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SAFETY POLICY & PROCEDURE

Lockout/Tagout

SPP# 1910.147

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1.0 Purpose

The purpose of this safety policy and procedure is to establish methods for isolating machines or equipment from hazardous energy sources before routine maintenance and servicing of those machines and equipment by North Carolina Department of Transportation (NCDOT) employees.

2.0 Scope and Applicability

Uncontrolled energy is a hazard to operators and other employees in the area of the machinery, equipment, or processes. Those who service and maintain machinery or equipment are especially vulnerable because the machinery or equipment might become energized while being serviced or stored energy might be unexpectedly released. A lockout/tagout device is used to keep equipment from being set in motion and endangering employees.

This safety policy and procedure provides guidelines for isolating machines or equipment from energy sources. It emphasizes two major components of the lockout/tagout requirements in the form of training and the procedure to be followed. The training component is organized into:

- General training requirements
- Authorized employee training
- Affected employee training
- Supervisor training

The training component addresses all the procedural details of an effective lockout/tagout program. The equipment survey component addresses the identifications of energy sources and the assignment of lockout/tagout devices for those energy sources. This document also details the areas of responsibility for managers/unit heads, supervisors, employees, and Safety and Risk Management. This safety policy and procedure affects employees who service, maintain, and operate stationery equipment and machines.

3.0 Reference

This safety policy and procedure is established in accordance with Occupational Safety and Health Standards for General Industry (29 CFR 1910.147).

4.0 Policy

It is the policy of the North Carolina Department of Transportation (NCDOT) to provide a place of employment free from recognized hazards that cause or are likely to cause death or serious physical harm to employees or the public. Therefore, all energized machines and equipment must be locked out and/or tagged out before any maintenance or servicing is performed. When hazards exist that cannot be eliminated, then engineering practices, administrative practices, safe work practices, Personal Protective Equipment (PPE), and proper training regarding Lockout/Tagout will be implemented. These measures will be implemented to minimize those hazards to ensure the safety of employees and the public.

5.0 General Responsibilities

It is the responsibility of each manager/unit head, supervisor and employee to ensure implementation of NCDOT's safety policy and procedure on Lockout/Tagout. It is also the responsibility of each NCDOT employee to report immediately any unsafe act or condition to his or her supervisor. Specific responsibilities are found in Section 6.3.

6.0 Procedure

This section provides applicable definitions, establishes general provisions, and identifies specific responsibilities required by NCDOT's Lockout/Tagout Program. NCDOT requires that Lockout/Tagout be used. If the equipment does not have provisions for accepting a lock, a Tagout system may be used.

1. The purpose of the tagout device is to indicate that the energy source isolating device and the equipment being controlled may not be operated until the tagout device is removed.
2. Tags must achieve a level of safety that is equivalent to that which would be achieved through a lockout system. In other words, the employer must implement additional safety measures that "bridge the gap" between the degree of safety achieved through lockout and the degree of safety achieved through tagout. An example would be to lockout the energy source that feeds the equipment you cannot apply a lock, but can only implement tagout.

6.1 Definitions

Affected Employee

An employee whose job duties require operation or use of a machine or piece of equipment in a location in which servicing or maintenance is being performed under Lockout/Tagout Procedures.

Authorized Employee

An employee who lockouts or tagouts a machine or piece of equipment in order to perform servicing or maintenance on that machine or piece of equipment. An affected employee becomes the authorized employee when that employee's duties require him or her to perform the service or maintenance covered under this policy.

Capable of Being Locked Out

An energy isolating device capable of being locked out if it has a hasp or other means of attachment through which a lock can be affixed to the equipment or machine.

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 additionally by which no pole can be operated independently; a line valve; a blind; or any similar device used to block or isolate energy. Push buttons, selector switches, and other control circuit-type devices are not energy isolating devices.

Energy Source

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

Hasp

Lockout tagout device which can accept multiple locks and tags. (See Figure 1.)



Figure 1

Lockout

The placement of a lockout device on an energy isolating device, ensuring that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

Lockout Device

A lock and/or device capable of accepting a lock that utilizes a positive means to hold an energy isolating device in a safe position to prevent the energizing of a machine or piece of equipment. (See Figure 2)

Included are blank flanges and bolted slip blinds.



