOSHA requirements. Each individual that works on the equipment or system shall attach his or her personal safety lock.

c) Locks shall be used whenever possible to secure blanks or the point of separation by inserting the lock through a bolt hole. Locks at the point of isolation shall be identifiable.

d) Mechanical potential energy sources shall be isolated by any of the following methods.

(i) Install a block or blocks to support a suspended object; or

(ii) Securing a moving object or part with a pin, chain, bar or other method to prohibit movement; or

(iii) Removal of a suspended or movable object; or

(iv) Removal or dissipation of energy contained in springs.

e) A lock shall be used to secure a mechanical potential energy isolating device, whenever possible. A tag must be used whenever a lock cannot be used.

2. Electrical Lockout

a) The following lockout procedure is to be used for 480 volt disconnects:

(i) Return **OFF-AUTO** switch to **AUTO** position.

(ii) Ask an operator for a "bump test". **Verification of equipment non-start must take place.** Other members involved in the same project may want to witness this bump test.

(iii) IF WORK INCLUDES CONTACT WITH POWER LEADS (I.E. DISCONNECT MOTOR, ETC.), EACH STAB IN THE DISCONNECT SHALL BE VERIFIED AS ISOLATED WITH A VOLTAGE TESTER BY AN E&I TECHNICIAN.

(iv) Each individual performing work on the equipment shall attach his or her personal safety locks to the hasp of the cubicle door utilizing a multiple locking device. When a group lockout is utilized, the group lock is applied to the cubical door and each individual performing work on the equipment shall attach their personal lock on the lock box.

(v) The disconnect is now electrically "locked out".

(vi) If assigned to the job after the equipment or system has already been locked out, **do not** attempt to press the start button. This is to protect the individuals already working on the equipment. A visual check of the main disconnects can ensure they are locked out.

b) Where a circuit breaker is the disconnect of a power supply to a piece of equipment to be worked on, that circuit breaker shall be locked out utilizing a circuit breaker lockout device and a safety lock.

c) Any lockout which permits exposure to live, or potentially live, components or connections energized at a potential of 50 volts or more must be conducted with the assistance of an E&I Technician or qualified mill member. In addition, lockout of any electrical equipment, exposed or not exposed, with a known deficiency such as IR scan or over-duty must be conducted with the assistance of a Qualified Electrical Person (QEP). A sample deficiency tag is shown in Appendix B.

d) Qualified outside electrical service or mechanical maintenance personnel must be authorized by a mill member to perform switching and personal lockouts as required for their work without mill assistance. Outside electrical service or maintenance personnel are not allowed to assist with mill lockouts in the event an E&I technician or qualified mill member is not available.

3. Portable or Hand Held Equipment Lockout

De-Energize equipment that is operated by electrical plug-in or by air pressure by unplugging/uncoupling their electrical or power sources.

Attach a "DANGER - DO NOT OPERATE" tag at the plug or coupling.

4. Group Lockout

Group lockout can be used whenever the Supervisor, Team Leader, or Lockout coordinator of the proprietor department judges that it is impractical to use individual locks at each location required to be locked out. The following procedure must be strictly followed when performing the group lockout:

a) The supervisor, Team Leader, or lockout coordinator of the equipment or system to be locked out shall be responsible for the group lockout.

b) The equipment or system must be cleared.

c) The Supervisor, Team Leader, or lockout coordinator will follow the lockout procedure (Section V.D.1. and 2.). Group locks will be used in place of individual locks in a group lockout.

d) Locks required for the group lockout can be obtained from the departmental lock board.

e) A listing of locations where locks have been applied for the identified job needs to be at the key lock box with date and person responsible for lockout.

f) After the completion of the lockout, all keys controlling the safety locks will be placed in a key lock box located near the production department control room. The key lock box shall be identified for the appropriate equipment or system being locked out.

g) The Control Room Operator (CRO), lockout coordinator or authorized mill member shall attach a CRO lock with a multiple lockout device to the hasp of the key lock box. This lock shall be the first on and the last off.

h) Each individual working on the equipment or system shall place his or her personal safety locks on the hasp of the key lock box, with the following in mind:

(1) The group lockout procedure does not relinquish the responsibility of the individual from verification that the equipment or system to be worked on is properly locked out. Verification that the lockout has been completed for the task to be performed is done by using the group ZES/lockout procedure sheets (See Appendix D). **No work is allowed under a group lockout until the job status is marked as "ready".**

(2) If being assigned to the job after the equipment or system has been locked out, do not attempt to press the start button. This is to protect the individuals already working on the equipment. However, you can visually check the main electrical disconnect and valves to ensure they are locked out.

5. Fire System Lockout

Refer to the Fire System Policy and contact the mill security department.

