



August 31, 2017

Bruce Miles
Safety and Health Compliance Supervisor
North Carolina Occupational Safety and Health Division
1101 Mail Service Center
Raleigh, NC 27699-1101

Re: OSH Inspection 318107984

Certified Mail -Receipt

Dear Mr. Miles:

I am writing in response to the 318107984 Executed Settlement Agreement sent August 16, 2017 to The University of North Carolina at Chapel Hill (the "University"), which the University received on August 28, 2017. The Agreement modified the Citation and Notification of Penalty, NCOSHA-2, issued on July 17, 2017. Abatement of the citation items outlined in NCOSHA-2 is provided below:

Citation 01 Item 001

Type of Violation: **Serious**

29 CFR 1910.303(b)(1): Electrical equipment was not free from recognized hazards that were likely to cause death or serious physical harm to employees:

a) Facility, Gland Seal Leak Off Pumps 1 & 2-On 2/20/17, an employee used a selector switch to turn off the pump and the selector switch was inside an electrical control box labeled 'SES Duplex Control, 200/230/460/575'. Inside the electrical box, there were live electrical wires and connectors.

Date By Which Violation Must Be Abated:
Penalty:

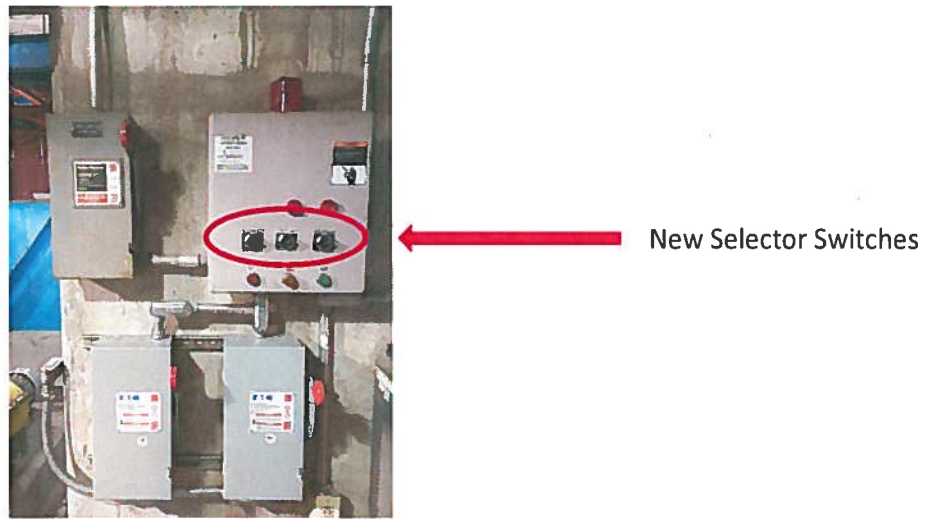
Corrected During Inspection
\$1,687.50

Corrective Action:

Before correction, employees had to open the electrical control box to access selector switch.



After correction, the selector switch is on the outside of the box. Employees are not exposed to electrical hazards.



Citation 01 Item 002

Type of Violation: **Serious**

29 CFR 1910.147(d)(3): All energy isolating devices that were needed to control the energy to the machine or equipment were not physically located and operated in such a manner as to isolate the machine or equipment from the energy source(s):

a) Facility, Gland Seal Leak Off Pumps 1 & 2- where the energy isolation device used by an employee was inadequate because it was not physically located and operated in a manner as to isolate the pump from the energy source. On 2/20/17 an employee tagged the selector switch of the pump and turned off the pump instead of tagging the circuit breaker or disconnect switch. The selector switch was located inside an electrical control box labeled 'SES Duplex Control, 200/230/460/575'. A selector switch is not an acceptable energy isolation device because they can be subject to component failure, program errors, magnetic field interferences, electrical surges, improper use or inadvertent use, exposing the employees to the unexpected energization of the equipment.

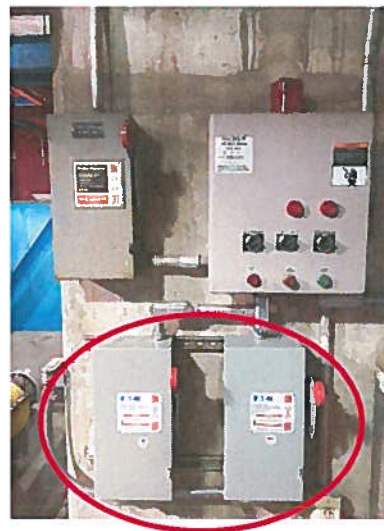
Abatement: An energy isolation device is a mechanical device that physically prevents the transmission or release of energy, including but not limited to the following: a manually operated electrical circuit breaker or a disconnect switch.

