

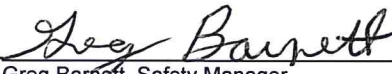

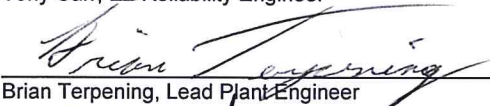



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ISSUED BY:  Safety Manager Coosa Pines Mill <u>7-16-18</u> DATE	APPROVED BY:  General Manager Coosa Pines Mill <u>7-30-18</u> DATE
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DISTRIBUTION ALL MANAGERS ALL TEAM LEADERS	

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1.0 PURPOSE

The Electrical Safe Work Practices (ESWP) Policy sets the requirements for the Coosa Pines Operations mill site. The purpose of the policy, described herein, is to protect employees, contractors, and visitors from accident and injury when exposed to electrical hazards.

2.0 SCOPE

- 2.1 This program applies to all operations, contractors and persons on the Coosa Pines mill site. Strict observance of this policy is a part of Coosa's Accident and Injury Prevention Program.
- 2.2 Contractors are responsible for informing their employees of the requirements of this policy and to provide them with the necessary tools, training, resources, certifications and equipment to safely/effectively perform their work activities.
- 2.3 Visitors will be escorted in all areas that contain electrical hazards. (A Coosa Pines management official may authorize a visitor to access a specific area unescorted.)

3.0 REFERENCES

- 3.1 OSHA Regulations
 - 1910.331 (Safety Related Work Practices)
 - 1910.332 (Training)
 - 1910.333 (Selection and Use of Work Practices)
 - 1910.334 (Use of Equipment)
 - 1910.335 (Safeguards for Personnel Protection)
- 3.2 NFPA 70E Handbook for Electrical Safety in the Workplace.

4.0 DEFINITIONS

- 4.1 Routine work for Qualified Persons - Normal de-energizing and re-energizing switches for lock-out, troubleshooting electrical circuits, re-setting overloads or tripped breakers. Normal work within the confines of the MCC room, changing lights, and cleaning the MCC room. Any PM work done within the confines of the MCC room.
- 4.2 Refer to **NFPA 70E Handbook for Electrical Safety in the Workplace**. To view a copy of this book, go to your area E-Shop, E&I Coordinator, or Area Maintenance Planner.

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5.0 RESPONSIBILITY

5.1 The Safety Manager is responsible for oversight of this policy, ensuring its accuracy and compliance with regulatory and corporate requirements.

5.1.1 All supervisors and managers are responsible for ensuring that employees, contractors or visitors under their charge comply with this policy. Supervisors have the primary responsibility for enforcement of the PPE Policy in their area. This involves:

5.1.2 Providing appropriate PPE and making it available to their employees;

5.1.3 Ensuring employees are trained to properly use, care and clean PPE;

5.1.4 Maintaining records on PPE assignments, inspections and training;

5.1.5 Ensuring that PPE policy elements are followed and that employees properly use and care for PPE;

5.1.6 Seeking assistance from Safety to evaluate hazards;

5.1.7 Notifying employees, Safety Department, and other affected individuals, when new hazards are introduced or processes are added or changed;

5.1.8 Ensuring defective, expired, or damaged equipment is repaired or disposed of and replaced as necessary.

5.2 Employees are responsible for following the requirements of this policy. They will:

5.2.1 Wear PPE as required;

5.2.2 Become knowledgeable of all PPE requirements, and the proper use/care of PPE;

5.2.3 Clean and maintain PPE in good working order.

5.2.4 Before each use, all employees, visitors and contractors must inspect all PPE/tools for wear and damage. Any damaged or defective PPE must be removed from service, tagged out, repaired or replaced before continuing task at hand.

5.3 Electrical Safety Team

5.3.1 The Electrical Safety Team shall serve as a technical/regulatory resource for the mill. They will review this policy every 12 months to verify it ensures work is completed in a safe and efficient manner. Team members: Safety Manager, E/I Reliability Engineer, Lead Plant Engineer, and E&I Coordinator.

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5.4 Operations Shift Team Leaders, Maintenance Coordinators, and Maintenance Planners

5.4.1 Operations Shift Team Leaders, Maintenance Coordinators, and Maintenance Planners are responsible for:

- Ensuring all work activities in and around the electric system at the mill comply with this policy (including mill employees, contractor and subcontractor employees, temporary employees and visitors to the mill).
- Assure employees, contractors, and visitors are trained on the ESWP and Safe Work Procedures prior to the initiation of work.
- Implement a near-miss accident investigation to identify causes of electrical events and to establish an action plan to prevent any reoccurrence.

5.5 Employees

5.5.1 Employees are responsible for being knowledgeable of, and for compliance with this Electrical Safe Work Practices policy, the related Electrical Safe Work Procedures, and their application to daily work activities. Prior to performing electrical work activities, employees will:

- Conduct a Job Hazards Analysis prior to starting any electric work activity (**See Section 6.3.4 of this document**)
- Inspect all electrical tools to assure they are adequate for the job assignment and will provide protection
- Wear the appropriate personal protective equipment for the work activity and exposure involved
- Inspect all required electrical tools and Electrical required PPE before each use.
- Tag and take out of service any worn/defective tool or PPE. Report to your supervisor any findings after each inspection so replacements can be issued.

5.6 Contractors

5.6.1 Contractors who will be exposed to electrical hazards are responsible for presenting to the mill representative a Job Hazard Analysis for the proposed work activity that complies with the mill's Electrical Safe Work Practices policy.

5.6.2 Contractor managers are responsible to ensure all their employees and subcontractors are knowledgeable of this ESWP Policy and associated Electrical Safe Work Procedures.

5.6.3 Contractor Managers, Planners and Engineering will ensure that all appropriate personal protective equipment and tools are available prior to entering the mill.

5.6.4 The test records for the electrically rated equipment and tools will be available for the mill to review prior to commencing work activity.