E. Personal Lock Removal

The following applies to normal removal of a personal lock, whether you are on an individual or group lockout.

1. At the completion of the task, end of shift, or when relieved from the task by their supervisor, individuals shall remove their personal safety lock

2. **If the equipment is ready to be placed in service**, remove your personal safety lock and notify the CRO, lockout coordinator (LOC) or authorized mill member of the state of the equipment.

3. **If the job is not complete, you must do one of the following before removing your personal lock** (see Appendix A). **Equipment in an unsafe state should never be left without a lock in place!**

   a) If a person or crew is immediately applying their lock(s) for the same job, communicate the status of the job to the next person or crew before removing your lock **or**

   b) If other locks (group, CRO, etc.) are in place, your personal lock can be removed. Tell either the CRO or LOC that you have removed your lock and completed your work **or**

   c) If other locks are in place, but you know of an unusual condition that could create a risk on startup, review the condition with the operating department and decide if an information tag would help communicate the condition. If the answer is "yes", you must: 1) fill out an information tag identifying the unsafe condition, 2) attach it to the lock box or lockout device, and 3) communicate the status to either the CRO or LOC before removing your lock, **or**

   d) If your lock is the only lock on the job, and you are aware that the equipment is in a not ready to run state, you must: 1) fill out an information tag identifying the unsafe condition, 2) attach it at the lockout, and 3) communicate the status to the CRO or LOC. **Before your lock is removed, an extended lock or other lock must be applied**.

4. When the job is defined as extended; the Operations/Maintenance Coordinator, or their designee, per the extended lockout procedure (Section V.I.), should place an Extended Lockout lock on the equipment or system.

5. An informational tag is not a substitute for a lock. **Any equipment that is unsafe to operate is to be locked out at all times!!**

6. If an informational tag is present indicating an unsafe condition, the person removing the tag must first verify that the unsafe condition has been eliminated and the equipment is safe for lock-in. The tag and lock can then be removed.

7. When all safety locks and tags have been removed from the key lock box hasp, the lock-in process may proceed.

F. Lock-In (Restoring Equipment)

Once all of the safety locks have been removed, the CRO of the clearing group must be notified that all work is completed and the equipment or system is ready to be re-energized. An authorized member must verify the equipment status prior to start-up of the equipment.

1. Guidelines for Lock-In

   a) Be sure all worker's personal safety locks have been removed.

   b) All jobs have been completed, tools removed and the area cleaned.

c) All physical disconnects have been restored.

d) All blanks removed and valves in proper position.

2. After the authorized members have assured themselves that the equipment or system is safe to start-up, they will be able to re-energize the equipment or system.

3. The CRO or authorized member shall notify the E&I Technician or qualified mill member that the equipment is ready to be re-energized. The E&I Technician or qualified mill member shall re-energize the circuit, as follows (This task requires all members to wear PPE as defined in the table on the lock out proficiency form. Ensure no one is within 10 feet of the lock in process if they are not wearing PPE.):

a) Verify **OFF-AUTO** switch is in **OFF** position.

b) Standing to either side of the door, throw main disconnect handle (into the up position), closing the 480 volt circuit powering the equipment.

c) Turn **OFF-AUTO** switch to the **AUTO** position.

d) 480 volt starter is ready to operate.

4. Lock-in for equipment powered by more than 480 volts must be performed with the assistance of an E&I Technician or qualified mill member to work with voltages greater than 480 volts.

G. Lock and Key Control

1. The Health and Safety Department will issue and maintain lock and key control over the personal safety locks for all Quinnesec members.

a) Each maintenance member will be issued a set of four (4) personal safety locks. The locks will be keyed alike with the individual receiving one key per set.

b) All other members will be issued two (2) personal safety locks if deemed necessary.

2. Requests for additional locks will be handled by the Health and Safety Department.

3. **AT NO TIME shall any member use another member's personal safety lock**.

4. All individuals are required to attach and remove **their own locks**.

5. For large jobs requiring numerous locks for the group lockout procedure, lockout equipment can be obtained from a departmental lock board. Lock boards are set up near the operational control rooms or mounted on the wall alongside the process, if more appropriate. The lock boards have a supply of locks with keys, multiple locking devices, and chains. Departments are responsible to maintain their lock boards.

6. All personal safety locks and group lockout locks will be issued through the Health and Safety Department. No other type of lock is acceptable.