Date By Which Violation Must Be Abated:
Penalty:

Corrected During Inspection
\$843.75

Corrective Action:

Employees will use the disconnect switch (i.e., breaker) as an energy isolation device instead of the selector switch when performing lockout tagout of Gland Seal Leak Off Pumps 1 and 2. The standards, a list of valves, switches and other items that must be deenergized to isolate the piece of equipment, were updated to reflect this change (see below).



New LOTO Location



Gland Seal Leak Off Pump 1 Standard

Lock Out / Tag Out

Find Select Action

List Lock Out / Tag Out

Tag Out: 1210 #1 gland seal leak off pump Site: CG
 Location: CAM >> Cameron Steam Plant
 Asset: >>

Lock Out Operations Filter 1 - 5 of 5

Location	Asset	Description	Required State
>>	>>	#1 gland seal leak off pump 480V breaker (No PPE Require	OFF
>>	>>	#1 gland leak off pump suction valve	C
>>	>>	#1 gland leak off pump discharge valve	C
>>	>>	#1 gland leak off pump primer isolation valve (1st floor)	C
>>	>>	#1 gland leak off pump suction strainer drain valve	O

Gland Seal Leak Off Pump 2 Standard

Lock Out / Tag Out

Find: Select Action

Lock Out / Tag Out

Tag Out: 1209 #2 gland seal leak off pump Site: CG

Location: CAM >> Cameron Steam Plant

Asset: >>

Lock Out Operations Filter 1 - 5 of 5

Location	Asset	Description	Required State
>>	>>	#2 gland seal leak off pump 480V breaker (No PPE Require	OFF
>>	>>	#2 gland leak off pump suction valve	C
>>	>>	#2 gland leak off discharge valve	C
>>	>>	#2 gland leak off pump primer isolation valve (1st floor)	C
>>	>>	#2 gland leak off pump suction strainer drain valve	C

Citation 02 Item 001

Type of Violation: **Non-Serious**

29 CFR §1904.32(b)(6): The Summary of Work-Related Injuries and Illnesses (OSHA Form 300A or equivalent) for the previous year was not posted between February 1 and April 30.

a) Facility, UNC Cogeneration Facility (COGEN) - where a hardcopy of the OSHA 300A was not posted at each of the establishments, and in a conspicuous place where notices to employees are normally posted in the workplace.

Date By Which Violation Must Be Abated:
Penalty:

Immediately Upon Receipt
\$562.50

Corrective Action:

The University of North Carolina at Chapel Hill will utilize the distribution process that Human Resources has developed for required labor law posters to post, once a year (February 1 to April 30), the "The Summary of Work-Related Injuries and Illnesses" (OSHA Form 300A or equivalent). In addition, "The Summary of Work-Related Injuries and Illnesses" will also be posted electronically at this site <http://ehs.unc.edu/workplace-safety/worker-comp/osha/>, even after the required posting period.

Citation 02 Item 002

Type of Violation: **Non-Serious**

29 CFR 1910.147(c)(6)(ii): The employer did not certify that periodic inspections of the energy control procedures had been performed:

a) Facility, UNC Cogeneration Facility (COGEN) -where the periodic inspections of the Lock out/Tag7/28/2017/28/2017out (LOTO) program were not certified.

The certification shall identify the machine or equipment on which the energy control procedures are being utilized, the date of the inspection, the employees included in the inspection, and the person performing the inspection.

Date By Which Violation Must Be Abated:

Immediately Upon Receipt

Penalty:

\$0.00

Corrective Action:

The Cogeneration Facility will utilize the Periodic Inspections Certification form to document periodic inspections of their Lockout Tagout procedures at least annually. The facility will also add a "Periodic Inspection" section to their Tagging and Clearance (i.e., Lockout Tagout) Procedure specifying that the periodic inspections will be conducted at least annually and documented on the certification form. See attachment.

In addition, University check number 001047650, in the amount of \$3093.75, is included and satisfies the amended penalty amounts.

If you have additional questions or concerns, please do not hesitate to contact me at 919-843-5913.

