WFBMC ENVIRONMENTAL HEALTH & SAFETY / ENGINEERING LOCKOUT/TAGOUT (CONTROL OF HAZARDOUS ENERGY) PLAN	
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INTRODUCTION

POLICY

This policy and procedure is intended to protect employees at Wake Forest University Baptist Medical Center (WFBMC) from hazards caused by the inadvertent activation of equipment during maintenance. This policy establishes the minimum requirements for controlling hazardous energy.

PURPOSE

The protection of those who could be exposed (during the servicing and maintenance of equipment) to unexpected energization, start up, or release of stored energy, such energy release could result in injury or death.

Hazard Types

- Electrical: hazards resulting from direct contact with energized circuits, such as those found in fans, motors, or control panels.
- Mechanical: hazards caused by movement of blades, presses, pump shafts, gears, etc.

- Chemical: hazards resulting from the sudden release of materials from valves, pipes, tanks, etc.
- Thermal: hazards associated with hot steam in pipes, heat from a boiler, etc.
- Pneumatic: hazards associated with pneumatic pumps, pneumatic lines and tubing, pressurized fittings, etc.
- Hydraulic: hazards associated with hydraulic equipment, such as loading and unloading platforms, etc.
- Stored Energy: hazards from stored energy in batteries, capacitors, springs, gravity, accumulators, etc.

SCOPE

These requirements cover the servicing and maintenance of equipment where the unexpected energization, start up or release of stored energy could cause injury to employee, contractors or faculty and staff at WFBMC. WFBMC Lockout/Tagout Plan applies to all work areas at WFBMC when servicing or conducting maintenance on equipment. These requirements do not apply to the following:

- Normal production operations where the employee is not required to remove or bypass guards or safety devices, nor to place any part of his/her body into a danger area during the equipment operating cycle.

- Work on cord and plug connected electrical equipment, for which exposure to the hazards of unexpected energization or start-up is effectively controlled by unplugging the equipment from the energy source and keeping the plug under the exclusive control of the employee performing the maintenance.

DEFINITIONS

Affected employee **-** An employee whose job requires him/her to operate or use a machine or equipment on which servicing or maintenance is being performed under lockout or tagout, or whose job requires him/her to work in an area in which such servicing or maintenance is being performed.

Authorized employee - A person who locks out or tags out machines or equipment in order to perform servicing or maintenance on that machine or equipment.

Capable of being locked out - An energy isolating device is capable of being locked out if it has a hasp or other means of attachment to which, or through which, a lock can be affixed, or it has a locking mechanism built into it. Other energy isolating devices are capable of being locked out, if lockout can be achieved without the need to dismantle, rebuild, or replace the energy isolating device or permanently alter its energy control capability.

Control Reliability – A method of ensuring the integrity of the performance of guards, devices or control systems (American National Standard for Machine Tools – Other B11 Machine tools Safety Standards- Performance Criteria for the Design, Construction, care and operation, ANSI B11.19-1990).

> *NOTE: The American National Standard for Machine Tools – Performance Criteria for Safeguarding, ANSI B11.19-2003, defines the term as [t]he capability of the machine control system, the safeguarding, other control*

components and related interfacing to achieve a safe state in the event of a failure within their related functions. This standard provides performance requirements for the design, construction, installation, operation and maintenance of the safeguarding (guards, safeguarding devices, awareness devices, safeguarding methods, safe work procedures). This standard does not provide the requirements for the selection of the safeguarding for a particular application, though there is guidance provided.

Controller – a device or group of devices that serves to govern in some predetermined manner, the electric power delivered to the apparatus to which it is connected.

Disconnecting means – A device, group of devices or other means by which the conductor of a circuit can be disconnected from its source of supply.

Energized - Connected to an energy source or containing residual or stored energy. Conductors and parts of electric equipment that have been de-energized, but have not been locked and tagged out with 1910.333(b) must be treated as energized parts. Likewise, conductors and parts of electrical equipment that have been de-energized under procedures other than those required by 1910.269(d) or (m) and (n), as applicable must be treated as energized.