H. Emergency Lock Removal

In the event a personal safety lock has been accidentally left in place, the following procedure must be strictly followed:

1. Identify the individual that has been assigned the lock that is required to be removed. Each lock will be tagged with the individual's name.
2. It is the Supervisor or Team Leader's responsibility to make absolutely sure that the individual who has attached the lock has left the mill.
    - Attempt to contact the individual by phone. (This is to locate the employee).
    - Check with co-workers.
    - Is their car gone from the parking lot?
    - Are their personal items gone (lunch box, tools back in place)?
    - Is the locker room empty?
    - Has the individual scanned out of the mill? (Check with Plant Protection)

After the supervisor has identified the lock and to whom it has been assigned, and attempted to locate the individual then the supervisor may proceed with the removal of the safety lock. The removal shall proceed as stated in the remaining steps of this procedure.

3. The Supervisor or Team Leader will contact Plant Protection requesting that the personal safety lock which has been left on the equipment or lockbox be removed.
4. The Plant Protection officer and the supervisor will review the equipment and/or system that requires lock removal.
5. Prior to the lock being removed, the supervisor shall place a caution tag on the equipment that is to be re-energized. This tag will indicate that this equipment or system is now re-energized. Additional caution tags shall be attached to the electrical cubicle door. The Plant Protection Officer will bring the caution tag along with the key to that location.
6. After it has been determined by both individuals that there are no members working on the equipment and the equipment is safe to start up, the Plant Protection officer will give the key to the supervisor who will remove the lock.
7. The Plant Protection Officer shall note the lock removal in the Plant Protection Log Book.
8. The Plant Protection Officer shall maintain possession of the safety lock, and it is the responsibility of the individual whose lock was removed to pick it up at

Plant Protection and to remove the caution tags from the energized piece of equipment. This is to be done the next day that the individual returns to work.

9. The emergency lock removal procedure applies to contractors' and visitors' locks after verification that the equipment is clear, and the individual's location is determined. These locks may need to be cut-off with Plant Protection supplied bolt cutters, as Plant Protection does not have key control.

I. Extended Lockout

1. Equipment that is out of service for an extended period, cannot be operated, or is partially dismantled with parts out for repair service, shall be locked out by the area Operations/Maintenance Coordinator or their designee.

2. The area Operations/Maintenance Coordinator or their designee will utilize the safety locks provided for this purpose and will attach an informational tag.

3. Each operating department will maintain a log indicating the location and purpose of all placed extended locks.

4. Extended locks are not to be removed until all work is completed and the equipment is verified safe for operation.

J. Outside Contractors

1. Outside contractors working at the Quinnesec Mill shall comply with all mill Lockout Policy requirements. It is the responsibility of a contractor's host department at the mill to ensure compliance with these policies.

2. Each contractor performing work at the Quinnesec Mill will be responsible for their own locks. Each lock must be identified with a tag indicating the company and employee.

3. Contractor employees must each possess their own individual locks. These employees are required to personally lockout or add their lock to any equipment they work on.

K. Radiation Lockout Procedure

1. Before work is performed on equipment, or a vessel is entered, the proprietor must first determine if the equipment or vessel contains a radioactive source. If it does, contact a Certified Radiation Safety Member to assist in locking out the source and performing a survey of the area.

2. Radiation Lockout Permit

a) A radiation lockout permit is required prior to allowing anyone to work on a radiation source or detector or enter certain vessels containing a radioactive source.

b) All lockout permits can be obtained in the control room by the lock boards.

c) The lockout permit must be completed by the Certified Radiation Safety Member, proprietor, and member performing the task.

d) The completed permit shall be posted near the site of the work or entry.

e) All expired permits shall be sent to the Plant Protection Office.

3. Certified Radiation Safety (CRS) Member

a) Only CRS members have keys to the radiation locks on the sources.

b) All CRS members are trained in use and calibration of the survey meter.

c) Only a CRS member can lockout and survey a radioactive source in the mill.

4. Lockout Procedure

a) The proprietor must contact a CRS member if the equipment or vessel contains a radioactive source.

b) The CRS Member will obtain the survey meter and meet the proprietor at the source.

c) With the source open, the CRS member will survey both the source side and the detector side looking for the presence of radiation. These results will be recorded on the Radiation Lockout Permit.

d) The CRS member will then close and lockout the source utilizing the attached multiple locking device and radiation lock.

e) The CRS member will again survey both the source side and the detector side looking for a significant reduction in radiation. The results will be recorded on the Radiation Lockout Permit. The radiation device is now ready for individual or group lockout procedures.

NOTE: If there is no difference in observed radiation between Steps "c" and "e", this indicates that the **source is not properly closed**. In this case, retry the lockout procedure. If the procedure is still not successful, **DO NOT ENTER** the vessel or begin work on the equipment. Contact the Safety Department.

5. Lock-In Procedure

When the job is completed and individual and group locks have been removed, the proprietor of the lockout must.

a) Be sure all persons who were working on the equipment or vessel have left the area.

b) Contact a CRS member to assist in restoring the source to operational condition.

c) The CRS member will remove the radiation lock, open the source, and re-attach the lock to the open position.

d) Return the completed Radiation Lockout Permit to the Plant Protection office.