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6.0 ELECTRICAL SAFETY PROGRAM (NFPA 70E SECTION 110.7)

6.0.1 ELECTRICAL SAFETY PROGRAM PRINCIPLES

Coosa Pines' Safety Principles form the foundation for all mill safety policies, including our Electrical Safety Program:

- All Accidents and Injuries are preventable.
- We are responsible for our own safety and the safety of others.
- We will seek a safe way to perform every job.
- Safety on and off the job is a cornerstone of a successful and caring operation.
- Everyone is responsible for identifying, reporting, and eliminating unsafe acts and conditions.
- Working safely is a condition of employment at Coosa Pines.
- We believe communicating our safety expectations and requirements with all E&I personnel is essential to working injury-free.
- We believe in assessing the safety knowledge and skills of our employees.
- Involvement and feedback from all of our E&I personnel is critical to our continual safety improvement efforts.
- Good housekeeping is essential to our safety.
- Maintaining our electrical documentation is critical to our electrical safety.
- Developing and continually improving work procedures for electrical jobs will improve safety.
- Our E&I predictive and preventative maintenance programs are not only critical to having reliable equipment and systems, but to having safe equipment.
- All work performed on our equipment and systems should meet or exceed industry codes and standards.
- Before working on equipment, we will establish an electrically safe work condition.
- If equipment can not be de-energized, an approved permit is required before work can begin. Any work on energized equipment falls under the guidelines of the mill's ***Energized Equipment Work Permit Policy***.
- Only electrical qualified or certified (E&I) employees can pull disconnects, buses, breakers, fuses and rack/in out located in MCC/electrical equipment room.
- Only appropriate tools are to be used. Tools will be inspected prior to use.
- We value observations and audits such as BBS, LSA, Housekeeping, HELP, and formal Electrical Safety Program Audits, as they help us improve safety.

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6.0.2 Coosa Pines' Electrical Safety Program includes the following components:

- Requirements for Hazard Analysis.
- Requirements for the mill's E&I Safety Training Program.
- Requirements for use of electrical equipment, including test instruments and equipment, portable electrical equipment, GFCI protection devices, and overcurrent protection.
- Requirements for establishing an electrically safe work condition.
- Requirements for temporary grounding equipment for personal protection.
- Requirements for working while exposed to electrical hazards.
- Requirements for safety-related maintenance.
- Requirements for special equipment.
- Requirements for audits.

6.1 ELECTRICAL SAFETY PROGRAM CONTROLS

6.1.1 The controls used to measure and monitor Coosa Pines' Electrical Safety Program include:

- The electrical safety knowledge and skills of all E&I personnel will be assessed on an annual basis. Annual NFPA training will be conducted by contract trainer. E/I personnel will be assessed internally by a documented visual observation and or testing process by a vendor or Coosa E&I lead person or E&I manager.
- All E&I personnel at Coosa Pines, including contractors, are required to wear/use FR rated clothing and tools as well as Electrical Hazard footwear compliant with applicable ANSI standards. Where insulated footwear is used as protection against step and touch potential, dielectric overshoes shall be required. Insulated soles shall not be used as primary electrical protection.
- All E&I personnel at Coosa Pines, including contractors, are required to conform to all aspects of the mill's Electrical Safety Program.
- Coosa Pines will monitor and evaluate the effectiveness of the E&I predictive and preventative maintenance program.
- Coosa Pines E&I will inspect all E&I tools and safety equipment before use, and on a scheduled basis. This inspection process/form will be tracked and (gloves, dates, expiration dates, annuals...) documented.
- Every electrical conductor or circuit part is considered energized until proven otherwise. Coosa Pines will require electrical equipment to be placed in an electrically safe work condition per NFPA 70E. Any work on energized equipment falls under the guidelines of the mill's ***Energized Equipment Work Permit Policy***.
- Coosa Pines will use a variety of audits and observations, including Layered Safety Audits, Housekeeping Audits, HELP Audits, and formal Electrical Safety Program Audits, to monitor Electrical Safety Program compliance and to improve the effectiveness of the program.
- Coosa will use the mill's Incident Reporting System to record and analyze E&I safety incidents, including near misses, first aid incidents, and recordable injuries, to improve electrical safety.

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6.2 HAZARD/RISK EVALUATION

- 6.2.1 Coosa Pines Operations conducts a Short Circuit Analysis and Arc Flash Study every **(5) five years**. From this study, Arc Flash Protection Boundaries for all mill energized electrical conductors and circuit parts operating at 480 volts or more are established, per NFPA 70E requirements. Preventive maintenance notifications from the
- 6.2.2 Coosa Pines Operations has conducted a millwide **Safety Hazard and Risk Analysis** for each E&I position on site. This analysis includes electrical hazards. Documentation of this analysis can be referenced on the Coosa Pines Information Portal.
- 6.2.3 The procedure by which Coosa Pines Operations conducts a hazard/risk evaluation for work within the Limited Approach Boundary of energized electrical conductors and circuit parts operating at 50 volts or more (or where an electrical hazard exists) is detailed in the mill's ***Energized Equipment Work Permit Policy***. This policy outlines the methods used to identify the hazard/risk process that must be used by employees to evaluate tasks before energized electrical work is started.
- 6.2.4 Before electrical work begins, a Job Hazard Analysis will be performed. A Job Hazard Analysis will include, at a minimum:
- Assessment of potential electric shock hazards
 - Determination of the electric shock protection boundaries
 - Analysis of arc flash hazards: **Refer to ARC Flash Warning Label**
 - The distance from the source on which the energy levels are based
 - The arc flash energy levels in cal/cm² at the working distance
 - The arc flash protective clothing and equipment required
 - Determination of the arc flash protection boundaries
 - Safe approach distances to exposed energized conductors or equipment
 - Any special precautions
 - Energy source controls
 - Description of the safe work practices to be used
 - Determination of the personal protective equipment to be used
 - **Means used to restrict access by unqualified persons.** Use Yellow/Red chains/barricade tape, cones, and portable barriers, add signage to make sure no one enters restricted area!!
 - Determination of any job-specific hazards

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7.0 TRAINING REQUIREMENTS (NFPA 70E SECTION 110.6)

7.1 SAFETY

All employees, contractors and visitors who face a risk of electrical hazard that is not reduced to a safe level by the applicable electrical installation requirements will be trained to understand the specific hazards associated with electrical energy. This training will include all safety-related work practices and procedural requirements necessary to provide protection from the electrical hazards associated with their respective job or task assignments.

Coosa's Electrical Safety Training Task Analysis Guide (TAG) documents the mill's Electrical Safety Training Plan. This plan outlines the mill's electrical hazard training, which will be conducted in a combination of methods, including self-paced learning, classroom instruction, and structured on-the-job training. The degree of training will be determined by the risk to the employee.

