NOTICE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

Air Traffic Organization Policy

N JO 3900.72

Effective Date:
02/02/2010

Cancellation Date:
02/02/2011

SUBJ: Lockout/Tagout Procedures – New Equipment Installation and Major Modifications

1. Purpose of this Notice. This notice provides requirements for utilizing and developing Lockout/Tagout (LO/TO) procedures when installing new equipment or making major modifications to existing equipment.

2. Audience. This notice applies to FAA Air Traffic Organization organizations that manage, implement, and/or execute the requirements in the LO/TO Program. This document is distributed to all FAA headquarters, service centers and service areas in which FAA personnel maintain and/or work on equipment containing electrical and/or other energy sources, such as mechanical, hydraulic, pneumatic, chemical, thermal, etc.

3. Where Can I Find This Notice. You can find this notice on the Directives Management System (DMS) website: https://employees.faa.gov/tools_resources/orders_notices/

4. Requirements.

a. The issue of responsibility for developing LO/TO procedures was recently raised by a System Support Center (SSC) during the installation of a Direct Current (DC) BUS System ("DC Bus") at a facility. The issue was resolved through collaboration among several organizations, including the Environment and Occupational Safety & Health (EOSH) Services Group, Power Services Group, and several field organizations. Although the EOSH Services Group is initiating development of a national LO/TO Program, the procedures developed as a result of this collaborative effort are considered significant enough to merit dissemination to field facilities to avoid employee injury due to the release of (stored) hazardous energy.

b. During the installation of new equipment, and as part of the customary Joint Acceptance Inspection process imposed on new installations and equipment construction projects, LO/TO procedures will be required to ensure that safe working conditions are achieved prior to personnel working on known electrical and/or other energy sources. The establishment of safe

working conditions includes the following steps, detailed in Occupational Safety and Health Administration (OSHA) 29 CFR 1910.147 regulations, and National Fire Protection Association (NFPA) consensus standard NFPA 70E (2009): (1) citing the hazardous energy supply sources, (2) shutting down or isolating the hazardous energy sources, (3) applying locks and/or tags to the new and associated equipment, and (4) testing the machine to ensure that all hazardous energy has been removed.

c. A site review and pre-installation meeting shall be conducted between installation and FAA site personnel (i.e., affected and authorized site personnel). The purpose of such a meeting is to jointly develop a LO/TO procedure(s) pertaining to the new equipment installation.

d. In some instances, de-energizing or LO/TO principles on new equipment can be considered exempt if conditions as identified in OSHA 29 CFR 1910.147(c)(4)(i) are fully met. Contact the local Safety and Environmental Compliance Manager (SECM) to verify that new equipment is exempt from LO/TO.

e. When no exempt conditions apply, FAA site personnel have responsibilities under the LO/TO program involving new equipment installations which include the following requirements to:

(1) Be trained in LO/TO principles and hazardous energy control applicable to the site-specific energy isolating devices and equipment involved in the installation project; a LO/TO plan shall be developed on the basis of the existing or new equipment and system and shall utilize an up-to-line diagram.

(2) Be knowledgeable with the physical location(s) of all possible energy-isolating device(s) and electrical circuits affected or involved with the installation of the new equipment, and share the applicable electrical site-specific power distribution knowledge with the installation personnel; provide Engineering Services complete cooperation and collaboration in the development of equipment-specific LO/TO procedures as needed.

(3) Coordinate with Air Traffic Control personnel where applicable.

(4) Assist installation personnel in determining if the work area will need to be secured by utilizing physical barriers, signs, and possibly attendants.

(5) Assist installation personnel in determining if equipment with the potential to store energy exists in the immediate work area of the new equipment installation.

(6) Control all sources of hazardous energy to minimize employee exposure to hazardous energy.

(7) Place site-issued locks and/or tags on the energy isolating device(s) at the same time as the new equipment installer attaches the locks and/or tags on the hazardous energy source(s) isolation devices, in support of the new equipment installation project.

(8) The LO/TO device shall be unique and readily identifiable as a LO/TO device.

(9) Ensure that group or complex LO/TO principles are applied when necessary in accordance with OSHA 29 CFR 1910.147(f)(3) and NFPA 70E-Article 120, respectively. Contact the SECM with any questions regarding these requirements.

(10) Ensure that the installation personnel utilize properly-rated test equipment and check if it is functional before and during the new equipment installation activities.