6. Documentation

a) The Health and Safety Department will maintain an active file of all Radiation Lockout Permits.

b) Health and Safety retains a list of individuals qualified to perform radiation lockouts.

c) Health and Safety retains a list of radiation sources throughout the mill.

VI. RESPONSIBILITIES

A. Health and Safety

1. Responsible for new Member training.
2. Responsible for providing annual training for members authorized to conduct proficiency reviews.
3. Maintains documentation of training and periodic inspection records.
4. Responsible for issuing personal safety locks and maintaining lock and key control logs.
5. Responsible for Plant Protection personnel training for key control and lock removal procedure.
6. Responsible for training contractors on the lockout and tag-out policy.
7. Responsible for conducting periodic inspections of the lockout procedures. (See Appendix C)
8. Responsible for retaining documentation on radiation sources and qualified individuals for lockout of sources.

B. Members

1. Each affected member shall annually be instructed on provisions and requirements of this lockout policy and demonstrate proficiency in its use. This is the responsibility of the Safety Captain and Supervisor/Team Leader.
2. Each member shall effectively enforce compliance of this lockout procedure.
3. Each member shall assure that the locks and devices required for compliance with the lockout procedure are used.
4. Prior to setting up, adjusting, repairing, inspecting, serving, installing, or performing maintenance work on equipment or system, the individual shall be knowledgeable in the steps to be taken to assure he or she is aware of potential machine motion or release of energy.

5. Members shall consult with their supervisor or other appropriate knowledgeable team members whenever there are any questions regarding safe lockout procedures.
6. Members shall obtain and care for the locks and other devices required to comply with the lockout procedure.
7. Members are responsible for replacing guards, housekeeping, notifying the CRO/ lockout coordinator of the job status and removing locks on equipment or systems.
8. Members are responsible for reviewing equipment status with the operating department and placing informational tags when personal locks need to be removed and equipment is unsafe to startup.
9. Members are responsible to remove their personal locks when:
    a) The task is completed.
    b) They are relieved from the task by their supervisor.
    c) At the end of their shift.

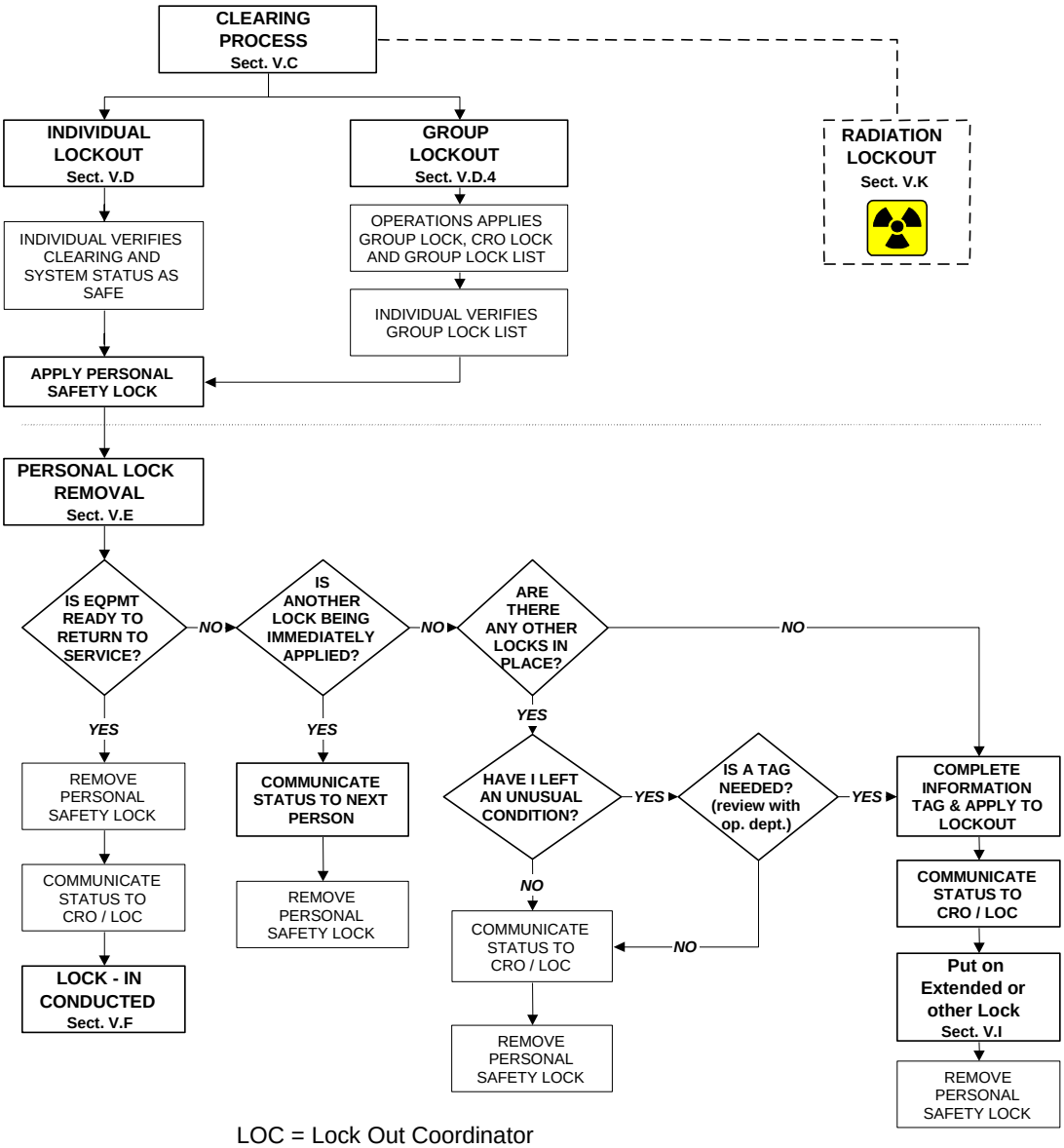
C. Maintenance/Engineering or Host Department