Energy isolating device - A mechanical device that physically prevents the transmission or release of energy, including but not limited to the following:

1. A manually operated electrical circuit breaker.
2. A disconnect switch.
3. A manually operated switch by which the conductors of a circuit can be disconnected from all ungrounded supply conductors, and, in addition, no pole can be operated independently.
4. A line valve, bolted blank flange and bolted slip blinds.
5. A block (e.g., a safety block).
6. Any similar device used to block or isolate energy.

Push buttons, selector switches and other control circuit type devices are not energy isolating devices.

NOTE: Programmable logic controllers (PLCs) are used in many machine applications and these control circuit devices are not considered energy isolation devices for purposes of the LOTO Standard. Safety functions, such as stopping or preventing hazardous energy (motion), can fail due to component failure, program errors, magnetic field interference, electrical surges, improper use or maintenance, etc.

Energy source - Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy.

Group Lockout / Tagout – Group LOTO allows authorized individual employees to be protected from hazardous energy when they are part of a group (two or more employees) performing covered servicing or maintenance. Group LOTO is the means by which each authorized employee performing the servicing and /or maintenance exercises his control over the associated hazardous energy by

attaching his personal LO or TO device onto a group LOTO mechanism. It consists of personal LOTO Devices, group LOTO devices/mechanisms and equipment LOTO devices.

Group lockout/tagout mechanism – Any device or mechanism that, when used as part of a group LOTO system, permits each individual employee to use his personal lockout or tagout devices to physically secure energy isolating device(s) during the servicing or maintenance work. The use of group lockout hasps, lockboxes (containing keys or tabs from equipment locks or job tags) or similar group mechanisms.

Hazardous Energy – Any energy, including mechanical (e.g., power transmission apparatus, counterbalances, springs, pressure, gravity), pneumatic, hydraulic electrical, chemical, nuclear and thermal (e.g., high or low temperature) energies, that could cause injury to employees. Danger is only present when energy may be released in quantities or at rates that could injure employees.

Hot tap - A procedure used in the repair, maintenance and services activities which involves welding on a piece of equipment (pipelines, vessels or tanks) under pressure, in order to install connections or appurtenances. It is commonly used to replace or add sections of pipeline without the interruption of service for air, gas, water, steam, and petrochemical distribution systems.

Isolation Switch – A switch intended for isolating an electric circuit from the source of power. It has no interrupting rating and it is intended to be operated only after the circuit has been opened by some other means.

Lockout - The placement of a lockout device on an energy isolating device, in accordance with an established procedure ensuring that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

Lockout device - A device that utilizes a positive means such as a lock, either key or combination type, to hold an energy isolating device in the safe position and prevent the energizing of a machine or equipment. Included are blank flanges and bolted slip blinds.

Principal Authorized Employee (*Supervisor) or designated authorized employee* - The authorized employee who supervises or oversees a group of servicing/maintenance employees (e.g., plumbers, carpenters, electricians, metal workers, mechanics).

Safeguarding - ANSI B11.19-1990 national consensus standard defines safeguarding as the *method(s) for protection of personnel from hazards, using guards, safety devices, or safe work procedures.* The following ANSI B11.19-1990 definitions describe the various types of safeguarding.

1. *Guard - A barrier that prevents entry of an individual's hand or other body part into the hazardous area.*
2. *Safeguarding device - A control or attachment that:*
    - *a. Restrains the operator from inadvertently reaching into the hazardous area, or*

b. Prevents normal or hazardous operation, if any part of an individual's body is inadvertently within the hazardous area, or
c. Automatically withdraws the operator's hands, if the operator's hands are inadvertently within the hazardous area during the hazardous portion of the machine cycle, or
d. Maintains the operator or the operator's hands during the hazardous portion of the machine cycle at a safe distance from the hazardous area.

NOTE: The 1990 ANSI B11.19 term *Safeguarding Device* was modified to *Safeguarding (Protective) Device* in the revised 2003 ANSI standard. The 2003 ANSI edition defines a *safeguarding (protective) device* as: *A device that detects or prevents inadvertent access to a hazard*. Devices that detect, but do not prevent employee exposure to machine hazards (e.g., through one of the four methods in 2a through 2d above), do not comply with the machine guarding provisions contained in Subpart O, when guards or safeguarding devices are feasible.

Servicing and/or maintenance - Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines or equipment. These activities include lubrication, cleaning or unjamming of machines or equipment and making adjustments or tool changes, where the employee may be exposed to the unexpected energization or startup of the equipment or release of hazardous energy.