(11) Conduct a visual inspection of the work area to verify that all tools, and all possible mechanical restraints, electrical jumpers, looped branch circuits, and shorts have been removed such that a safe de-energized condition exists prior to removal of the locks and/or tags and energizing the equipment.

(12) Incorporate the LO/TO procedure of the new equipment into the existing site LO/TO plan following completion of new installation.

(13) Forward to the FAA EOSH Services Group, Electrical Safety Program Manager, an electronic copy of the site-specific LO/TO plan to upload to a national database of LO/TO plans (i.e., TechNet).

(14) Conduct an audit, at least annually, by a qualified person which covers at least one LO/TO in progress and the procedure details. The audit shall be designed to correct deficiencies in the procedure or in employee understanding.

(15) Utilize specific procedures during shift or personnel changes to ensure the continuity of LO/TO protection, including provision for the orderly transfer of LO/TO device protection between outgoing and incoming employees, to minimize exposure to hazards from the unexpected energization or start-up of the machine or equipment or the release of stored energy.

f. Installation personnel from the on-site Engineering Services or its representative(s), conducting the new equipment installation at the FAA site will be required to:

(1) Be familiar with the hazardous energy sources associated with the installation of the new equipment.

(2) Furnish and/or develop equipment-specific LO/TO procedure(s) for new equipment installations, when applicable, prior to commencement of the installation project. (LO/TO procedures may be developed by equipment manufacturer when possible).

(3) Have knowledge of the energy isolating devices and associated LO/TO locations on the new equipment.

(4) Verify that the single line diagram is up-to-date.

(5) Collaborate with site personnel to secure the work area and, when necessary, utilize physical barriers, signs, and possible attendants.

(6) Affix assigned individual LO/TO devices to the identified energy isolating device(s) after the site personnel have established safe working conditions on the hazardous energy source(s).

(7) Review the presence of potentially stored or residual energy sources (such as that in capacitors, springs, elevated machine members, rotating flywheels, hydraulic systems, and air, gas, steam, or water pressure, etc). When necessary, apply safe release procedures to the potentially stored energy sources.

(8) Verify that properly rated test equipment is functional and in proper working condition prior to conducting any measurement activities.

(9) Verify that site energy and equipment energy sources have been placed in a safe working condition by utilizing test equipment and wearing properly rated personal protective equipment in accordance with the current NFPA-70E standard.

(10) Verify continuous proper operation of the test equipment after the equipment and energy isolating device circuits have been checked.

(11) Verify that the newly installed and other affected equipment and devices do not operate by utilizing the normal equipment controls.

(12) Remove the locks and/or tags at the same time the site personnel remove their locks and tags.

(13) Re-energize the affected energy isolating device(s) and return the equipment to normal safe operating condition only after visually inspecting the area to ensure that all individuals are clear of the affected area, that all tools and other items have been removed, and that operating controls are in the "off" position.

g. A post-installation review meeting shall be conducted between the installation and authorized site personnel to ensure that the developed LO/TO procedure(s) pertaining to the new equipment is verified to be complete and accurate.

h. This process will ensure that LO/TO procedures are developed for new equipment installations, and serve to protect site and installation personnel from hazardous energy sources.

i. The funding requirements for LO/TO will be provided by the establishing program office.

j. Appendix A. Sample Scope of Work – Lockout/Tagout Written Procedures, contains the Scope of Work utilized for the development of Hazardous Energy Control (Lockout/Tagout) Written Procedures for LaGuardia Airport, New York. This scope of work is included with this notice to simplify the development of scopes of work for LO/TO procedures.

k. Any questions regarding this notice should be directed to Michele Jayatilaka, Electrical Safety Program Manager, Environment and Occupational Safety & Health (EOSH) Services Group, AJW-23, at (202) 385-6562.

5. Distribution. This notice is distributed in headquarters to group level within Technical Operations, En Route and Surveillance, Terminal Services, and to the Employee Safety and Workers Compensation Division; to group level within the Technical Operations service areas and the service centers; to division level in the FAA Academy at the Mike Monroney Aeronautical Center, to all Technical Operations System Support Center Managers, and to all Technical Operations field offices with a maximum distribution.