Figure 2

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 lubricating, cleaning, or unjamming of machines or equipment and making adjustments or tool changes, where the employee may be exposed to 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 or 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.

6.2 General Provisions

This section details the provisions of this safety policy and procedure with each provision discussed in a separate subsection. These provisions are:

- General Training Requirements
- Authorized Employee Training
- Affected Employee Training
- Supervisor Training
- Equipment Survey

6.2.1 General Training Requirements

General training requirements for the Lockout/Tagout program shall consist of:

- Basic lockout/tagout training
- Training on the limitations of tags
- Authorized and affected employee retraining
- Certification of lockout/tagout training

Basic lockout/tagout training shall communicate a basic awareness of the procedures and skills that employees are required to possess. This training shall ensure that:

- Each authorized employee receives training in the recognition of applicable hazardous energy sources, the type and magnitude of the energy available in the workplace, and the methods and means necessary for energy isolation and control
- Each affected employee be instructed in the purpose and use of the energy control procedure
- All other employees be instructed when work operations are in an area where energy control procedures are used

Training on the limitations of tags must be provided to the identified employees. Tagout systems are not completely foolproof. Instructions should include, among others, the following examples of tag limitations:

- 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 and it is never to be bypassed, ignored, or otherwise defeated
- In order to be effective, 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
- 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 parts 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

Authorized and affected employee retraining is required when:

- There is a change in their job assignments, a change in machines, equipment, or processes that presents a new hazard, or when there is a change in the energy control procedure.
- A NCDOT supervisor has reason to believe that there are deviations from or inadequacies in the employee's knowledge or use of the energy control procedures.

This retraining shall establish employee proficiency and introduce new or revised control, methods and procedures, as necessary.

Certification of lockout/tagout training must be accomplished and updated when such training has taken place. The certification shall contain each employee's name, job title, division/unit, and dates of training. Appendices A and B contain Lockout/Tagout training certification forms for authorized and affected employees respectively.

6.2.2 Authorized Employee Training

Authorized employees are those who use lockout/tagout devices. This training will be the responsibility of the supervisor.

Training requirements for authorized employees will include the following:

- Purpose of the standard and hazards controlled
- When the standard applies
- Definitions of terms used
- Equipment used for lockout/tagout:
 - standardized appearance
 - personal identification procedures
- Procedures, including:
 - preparation for shutdown
 - shutdown, isolation, blocking, and securing
 - placement, removal, and transfer of devices
 - release of stored energy
 - testing to verify effectiveness of energy control
 - release from lockout/tagout:
 - procedural requirements
 - release if employee who applied device is no longer at facility
- Special procedures and rules for tagout systems
- Special procedures for changes of shifts and personnel changes
- Special procedures and practices for group lockout/tagout:
 - procedure
 - authority for lockout/tagout in group situations
- Inspection program
- Communication and reporting of problems

Appendix C presents NCDOT's lockout/tagout procedure for authorized employees.

6.2.3 Affected Employee Training

Affected employees are those who operate equipment locked or tagged, or employees who work in the area where the devices are in use. Affected employee training may cover:

- Introduction to procedures outlined above for authorized employees
- Prohibition against energizing any machine or piece of equipment that is locked or tagged out

6.2.4 Supervisor Training

In addition to the employee training mentioned above, supervisors will receive additional training which includes the following elements:

- Determination of machinery and equipment to be included in the Lockout/Tagout Program
- Energy isolation points of each piece or class of machinery and equipment
- Training requirements, scheduling, responsibility
- Annual retraining circumstances and requirements for employees
- Inspection requirements and responsibilities
- Outside contractor personnel requirements

6.2.5 Equipment Survey

A survey is required to identify all isolating devices prior to a lockout/tagout event. The purpose of the survey is to determine which switch(s), valve(s), or other energy isolating devices applies to the equipment in order to establish lockout/tagout procedures for each type of equipment. Appendix D contains forms for performing an equipment survey for a facility.

6.3 Specific Responsibilities

6.3.1 Managers & Unit Heads

Managers/Unit Heads shall be responsible for the completion of a survey of machinery and equipment within their area to determine which machinery and equipment should be included in the Lockout/Tagout Program.

Managers/Unit Heads shall be responsible for identifying all affected and authorized employees.