7.2 EMERGENCY PROCEDURES

7.2.1 Employees exposed to electrical hazards will be trained in methods of release of victims from contact with exposed energized electrical conductors or circuit parts. Certified instruction in methods of first aid and emergency procedures, such as approved methods of resuscitation, emergency first-aid, and the procedures to contact emergency assistance, will be conducted on an every other year basis. All qualified personnel will be trained in these methods.

7.2.2 Coosa Pines has an ***Energized Equipment Work Permit Policy*** in place that involves Emergency Response Team (ERT) personnel who are specifically trained and available to respond to any emergency situation in the mill.

7.3 QUALIFIED PERSON

Coosa Pines hires only Journeyman E&I personnel through a selection/screening process that includes background checks, employment history review, and electrical and instrument knowledge assessments. All newly-hired E&I personnel must go through an Orientation/Probation period of 90 days to ensure the employee has demonstrated the required knowledge and skills of a Journeyman E&I technician.

7.3.1 A qualified person is familiar with the construction and operation of the electrical equipment and the hazards involved, and has received safety training to recognize and avoid the hazards involved. An employee could be qualified to perform one work task and not qualified to perform a different task. In order to be considered qualified for a task, the employee has to demonstrate that he/she can perform the task.

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7.3.2 Persons who are qualified to work on energized electrical conductors or circuit parts will be familiar with the proper use of special precautionary techniques, personal protective equipment, and insulated tools and test equipment used in dealing with electrical equipment.

7.3.3 Persons who are qualified to work on energized electrical conductors or circuit parts will be trained and permitted to work within the Limited Approach Boundary of exposed energized electrical conductors and circuit parts operating at 50 volts or more.

7.3.4 Persons who are qualified to work on energized electrical conductors or circuit parts will be additionally trained in all of the following:

- The skills and techniques necessary to distinguish energized (live) parts.
- The ability to determine the nominal voltage of the live parts.
- The clearance (safe working) distances for the corresponding voltages.
- The decision-making process necessary to determine the degree and extent of the hazard and the personal protective equipment and job planning necessary to perform the task safely.
- The selection of appropriate electrical circuit test equipment and demonstration of its proper use.

7.3.5 An employee who has not performed a work task involving an exposed energized electrical conductor or circuit part for one or more years is considered to be unqualified for the task until the worker has been re-trained.

7.3.6 An unqualified person who is undergoing training to become a qualified person is considered qualified if he or she is under the direct supervision of a qualified person.

7.4 UNQUALIFIED PERSON

Workers who might be exposed to an electrical hazard as a work task is performed must be trained to recognize that a hazard exists and how to avoid that hazard. Any person who has not received specific training is an *unqualified person*. A worker who has been trained to perform a task might be qualified to perform that task and still be unqualified to perform any other task. The characteristics of being qualified and unqualified are task dependent.

7.4.1 Unqualified persons will be trained in and be familiar with electrical safety-related practices and electrical hazards necessary for their safety.

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7.4.2 Unqualified persons will not perform any electrical switching operations. Unqualified persons are prohibited from performing electrically related tasks that are outside their training.

7.4.3 Unqualified persons are not allowed unescorted access to electrical equipment rooms or transformer substations. Any unqualified person must be escorted by a qualified person in these areas.

7.4.4 Unqualified persons are prohibited from opening an electrical equipment enclosure for any reason.

7.4.5 If an unattended open electrical enclosure is observed, unqualified persons must not attempt to close it; instead, they must report this condition to a qualified person immediately.

7.5 RE-TRAINING

An employee will receive additional training (or re-training) under any of the following conditions:

- If supervision or annual inspections indicate that the employee is not complying with the safety-related work practices.
- If new technology, new types of equipment, or changes in procedures necessitate the use of safety-related work practices that are different from those that the employee would normally use.
- If the employee must use safety-related work practices that are not normally part of his or her regular job duties.

7.6 JOB BRIEFING

7.6.1 GENERAL

Prior to beginning work, a Job Hazard Analysis will be performed for each activity that has the potential for personnel to be exposed to injury due to electrical hazards (See **Section 6.3.4** of this policy).

7.6.1.1 The Job Hazard Analysis Safe Work Permit (SWP) results will be communicated to those who could be exposed to the hazards prior to beginning work.

7.6.2 REPETITIVE OR SIMILAR TASKS

If the work or operations to be performed during the work day or shift are repetitive and similar, at least one job briefing will be conducted before the start of the first job of the day or shift. Additional job briefings will be held if changes that might affect the safety of employees occur during the course of the work.

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7.6.3 ROUTINE WORK

A brief discussion is satisfactory if the work is routine and the employee can be expected to recognize and avoid the hazards. A more extensive discussion is required if the work is complicated, particularly hazardous, or the employee cannot be expected to recognize and avoid the hazards.

7.7 WORKING WHILE EXPOSED TO ELECTRICAL HAZARDS

Safety-related work practices will be used to safeguard employees from injury while they are exposed to electrical hazards from electrical conductors or circuit parts that are or can become energized. The safety-related work practices will be consistent with the nature and extent of the associated electrical hazards. Qualified employees will be trained in safety-related work practices for the following conditions:

- Energized Electrical Conductors and Circuit Parts – Hazardous Condition
- Working Within the Limited Approach Boundary of Exposed Electrical Conductors or Circuit Parts that Are or Might Become Energized
- Electrical Hazard Analysis
- Energized Equipment Work Permit (make hyper link)
- Access for Unqualified Persons
- **Safety Interlocks**

7.8 TRAINING DOCUMENTATION

All training conducted at the Coosa Pines mill site is documented and recorded using the mill's Learning Management System (LMS).

8.0 USE OF EQUIPMENT (NFPA 70E SECTION 110.9)

8.1 TEST INSTRUMENTS AND EQUIPMENT

Electrical test instruments and equipment used will meet applicable codes and standards and will be purchased per the Coosa Pines ***TAG AD-MTEI-OWP-0002 Electrical Safety Equipment Purchasing Specifications***.

8.1.1 Only qualified persons may perform testing work on energized electric circuits and equipment – or equipment where an electrical hazard exists.

8.1.2 Test instruments, equipment and their accessories will be rated for the circuits to which they will be connected.

8.1.3 Test instruments, equipment and their accessories will be designed for the environment to which they will be exposed, and for the manner in which they will be used.