Setting up - Any work performed to prepare a machine or equipment to perform its normal production operation.

Tagout - The placement of a tagout device on an energy isolating device, in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.

Tagout device - A prominent warning device, such as a tag and a means of attachment, which can be securely fastened to an energy isolating device in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed. WFBMC Engineering uses a two part tear-off tagout tag.

Yellow Large System Locks – the use of designated yellow master locks for locking out large systems.

REGULATORY OVERVIEW

The following regulations or policies pertain to the Control of Electrical Energy.

Federal Regulation	Title
OSHA 29 CFR 1910.147	Control of Hazardous Energy – lockout/tagout
OSHA Directive Number: CPL 02-00-147	The Control of Hazardous Energy – Enforcement Policy and Inspection Procedures
OSHA 29 CFR Subpart S, 1910.301-1910.335	Electrical

ROLES AND RESPONSIBILITIES

WFBMC ENVIRONMENTAL HEALTH AND SAFETY

- Develop and implement Lockout/Tagout (Control of Hazardous Energy) Plan.
- Review plan annually.
- Assist Engineering with training and retraining of authorized employees.
- Investigate and document all reported accidents and/or near-miss accidents that are directly or indirectly related to the locking and tagging of equipment.

PRINCIPAL AUTHORIZED EMPLOYEE (SUPERVISOR)

- Attend and complete all safety training requirements.
- Administer the Lockout/Tagout Plan.
- Authorize the use of tagout only procedures.
- Document LOTO procedures and maintain LOTO Form.
- Perform annual audit (periodic inspections) of the LOTO Procedures.
- Report all workplace injuries, unsafe conditions and near misses to their supervisors and/or WFBMC EH&S/WFBMC Safety.

AUTHORIZED EMPLOYEES

- Attend and complete all safety training requirements.
- Adhere to the requirements of the Lockout/Tagout (Control of hazardous Energy) Plan.
- Ensure the security of their locking devices.
- Complete documentation procedures.
- Report all workplace injuries, unsafe conditions and near misses to their supervisors and/or WFBMC EH&S / WFBMC Safety.

AFFECTED EMPLOYEES

- Attend appropriate safety training.
- Awareness of electrical safety issues.
- Notify the appropriate persons when equipment needs servicing.
- Follow Lockout/Tagout instructions given by the authorized employees.
- Report safety concerns.

CONTRACTORS OR OTHER NON MEDICAL CENTER EMPLOYEES

- Comply with the WFBMC Lockout/Tagout (Control of Hazardous Energy) Plan and OSHA standard 1910.147, 1910 Subpart S which includes 1910.331 – 1910.335.
- Whenever outside servicing personnel are to be engaged in Lockout/Tagout activities, WFBMC and the outside employer will inform each other of their respective lockout or tagout procedures.
- WFBMC Employees will ensure that his/her employees understand and comply with the restrictions and prohibitions of the outside employer's energy control program.

MINIMUM REQUIREMENTS

WFBMC will establish a program consisting of energy control procedures, employee training and periodic inspections to ensure that before any employee performs any servicing or maintenance on a machine or equipment where the unexpected

energizing, startup or release of stored energy could occur and cause injury, the equipment will be isolated from the energy source and rendered inoperative.

Locking devices and tags will be used when employees are performing maintenance or service to any equipment or system where unexpected or unintentional motion could cause harm. Locking devices will also be used when guards or other safety devices must be removed during service or when moving or energized parts put any part of the employee's body at risk of injury.

Examples of conditions where locking and tagging should be used may include, but are not limited to:

- Clearing blocked or jammed mechanical equipment;
- Maintenance or repair work on equipment with moving parts;
- Confined space entries (Refer to the WFBMC Confined Space Program); and
- Repairs or installation of electrical equipment.

If the equipment being serviced must be temporarily re-activated (for example, to test the equipment as part of the installation) all start-up and lockout procedures must be followed.

WORKING WITHOUT A LOCK

At WFBMC, lockout is the preferred method over tagout. Only use tagout when a lock cannot be applied to the equipment. The tagout device will be attached to the same location that the lockout device would have been attached.

An Engineering Supervisor must authorize the use of tagout only procedure.