Very truly yours,



Mary Beth Koza
Director, Department of Environment, Health and Safety

**UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL
COGENERATION FACILITY AND MANNING DRIVE STEAM PLANT
OPERATIONS TAGGING AND CLEARANCE PROCEDURE**

REVISION NO.: 11	EFFECTIVE DATE:
PREPARED BY: Tim Aucoin Wayne Floyd	REVISION DATE: August 28, 2017

1. PURPOSE:

The purpose of this procedure is to ensure that the machinery or equipment is rendered inoperative and safe to work on before any employee performs any servicing or maintenance on machinery or equipment, where the unexpected energizing or release of stored energy could occur and cause injury. The procedure is in accordance with OSHA standard 1910.147.

2. DEFINITIONS:

LOTO- is a computer based Lockout/Tagout management system utilizing the MAXIMO system for all equipment clearances in the UNC Cogeneration Facility and Manning Drive Steam Plant.

AUTHORIZED PERSON is the Shift Supervisor, or his/her designee, who is responsible for directing the placing of all “DO NOT OPERATE TAGS” and/or locks on all energy isolating devices that apply to the system or equipment to be locked or tagged out. This individual is designated as a “Full Operator” in LOTO.

DESIGNEE- can be any Cogeneration Facility employee that is current in his/her University Environmental Health and Safety-Cogeneration Facility LOTO training module.

FULL OPERATOR is the designee who is responsible for the placing of all “Do NOT OPERATE TAGS” and/or locks on all energy isolating devices that apply to the system or equipment to be locked or tagged out.

REQUESTER is a Cogeneration Facility employee current in LOTO training who requests that a system or piece of equipment be removed from operation and cleared of any energy source or stored energy. This individual is designated as “Requester” in LOTO.

CLEARING OPERATOR is the person assigned by the AUTHORIZED PERSON to secure all appropriate devices and equipment and to hang the tags in preparation for a CLEARANCE. The CLEARING OPERATOR may be anyone from Cogeneration Systems who has successfully completed the University Environment Health and Safety- Cogeneration Facility training module. This individual is designated as “Operator” in LOTO.

CLEARANCE on equipment signifies that the equipment or system has been rendered de-energized, de-pressurized, or any other stored energy has been released before the specific work for which the CLEARANCE has been issued can be performed.

CLEARANCE HOLDER is the person, or is the one immediately in charge of the maintenance employees, who is responsible for the maintenance work or testing that is to be done on the equipment or system for which the CLEARANCE has been issued. Anyone needing to work on a cleared piece of equipment or a part or area of that cleared equipment may do so by getting approval from the Clearance Holder and the Authorized Person and signing onto the Clearance Holder's clearance. This procedure refers to those persons as "Sign-Ons".

RELEASING is when the CLEARANCE HOLDER reports to the AUTHORIZED PERSON that he/she has completed the work for which the CLEARANCE was issued and the equipment or system is ready to return to service.

AFFECTED EMPLOYEE is an employee who is required to use the machines or equipment that is being locked out/tagged out or who must work in such an area.

WORKING COPY is a checklist that is printed for the CLEARANCE HOLDER to verify all equipment or system has been rendered de-energized, de-pressurized, or any other stored energy has been released before the specific work for which the CLEARANCE has been issued can be performed prior to the issuance of the clearance.

CLEARANCE SHEET filled out in the Control Room that shows the information on the CLEARANCE. This CLEARANCE SHEET is kept in the control room in a log book.

A STANDARD is a list of valves, switches and other items that must be de energized to isolate the piece of equipment.

A CUSTOM STANDARD is developed when a piece of equipment does not have a standard. The CUSTOM STANDARD can be created as a Standard by the AUTHORIZED PERSON after the clearance has been issued.

PERSONAL PROTECTIVE EQUIPMENT (PPE) is safety equipment that is required to perform a specific task. The Standard shall list Arc Flash PPE, if required.

QUALIFIED INDIVIDUAL is a Cogeneration Facility employee who has been properly trained to perform the required task.

WARNING:

ANY PERSON WHO OPERATES A VALVE, SWITCH OR ANY OTHER DEVICE TO WHICH A LOCK OR TAG IS ATTACHED WILL BE SUBJECT TO DISCIPLINARY ACTION, UP TO AND INCLUDING TERMINATION.