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8.1.4 Contacting an exposed, energized electrical conductor with an instrument to measure voltage normally results in a small arc immediately before contact is made or broken. Therefore, when flammable materials are present, any tools or electrical testing equipment capable of igniting them will not be used until measures are taken to prevent hazardous conditions from developing. When flammable materials are present on a regular basis, electrical test equipment rated for the hazard according to **NFPA 70E** will be used.

8.1.5 Test instruments and equipment and all associated test leads, cables, power cords, probes and connectors will be visually inspected for external defects and damage before each use.

8.1.6 If there is a defect or evidence of damage or improper operation of test instruments and equipment or their accessories, the item must be removed from service until necessary repairs and tests to return the equipment to a safe state have been made, or the item has been replaced.

8.1.7 When test instruments are used for the testing of the absence of voltage on conductors or circuit parts operating at 50 volts or more, the operation of the test instrument will be verified before and after an absence of voltage test is performed.

8.2 PORTABLE ELECTRIC EQUIPMENT

Portable electric equipment and tools (receives its energy through a cord/plug/receptacle and is easily moved from one location to another) used on site will meet applicable codes and standards and will be purchased per the site's ***TAG AD-MTEI-OWP-0002 Electrical Safety Equipment Purchasing Specifications***. Where an alternative is available, it is more electrically safe to use tools and equipment powered from a power source such as batteries, air, hydraulics, etc.

8.2.1 Portable electric equipment will be handled in a manner that will not cause damage.

8.2.2 Flexible electric cords connected to portable electric equipment will not be used for raising or lowering the equipment.

8.2.3 Flexible cords will not be fastened with staples or hung in such a fashion as could damage the outer jacket or insulation.

8.2.4 Flexible cords used with grounding-type utilization equipment will contain an equipment grounding conductor, such as including a grounding conductor in the supply conductor, double insulation, or ground-fault circuit interrupters (GFCI).

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8.2.5 Unless the portable electric equipment is rated as double-insulated, the cord supplying the energy must include a grounding conductor. The plug must be a grounding-type attachment plug and the receptacle must be a grounding-type receptacle.

8.2.6 Attachment plugs and receptacles will not be connected or altered in a manner that would interrupt the continuity of the equipment grounding conductor.

8.2.7 The attachment plug will not be altered in order to allow use with a receptacle for which it was not intended.

8.2.8 Adapters that interrupt the continuity of the equipment grounding conductor will not be used.

8.2.9 When used, GFCI devices will be connected directly into the electrical supply, followed by the extension cord and then the portable electric equipment.

8.2.10 Temporary wiring systems will be protected via GFCI.

NOTE: A GFCI ***does not*** provide protection against injuries from simultaneous contact between the line conductor and the neutral conductor.

8.2.11 Portable electric equipment, tools, cords, GFCI devices, etc., will be visually inspected before each use for any defects. Coosa Pines does not repair damaged extension cords, flexible electric cords, etc. Damaged electrical cords will be thrown away.

8.2.12 Stationary portable electric equipment (personal computers, water coolers, household appliances, etc.) that are installed such that the cord and plug are not subject to physical damage during normal use, do not need to be tested or inspected except when they are relocated or repaired.

8.2.13 If there is a defect or evidence of damage or improper operation of portable electric equipment or its accessories, the item must be removed from service until necessary repairs and tests to return the equipment to a safe state have been made or the item has been replaced.

8.2.14 When portable electric equipment is placed into service, the pin configuration of the plug must match the configuration of the receptacle. Pins must not be damaged or removed.

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8.2.15 When outside of office areas, use GFCI when plugging in any portable electric equipment.

8.2.16 Employee's hands must be dry when plugging and unplugging portable electric equipment. Insulating protective equipment must be used in wet areas.

8.2.17 Locking type connectors will be secured after connection.

8.2.18 All 480V welding receptacles will be de-energized before welding plugs are inserted into the receptacles; or if the voltage cannot readily be removed from the receptacle, then the person inserting the plug into the energized receptacle must be protected from the hazard by wearing clothing rated at Hazard Risk Category 2 and insulated gloves. All 480V welding receptacles will have local interlock disconnects installed over time.

8.3 GFCI PROTECTION DEVICES

GFCI protection devices will be tested per manufacturer's instructions.

8.4 OVERCURRENT PROTECTION MODIFICATION

Overcurrent protection must be maintained within **National Electric Code (NEC)** requirements.

8.4.1 Overcurrent protection of circuits and conductors will not be modified, even on a temporary basis, beyond that permitted by applicable portions of electrical codes and standards dealing with overcurrent protection.

9.0 ESTABLISHING AN ELECTRICALLY SAFE WORK CONDITION

9.1 PROCESS OF ACHIEVING AN ELECTRICALLY SAFE WORK CONDITION (NFPA 70E ARTICLE 120.1)

An electrically safe work condition will be achieved when performed in accordance with the procedures of **NFPA 70E Article 120.2** and verified by the following process:

9.1.1 Determine all possible sources of electrical supply to the specific equipment. Check applicable up-to-date drawings, diagrams, and identification tags.

9.1.2 After properly interrupting the load current, open the disconnecting device(s) for each source.

9.1.3 Wherever possible, visually verify that all blades of the disconnecting devices are fully open or that drawout-type circuit breakers are withdrawn to the fully disconnected position.

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- 9.1.4 Apply lockout/tagout devices in accordance with the mill's *Hazardous Energy Lockout Policy (H.E.L.P.)* procedures.
- 9.1.5 Use an adequately rated voltage detector to test each phase conductor or circuit part to verify they are de-energized. Test each phase conductor or circuit part both phase-to-phase and phase-to-ground. Before and after each test, determine that the voltage detector is operating satisfactorily.
- 9.1.6 Where the possibility of induced voltages or stored electrical energy exists, ground the phase conductors or circuit parts before touching them. Where it could be reasonably anticipated that the conductors or circuit parts being de-energized could contact other exposed energized conductors or circuit parts, apply ground connecting devices rated for the available fault duty.

NOTE: In addition to establishing an electrically safe work condition, employees must ensure that all other hazardous energy sources, such as pneumatic, hydraulic, thermal, and mechanical, have also been isolated.

9.2 DE-ENERGIZED ELECTRICAL CONDUCTORS OR CIRCUIT PARTS THAT HAVE LOCKOUT/TAGOUT DEVICES APPLIED (NFPA 70E ARTICLE 120.2)

GENERAL

Coosa Pines Operations will identify, document, and implement lockout/tagout procedures conforming to **NFPA 70E Article 120** to safeguard employees from exposure to electrical hazards. The lockout/tagout procedure will be appropriate for the experience and training of the employees and conditions as they exist in the workplace.