1. Is responsible for reviewing lockout and tagout of equipment for contractors working on mill property.
2. To assure compliance to the mill lockout and tagout procedures for contractors.
3. Responsible for development, review and approval and posting of IES procedures performed by maintenance technicians.

D. Operating Areas

1. Responsible for providing initial and refresher training to members on specific lockout procedures for their area as specified in the policy.
2. Responsible for development, review, approval and posting of ZES procedures.
3. Responsible for development, review and approval and posting of IES procedures as necessary in their area.
4. Responsible for developing systems to ensure appropriate communication, review and control of the lockout process in their area, including assignment of authorized personnel where appropriate.
5. Responsible for addressing issues identified during the periodic inspection program.
6. Responsible for the placement and removal of the Extended Lockout lock(s).
7. Responsible for maintaining adequate PPE to be used for 480 volt lockout

APPENDIX A
Personal Lock Application and Removal



LOC = Lock Out Coordinator

1/03

APPENDIX B

QUINNESEC MILL
LOCKOUT PROFICIENCY DOCUMENTATION FORM

Instructions: Per mill policy and MIOSHA requirements, each affected member must be certified that they have the knowledge and skills necessary to perform lockout safely. This form is to be used for certifying the affected member is proficient in lockout. Authorized members are to interview the affected member and witness the member physically demonstrate proficiency in lockout in the areas identified by this sheet as it applies to their job. Both affected and authorized member must sign-off that this demonstration occurred. Submit completed forms to Health and Safety.

VII. Employee Interview

____ Lockout (ZES) Policy reviewed and understood

____ Member understands key types of energy requiring lockout (electrical, chemical, mechanical, nuclear, gravity, steam/thermal, hydraulic, pneumatic)

____ Member knows where to find specific lockout procedures, when applicable

VIII. Proficiency Demonstration

In order to ensure the affected member is knowledgeable in lockout practices**, the member must conduct a field demonstration, witnessed by the authorized member.** Use the checklist below to indicate which of the following practices were demonstrated by the affected member to verify proficiency:

____ Applying personal lock for individual or group lockout (valves, disconnects, lockbox, etc.)

____ Mechanical clearing practices (valves, stored energy, drains, etc.)

____ Electrical clearing practices **(Demonstrate Lockout and Lock in)**

- **Properly identify equipment to be locked out: Must Use the name of the equipment and the equipment number for identification purposes.**
- **Define PPE required for task. See PPE Requirement Below**
- **Contact E&I if starter door is not securely fastened with all fasteners in place**
- **Call E&I if equipment is tagged with a deficiency. See sample tag below.**
- **For E&I assisted lockouts : When the E&I places the lock on the knife switch, the E&I and operator will both initial the lockout sheet indicating the lock is on the correct piece of equipment (based on the equipment number on the lockout sheet). When the operator places the lock on the 2300 disconnect (after E&I throws the disconnect), the operator will initial the lockout sheet**
- **Demonstrate clearing process of steps to operating disconnect switch; standing to the side facing disconnect.**
- **Bump Test**

____ Isolating potential or stored energy (block, secure, remove, etc.)

____ Applying group locks (group identification, ZES procedure use, group box, tags, etc.)

____ Removing personal locks for unusual situations (i.e. shift change, unfinished work, extended locks)

____ Lock-in (mechanical and/or electrical – off/auto, disconnect operation)

Certification: I understand the practices I need to follow to ensure my safety and those of my fellow workers when performing lockout. I also know whom to contact if I have questions.

