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Authority: Safety Manager <small>DocuSigned by:</small>  Jim Boizot 8/19/2019	Current Effective Date: 08/15/2019
<small>A94E1064C95C4A2...</small> Review Frequency: Annually	Next Review Date: 08/15/2020

Purpose:

To ensure the safety of employees by establishing appropriate lockout/tagout (LOTO) procedures for equipment which is capable of storing hazardous energy, including but not limited to: electrical, chemical, mechanical hydraulic, pneumatic, and thermal.

Program:

This program applies to all work at Platte River Headquarters, Substations and the DRC involving the installation, service maintenance, adjustment, or the handling of machines, power equipment, or utility systems less than 600 volts where the unexpected energization of equipment or the release of stored energy could cause injury or death.

Work on or near mechanical and/or energized equipment is covered by this program if:

- An employee may contact electrified or otherwise energized components while performing work,
- An employee is required to remove or bypass any guard, interlock, or safety device (including equipment covers) to perform work; or
- An employee is required to place any part of his or her body into an area on the machinery or piece of equipment where work is performed.

This program does not apply to:

- Any work activities that involve Rawhide Energy Station Clearance and Tagout/Lockout Procedure, circuits involving the Bulk Electric System (BES) and Power System Switching Procedure.
- Routine, repetitive, integral activities to normal production, such as lubrication, provided that alternative measures offer protection (i.e., tools, guarding, etc.), or in such a manner that does not place the employee in harm's way.
- Operational testing when specific procedures have been developed and are followed.
- Work on electrical equipment that is connected by a cord and plug where the hazard of the equipment being accidentally turned on or releasing stored energy is eliminated by unplugging the equipment. The plug must remain under the exclusive control of the employee performing the work throughout the duration of the operation. "Under the exclusive control of the employee" means that the

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authorized employee would be able to prevent the equipment from becoming reenergized during his or her servicing or maintenance of that equipment. The plug is under the exclusive control of the employee if it is physically in the possession of the employee, or within arm's reach and in (the employee's) line of sight, or if the employee has affixed a lockout device on the plug.

- Lockout of local disconnects on facilities equipment by contractor personnel, provided prior approval is granted by the supervisor or manager.
- Work on equipment that cannot be shut down.

Program Requirements:

Assessments shall be performed on each tool/equipment, and or electrical system to identify potential hazardous energies and to document the control of hazardous energy. The procedures for the control of hazardous energy shall be written in the "Substation/Facilities Job Safety Tailgate Form". (Appendix A)

All written hazardous energy control procedures must include the following information:

- Specific procedural steps for shutting down, isolating, blocking, and securing systems or equipment to control hazardous energies.
- Specific procedural steps for the placement, removal, and transfer of locks and tags and the responsibility for placing them.
- Specific requirements for testing a system or equipment to determine and verify the effectiveness of LOTO and other energy control measures.
- Type and magnitude of the energy hazards.
- Name of employees authorized to lockout/tagout the equipment.
- Control of Hazardous Energy Procedures need not document the required procedure for a particular system or equipment, when all of the following elements exist:
 - The system or equipment has no potential or residual energy, or re-accumulation of stored energy, after shutdown which can be readily identified.
 - The system or equipment has a single energy source, which can be readily identified and isolated.
 - The isolation and locking out of the energy source will completely de-energize and deactivate the system or equipment.
 - The lockout device is under the exclusive control of the authorized "employee" performing the servicing or maintenance.
 - The system or equipment is isolated from that energy source and locked out during servicing or maintenance.
 - A single lockout device will achieve a locked-out condition.
 - The servicing or maintenance does not create hazards for other "employees."

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Locks and Tags

Lockout and tagout devices must meet the following criteria to ensure that they are effective and not removed inadvertently:

- Lockout devices must work under environmental conditions in which they are used.
- Tags must be legible and clearly visible.
- Lockout and tagout devices must be designated by color, shape, or size. Tagout devices must have a standardized print and warning format.
- Lockout devices must be strong enough to prevent removal without the use of unusual techniques.
- Tagout devices and the means to attach them must be substantial enough to prevent inadvertent or accidental removal. (Tags must be able to withstand a minimum of 50 pounds of force without tearing or disconnecting.)
- Tags used for LOTO must contain the language: “Danger – Do Not Operate.”