- 9.2.1 All electrical circuit conductors and circuit parts will be considered energized until the source(s) of energy is (are) removed, at which time they will be considered de-energized. All electrical circuit conductors and circuit parts will not be considered to be in an electrically safe work condition until all of the applicable requirements of the Coosa Pines Operations' *Electrical Safe Work Practices Policy, Sections 9.1.1 - 9.1.6* have been met.
- 9.2.2 Electrical conductors and circuit parts that have been disconnected, but not under lockout/tagout, tested, and grounded (where appropriate) will not be considered to be in an electrically safe work condition, and safe work practices appropriate for the circuit voltage and energy level will be used. Lockout/tagout requirements will apply to fixed, permanently installed equipment, to temporarily installed equipment, and to portable equipment.

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9.3 TEMPORARY PROTECTIVE GROUNDING EQUIPMENT FOR PERSONAL PROTECTION (NFPA 70E ARTICLE 120.3)

9.3.1 PLACEMENT

Temporary protective grounds will be placed at such locations and arranged in such a manner as to prevent each employee from being exposed to hazardous differences in electrical potential.

9.3.2 CAPACITY

Temporary protective grounds will be capable of conducting the maximum fault current that could flow at the point of grounding for the time necessary to clear the fault.

9.3.3 EQUIPMENT APPROVAL

Temporary protective grounding equipment will meet the requirements of **ASTM F 855**, *Standard Specification for Temporary Protective Grounds to be Used on De-energized Electric Power Lines and Equipment*.

9.3.4 IMPEDANCE

Temporary protective grounds will have an impedance low enough to cause immediate operation of protective devices in case of accidental energizing of the electric conductors or circuit parts.

10.0 WORK INVOLVING ELECTRICAL HAZARDS (NFPA ARTICLE 130)

10.1 ENERGIZED EQUIPMENT WORK PERMIT

Coosa Pines Operations has established an ***Energized Equipment Work Permit Policy*** that defines the procedures required to work on exposed electrical conductors and circuit parts operating at or having the potential to be operated at 50 volts or more. These procedures were written in accordance with the requirements of **NFPA 70E Article 130 – *Work Involving Electrical Hazards***.

10.2 APPROACH BOUNDARIES TO ENERGIZED ELECTRICAL CONDUCTORS OR CIRCUIT PARTS (NFPA 70E ARTICLE 130.2)

10.2.1 SHOCK HAZARD ANALYSIS

A Shock Hazard Analysis determines the voltage to which personnel will be exposed, boundary requirements, and the personal protective equipment necessary in order to minimize the possibility of electric shock to personnel.

10.2.1.1 The shock protection boundaries identified as Limited, Restricted, are applicable to the situation in which approaching personnel are exposed to energized electrical conductors or circuit parts. The dimension associated with each of these boundaries depends on the maximum voltage to which a

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worker might be exposed. These dimensions can be referenced in NFPA 70E Table 130.4 (D).

- 10.2.1.2 The Limited Approach Boundary is the closest approach distance for an unqualified worker unless additional protective measures are used. The Restricted Approach Boundary is the closest approach distance for a qualified worker unless additional protective measures are used. The Prohibited Approach Boundary must not be crossed unless the work task is guided by the measures identified in the mill's ***Energized Equipment Work Permit Policy***.

10.3 ARC FLASH HAZARD ANALYSIS (NFPA 70E ARTICLE 130.3)

An Arc Flash Hazard Analysis determines the Arc Flash Protection Boundary and the personal protective equipment that people within the Arc Flash Protection Boundary will use. The Arc Flash Protection Boundary will be updated when a major modification or renovation takes place. It will be reviewed periodically, not to exceed five years, to account for changes in the electrical distribution system that could affect the results of the Arc Flash Hazard Analysis.

10.3.1 ARC FLASH PROTECTION BOUNDARY

Coosa Pines Operations contracted GE Energy Services to conduct a Short Circuit Analysis and Arc Flash Study. Per the study, GE established Arc Flash Protection Boundaries for all mill energized electrical conductors and circuit parts operating at 50 volts or more.

- 10.3.1.1 Where arc flash energy exceeds Hazard Risk Category 4, all exposed electrical circuit conductors or circuit parts ***MUST*** be de-energized before work within the Arc Flash Protection Boundary can begin.
- 10.3.1.2 Where arc flash energy is Hazard Risk Category 3 or 4 at the working distance, at least one additional person must be present who is trained in electrical emergency procedures, or who is in direct contact with someone trained in electrical emergency procedures, to immediately respond and assist in the event of an incident. This is a requirement of the mill's ***Energized Equipment Work Permit Policy***.

10.3.2 PROTECTIVE CLOTHING AND OTHER PERSONAL PROTECTIVE EQUIPMENT (PPE) FOR APPLICATION WITH AN ARC FLASH HAZARD ANALYSIS

Where it has been determined that work will be performed within the Arc Flash Protection Boundary, the selection of protective clothing and other personal protective equipment will be based on the Hazard/Risk Category of the task, as determined by the Incident Energy Analysis (See the

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Coosa Pines **PPE Policy** for details. Specific examples can be referenced in NFPA 70E Tables 130.7 (C) (10) and (C) (11)).

10.3.2.1 The specifications for arc flash protective clothing, tools and equipment used at Coosa Pines Operations can be referenced in the mill's **TAG AD-MTEI-OWP-0002 Electrical Safety Equipment Purchasing Specifications**.

10.3.2.2 The selection, use and care of rubber insulating materials must meet the specifications of applicable ASTM and ANSI standards. The most recent test date, or date the rubber insulating product was put in service must be clearly indicated. These items must have markings that clearly show their class, type, maximum use voltage, and test voltage.

10.3.2.3 Prior to each use, rubber insulating materials must be visually inspected. This inspection must include verification that the test date, or date put in service, is not past six months. The inspection must also look for holes, tears, cuts, punctures, ozone damage, imbedded foreign objects, and texture changes.

10.3.2.4 Rubber insulating materials are tested periodically at their rated test voltage. The interval between these tests will not exceed six months.

10.3.2.5 Voltage rated (VR) insulated tools and/or insulated handling equipment must be used while working near exposed energized conductors or circuit components.