3. GENERAL GUIDELINES:

The following general guidelines are to be followed when issuing CLEARANCES:

- 1) No device shall be operated, energized or its status changed that has a lock or tag attached to it.
- 2) Locks and tags shall be used wherever possible. Tags shall be affixed directly to the control device to be CLEARED. The control room has specialized devices suitable for most switches that are not configured for normal attachment. Each tag will be singularly numbered. Each lock shall bear an identification number traceable to the person who installed it. The Shift Supervisor, Operations Superintendent, Maintenance Superintendent, I & E Superintendent and Maintenance supervisors shall maintain a master list of who is issued each lock.
- 3) When a tag cannot be affixed directly to the device operator or switch, it shall be located as close as safely possible to the device in a position that will be immediately obvious to anyone attempting to operate the device.
- 4) It may be necessary to use chains and locks on valves or to remove the valve handle to render the system safe.
- 5) Tags will be secured by a nylon self-locking tie (tie wrap), which will require cutting before the tag can be removed.
- 6) The Cogeneration Systems Supervisor or a Plant Engineer current in LOTO training who is directing the work of an outside contractor or other work group not a part of the Cogeneration Systems shall inform all such outside organizations of the elements of this program.

4. LOCKOUT/TAGOUT SEQUENCE PROCEDURE:

The following steps shall be followed to insure that any system or equipment is isolated from all energy sources and rendered safe to work on:

- 1) The REQUESTER requests a CLEARANCE using LOTO. During normal working hours, the REQUESTER should contact the Shift Supervisor and inform him/her of the request.
- 2) The REQUESTER will provide the following information:
 - Cogen Facility and system associated with the equipment to be cleared.
 - Tag location list, if a standard exists select it; if a standard does not exist, select custom.
 - Clearance request date.
 - Short description of equipment to be cleared.
- 3) The AUTHORIZED PERSON and CLEARING OPERATOR shall notify all AFFECTED EMPLOYEES of systems or equipment that will be locked out and/or tagged out and inform them of the reason.

- 4) The AUTHORIZED PERSON shall make a survey of existing standards in LOTO to produce a Lockout/Tagout Standard to locate and identify all isolating devices required for the CLEARANCE. The AUTHORIZED PERSON shall create a Lockout/Tagout Standard or Custom if none is available which covers the CLEARANCE.
- 5) The AUTHORIZED PERSON fills out the CLEARANCE SHEET, including the tags required to isolate the equipment from its energy source. Tags are scanned in by bar code scanner or keyed in manually to LOTO. The AUTHORIZED PERSON reviews the CLEARANCE SHEET, approves it and prints a working copy for the CLEARANCE HOLDER and the CLEARING OPERATOR to use as a guide in placing the tags and executing the lockout/tagout.
- 6) If the equipment or machine is operating, it must shut down by the normal shutdown procedure. If the machine is connected to an energized breaker or starter, then follow the Electrical Safety Procedure for proper arc flash boundaries and PPE.
- 7) The CLEARING OPERATOR shall operate the valves, switches or any other energy isolation devices to ensure that the equipment will be isolated from its energy source.
- 8) Multiple locks, locks and tags shall be affixed to each energy isolation device in a manner that will hold the device in a safe or off position. The lock(s) will be placed by the CLEARANCE HOLDER or a Sign-On.
- 9) A verification of the isolation devices will now be performed. This is to insure that the equipment is disconnected from all the energy sources. This check can be done from a local jog or start switch or from a start signal from the DCS to insure that the equipment will not start. Where piping systems are involved, a drain or vent valve will be opened to insure that any stored energy is released. All exposed electrical connections shall be checked with an electrical meter, by a qualified individual.
- 10) The CLEARANCE HOLDER reviews the WORKING COPY with the AUTHORIZED PERSON and the CLEARANCE HOLDER visually verifies the placement of all tags. The CLEARANCE HOLDER affixes his/her lock to the devices deemed necessary and reports to the AUTHORIZED PERSON the identification and placement of the locks. All the above applies to all Sign-Ons.
- 11) The final details are entered into LOTO (lock numbers and placement of additional devices secured during the clearance review, etc.) and the AUTHORIZED PERSON issues the CLEARANCE. The CLEARANCE HOLDER shall sign the CLEARANCE SHEET indicating acceptance of the CLEARANCE. Anyone approved to be a Sign-

On will fill out the appropriate information, sign and date the clearance sheet. This single certified CLEARANCE is retained in the official log in the Control Room. The CLEARANCE HOLDER may request a final working copy; however, anyone may view all active CLEARANCES by logging into LOTO or review LOTO book located in the control room.

