Electrical Lockout / Tagout

PURPOSE:
Lockout/Tagout (LOTO) is a primary method used within Airfield Maintenance (AFM) operations to protect personnel from electrical hazards during service and maintenance. The policy and procedure described below establishes minimum requirements needed to ensure circuits and components are isolated from hazardous electrical energy where the unexpected release of this energy could cause injury or death in accordance with 29 CFR 1910.147

POLICY:
The procedures listed below are to be used by all AFM personnel and associated contractors engaged in electrical maintenance, repair, or inspection of circuits that operate at 50 volts (to ground) or greater. These circuits are to be de-energized and locked out to prevent accidental energization during service. All personnel who perform work on affected circuits will be present to participate in Lockout/Tagout procedures (except in the case of Group Lockout as described in paragraph "E"). All personnel performing Lockout/ Tagout must be qualified electricians with a thorough understanding of the Lockout/ Tagout procedures described below.

STANDARD PROCEDURE:
A. Location of Lockout / Tagout Devices
Lockout / Tagout devices will be available at the regulator vault and at the Field Maintenance Electrical (FME) shop. In addition, a LOTO kit will be available in each of the FME work trucks. All Job locks (see "H" definitions) and Personal Locks for FME personnel will be provided by AFM. There will be no spare keys for personal locks. "Job Locks" will be keyed alike and keys made available only to FME employees. If the key to a lock is lost or unserviceable while the lock is on a cabinet/breaker, etc., all procedures for forcibly removing lockout devices will be followed as listed in paragraph "D". In the event a lock is to be cut off, personnel must inform the electric shop foreman so a new lock can be purchased.

B(1). Application of Controls and Lockout / Tagout Devices
The established procedure of applying energy controls includes the specific actions that must be implemented in sequence. When a circuit is going to be de-energized, the following steps will be followed by the authorized employee(s):

1. If the circuit(s) to be locked out power(s) airfield lighting, notify Airport Operations and personnel in the FAA control tower of the effects this will have prior to de-energizing the circuit. For non-airfield circuits, check and notify any persons or entities that may be affected by the loss of power.
2. For Airfield circuits, place affected circuit(s) in "Maintenance Lockout" (see definition) with designated computer.
3. Turn the circuit breaker(s) at the regulator(s) and/or at the power panel(s) to OFF.

4. Once the circuit breaker(s) are off, place a multiple lock hasp on the breaker(s). All persons actually working on the circuit must apply their own Personal Lock unless group lockout is to take place as described in "E." below.
5. All Personal Locks will be removed prior to going off shift. A Job Lock is to be installed if the circuit must remain de-energized until work resumes, at which time Personal Locks will be re-installed until all work is finished and the circuit is safe. If a contractor has a circuit locked out, there is no need for FME to place a personal lock on the circuit unless they are also working on the circuit.
6. Place a tag on each Personal lock identifying the person who applied it, the date, and their contact phone number

***Exception:** For Airfield Lighting Vault LOTO (constant current systems), the **Circuit Control Log** may be used to indicate the identity of the persons applying the lockout devices.

7. **Airfield cutout cabinet Entry**: If circuits within the cabinet cannot be de-energized prior to entry, follow energized work permit procedures.
8. **Verification**, Constant current circuits: **Verify** that the circuit(s) to be worked on is/are de-energized at the vault by performing the following:
    a. After locking-out a circuit(s), attempt to energize that circuit(s) with the corresponding regulator switch and verify that the 'ACE' panel reads 0 (zero) amps.

*If locking out an entire regulator bank(s), attempt to energize a single circuit at said bank(s) and once again check the 'ACE' panel for zero amps.
b. All employees who apply lockout devices at the airfield electrical vault must complete the top portion of the CIRCUIT CONTROL LOG confirming that the circuit is de-energized

9. **Verify** the circuit is de-energized at the work location:

a. Parallel circuits: Attempt to energize the locked-out circuit by its normal means (i.e. turn the switch to 'on') then test for voltage using an appropriate volt meter.

b. Constant current airfield circuits: Attempt to energize the locked-out circuit with all means (ALCMS Computer, Pilot Radio Control, FAA Control Tower). Test for current by first using a non-contact tester and then using a true RMS amp meter. When contractors are involved, see B(2) below.

B(2). CONTRACTORS: Application of Controls and Lockout / Tagout Devices- All contractors will comply with LOTO procedures as described in this document and shall review this section prior to participating in LOTO. If a contractor requires an Airfield lighting circuit to be de-energized, they will identify which circuit(s) are in need of de-energization and coordinate with the Field Maintenance Electrical shop (FME). FME will de-energize or energize airfield circuits as needed. If necessary, FME will coordinate with Airport Operations to gauge what impact the de-energized circuit will have on the airport

before locking out the circuit. FME will respond on a work permitting basis. Procedures as follows:

1. The authorized contractor representative and FME personnel will meet at the defined panel or vault.
2. The contractor must supply their own locks and tags.
3. Application of locks and tags shall follow the procedures listed in B(1) *except for* "B(1), 9., b.". **Verification** of de-energization for constant current airfield circuits at the work location shall *instead* consist of the following actions:
    a. The contractor representative at the vault shall ensure an additional contractor representative is standing by at the airfield work location(s) ready to perform verification of de-energization
    b. The FME representative performing LOTO will turn on all lighting circuits on the airfield.
    c. While the entire field is energized, the contractor field representative will ensure the lighting circuit(s) they are about to work with is/are truly de-energized through visual verification (i.e. making sure lights at the work location do not illuminate) and through the use of a non-contact tester and a true RMS amp meter.
    d. Once de-energization is verified, the contractor's field representative shall contact the contractor representative at the vault location (via phone/radio) and verbally confirm that verification at the work location is complete
    e. The FME representative at the vault will then turn the unlocked airfield lights back off.
4. All authorized employees applying LOTO devices in the vault (including FME personnel) will enter the appropriate information in the top portion of the ANC Airfield Lighting CIRCUIT CONTROL LOG, including a signature from the contractor representative verifying that de-energization at the work location is confirmed
5. When the circuit is to be re-energized, the bottom portion of the Circuit Control Log will be completed to confirm that all precautionary steps have been taken prior to re-energization. (See paragraph C)

C. Removal of Locks and Tags for Return to Service

Before Lockout/ Tagout devices are removed and a circuit is re-energized, the following step shall be taken:

1. Inspect the work area to ensure that tools and other non-essential items have been removed and that system components are intact and capable of operating properly. Airfield circuits will be tested with an Ohm Meter at the S1-Cut-Out to test for continuity and eliminate the possibility of an open circuit.
2. Identify affected employees in the vicinity of the circuit(s)/component(s) to be re-energized and notify them that re-energization is about to happen

3. Communicate re-energization to the control tower, ANC Operations, and other affected parties.
4. Energize the circuits/components
5. When Contractors are finished with repairs/maintenance, affected circuits and components will be tested and witnessed by both parties insuring their functionality before the contractor leaves the premises.
6. **Remove Locks and Tags: Make sure that ONLY those persons who attached Personal lock(s) and tag(s) remove them.** (In the very few instances when this is not possible, the device may be removed under the direction of the Manager, Assistant Manager, or Electrical Foreman provided that they strictly adhere to the specific procedures outlined in paragraph "D").
7. Complete the bottom portion of the Circuit Control Log

D. Removal of another Person's Lock or Tag

1. Attempt to contact the individual identified with the lock or tag; and, if unsuccessful, contact the supervisor of the individual identified with the lock or tag. Supervisors need to verify if that individual has clocked out and/or left the premises.
2. Follow steps under paragraph "C".
3. Notify the worker before he/she resumes work at that facility that their Personal Lock, Group Lock, or tag has been removed.

E. Group Lockout / Tagout

When service/maintenance is performed by a crew or group, and when the application of multiple personal locks/tags to an energy isolation device is not practical or feasible, the group may utilize a procedure which affords members of the group a level of protection equivalent to that provided by the implementation of a Personal Lockout/Tagout device. A "Group Lock Box", as described in example below, will be for this purpose.

Example: Three circuits are to be de-energized, locked out, and serviced by a group of 5 individuals. One lockout device may be applied to each of these 3 circuits by a "Primary Authorized Employee" who then places the 3 keys to these locks in a Group Lock Box. This box will be designed to receive the personal locks/tags of all 5 authorized employees involved in the service activities. The Primary Authorized Employee's personal lock/tag attached to the lock box will identify them as such. The Primary Authorized Employee has added responsibility to oversee and coordinate LOTO for the crew they represent. *Contractors are responsible for implementing their own group lockout procedures*.

F. Locks and Tags (general):

Locks and tags are never to be bypassed, ignored, or defaced.

1. Tags must be legible and understandable to be effective.
2. Tags and locks, and their means of attachment, must be made of material that will withstand the working environment where the tags will be used.

3. Tags and locks must be attached securely so they cannot inadvertently be detached during use.

G. Periodic Inspection

Management shall arrange for a periodic inspection of the energy control procedures at least annually to ensure that the procedure and the requirements of this standard are being followed.

H. Definitions:

1. **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.
2. **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. An affected employee becomes an authorized employee when that employee's duties include performing servicing or maintenance covered under this section.
3. **Energized -** Connected to an energy source or containing residual or stored energy.
4. **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, and, in addition, no pole can be operated independently; a line valve; a block; and any similar device used to block or isolate energy. Push buttons, selector switches and other control circuit type devices are not energy isolating devices.
5. **Group Lock Box –** A box designed to accept multiple personal locks and assists with the process of Group Lock Out. (See example given in Paragraph E.)
6. **Job Lock -** A device used for added security and the continuity of energy isolation during a multiple-shift operations. These locks are not individually keyed and do not serve the same purpose as a personal lock.
7. **Lockout -** The placement of a lockout device on an energy isolating device, in accordance with an established procedure, that ensures the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.
8. **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.
9. **Maintenance Lockout -** A proprietary software program developed by ADB for use with the Airport Lighting system. The program provides two basic functions:
   a. A circuit in maintenance lockout cannot be operated by air traffic control or any other user. Only the logged in user, has control.
   b. The circuit is also tagged that it is in maintenance lockout and will not cause alarms.
10. **Personal Lock –** A lockout device that is individually keyed (with no duplicate keys available) and designed to protect an authorized employee. Personal locks ensure that each authorized employee is protected by a lockout device that can only be removed by the authorized employee that applied the device.

11. **Primary Authorized Employee -** This employee is designated as the "group leader" when Group LOTO is implemented. This individual coordinates group LOTO and is responsible for ascertaining the individual exposure status of each employee within their group. (See example given in Paragraph E.)
12. **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.
13. **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.

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