10.3.3 EQUIPMENT LABELING

Equipment will be field marked with a label containing the available incident energy or required level of PPE. These labels will indicate, at a minimum, the following:

- Shock hazard when cover removed or open
- NFPA 70E Hazard Risk Category
- Calculated arc flash protection boundary
- Calculated incident energy at 18 inches
- NFPA 70E Limited Approach Boundary
- NFPA 70E Restricted Approach Boundary
- Equipment location
- Equipment number
- Required PPE

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10.3.3.1 For each electric room, general Arc Flash Danger warning signs are posted at the entry doors.

10.3.3.2 Detailed Arc Flash signage has been produced for and posted at each MCC, switchgear, and load interrupter in the mill. The signage specifies the Hazard Risk Category for the equipment. See **Attachment 4.0** of this policy.

10.3.3.4 Signage reviewing PPE requirements by each Arc Flash Hazard Category has been posted in each power center.

10.4 TEST INSTRUMENTS AND EQUIPMENT USE (NFPA 70E ARTICLE 130.4)

Only qualified persons will perform testing work within the Limited Approach Boundary of energized electrical conductors or circuit parts operating at 50 volts or more.

10.5 WORK WITHIN THE LIMITED APPROACH BOUNDARY OF UNINSULATED OVERHEAD LINES (NFPA 70E 130.5)

When working within the Limited Approach Boundary of uninsulated overhead lines, Coosa Pines Operations follows the guidelines of NFPA 70E Article 130.5.

10.6 OTHER PRECAUTIONS FOR PERSONNEL ACTIVITIES (NFPA 70E ARTICLE 130.6)

10.6.1 ALERTNESS

10.6.1.1 Employees will not be allowed to work within the Limited Approach Boundary if alertness is impaired due to illness, fatigue, etc.

10.6.1.2 Employees will be alert to changes in job scope that may result in different or additional hazards.

10.6.2 BLIND REACHING

Employees may not reach blindly into areas that may contain exposed energized conductors.

10.6.3 ILLUMINATION

10.6.3.1 Areas or rooms where there are exposed energized conductors or open electric bus will be illuminated to adequately light the area and allow work to be performed in a safe manner.

10.6.3.2 The work area may be illuminated by either permanent fixtures, temporary light circuits or portable battery operated lights.

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10.6.3.3 Employees must be able to see all of the physical hazards and electrically energized parts of the equipment when reaching into a confined work area.

10.6.4 CONDUCTIVE ARTICLES BEING WORN

Conductive apparel is prohibited from being worn by employees who are (or may be) exposed to an electrical hazard. Please refer to the mill's **Personal Protective Equipment Policy—Torso Protection & Rings, Watches, Jewelry** sections for more details.

10.6.5 CONDUCTIVE MATERIALS, TOOLS, AND EQUIPMENT BEING HANDLED

Any conductive material and/or equipment in contact with any part of an employee's body will be handled in a manner that will prevent contacting exposed energized conductors or circuit parts.

10.6.5.1 All ladders will meet or exceed to Coosa Pines Ladder Safety Policy SAF-1.12.

10.6.6 CONFINED OR ENCLOSED WORK SPACES

10.6.6.1 Any person working in a congested space containing exposed energized conductors or circuit parts will use protective shields, barriers, or insulating materials as necessary to avoid inadvertent contact.

10.6.6.2 Doors, hinged panels, and other covers will be secured to prevent the risk of an individual contacting an exposed energized conductor or circuit part.

10.6.6.3 Refer to the mill's **Confined Space Entry Policy** for more details.

10.6.7 HOUSEKEEPING DUTIES

Housekeeping duties will not be performed unless adequate safeguards (e.g., insulating equipment or barriers) are provided where live components present an electrical contact hazard.

10.6.8 OCCASIONAL USE OF FLAMMABLE MATERIALS

10.6.8.1 When flammable materials are present, electrical equipment capable of igniting them will not be used until measures are taken to prevent hazardous conditions from developing.

10.6.8.2 When flammable materials are present on a regular basis, electrical equipment rated for the hazard according to **NFPA 70, National Electric Code** will be used.

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10.6.9 ANTICIPATING FAILURE

When there is evidence that electric equipment could fail and injure employees, the electric equipment will be de-energized unless it can be demonstrated that de-energizing introduces additional or increased hazards or is infeasible because of equipment design or operational limitation. Until the equipment is de-energized or repaired, employees will be protected from hazards associated with the impending failure of the equipment.

Coosa Pines Operations utilizes Visual Observations, Housekeeping Audits, HELP Audit forms, formal Electrical Safety Program Audits, and Layered Safety Audits (LSA) to identify potential unsafe acts and conditions. The Work Order System is used to submit work request to make repairs of unsafe finding. The Incident Reporting System (IRS) is used to report near misses found of unsafe electrical conditions. Job Feedback Forms allow maintenance personnel to identify unsafe conditions as they are encountered in the field.

10.6.10 ROUTINE OPENING AND CLOSING OF CIRCUITS

Load-rated switches, circuit breakers, or other devices specifically designed as disconnecting means will be used for the opening, reversing, or closing of circuits under load conditions. Other means such as cable connections not of the load-break type, fuses, terminal plugs and cable splice connections are not to be used.

10.6.10.1 Coosa Pines Operations allows qualified personnel to perform routine opening and closing of **specified** circuits. See **Attachment 1.0** of this policy.

10.6.11 RECLOSING CIRCUITS AFTER PROTECTIVE DEVICE OPERATION

The cause of a protective device operation due to a fault condition (i.e., short circuit, phase-to-phase fault, phase-to-ground fault, etc.) will be identified and corrected by a qualified person before a circuit is re-energized. Where it is determined that the protective device operation was caused by an overload rather than a fault condition, examination of the circuit will not be required before the circuit is re-energized.

10.7 PERSONAL AND OTHER PROTECTIVE EQUIPMENT (NFPA 70E 130.7)

Employees working in areas where electrical hazards are present will be provided with, and will use, protective equipment that is designed and constructed for the specific part of the body to be protected and for the work to be performed. Refer to the mill's **TAG AD-MTEI-OWP-0002 Electrical Safety Equipment Purchasing Specifications** and **Personal Protective Equipment**

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Policy for more information about personal and other protective equipment used at Coosa Pines.

10.7.1 CARE OF EQUIPMENT

Protective equipment will be maintained in a safe, reliable condition. The protective equipment will be visually inspected before each use. Protective equipment will be stored in a manner to prevent exposure to physically damaging conditions and from moisture, dust, or other deteriorating agents.