Employee: _____ Signed:_____ Date: ____/____/____

Dept: _____ Crew: _____

The member above has demonstrated proficiency in the application of lockout practices.

Authorized Member: _____ Signed:_____ Date: ___/____/____

Submit completed forms to Ole' area Coordinator.

APPENDIX B – page 2

PPE 480 Volt Lockout	
Starter Doors Closed	
Item #	Rated Flash Protection PPE
1	Lab Jacket 12.4cal/CM2
2	Safety Glasses
3	Hard Hat/Face Shield 10 cal/CM2
4	Leather gloves
5	Hearing Protection

This chart is specifically for 480 V lockout. If you are looking for the NFPA 70E PPE requirements, please see the Quinnesec Mill Electrical Safety Policy.

Sample deficiency tag. Any equipment that has been tagged with a deficiency requires E&I assistance for all servicing including lockout.

APPENDIX C

Quinnesec Mill
Lockout Periodic Inspection Form

Observer's Name: _____ Date: _____

Department/Area Reviewed: _____

Shift Reviewed: _____ Time _____ am/pm

Affected Member(s) (AM): _____ Lockout Rep. (LOC): _____

Lockout Procedure, Group or Job Name: _____

Energy Source(s) Isolated?	**Yes**	**N/A**	**Comments**
Mechanical			
Chemical			
Electrical			
Nuclear			
Gravity			
Explosive			
Steam/Thermal			
Hydraulic Pressure			
Pneumatic Pressure			
Inertia			
Other Auxiliary Power Sources: _____			

	Answer the following questions by observing the lockout and interviewing affected member(s).	**Yes**	**No**
LOC	Was a pre-job review of lockout requirements conducted?		
LOC	Have the lockout procedures been reviewed to ensure they are accurate? If available, attach a copy to this form.		
LOC	All affected members notified that a lockout is being performed on the equipment?		
LOC	Is the affected member(s) aware of type and magnitude of energy that the equipment utilizes?		
LOC	Has mechanical clearing/isolation been properly performed? (valves, blanks, pins, line removal, etc.)		
LOC	Has the equipment been tested (bumped) to ensure the correct disconnect has been locked out?		
LOC	Has all stored or residual energy been dissipated/released, or otherwise secured?		
LOC	Are the energy isolating devices locked out with assigned locks having proper identification?		
LOC	If a group lockout, is the group box properly used? Procedure available?		
Both	Is the lock/hasp secured so that energy sources are disconnected and isolated from the equipment/process being serviced?		
AM	If more than one individual is required to lock out the piece of equipment, has each placed their own lock on the energy isolating device?		
LOC	Are there any changes noted on the lockout procedure? (If so, please include with attachment)		

IX.
X. Provide explanation for any questions answered "NO" _____

Findings/Corrective Actions: _____

Observer's Signature _____ Signature Of Individual Performing Lockout _____ Signature of Lockout Representative _____

Quinnesec Mill

ZES LOCKOUT PROCEDURE

GROUP BOX	1
LOCK SERIES	3

Procedure Number	2

EQUIPMENT/SYSTEM	4

GENERAL INFORMATION

Lock Start Date: (today's date)	5	Lockout Prepared by:	Designated Person (s)	Lockout Audited By (Optional)
Lock Start Time: (optional)	6	#1 8	9	10
Unlock Time: (optional)	7	#2		

JOB(S) DESCRIPTION (if not listed, attach to document)	IES (√)	STATUS (INITIAL) Ready 13
11	12	

HAZARDOUS ENERGY SOURCES

	Electrical		Chemical		Thermal		Pneumatic 14
	Radiation		Hydraulic		Mechanical Potential		

Unique Hazards:

- 15

SPECIAL JOB INSTRUCTIONS/PROCEDURES 16

- This ZES procedure does not cover isolation of seal water to equipment
- Items that cannot be locked, but must be isolated, are to be provided with tag, and indicated as "locked out" below
- MUST verify that system drains are opened and confirm cleared before initialing/locking if applicable.

LOCKOUT/ISOLATION

LOCK OUT (initial)	LOCK #	EQUIPMENT DESCRIPTION/LOCATION	EQPMT NO.	ISOLATION DEVICE/MCC LOCATION	BUMP TEST	METHOD OF ISOLATION AND VERIFICATION	UN LOCK (initial)
17	18	19	20	21	22	23	24

Edit History

Edit Description	Date	By Who?
25		

APPENDIX E
User's Guide – ZES/Lockout Procedures Format

(**Note: If a local printer is used, you must check the printout against the complete form on the computer to make sure the sheet printed completely.)**

The following guidance identifies the "how to use" for the ZES format and the process to ensure consistent development of procedures that will meet both IP and MIOSHA criteria. **Numbers below correspond to those shown on the form in Appendix D. Note: In the form, shaded areas are to be completed at time of use.**

HEADER: This area will include the subject name, the owner of the document, the last review date and review period. The last review date is the most recent date the document has been reviewed. Lockouts needs to be reviewed for accuracy at least annually.