After January 2, 1990, whenever replacement or major repair, renovation or modification of equipment is performed and whenever new equipment are installed, energy isolating devices for such equipment will be designed to accept a lockout device.

PROTECTIVE MATERIALS AND HARDWARE

Locks, tags, chains, wedges, key blocks, adapter pins, self-locking fasteners, or other hardware will be provided by WFBMC Engineering for isolating, securing or blocking of equipment from energy sources.

Lockout devices and tagout devices will be singularly identified; will be the only devices(s) used for controlling energy; will not be used for other purposes and will meet the following requirements:

- Durable
  - Lockout and tagout devices will be capable of withstanding the environment to which they are exposed for the maximum period of time that exposure is expected.
  - Tagout devices will be constructed and printed so that exposure to weather conditions or wet and damp locations will not cause the tag to deteriorate or the message on the tag to become illegible.

- Tags will not deteriorate when used in corrosive environments such as areas where acid and alkali chemicals are handled and stored.

- Standardized
  - Lockout and tagout devices will be standardized within WFBMC in at least one of the following categories: Color; shape; or size; and additionally, in the case of tagout devices, print and format will be standardized.

- Substantial
  - Lockout devices will be substantial enough to prevent removal without the use of excessive force or unusual techniques, such as with the use of bolt cutters or other metal cutting tools.
  - Tagout devices, including their means of attachment, will be substantial enough to prevent inadvertent or accidental removal.
  - Tagout device attachment means will be of a non-reusable type, attachable by hand, self-locking, and non-releasable with a minimum unlocking strength of no less than 50 pounds and having the general design and basic characteristics of being at least equivalent to a one-piece, all environment-tolerant nylon cable tie.

- Identifiable
  - Lockout devices and tagout devices will indicate the identity of the employee applying the device(s).
  - Tagout devices will warn against hazardous conditions if the equipment is energized and will include a legend such as the following: "***Do Not Start". "Do Not Open". "Do Not Close". "Do Not Energize". "Do Not Operate"***.

WFBMC ENGINEERING

Wake Forest Baptist Medical Center (WFBMC) Engineering will be issued three red designated lockout locks per authorized employee. On one side of the lock, it will state "Do not operate" and on the other side of the lock, it will list the name of the authorized employee.

For the shutdown of large systems contact the Principal Authorized Employee (Engineering Supervisor). Twelve yellow Master lockout locks have been designated for these large system shutdowns. Power Plant will have twenty four locks.

In addition of issuing locks, a two part tear-off tagout tag with the words "Do Not Operate" will be issued to the authorized employees and utilized in conjunction with the lock.

BIOMEDICAL ENGINEERING

Biomedical Engineering will be issued 6 orange Master locks to be designated lockout locks for the machine shop equipment. On one side of the lock, it will state "Do not operate" and on the other side of the lock, it will list the name of the authorized employee.

ARP

Designated ARP Staff will be issued blue Master locks to be designated lockout locks for the autoclaves, tunnel and rack washer and Garbels. On one side of the lock, it will state “Do not operate” and on the other side of the lock, it will list the name of the authorized employee.

REMOVAL OF LOCKS

Each lockout or tagout device shall be removed from each energy isolating device by the employee who applied the device.

When the authorized employee who applied the lockout or tagout device is not available to remove it, that device may be removed under the direction of the Supervisor. The Supervisor will follow the procedure outlined below before removing a lockout or tagout device.

- Verify the authorized employee who applied the device is not at WFBMC.
- Making all reasonable efforts to contact the authorized employee to inform him/her that his lockout or tagout device has been removed.
- Ensuring that the authorized employee has this knowledge before he/she resumes work.

SHIFT OR PERSONNEL CHANGES

To ensure the continuity of LOTO protection, an orderly transfer of LOTO device protection between off-going and oncoming employees will be utilized to minimize exposure to hazards from the unexpected energization or start-up of the equipment, or the release of stored energy.

GROUP LOCKOUT/TAGOUT

Group Lockout/tagout (LOTO) is required when more than one authorized employee is engaged in the performance of servicing and/or maintenance activities. Each authorized employee performing servicing or maintenance activities must be in control of the associated hazardous energy throughout the entire period of his exposure.

The principal authorized employee (supervisor) or a designated authorized employee will coordinate the overall lockout/tagout operation of the authorized employees to ensure continuity of protection.