10.7.2 PERSONAL PROTECTIVE EQUIPMENT

Refer to the mill's **Personal Protective Equipment Policy—Electrical PPE** section for more information about the personal protective equipment standards of the Coosa Pines Operations (Specific examples can also be referenced in NFPA 70E Tables 130.7 (C) (10) and (C) (11)).

10.7.2.1 Each E&I Technician, Planner, Coordinator and Trainee is originally provided with seven (7) sets of FR shirts, one (1) FR coverall, two (2) FR sock hoods, one (1) FR jacket, pair of voltage-rated gloves, and one arc-rated face shield.

10.7.2.2 FR clothing will be replaced at a rate of two sets per year. Additional clothing will be replaced as based on job related damage and with approval from the area E&I Coordinator.

10.7.2.3 Effective January, 2010, E&I Personnel will be required to purchase EH approved safety shoes and electrically safe eyewear as they replace their older equipment. Existing equipment will be replaced on an as-needed basis.

11.0 SAFETY-RELATED MAINTENANCE REQUIREMENTS

11.1 General Maintenance

Employees who perform maintenance on electrical equipment and installations at Coosa Pines Operations must be trained in, and familiar with, the specific maintenance procedures and tests required in compliance with the guidelines set forth in **NFPA 70E Article 205**.

11.2 Substations, Switchgear Assemblies, Switchboards, Panelboards, Motor Control Centers, and Disconnect Switches

Maintenance activities on or around substations, switchgear assemblies, switchboards, panelboards, motor control centers, and disconnected switches at Coosa Pines Operations will be done in compliance with **NFPA 70E Article 210**.

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11.3 Premises Wiring

All electrical wiring at Coosa Pines Operations will be installed and maintained in accordance with the standards set forth in **NFPA 70E Article 215**. See **Attachment 2: "Power Centers"** and **Attachment 3: "Outside Substations"** of this document for more details.

11.3.1 Coosa Pines follows NEC Standards for installing and maintaining buried electrical power feeders. Coosa Pines has an **Excavation Policy** that addresses the proper procedures for buried electrical power feeders.

11.3.2 The location of all buried electrical power feeders at the Coosa Pines facility are properly documented and available for review anytime that excavation work is done. Qualified persons review and approve any excavation work done near buried electrical power feeders. If necessary, buried electrical circuit feeders are de-energized during the time the excavation work is in progress and, if necessary, a qualified person is present during the excavation work.

11.4 Controller Equipment

All control equipment at Coosa Pines Operations will be defined by and maintained according to **NFPA 70E Article 220**.

11.5 Fuses and Circuit Breakers

The maintenance standards for fuses and circuit breakers at Coosa Pines Operations will be in accordance with **NFPA 70E Article 225**.

11.6 Rotating Equipment

All rotating equipment at Coosa Pines Operations will be defined by and maintained according to **NFPA 70E Article 230**.

11.7 Hazardous (Classified) Locations

Maintenance of equipment in hazardous locations of Coosa Pines Operations will be done in accordance with the standards set forth in **NFPA 70E Article 235**.

11.8 Batteries and Battery Rooms

Standards for the care and maintenance of batteries and battery rooms and storage facilities at Coosa Pines Operations will follow the guidelines of **NFPA 70E Article 240**.

11.9 Portable Electrical Tools and Equipment

Standards for the care and maintenance of portable electrical tools and equipment at Coosa Pines Operations will follow the guidelines of **NFPA 70 Article 245**.

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11.10 Personal Safety and Protective Equipment

Standards for the upkeep of personal protective equipment at Coosa Pines Operations will follow the guidelines of **NFPA 70E Article 250**.

12.0 SAFETY REQUIREMENTS FOR SPECIAL EQUIPMENT

12.1 Safety-Related Work Practices for Electrolytic Cells

For safety-related work practices on or around Electrolytic Cells, Coosa Pines Operations will follow the guidelines of **NFPA 70E Article 310**.

12.2 Safety Requirements Related to Batteries and Battery Rooms

For safety requirements related to Batteries or Battery Rooms, Coosa Pines Operations will follow the guidelines of **NFPA 70E Article 320**.

12.3 Safety-Related Work Practices for Use of Lasers

For safety-related work practices on or around Lasers or Laser Equipment, Coosa Pines Operations will follow the guidelines of **NFPA 70E Article 330**.

12.4 Safety-Related Work Practices: Power Electronic Equipment

For safety-related work practices on or around Power Electronic Equipment, Coosa Pines Operations will follow the guidelines of **NFPA 70E Article 340**.

12.5 Safety-Related Work Requirements: Research and Development Laboratories

For safety-related work practices on or around Research and Development Laboratories, Coosa Pines Operations will follow the guidelines of **NFPA 70E Article 350**.

13.0 ELECTRICAL SAFETY AUDITING

The Coosa Pines Operations Electrical Safety Program will be audited to help ensure that the principles and procedures of the Electrical Safety Program are being followed. The frequency of audits will be every two years. Where audit results determine that the principles and procedures of the Electrical Safety Program are not being followed, appropriate revisions will be made.

13.1 All audits will be documented. Audit documentation will record the date and results of each audit. Audits must contain at least the following four components:

- Employees are implementing the requirements of the Electrical Safety Program.
- The program addresses all hazards that might exist on a work site.
- Define the process to ensure procedures are revised, as new information becomes available. In the event that an incident or injury occurs, all associated procedures must be reviewed and revised as necessary. Any shortcoming determined in the field or procedure audit must trigger change to procedures that are in place or generation of an entirely new procedure. **All**

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procedures contained in the Electrical Safety Program must be reviewed on a frequency not greater than three years and revised as appropriate.

- The audit must define how any revision of specific procedures or a general change is communicated to employees.