Preparation for Lockout/Tagout:

The authorized and or qualified worker shall identify all energy sources. An initial survey must be made to identify all the equipment’s sources of power or energy (including stored energy sources such as electrical capacitors or elevated movable components) so that each energy source can be isolated.

Sequence of Lockout/Tagout System Procedure:

- The authorized or qualified worker will notify all affected employees that a lockout or tagout system is going to be utilized and the reason for it and estimated start and duration times. The authorized or qualified worker shall know the type and magnitude of energy that the system or equipment utilizes and understand the hazards associated with it.
- A system or any electrical equipment shut down for repair, cleaning or inspection must have all power switched and locked in the “off” position. Sources of power shall be disconnected, ensuring all sources of both primary and secondary power to the equipment are interrupted. If the equipment cannot be locked out, it is permissible to pull the fuses to render the equipment inoperable. A “Do Not Operate” tag is to be placed at the equipment controls. Any residual energy shall be dissipated. Note: Only electrically qualified workers can remove fuses and an energized work permit must be completed.
- The authorized or qualified worker shall lockout or tag all in-line points of control. In some cases, this may be more than one place or more than one lock if several people are working on equipment. Lockout requires the placement of a (orange) field lock to be placed on a circuit breaker, switch, valve, or other sources of energy. A field lock shall be utilized on all occasions when the device being locked out is capable of accepting a lock.
 - For activities involving Facilities Maintenance, if the lockout or tag is being applied to a local disconnect for one shift involving one employee then the use of a red personal lock is acceptable or the contractor’s lock.

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- If a field lock cannot be used, use a tag, providing at least one safety precaution equivalent to a lock (removal of fuses, blocking switches, and removal of circuit breakers.)
- Verify that all sources of hazardous energies have been isolated. During this step, Zero Energy Verification is performed in a manner appropriate for the equipment being isolated (i.e., attempt to start, use of meters/gauges, visual inspection, etc.). Verification may be performed before or after Lockout Devices are installed depending on the configuration of the equipment being tested.
- Remaining field locks and keys go into lock box.
- A (blue) control lock is placed on the corresponding lock box and the lockout is placed into active status.
- The authorized employee places their (red) personal lock on the lock box after verifying the clearance points of the lockout.

Temporary Removal of Lockout/Tagout Devices:

When it becomes necessary to remove locks or tags temporarily to test or position the system or equipment, specific actions must be taken in the following sequence:

- Clear the equipment of tools, material, or other non-essential items.
- Clear employees from the area and notify affected employees of removal of locks/tags and system/equipment re-energization.
- Remove the field (orange) locks and/or tags (authorized employee only).
- Energize and proceed with testing or positioning.
- De-energize all systems and reapply locks and tags to continue the servicing and/or maintenance work.

Abandoned Lock Removal

If a Personal Lock must be released but the authorized employee is not on site, the employee's supervisor will make reasonable attempts to contact the employee. If the employee is contacted, he/she must return to the site to remove their Personal Lock if possible. If this is not possible, the contact attempt will be documented. The employee's supervisor may then authorize the personal lock to be removed. When the employee returns to the site, the employee will be informed their personal lock was removed. To prevent the need to remove locks when an employee or contractor is not on site, personal locks should be removed from lock boxes they are not actively working on.

Restoring Equipment to Normal Operations and Lockout/Tag Removal:

After the service or maintenance is complete and equipment is ready for normal operations, the authorized employee will survey the area around the system or equipment to ensure no one is exposed. In addition, all affected employees must be notified that the lockout/tagout devices have been removed before the equipment is started. Check that all guarding and safety controls have been properly replaced and ensure all personnel are clear of the equipment.

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The authorized employee applying the lockout device cannot authorize someone else to install or remove their personal lock. If the employee who applied the lockout or tag is not available to remove it, that device may be removed under the direction of that employee's supervisor.