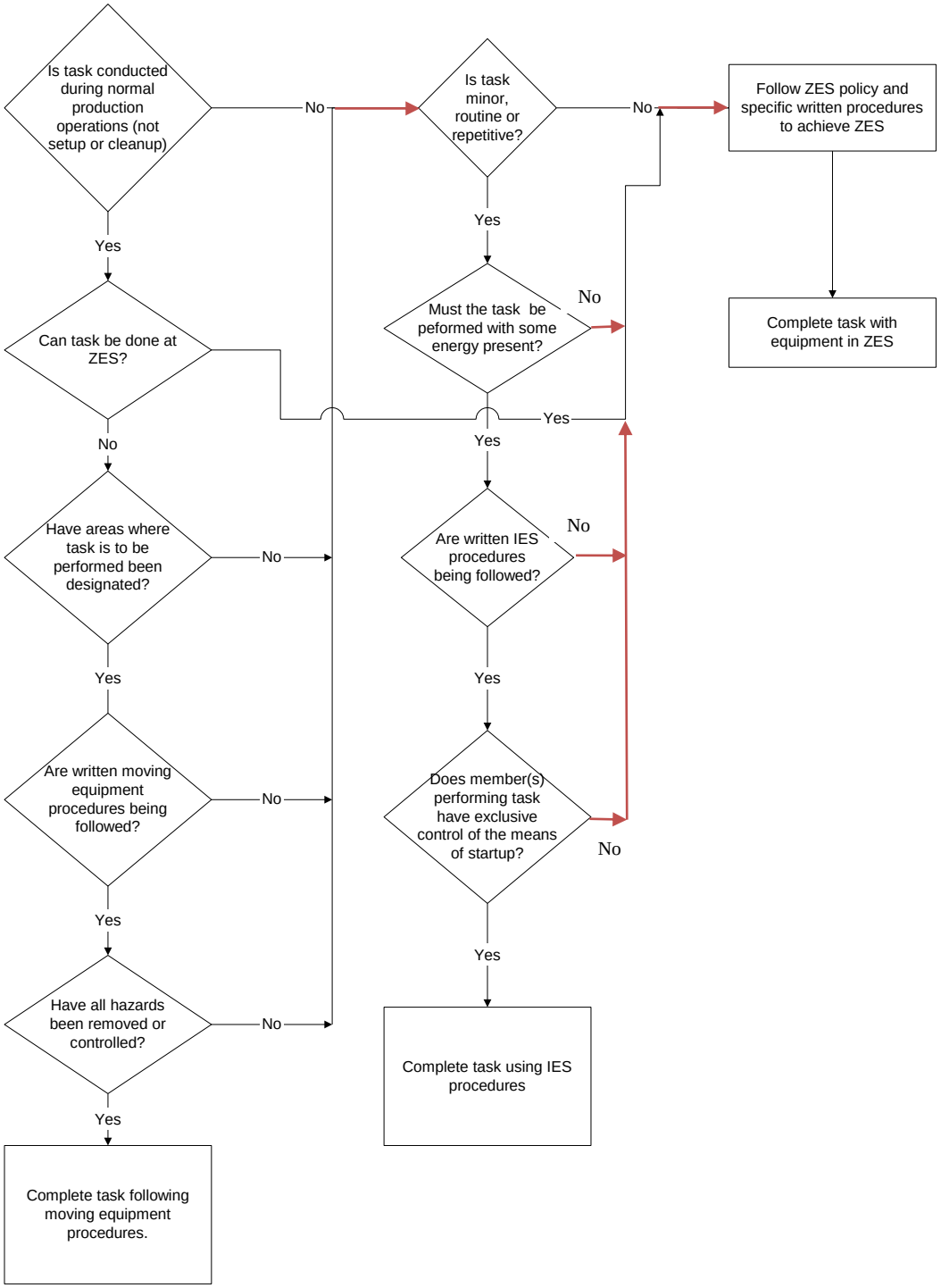
1. **Group Box:** This field must be used to list the group lock that is being applied for this particular lockout procedure. It can be completed when completing the procedure if the same group will be used each time, or left blank and written in at the time of the lockout. If an item within the lockout will be covered by 2 or more different group lockouts, list the group lock used for this particular procedure here. Do not list the additional groups being included (they will be listed under the remaining procedures).
2. **Procedure Number:** Use the mill functional area as the prefix, followed by a numeric designation within your department for the specific procedure. A subset number would follow the number for procedures contained within the main procedure (48-001-01: Bleach Plant, W-10 wire change)
3. **Lock Series:** A series of locks that are keyed alike and can only be used on one lockout at a time.
4. **Equipment/System:** Name of the equipment, process or equipment covered by the procedure.
5. **Lock Start Date:** Date the lockout was started
6. **Lock Start Time (optional):** Time the first lockout was released for work
7. **Unlock Time (optional):** Time the last lockout was removed before energizing the system.
8. **Lockout Prepared by (#1 , #2): Person #1:** The name of the person who made up the lockout sheet. **Person #2: The second person verifying the lockout if it is modified or developed from a "master" or blank sheet.** Each department is responsible for determining the qualifications for members to be authorized to prepare Group Lockouts.
9. **Designated Person(s):** Member(s) who have the following responsibilities or perform the following functions during the lockout:
    - Lockout coordinator or equal who provides overall coordination and controls the lockout process, including any changes to the lockout
    - Operations person assigned to the lockout on the day the lockout is placed. This may be more than one person if the job carries into the second shift, or multiple days.
    - Any person who performs part of the group locking/unlocking process. Members who initial boxes on the lockout must write or type their full name in this box.