Teri L. Bristol
Vice President, Technical Operations Services

Appendix A. Sample Scope of Work – Lockout/Tagout Written Procedures

FEDERAL AVIATION ADMINISTRATION

SCOPE OF WORK
Hazardous Energy Control (Lockout/Tagout)
Written Procedures

LaGuardia Airport, New York

Scope of Work

Lockout/Tagout (LO/TO) procedures will be developed in conformance with listed regulatory requirements stated in Section II below. The contractor will provide the technical support and an MS Word document of a site-specific LO/TO plan, LO/TO procedures assessment, an inventory of the equipment (see attached samples), and label requirements to the Federal Aviation Administration. The plan will establish procedures for the LO/TO of energy isolating devices whenever maintenance or servicing is done on machines or equipment. These procedures must be used to ensure that the machine or 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 machine, equipment, or release of stored energy could occur.

I. Introduction

Lockout/Tagout programs are designed to prevent accidental startup of machines or equipment, and to prevent the release of stored energy during servicing or maintenance. Through the use of specific procedures that involve applying locks and/or tags, equipment is isolated from energy sources and injuries to workers are prevented. While lockout is the preferred method of isolating machines or equipment from energy sources, tagout is permitted when the energy isolating devices are not lockable. Tagout may not be used when the energy isolating devices are lockable. For complex systems, OSHA requires specific written procedures. The FAA will provide the site specific procedures for the critical power system portion of the electrical system. The contractor will review these procedures and supplement them with all necessary information to provide compliance with the regulatory requirements.

II. Regulatory Requirements

An employer's lockout/tagout program must be developed to meet the Occupational Safety and Health Administration's (OSHA) requirements found in 29 CFR 1910.147, The Control of Hazardous Energy (Lockout/Tagout), and 29 CFR 1910 Subpart S Electrical Safety and NFPA 70E.

1-1.1 Scope of Work

PREPARATION FOR LOCKOUT/TAGOUT

- A survey must be completed to locate and identify all isolating devices to be certain which switch(es), valve(s), or other energy isolating devices apply to the equipment to be locked or tagged out. More than one energy source (electrical, mechanical, stored energy, or others) may be involved.

PROCEDURES TO THE DEVELOPED:

Equipment requiring a Lockout/Tagout procedure includes but is not limited to the following:

- Lockout/Tagout Procedures.
- Inventory of Equipment to be locked/tagged out based upon systems installed (See attached Inventory for guidance).
- A list of all Safety Equipment necessary to Lockout/Tagout the systems including, but not limited to, lockout devices and, necessary testing equipment.
- All required labels and locations.

SPECIFIC PROCEDURES

- System Specific Procedures will be in full compliance with regulatory requirements stated in Scope of Work II using the provided template.

SAMPLE Forms

FAA – _ _DISTRICT OFFICE – _ _SSC [*COMPLETE ABOVE APPLICABLE DISTRICT OFFICE AND SSC LOCATIONS*] **EQUIPMENT/SYSTEM SPECIFIC LOCKOUT/TAGOUT (LO/TO) PROCEDURE**	
Work Location: [*insert FSEP facility ident*]	**Equipment/Process** [*provide detailed description*]: _
Energy Type(s) [*chose and identify energy type in appropriate box below*]: **Kinetic** ☐ **Hydraulic** ☐ **Electrical** ☐ **Pneumatic** ☐ **Mechanical** ☐ **Other** ☐ [specify with detail here if applicable]	

Personal Protective Equipment / Equipment Requirements: [*specify equipment needs below*]	**References:** [*insert applicable Technical Instruction Manual references*]
• _ • _ • _ • _ • _ • _ • _ • _ • _	• _ • _ • _ • _ • _

• _	

Purpose: This procedure shall be used to ensure that authorized personnel performing maintenance on this equipment have protected all authorized and affected employees from hazardous energy sources.

Preparation for Shutdown:

1) Review energy sources and magnitudes. Consult the facility's one-line electrical diagram for the specific power configuration.
2) Notify all affected employees in the area that the system will be shut down and locked out.

WARNING: **The lockout/tagout actions outlined in this procedure do not supersede instructions found in any equipment technical order or instruction manual. Always review and perform all prerequisite maintenance procedures before performing lockout / tagout.**

Shutdown/Isolation of System [*insert required sequence of lockout procedures on system, in order to isolate any hazardous energy sources of the system and establish a safe working condition*]**:**

(a) _ .

(b) _ .

(c) _ .

(d) _ .

(e) _ .

(f) _ .

(g) _ .

(h) _ .

(i) _ .

(j) _ .

Verify Isolation of System [*to include trying to start the system and verify with testing equipment / device(s)*]:

- ✓ _ .
- ✓ _ .
- ✓ _ .
- ✓ _
- ✓ _ .
- ✓ _ .
- ✓ _ .
- ✓ _ .
- ✓ _ .
- ✓ _ .