Manager/Unit Heads shall ensure that the necessary funding is available for purchase of the required lockout/tagout safety equipment. Managers/Unit Heads will also ensure annual compliance with this safety policy and procedure through their inspection and auditing processes.

Managers/Unit Heads are responsible for coordinating required training with Safety and Risk Management.

6.3.2 Supervisors

Supervisors shall be responsible for ensuring that this safety policy and procedure is implemented in their areas.

Supervisors shall be responsible for ensuring that an adequate supply of locks, tags, and other safety equipment is available and is utilized in accordance with this safety policy and procedure.

Supervisors shall be responsible for the training of the employees and for ensuring that the training meets the requirements of this safety policy and procedure.

Supervisors shall be responsible for conducting a periodic inspection of LOTO procedures at least annually to ensure this safety policy and procedure is being followed. The inspection shall be conducted by observing each authorized employee performing LOTO to determine if the procedure is adequately being followed and to correct any deviations and inadequacies identified to ensure it is effective in protecting the authorized employee. This inspection shall be documented. Appendix E contains a form that may be used to document the inspection.

6.3.3 Authorized Employees

Authorized employees shall be responsible for following NCDOT's lockout/tagout procedures before any maintenance or servicing activities are begun.

Authorized employees will be responsible for notifying affected employees before beginning a lockout/tagout procedure on a piece of equipment or machinery.

Authorized employees shall report to their supervisors any changes in the machinery or equipment that would require a change in the lockout/tagout procedure.

6.3.4 Affected Employees

Affected employees shall attend the required training. This training will be given at least annually or when new employees or equipment are introduced into the work environment. Records for training will be maintained by the office in which the equipment and employees are located. This training will include electrical, hydraulic, chemical, thermal, and any other energy sources that have the ability to release without warning.

Affected employees shall ensure that all precautions required by this safety policy and procedure be observed.

Affected employees shall report to their supervisors any changes in the machinery or equipment that would require a change in the lockout/tagout procedure.

6.3.5 Safety and Risk Management

Safety and Risk Management will provide prompt assistance to managers/unit heads, supervisors, or others as necessary on any matter concerning this safety policy and procedure. Safety and Risk Management will assist in developing or securing required training. Safety and Risk Management will work with Purchasing and Central Equipment Unit to ensure that all newly purchased Locks and Tags comply with this safety policy and procedure.

Safety and Risk Management shall be responsible for monitoring the Lockout/Tagout Program and any changes in the machinery and equipment that may require modification of the Program.

Additionally, Safety Engineers will provide consultative and audit assistance to ensure effective implementation of this safety policy and procedure.

6.3.6 Central Equipment Unit

Central Equipment Unit shall maintain an inventory of lockout tags and hasps that comply with this safety policy and procedure.

APPENDIX A: Certification Training Form for Authorized Employees

Facility:			Location:		
<p>AUTHORIZED EMPLOYEE TRAINING</p> <p>Lockout/tagout for AUTHORIZED employees includes special instructions concerning scope, purpose, rules, and techniques for lockout/tagout of hazard energy sources including, but not limited to:</p> <ul style="list-style-type: none"> ▪ Intended use of the procedure ▪ Steps for shutting down, isolating, holding, and securing ▪ Steps for placement, removal, and transfer of lockout/tagout devices ▪ Requirements for testing to determine and verify effectiveness of lockout/tagout devices ▪ Other measures _____ 					
Employee's Name	Job Title	Division/Unit	Comments	AUTHORIZED	
				Date	Supervisor
Training Conducted by:		Date:	Reviewed by:		Date:

APPENDIX B: Certification Training Form for Affected Employees

Facility:			Location:		
AFFECTED EMPLOYEE TRAINING Lockout/tagout for AUTHORIZED employees includes special instructions concerning scope, purpose, rules, and techniques for lockout/tagout of hazard energy sources including, but not limited to: <ul style="list-style-type: none"> ▪ Intended use of the procedure ▪ Steps for shutting down, isolating, holding, and securing ▪ Steps for placement, removal, and transfer of lockout/tagout devices ▪ Requirements for testing to determine and verify effectiveness of lockout/tagout devices ▪ Other measures _____ 					
Employee's Name	Job Title	Division/ Unit	Comments	AUTHORIZED	
				Date	Supervisor
Training Conducted by:		Date:	Reviewed by:	Date:	