Each authorized employee will affix his personal lockout/tagout device to the group lockout device when he begins work. Each authorized employees will remove those devices when he stops working on the equipment being serviced/maintained.

No employee may affix (or remove) the personal LOTO device of another employee.

When the principal authorized employee or designated authorized employee verifies isolation, all of the authorized employees participating in the group LOTO will be informed of their right to verify the effectiveness of the lockout measures and will be allowed to personally verify that hazardous energy sources have been effectively isolated. An authorized employee will verify the effectiveness of the isolation measures and must perform this verification after affixing his personal lockout or tagout device to the lockout device and before performing servicing/maintenance activities.

Depending upon the measures necessary to detect the presence of hazardous energy, the verification of isolation may involve the use of a test instrument (e.g., combustible gas indicator), a visual inspection and/or a deliberate attempt to start-up equipment. Authorized employees will take whatever means are necessary to test the equipment to reliably verify that isolation and de-energization have been effectively accomplished before starting servicing/maintenance work on equipment that has been locked / tagged out. Verification must be performed by each authorized employee before starting work

Before re-energization the equipment, the following will be inspected:

- the equipment area to ensure that it is cleared of nonessential items, which could result in employee injuries
- the equipment components are operationally intact (e.g., to check that safeguards are properly applied and functioning)
- all employees in the equipment area will be safely positioned or moved from the area.

ANNUAL AUDIT (PERIODIC INSPECTIONS)

Due to the significant risks associated with inadequate energy control procedures and the failure to properly implement effective energy control procedures, annual audits (inspections) are required to be performed. These audits are composed of two components – the LOTO procedures and employees responsibilities. The audits will verify the following:

- LOTO procedures are adequate and being properly applied.
- Employees involved are familiar with their responsibilities
- Employees maintain proficiency in the energy control procedures that they implement.

A WFBMC Engineer or ARP Supervisor will be responsible for conducting the annual audits. He will observe the implementation of the energy control procedure for:

- Servicing and/or maintenance activities being evaluated
- Talking with employees implementing the procedure to determine that all the requirements of the LOTO standard are understood and being followed.

Annual Audit will be certified using the Lockout/Tagout Annual Audit Form (**APPENDIX C**).

Each energy control procedure is required to be inspected or similar equipment may be grouped for purposes of conducting a periodic inspection, if the equipment in the group has the same or similar types of control measures.

A designated authorized WFBMC Engineer or ARP Employee will inspect a representative number of such employees implementing one procedure within each

group. The inspection sampling must reasonably reflect servicing and/or maintenance operations and hazardous energy control practices for the procedures being inspected.

If procedures are grouped for inspection purposes, the designated authorized WFBMC Engineer or ARP Employee will select different individual procedures (from the group of same or similar procedures) each year for evaluation so that, over time, each individual procedure is inspected as part of an annual audit (inspection) program. However, within a group of procedures, the designated authorized WFBMC Engineer or ARP Employee may focus on a subset of procedures that are more likely to be deficient or incorrectly implemented by employees, if experience (e.g., accident rates associated with certain equipment or other factors (e.g., the unusually large number of employees required to accomplish the servicing activity) support such a strategy.

Energy control procedures used less frequently than once a year (based on a twelve-month interval) need be inspected only when used. These periodic inspections must contain at least two components:

1. An inspection of each energy control procedure
2. A review of each employee's responsibilities under the energy control procedure being inspected.

TRAINING REQUIREMENTS

Engineering, ARP and Biomedical Engineering will provide annual training to ensure that the purpose and function of the energy control program are understood by employees and that the knowledge and skills required for the safe application, usage, and removal of the energy controls are acquired by employees. The training will include the following:

- Authorized employee will receive training in the:
    - Recognition of applicable hazardous energy sources
    - Type and magnitude of the energy available in the workplace
    - Methods and means necessary for energy isolation and control.