Contractor Procedures:

When a contractor will be involved in a lockout procedure, the following steps are required to initiate the lockout:

- The Platte River authorized employee will review this procedure with the contractor supervisor prior to the initiation of the lockout.
- After the initiation of the lockout, but before the start of any service or maintenance activities, a walk-through with the contractor supervisor to verify accuracy of the lockout must be conducted. The contractor supervisor will place a contractor lock on the lock box.
- Contractors may place locks on local disconnect facilities equipment, provided that they have prior approval.

Training:

Employees who may be exposed to hazardous energy will receive training and retraining (as necessary). Minimum training for employees includes but not limited to:

Authorized and Electrically Qualified Worker:

- Details about the type and magnitude of the hazardous energy sources present in the workplace or in a particular type or piece of equipment.
- The methods and means necessary to isolate and control those energy sources; i.e. the elements of the energy control procedure(s).
- Sources of stored energy and methods to dissipate it.
- Types of lockout devices and how they are properly used.

Affected Employee:

- Recognize when the control procedure is being implemented.
- Understand the purpose of the procedure and the importance of not attempting to start up or use equipment that has been locked or tagged out.

Authorized, qualified and affected employees will be retrained whenever their job assignments change, energy-control procedures change, equipment or work processes present new hazards, or when they don't follow energy control procedures, or at a minimum on an annual basis to keep up with changes in industry standards and device types.

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Program Audits:

Audits of authorized employees shall be conducted annually to ensure compliance with LOTO procedures. The audits must be performed by an authorized or qualified worker other than the one(s) who is using the lockout/tagout procedure. The audits shall include:

- Whether the steps in the procedure are being followed.
- Whether the employees involved know their responsibilities under the procedure.
- Whether the procedure provides the necessary protection, and what changes, if any, are needed.
- The machine or equipment on which the lockout/tagout procedure was used.
- The date of the audit.
- The employees included in the audit.
- The name of the auditor who performed the audit.

Copies of the most current audits must be maintained with the associated department.

Implementing Parties and Assigned Responsibilities:

Affected Employees:

- Receive instruction about LOTO procedures and requirements.
- Do not restart or re-energize any piece of equipment or process which is either locked or tagged out, or attempt to bypass a lockout device.
- May not remove or tamper with locks or tags for any reason.
- May not apply locks or tags on any equipment unless properly trained.

Authorized and Electrically Qualified Workers:

- Follow the procedures in accordance with this written program and training provided.
- Complete all training required to be authorized and electrically qualified to work on specific equipment, tool(s) or systems.
- Maintain locks, keys, and electrical safety protective and testing equipment.
- Keys shall be located in a secure location and duplicate keys should only be available to supervisors.

Supervisors:

- Ensure that only authorized employees, who are qualified and trained, apply and remove locks and tags.
- Ensure that all safety equipment is stored and maintained and is available for employee use.
- Ensure that any deficiencies or deviations found in the working procedures are reported immediately and corrected prior to the commencement or continuation of any work.

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Safety:

- Provide training to all employees and contractors. Continuous training to be on an annual basis.
- Assist supervisors and employees on the types of lockout/tagout devices to use.
- Works with management to ensure compliance with this document.
- Update this procedure as necessary.

Associated Documents:

Platte River Power Authority's Electrical Safety Program, OSHA 1910.147, Control of Hazardous Energy.

Definitions and Acronyms:


- **Affected Employee** – An employee who operates or maintains equipment that may be locked/tagged out. Also, any person who works in an area where equipment is being serviced.
- **Authorized Employee** – An employee who locks out or tags out machine or equipment in order to perform servicing or maintenance on that machine or equipment
- **Capable of Being Lockout** – An energy isolating device is capable of being lockout if it has a hasp or other means of attachment to which, or through which a lock can be affixed, or if it has a locking mechanism built into it. Other energy-isolating devices will also be considered to be capable of being lockout, if lock out can be achieved without the need to dismantle, rebuild or replace the energy-isolating device or permanently alter its energy-control capability.
- **Control Lock** - The “master” lock used to lock all Lockout Device keys in a group Lockbox. The Control Lock is the first lock placed on the lock box and the last removed prior to equipment being returned to service.
- **De-Energized** – Disconnected from all energy sources and not containing residual or stored energy.
- **Energized** – Connected to an energy supply or containing residual or stored energy.
- **Energy Isolating Device** - A mechanical device that physically prevents the transmission or release of energy, including, but not limited to, the following: A manually operated electrical circuit breaker; a disconnect switch; a manually operated switch by which the conductors of a circuit can be disconnected from all ungrounded supply conductors; a line valve; a block; and any similar device used to block or isolate energy. The term does not include a push button, selector switch and other control circuit type device.
- **Energy Source** – Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy.
- **Field Locks** - Locks used to secure in-line points of control. Sets of Field Locks are keyed alike.

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- **Guard** – A physical barrier that prevents access to areas of the machine, equipment or process where a hazard exists.
- **Hazardous Energy** – Any electrical, mechanical, hydraulic, pneumatic, chemical, nuclear, thermal, gravity or other energy that could cause injury to personnel.
- **Lockout** – The placement of a lockout device on an energy isolating device, in accordance with an established procedure, ensures that the energy isolating device and the equipment being controlled cannot be operated until the lock-out device is removed.
- **Lockout Device** – A positive means such as a lock that secures an energy isolating device in a position that prevents the energizing of a machine equipment or process.
- **Lockout/Tagout** – The placement of a lock/tag on the energy isolating devices in accordance with an established procedure, indicating that the energy isolating device shall not be operated until removal of the lock/tag.
- **Personal Lock** - A lock assigned to an Authorized Employee. The Authorized Employee maintains custody of the key or combination.
- **Qualified Electrical Worker** – One who has demonstrated skills and knowledge related to the construction and operation of electrical equipment and installations and has received safety training to identify and avoid the hazards involved.
- **Stored Energy** – May take the form of mechanical (springs), thermal, hydraulic, chemical (batteries), potential and/or electrical.
- **Tag** – A prominent warning device, such as a tag and a means of attachment that can be securely fastened to an energy-isolating device to indicate that the device and the equipment being controlled cannot be operated until the tagout device is removed.
- **Zero Energy Verification** – The process of testing, in a manner appropriate for the equipment being isolated (i.e., attempt to start, use of meters/gauges, visual inspection, etc.), that energy has been dissipated, restrained, and adequately isolated to prevent inadvertent release.

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Appendix A

 Platte River Power Authority	Substations/Facilities Job Safety-Tailgate Form	
	Date:	WO#:
Job Supervisor:		
Names:		
Job Description & Location:		
Work Procedures:		
Job Hazards:		
Hazard Mitigation:		
PPE Requirements:		
Energy Source Controls: Address any energy sources that apply to the job, if an item doesn't apply then mark it: NA		
Clearance #:	Clearance Holder:	Grounds:
Low Voltage (50-600V) Isolations:		
Lock/Tag Locations:		
Mechanical or Stored Energy Isolations:		
Lock/Tag/Block Points:		
<p> <input type="checkbox"/> 1: Make notifications (<i>if not under clearance: PSO <u>may</u> need notified</i>). <input type="checkbox"/> 2: Turn off and lock or tag. <input type="checkbox"/> 3: Clear personnel= <u>dissipate</u> stored energy & <u>verify</u> dissipated (<i>if applicable</i>). <input type="checkbox"/> 4: Perform work. <input type="checkbox"/> 5: Unblock equipment & ensure safety devices are in place (<i>if applicable</i>). <input type="checkbox"/> 6: Clear workers & equipment & <u>keep area clear</u>. <input type="checkbox"/> 7: Remove locks &/or tags. <input type="checkbox"/> 8: Ensure area is clear & restart/energize. <input type="checkbox"/> 9: Make notifications. </p> <p style="text-align: center;"><u>Use Reverse Side of Page For Additional Notes If Needed</u></p>		
Employees Initials:		