- 12) The equipment is now locked and tagged out for the reason the CLEARANCE was issued.

5. CLEARANCE TRANSFER PROCEDURE:

In some cases, it may be necessary for someone other than the current CLEARANCE HOLDER to complete the work. This may occur when the time the job takes extends beyond the normal shift hours and/or two crews are working on the job. The following steps shall be followed to transfer the CLEARANCE from one party to another.

- 1) Both the current and new CLEARANCE HOLDER shall go to the AUTHORIZED PERSON and review the CLEARANCE SHEET. ALL Sign-Ons must sign off before a clearance can be cancelled or transferred. The current CLEARANCE HOLDER shall remove his/her locks and the new CLEARANCE HOLDER shall affix his/her locks to appropriate devices.
- 2) The current CLEARANCE HOLDER shall sign the release section of the form.
- 3) The AUTHORIZED PERSON shall cancel and reissue the CLEARANCE in LOTO, noting changes in the locks which are affixed. The new CLEARANCE HOLDER shall sign the new CLEARANCE SHEET. No tags will be changed during this reissue. Anyone needing to sign on can do so as previously described.

6. EQUIPMENT TESTING PROCEDURE

In some cases where lockout or tagout devices must be temporarily removed from the energy isolating device and the equipment energized for testing and positioning, the following sequence of actions shall be followed:

- 1) The CLEARANCE HOLDER makes sure that the equipment or machine is cleared of all tools and material.
- 2) All AFFECTED EMPLOYEES are removed from the machine or equipment area, by the CLEARANCE HOLDER.
- 3) All Sign-Ons must sign off and remove their locks.
- 4) The CLEARANCE HOLDER notifies the AUTHORIZED PERSON as to which devices must be energized to conduct the short operational test, removes his/her locks from those energy isolation devices and reports to the AUTHORIZED PERSON that the equipment is ready for testing or positioning.

- 5) The CLEARANCE HOLDER signs off the appropriate CLEARANCE SHEET for the equipment being tested. Prior to testing equipment, the CLEARANCE HOLDER must sign on the REISSUED CLEARANCE SHEET for the remaining items not needed for testing or positioning.
- 6) The AUTHORIZED PERSON verifies that it is safe to run the equipment and then directs the removal of the tags and locks required for the testing or positioning of the equipment. The energy isolation devices are then positioned so the equipment can be tested or positioned.
- 7) Once testing is completed and further work on the equipment is required, the CLEARANCE HOLDER requests the reissue of the CLEARANCE making the appropriate changes of position for the affected devices on the CLEARANCE SHEET. The energy isolation devices are repositioned and the locks and tags reattached as required by the CLEARANCE and the CLEARANCE is cancelled and reissued in LOTO, again making the appropriate changes of position for the affected devices.
- 8) Anyone needing to sign back onto the clearance can now do so as previously described as a Sign-On.
- 9) All electrical breakers and motor starters energize procedures shall be followed by the Electrical Safety Procedure. This procedure shall direct the personnel with the correct PPE and arc flash boundary.

7. RELEASE OF CLEARANCE PROCEDURE

The following steps shall be followed to remove all tags or locks from the equipment:

- a. The CLEARANCE HOLDER verifies that the equipment is ready to be returned to service, clear of all tools and material, and that all safety guards and devices are in their proper position.
- b. All AFFECTED EMPLOYEES are notified that a CLEARANCE is to be removed by the CLEARANCE HOLDER.
- c. All Sign-Ons must sign off and notify the Clearance Holder that the area and/or equipment they were working in/on are ready for service.
- d. The CLEARANCE HOLDER removes the lock(s) that he/she affixed to any energy isolation device, reports to the AUTHORIZED PERSON that the equipment is ready to return to service, and signs the release section on the CLEARANCE SHEET.