- Each affected employee will be instructed in the purpose and use of the energy control procedure.
- All other employees whose work operations are or may be in an area where energy control procedures may be utilized, will be instructed about the procedure, and about the prohibition relating to attempts to restart or reenergize systems or equipment which are locked out or tagged out.
- When tagout systems are used, employees will also be trained in the following limitations of tags:
    - Tags are essentially warning devices affixed to energy isolating devices, and do not provide the physical restraint on those devices that is provided by a lock.
    - When a tag is attached to an energy isolating means, it is not to be removed without authorization of the authorized person responsible for it, and it is never to be bypassed, ignored, or otherwise defeated.
    - Tags must be legible and understandable by all authorized employees, affected employees, and all other employees whose work operations are or may be in the area, in order to be effective.

- Tags and their means of attachment must be made of materials which will withstand the environmental conditions encountered in the workplace.
- Tags may evoke a false sense of security, and their meaning needs to be understood as part of the overall energy control program.
- Tags must be securely attached to energy isolating devices so that they cannot be inadvertently or accidentally detached during use.

RETRAINING

- When the Annual Audit (periodic inspections) indicates that an employee does not have the necessary knowledge or skills to safely work on hazardous energy sources.
- Whenever there is a change in job assignment.
- Whenever there is a change in the equipment or processes that presents a new hazard.
- When there is a change in the energy control procedure.
- Infrequently used energy control procedures must be performed prior to the start of the infrequent servicing/ maintenance task.

TRAINING PROGRAM EVALUATION AND VERIFICATION

A representative sampling of selected employees, authorized, affected and other will be interviewed to evaluate the effectiveness of the training program. The effectiveness will be done by verifying that authorized employees recognize and understand:

- All applicable hazardous energy sources.
- Type and magnitude of energy found in the workplace.
- Means and methods of isolating and/or controlling energy.
- Means of verification of effective energy control
- The purpose of the procedure to be used.

Verify that affected employees have been instructed in the purpose and use of the energy control procedure(s).

Verify that all other employees who work in the area where the energy control procedure(s) are utilized are instructed about the procedure and the prohibition against attempting to restart or reenergize equipment that is locked out/tagged out.

RECORD KEEPING

Engineering, ARP and Biomedical will retain the following documents and submit copies to WFBMC EH&S.

- Training records
- Annual audit (periodic inspections)

REVIEW

The Lockout/Tagout (Control of Hazardous Energy) Plan will be reviewed annually by Engineering and Environmental Health and Safety.

DATE	***INDIVIDUAL***	***REVIEW TYPE***
July 10, 2012	C. Caskey / L. Shore / S. Holladay	Annual

APPENDIX A – WFBMC ENGINEERING LOCKOUT/TAGOUT PROCEDURE

PURPOSE

This procedure establishes the minimum requirements for the lockout of energy isolating devices whenever maintenance or servicing is done on equipment or system. It will be used to ensure that the equipment is stopped, isolated from all potentially hazardous energy sources and locked out before employees perform any servicing or maintenance where the unexpected energization or start-up of the equipment or release of stored energy could cause injury.

COMPLIANCE WITH THIS PROGRAM

All employees are required to comply with the restrictions and limitations imposed upon them during the use of lockout. The authorized employees are required to perform the lockout in accordance with this procedure. All employees, upon observing the equipment or system which is locked out to perform servicing or maintenance will not attempt to start, energize, or use that equipment.

TYPE OF COMPLIANCE ENFORCEMENT TO BE TAKEN FOR VIOLATION OF THE ABOVE

The basic purpose of this policy is to ensure a safe working environment and safe work practices for all employees. Strict adherence to the procedures is mandatory. Therefore, all employees share equally in the responsibility for the application of these procedures. Supervisors and or team leaders share equally with the employees the responsibility for the adherence to these procedures, and will equally share in the disciplinary actions necessary as a result or failure to follow these requirements. The Departmental Chain of Command or Line of Responsibility and Authority will apply for any necessary disciplinary action that may result from the lack of adherence to these procedures.

STEP 1 - PREPARE FOR SHUT DOWN

At WFBMC Engineering, lockout is the preferred method over tagout.

Only use tagout when a lock cannot be applied to the equipment and it can be demonstrate that the tagging procedure will provide a level of safety equivalent to that obtained by the use of a lock.

An Engineering Supervisor must authorize the use of tagout only procedure.

- The authorized employee will understand the hazards of the energy and will know the methods to control the energy. He will ensure that if more than one energy source exists, that all are appropriately secured.