Release from LO/TO [*insert required sequence of procedures for restoring the system and/or electrical power supply to the system, in order to return to normal operating condition*]:

(a)_ .

(b)_ .

(c)_ .

(d)_ .

(e)_ .

(f) _ .

(g)_ .

(h)_ .

(i) _ .

(j) _ .

	Procedure Reviewed by (Authorized Person):	**Supervisor Signature:**	**Date Implement:**
			_ _/_ _/_ _

Additional relevant information:

- _ .
- _ .

FAA – _ _ DISTRICT OFFICE – _ _ SSC [COMPLETE ABOVE APPLICABLE DISTRICT OFFICE AND SSC LOCATIONS] **EQUIPMENT/SYSTEM SPECIFIC LOCKOUT/TAGOUT (LO/TO) PROCEDURE**	
Work Location: [*insert FSEP facility ident*]	**Equipment/Process** [*provide detailed description*]: _

Verification Statement.
"I have verified that this Lockout/Tagout procedure(s) has removed any hazardous energy from the equipment/process system as detailed and described above."

SSC Manager (Print Name) _	*Signature* _	*Verification Date* _ _/_ _/_ _
Technician _	*Signature* _	*Verification Date* _ _/_ _/_ _
TID/SPS _	*Signature* _	*Verification Date* _ _/_ _/_ _
Other (Specify and Print name) _	*Signature* _	*Verification Date* _ _/_ _/_ _

U.S. Department of Transportation Federal Aviation Administration	**Inventory of Facilities Evaluated for LO/TO**	
	SSC:	**Facility:**
	Date:	

Equipment Type	Location	Energy Source(s)	Lockout/Tagout Device Needed?			Energy Control Procedure Required	
			Yes	No	If Yes, What Type	Specific	General

1-2.1 The Contractor shall furnish all material, labor, and supervision to evaluate LO/TO hazards and the development of site specific written procedures.

1-2.2 The Contractor shall be responsible for the hiring and supervision of any Subcontractor, if necessary, to complete the actions specified in the Scope of Work.

1-3.0 Contact Points

1-3.1 The following personnel shall serve as point of contact for the contractors:
1-3.2 Primary from Engineering Services shall be _____ at office number _____ and cell number _____.
1-3.3 Alternate from the SSC shall be _____ at office number_____ and cell number _____.
1-3.4 FAA POC will establish with the contractor facility access procedures and hours, and working conditions/scheduling any down times.

2-1.0 Engineering Services shall provide contractor with applicable construction contract drawings and specifications (electrical and mechanical). Include in the solicitation a complete list of documents being provided, along with the associated timeline or milestones.

3-1.0 Contractor Qualifications.

3-1.1 The contractor completing the LO/TO procedures must have a minimum of five (5) years experience in preparing such documentation.

3-1.2 The contractor completing the LO/TO procedures must have completed a minimum of three (3) projects similar in size and complexity.

3-1.3 Finalized LO/TO procedures must be signed and sealed by an electrical engineer licensed in the State of New York.

4-1.0 The contractor requirements.

4-2.0 An on-site inventory of the installed facility equipment must be completed by the contractor. "As-Built" conditions must be taken into account when preparing the document. Require contractor to verify on-site conditions.

4-3.0 Contractual point of contact must be established. This individual will be required to distribute document for review and collection/consolidation of comments.

4-4.0 All equipment is to remain in operation if the LO/TO procedures are to be prepared for "live" operational facilities.

4-5.0 Contractor should be responsible for the repair of any equipment inadvertently damaged as a result of the testing/verification of procedures.

4-6.0 Contractor will provide insurance documentation of $ _____ value to cover any damages they cause during on site verification/testing of procedures.

4-7.0 Contractor to provide a complete list of all equipment requiring written LO/TO procedures and all equipment exempt from specific procedures for the facility. Contractor to provide 2 complete sets.

5-0.0 Contract Duration.

5-1.0 Concepts review and list of systems requiring written specific procedures 30 days after award of contract.

5-2.0 August 15 2009 50% review of systems and processes.

5-3.0 Final Draft November 30, 2009.

5-4.0 Verification and revision of procedures as needed.

5-5.0 Final LO/TO documents to be delivered on 2/27/2010.

6-1.0 Systems Covered:

- Electrical: Power, Fire Alarm and Suppression, Elevator, Dewatering (if required).
- Mechanical: Plumbing, Fire Sprinkler, Chilled Water, Fuel Systems, ACU, HVAC, Hot Water.