- e. The AUTHORIZED PERSON verifies that the equipment is fit to return to service and that all affected employees are notified and clear of the equipment.
- f. The AUTHORIZED PERSON directs the removal of all tags and locks affixed under the CLEARANCE and position the energy isolation devices so that the equipment is ready to be started up by normal procedures.
- g. All electrical breakers and motor starters energize procedures shall be followed by the Electrical Safety Procedure. This procedure shall direct personnel with the right PPE and arc flash boundary.
- h. The AUTHORIZED PERSON or DESIGNEE signs the CLEARANCE SHEET releasing the CLEARANCE.
- i. All LOCKOUT/TAGOUT devices are to be removed by the CLEARING OPERATOR. If the CLEARANCE HOLDER is not available to remove his/her locks or tags, they can be removed by the AUTHORIZED PERSON provided the following steps are followed:
- j. It is verified that the CLEARANCE HOLDER who applied the lock or tag is not on the site.
- k. If the CLEARANCE was issued to a Cogeneration Systems employee, then his/her direct Supervisor or his/her designee will be contacted and informed of the situation. He/she will then assume responsibility for the following steps.
- l. All reasonable effort has been made to contact the CLEARANCE HOLDER to inform him/her of the need to remove his/her locks and tags.
- m. The AUTHORIZED PERSON verifies that the equipment is fit to return to service and that all AFFECTED EMPLOYEES are notified and clear of the equipment.
- n. The AUTHORIZED PERSON and CLEARANCE HOLDER's direct Supervisor (or designee) shall remove all locks and tags so that the equipment is ready to be started up by normal procedures.
- o. The CLEARANCE HOLDER shall be made aware his/her CLEARANCE has been removed by his/her Supervisor or designee.
- p. The employee who originally attached the tags or locks is made aware of the fact that his/her lock or tag has been removed before he/she is allowed to resume work at the site. This will be done by the employee's supervisor prior to any job assignment upon his/her return to work.

- q. The AUTHORIZED PERSON or DESIGNEE verifies that the equipment is fit to return to service and assures that the clearance sheet has been signed per paragraph “h” of this section.

8. PERIODIC INSPECTIONS



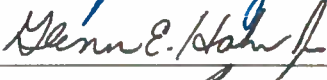


Periodic inspections will be performed, at least annually, to verify that LOTO procedures (i.e., STANDARDS) are properly applied. These periodic inspections will ensure that the employees involved are familiar with their responsibilities and that employees maintain proficiency in the energy control procedures that they implement. During the inspections, an employee other than the ones utilizing the STANDARD, must observe the implementation of the STANDARD during the servicing and/or maintenance activities and talk with employees implementing the procedure to determine that all the OSHA LOTO requirements are understood and followed by employees. Inspections will be documented on the Periodic Inspection Certification form.

PERIODIC INSPECTION CERTIFICATION

SECTION I: GENERAL INFORMATION		
Date:	Inspector(s):	
Authorized Employee(s):		
Affected/Other Employee(s):		
Specify equipment & location where the LOTO procedure is being used:		
(Employees conducting the lockout/tagout may not inspect their own procedures)		
SECTION II: LOCKOUT/TAGOUT PROCEDURE		
(1) Is there a written Lockout Tagout procedure for the equipment present at the work location?	Yes	No
(2) Were all affected employees notified of the lockout?	Yes	No
(3) Were all energy control sources turned to the “Off” or “Closed” position?	Yes	No
(4) Were all lockout devices and locks properly attached to each energy control isolation device?	Yes	No
(5) Were all Clearance tags containing an identification bar code attached to each energy control isolation device?	Yes	No
(6) Was all stored energy properly controlled? (Pneumatic & hydraulic energy bled, suspended parts lowered, etc)	Yes	No
(7) Was an attempt made to restart the equipment or otherwise ensure the effectiveness of the lockout prior to beginning the work?	Yes	No
(8) If a group lockout was required, did all employees involved attach their own locks and tags to each energy control isolation device?	Yes	No
(9) Were all locks and control devices properly removed after work was complete?	Yes	No
(10) Were all affected employees notified when the lockout was complete?	Yes	No
SECTION III: INSPECTION RESULTS AND SIGNATURES		
Please fully explain all “No” responses and note any other deficiencies that are not specifically covered by a checklist item:		
Authorized Employee Name:		
Signature: Date:		
Inspector Name:		
Signature: Date:		

THIS COMPLETED FORM TO BE KEPT IN THE Lockout Tagout book in the Control Room. Also, a copy of this completed form will be sent to UNC EHS Department

APPROVALS

Approver's Name	Approver's Signature	Date
Tim Aucoin Regulatory Compliance Coordinator		8/31/17
Wayne Floyd Operations Superintendent		8/31/17
Glen Hahn Maintenance Superintendent		8/31/17
Mike Buzzard I&C Superintendent		8-31-17
William T. Lowery II Plant Manager		8/31/2017