    - In order to shutdown some of the equipment, refer to the completed **LOTO ENERGY CONTROL PROCEDURE FORM, APPENIDX B** located in each Engineering Supervisor's Office or the Power Plant.
    - If a **LOTO ENERGY CONTROL PROCEDURE FORM** is not available or needs to be modified, then complete a new form found in **APPENDIX B.**

- Use the Yellow Large System Locks when locking out a large system. Complete **LOCKOUT/TAGOUT LOG FORM**, **APPENDIX D**

- All affected employees will be notified that a lockout/tagout procedure is going to be used on the equipment, the reason and the anticipated duration of the work.

STEP 2 - SHUT DOWN THE EQUIPMENT

If the equipment is in operation, shut it down by the normal procedure.
Check and verify that the equipment is stopped.

STEP 3 - ISOLATE THE EQUIPMENT

Deactivate the energy isolating device so that the equipment is isolated from its energy source by closing valves, opening isolation disconnect switches, turning off breakers, disconnect power cords, etc.

STEP 4 - APPLY LOCKOUT/TAGOUT DEVICES

A. Attach a lockout/tagout device as appropriate. The lockout/tagout device will be affixed in such a manner to hold the devices in a safe or off position.

B. Specialized lockout devices such as ball valve lockout, gate valve lockout, circuit breaker lockout, plug lockout, wall switch lockout, and group lockout will be utilized as required for attachment to energy isolating devices.

C. Sign and date the tag and return bottom portion of two part tear-off tagout tag to supervisor.

STEP 5 - RELIEVE STORED ENERGY

A. Relieve, disconnect, or restrain any residual hazardous energy present in isolated energy system.

B. Verify that all moving parts have stopped turning.

C. Vent or drain any pressurized fluid.

D. Install ground wires to discharge electrical energy.

E. Block or support elevated equipment.

STEP 6 -VERIFY ISOLATION OF EQUIPMENT

A. Double check steps 1-5 of six step procedure.

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

STEP 7 - RESTORE EQUIPMENT TO SERVICE

A. Check the equipment area to ensure that all tools and other items have been removed.

B. Check the equipment to ensure that all components are operationally intact, including re-installation of all guards.

C. Verify all personnel are clear and or in a safe location and that all control devices are in the off position.

D. Remove the lockout and or tagout device(s) and restore the energy control device to its normal state. Lockout/tagout devices may only be removed by the authorized employees who affixed the device to the equipment or by the authorized employee's supervisor in the employee's absence.

E. Notify all affected employees that the repair or maintenance is complete and the equipment is in service and or ready for use.

F. Restart the equipment and verify correct operation.

G. Return top portion of two part tear-off tagout tag to supervisor upon completion of work.

H. Supervisor logs LOTO procedure on **LOCKOUT/TAGOUT LOG FORM**, **APPENDIX D**.

APPENIDIX B - LOTO ENERGY CONTROL PROCEDURE FORM

LOTO ENERGY CONTROL PROCEDURE # _____

☐New Procedure ☐Modification/Revised Procedure

THE FOLLOWING ENERGY CONTROL PROCEDURE IS USED FOR THE EQUIPMENT LISTED BELOW.

EQUIPMENT DESCRIPTION

GENERAL DESCRIPTION	
MANUFACTURE	
MODEL NUMBER	
SERIAL NUMBER	
LOCATION	

CONTROLS

The following controls, including start/stop buttons, toggle switches, emergency stop buttons, shut-off valves, etc., have been identified for this equipment.

DESCRIPTION OF CONTROL	LOCATION OF EQUIPMENT

ENERGY SOURCES/ISOLATION DEVICES

The following energy sources and energy isolation devices supporting this equipment have been identified.

ENERGY TYPES: (CHECK ALL THOSE APPLICABLE)	
☐ Electrical	☐ Pneumatic
☐ Hydraulic	☐ Steam
☐ Chemical	☐ Thermal
☐ Stored Energy	☐ Other

SOURCES / DEVICES AND MAGNITUDE	LOCATION	TYPE OF LOCK/TAG NEEDED

INVOLVED EMPLOYEES

The following employees may be involved, in various ways, with the shutdown, servicing, and restart of this equipment

AUTHORIZED EMPLOYEES	**DEPARTMENT/LOCATION**

Date written		Date of revisions	
Authors			
Authorized Reviewer(s)		Date reviewed	
Approvals		Date approved	