    The names of the person(s) are written in this space as they participate in lockout process.
10. **Lockout Audited By (optional):** Allows operations to audit a Group lockout and designate that it has been audited on the form. This can be done before or after work has started under the Group. Enter initials for lockouts that are audited. (This is separate from health and safety ZES audits).
11. **Job Description:** Description of the job(s) taking place under the lock. If the process lockout will involve all items identified in the procedure, this can be a single task description (i.e. clean and inspect system). Otherwise, jobs are to be separately listed to ensure that the procedure is effectively reviewed and applied for each individual job, especially for locks that are applied in the midst of a larger job (outage job modifications). Can be filled in at time of job, or pre-filled when the

work schedule is completed. It is acceptable to attach a list of jobs under the lockout that allows the same tracking as identified in this section.

12. **IES:** Check this box if the task involves the requirement for partial energy to be present. If checked, a written procedure must be available to identify the steps to be taken for control of energy sources.
13. **Ready:** Indicates that the lockout has been placed for that task. **The operations designated person** (either the member placing the locks, or the lockout coordinator) **must initial for work to proceed.**
14. **Hazardous Energy Sources:** Check those boxes that correspond to the hazardous energies that could potentially be present when bringing the system to zero energy state.
15. **Unique Hazards:** List those hazards that specifically need to be called out to advise personnel of potential serous risks to their safety if not properly addressed. (i.e. methods for relieving stored energy).
16. **Special Job Instructions/Procedures:** Identify those steps or items that need to be addressed to allow the equipment/system to be prepared for safe isolation, other than the lockout steps identified in the lockout table (i.e. equipment that requires special measures for isolation – block and tag, pin and tag, or OEM device).
17. **Lockout:** Initials of one of the designated persons conducting the lockout for that particular item. **When the E&I places the lock on a knife switch, the E&I and operator will both initial the lockout sheet indicating the lock is on the correct piece of equipment (based on the equipment number on the lockout sheet). When the operator places the lock on the 2300 disconnect (after E&I throws the disconnect), the operator will initial the lockout sheet**
18. **Lock Number:** Area lock number applied to that item (can be pre-filled).
19. **Equipment Description:** Description of item to be locked out or isolated. Can be used to list items by floor area, or arranged for mechanical and electrical groupings to aid in lockout process.
20. **Equipment Number:** Mill functional number, corresponding to field item, where labeled. Not available for all mill components. Provide where designation currently exists.
21. **Isolation Device/MCC Location:** For electrical, list the MCC location for the disconnect, unless remotely located in the field. Can be used to specifically list mechanical or other device locations. ** Equipment description and isolation device/MCC location combined descriptions must be clear to prevent errors in identifying the proper component for lockout.
22. **Bump Test:** Initials of one of the designated persons conducting the bump test for electrical components.
23. **Method of Isolation/Verification:** Must list action required to bring item to ZES conditions. Electrical example is “open and lock”, mechanical example “close and lock”, or “open, drain and lock”. Use to identify special needs (E&I reqd), or for devices that will not be locked “block and tag”.
24. **Unlock**: Initials of one of the designated persons when lock or isolating device has been removed.
25. **Edit History:** Use for keeping a history of modifications to the ZES procedures.

APPENDIX F
Relationship of ZES, IES and Moving Equipment Practices



APPENDIX G
Revised Lockout Procedure Notice

Revised Lockout

Date _____ Time _____ Revised By _____

Description:

_____

_____

_____