APPENDIX C: Lockout/Tagout Procedure

Sequence of Lockout or Tagout

- Prepare for shutdown by locating all energy sources that power the equipment. Each energy source will be identified on the Lockout/Tagout Procedure. More than one energy source (electrical, mechanical, hydraulic, pneumatic, thermal, or others) may be involved.
- Notify all affected employees that a lockout or tagout system is being implemented and provide the reason why.
- Refer to the LOTO procedure for the specific type of equipment to determine type and magnitude of energy present.
- Shut down machine or equipment by normal stopping procedure.
- Shut off the electrical power supply disconnect switch, valve(s), or other energy isolating devices(s) so that the equipment is isolated from all its energy source(s). Stored energy (such as that in springs, elevated machine members, rotating flywheels, hydraulic systems, and air, gas, steam, or water pressure, etc.) must be dissipated or restrained by methods such as repositioning, blocking, bleeding down, etc.
- Lockout and tagout the energy isolating devices with assigned individual lock(s) and tag(s).
- Verify the energy isolating sources are disconnected by operating the ON switch or normal operating controls. Ensure that no personnel are exposed before operating the controls. (Return operating control to neutral or off position after test.)
- The equipment is now locked out and can safely be worked on.
- After servicing is complete and the equipment is ready for normal operations, check the area around the equipment to ensure that all tools, parts, etc. have been removed and guards have been reinstalled.
- Ensure that all employees are in the clear and remove all lockout/tagout devices. Operate the energy isolating devices to restore energy to the machine or equipment.
- Notify affected employees that servicing is complete, and the equipment is ready for use.

Procedure Involving More Than One Person

In the preceding steps, if more than one individual is required to lockout/tagout equipment, each person shall place his or her own personal lockout/tagout device on the energy isolating device(s). When an energy isolating device cannot accept multiple locks or tags, a multiple lockout/tagout hasp shall be used.

Equipment Specific LOTO Procedures

For the authorized employee to identify the type and magnitude of the energy available, equipment specific LOTO procedures should be available. Appendix D: Lockout/Tagout Equipment and Energy Source Survey Form may be used to establish those equipment specific LOTO procedures.

APPENDIX D: LOTO Equipment and Energy Source Survey Form

TYPES OF HAZARDOUS ENERGY AT THIS FACILITY		
Facility Name _____		
	General Description	Location
Electrical		
Pneumatic		
Hydraulic		
Other (Steam, Hot Water, Water Pressure, etc.)		

APPENDIX D: LOTO Equipment and Energy Source Survey Form (cont.) 2

ELECTRICAL EQUIPMENT				
Equipment Name	Primary Isolating Device (Type)	ID Number	Location	Magnitude (Volts)

APPENDIX D: LOTO Equipment and Energy Source Survey Form (cont.) 3

HYDRAULIC EQUIPMENT				
Equipment Name	Primary Isolating Device (Type)	ID Number	Location	Magnitude (psi)

APPENDIX D: LOTO Equipment and Energy Source Survey Form (cont.) 4

PNEUMATIC EQUIPMENT				
Equipment Name	Primary Isolating Device (Type)	ID Number	Location	Magnitude (psi)

APPENDIX D: LOTO Equipment and Energy Source Survey Form (cont.) 5

OTHER EQUIPMENT				
Equipment Name	Primary Isolating Device (Type)	ID Number	Location	Magnitude (psi, temp.)

APPENDIX E: LOTO Periodic Inspection Form

Facility:**Location:**

Periodic Inspection of LOTO Procedures & Program

Inspection of LOTO Procedures shall consist of observing all Authorized Employees performing a LOTO procedure on a piece of equipment to determine if procedures are being followed and to correct any deviations or inadequacies identified to ensure it is effective in protecting the authorized employee. Results shall be documented including any deficiencies found. Inspection shall include these items.

- Proper lockout devices and tags are being used.
- Procedure being followed.
- Deviations and inadequacies in procedure to effectively protect the Authorized Employee.

Inspection of LOTO Program shall consist of verifying and documenting the following items:

- All employees performing LOTO have been trained as authorized employee and this training is documented.
- Lockout devices and tags are readily available for performing LOTO.

[illegible]