APPENDIX C - LOCKOUT / TAGOUT ANNUAL AUDIT FORM

JOB DESCRIPTION/ EQUIPMENT LOCKED OUT	

Employee(s) Interviewed - Employee Name (print)	Authorized	Affected
	☐	☐
	☐	☐
	☐	☐
Have Authorized Employee(s) been trained?	☐	☐

IF NO, STOP THE ACTIVITIES AND CONTACT WFBMC ENGINEERING SUPERVISOR

LOCKOUT/TAGOUT DEVICES	YES	NO	N/A
1. Have lockout locks been issued to you?	☐	☐	☐
STEP 1: PREPARING FOR SHUTDOWN	**YES**	**NO**	**N/A**
1. Have the type and amount of energy source(s) on the equipment been identified?	☐	☐	☐
2. Have the possible dangers related to the energy source being controlled been identified?	☐	☐	☐
3. Are the steps necessary to control the energy source understood?	☐	☐	☐
4. Have all affected employees been notified when the equipment will be shut down for service?	☐	☐	☐
STEP 2: SHUT DOWN EQUIPMENT			
1. Was equipment shut down by normal procedure?	☐	☐	☐
2. Was equipment checked and verifed that the equipment had stopped?	☐	☐	☐
STEP 3: ISOLATE THE EQUIPMENT			
1. Has the main breaker or control switch been shut off?	☐	☐	☐
2. Have the valves been closed?	☐	☐	☐
3. Have process lines been disconnected?	☐	☐	☐
STEP 4: ATTACH LOCKOUT/TAGOUT DEVICES			
1. Have the lockout lock(s) been applied?	☐	☐	☐
STEP 5: RELIEVE STORED ENERGY			
1. Has any residual hazardous energy present in isolated energy system been relieved, disconnected or restrained?	☐	☐	☐
2. Has all moving parts been verified that they have stopped turning?	☐	☐	☐
3. Has any pressurized fluid been vented or drained?	☐	☐	☐
4. Have ground wires been installed to discharge electrical energy?	☐	☐	☐
5. Has elevated equipment been blocked or supported?	☐	☐	☐
STEP 6: ISOLATION OF EQUIPMENT			
1. Have the start switches on the equipment been tested?	☐	☐	☐
2. Have the pressure gauges been checked to insure that lines are depressurized?	☐	☐	☐
3. Are blocks or cribs secure?	☐	☐	☐
4. Have electrical circuits been checked to verify that voltage is at zero energy?	☐	☐	☐
5. Are blanks, used to block feed chemicals, secure, and not leaking	☐	☐	☐
STEP 7: RESTORING EQUIPMENT TO SERVICE			
1. Was the equipment area checked to ensure that all tools and other items have been removed?	☐	☐	☐

2. Was the equipment checked to ensure that all components are operationally intact, including re-installation of all guards?	☐	☐	☐
3. Was it verified that all personnel were cleared and or in a safe location and that all control devices were in the off position?	☐	☐	☐
4. Were Lockout/tagout devices removed by the authorized employees who affixed the device to the equipment?	☐	☐	☐
5. Were all affected employees notified that the repair or maintenance was complete and the equipment was in service and or ready for use?	☐	☐	☐
6. Was equipment restarted and verified of correct operation?	☐	☐	☐
7. Was the top portion of two part tear-off tagout tag returned to supervisor upon completion of work?	☐	☐	☐
Deviations			
1. Are deviations required in training the authorized employees?	☐	☐	☐
2. Are deviations required to the LOTO Procedure to ensure adequate protection is provided?	☐	☐	☐

PRINCIPAL AUTHORIZED EMPLOYEE(S) CONDUCTING INSPECTION	
PRINT NAME:	DATE:
SIGNATURE:	
AUTHORIZED EMPLOYEE AUDITTED	
PRINT NAME:	DATE:
SIGNATURE:	

APPPENDIX D– LOCKOUT/TAGOUT LOG FORM

							ZONE NUMBER	
DATE	**EMPLOYEE'S NAME(S)**	**Yellow System Lock(s) #**	**TAG #**	**EQUIPMENT/SYSTEM LOCKED OUT**	**TIME INSTALLED**	**TIME REMOVED**	**SUPERVISOR INITIALS**	**COMMENTS**