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- 14.0 RECORD OF REVISIONS

Section	Revision Number	Effective Date	Description
All Sec. 09	Original	August 12, 1992	Original Policy development.
ALL	1	April 17, 2006	This is a complete revision of the Policy.
ALL Sec 6.3	2	December 12, 2008	Changed company name to AbitibiBowater. Added Arc Flash PPE requirements 6.3.3 and 6.3.4.
Sec. 6.2	3	April 22, 2009	Added requirement for an Energized Equipment Work Permit to section 6.2 Equipment (Electric Powered).
ALL	4	August 31, 2009	Revised to reflect new corporate requirements
ALL	5	December 9, 2009	Complete re-write of policy to mirror organization of NFPA 70E standard.
ALL	6	February 5, 2010	Re-shuffling of sections and subsequent re-numbering. Removal of existing section titled "Working While Exposed to Electrical Hazards." This section was deemed unnecessary. Creation of new Section 13.0 – "Electrical Safety Auditing."
6.3.1	7	May 17, 2010	Added CMMS auto-notification every five years for Arc Flash Studies.
Attachments	8	February 9, 2011	De-activated Attachment 1.0 until further notice. Added Attachment 4.0 to show examples of Arc Flash Signs.
4.2	9	April 20, 2012	Added 4.2 Routine Work for Qualified Persons – Normal de-energizing and re-energizing switches for lock-out, troubleshooting electrical circuits, re-setting overloads or tripped breakers. Normal work within the confines of the MCC room, changing lights, and cleaning the MCC room. Any PM work done within the confines of the MCC room.
ALL	10	March 19, 2013	Name change to Resolute.
ALL	11	July 12, 2018	Annual review and updates.

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ATTACHMENT 1.0

OPERATION of CIRCUIT BREAKERS (0 to 480 volts)

- 1.0 Operation of the 0 to 480 volt Circuit Breaker.
 - 1.1 Circuit Breakers shall be operated by the E/I Technician.
 - 1.2 Circuit Breakers may be operated by Qualified Personnel as described in sections 2.0 and 3.0.
 - 1.3 **Link to TAG** – AD-MSSA-OWP-0027 Re-energize the Electric Power System

- 2.0 Circuit Breaker with Jog Switch at the Equipment.
 - 2.1 Qualified Personnel may operate Circuit Breakers that have a “jog” switch at the equipment.
 - 2.2 Operating procedures are described in “TAG” system.
 - 2.3 **LINK TO TAG** – AD-MSSA-OWP-0009 Circuit Breaker 0 to 480V Jog Switch at Equipment

- 3.0 Circuit Breaker with the Voltage Awareness Device.
 - 3.1 Voltage Awareness Devices may be installed on Circuit Breakers when there is no “jog” switch installed by the equipment.
 - 3.2 Qualified Personnel may operate Circuit Breakers that have a Voltage Awareness Device.
 - 3.3 Operating procedures are described in “TAG” system.
 - 3.4 **LINK TO TAG**- AD-MSSA-OWP-0010 Circuit Breaker 0 to 480V with Voltage Awareness Device

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ATTACHMENT 2.0

POWER CENTERS

Power Center rooms shall be inspected monthly (30 days).

- 1.0 POWER CENTER room entrance doors will be posted with ARC Flash Warning Labels and ARC Flash PPE Requirements.
- 2.0 PCB POWER CENTER Transformer Rooms will be posted with ARC Flash Warning Labels and ARC Flash PPE Requirements and will have PCB Warning Labels. They will contain no combustibles and must be kept locked.
- 3.0 All Power Center entrance doors will be capable of closing and latching.
- 4.0 ARC Flash Signage will be on each MCC on all four sides.
- 5.0 All switches will be identified with proper identification labels.
- 6.0 Doors on all the switches and cabinets will be closed and latched.
- 7.0 Housekeeping in the POWER CENTERS room will include sweeping, removing cob webs, emptying trash containers, and checking for evidence of pests, mice, etc.
- 8.0 All lights must be working.
- 9.0 The air conditioning (or ventilation system), and air purification unit must be working, and air filters replaced as needed.
- 10.0 The floor drains must be open and functioning.
- 11.0 Fire Extinguishers must be checked on a monthly basis.
- 12.0 Reference and operating manuals and system schematic drawings must be neatly bound and properly stored to protect materials and prevent hazards.
- 13.0 MCC rooms must be dry and free of moisture, no standing water and must have no leaking roofs.

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ATTACHMENT 3.0

OUTSIDE SUBSTATIONS

1.0 Substations.

1.1 Substations use transformers to reduce voltage from transmission levels to distribution levels.

1.2 **All** work in an energized substation requires an ***Energized Equipment Work Permit.***

2.0 Fencing of outside substations.

2.1 All equipment for an outside substation shall be enclosed by a fence that meets the design described in the ***National Electric Safety Code.***

2.2 Fence posts, fence material, and barbed wire tops shall be grounded or bonded (attached) to the outside substation ground grid at designated intervals.

2.3 Hinges on gates shall have bonding straps providing a positive connection between the gate and the fence.

2.4 A DANGER sign shall be placed on each side of the substation.

3.0 Grounds.

3.1 Outside substations shall have a ground grid of sufficient capacity to handle all ground faults.

3.2 All equipment for an outside substation shall be grounded or bonded (attached) to the substation ground grid.

3.3 If switch platforms are used on the equipment, the platform shall be grounded (attached) to the substation ground grid.

3.4 All fixed metal equipment inside the fenced area shall be grounded or bonded (attached) to the substation ground grid.

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4.0 Locks.

- 4.1 All gates, doors or other means of entering outside substations shall be closed and locked.
- 4.2 Keys for substations shall be issued to qualified persons and Shift Team Leaders.

5.0 Access.

- 5.1 Only qualified persons shall enter the substation yard or control room.
- 5.2 Qualified persons entering the substation yard or control room shall notify the Utilities Lead Operator prior to entering.
- 5.3 Persons shall provide the Utilities Lead Operator the substation name, your name, date, time and purpose of entering the substation.
- 5.4 Upon leaving the substation, close and lock the access, and notify the Utilities Lead Operator of your departure providing the date and time.

6.0 Mobile equipment.

Mobile equipment referred to in this work activity is any type of equipment that has a high ground clearance or has an elevating device (crane, aerial lift, fork lift, front end loader, dump truck, etc.).

- 6.1 Mobile equipment operated in the substation shall be grounded at all times.
- 6.2 When equipment is moving through the substation a chain attached to the equipment and dragging on the surface of the substation will be sufficient. Employees must use caution when accessing equipment.
- 6.3 Equipment in the stationary operating position shall have a ground conductor attached to the equipment and substation ground grid.
- 6.4 Operation of a crane or aerial lift shall be performed by a qualified person in accordance with procedures provided by the manufacturer.
- 6.5 A minimum clear distance of ten (10) feet must be maintained between energized equipment and any mobile equipment, including any part of the equipment that elevates moves or rotates.

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6.6 Employees shall maintain the ten (10) foot distance between themselves and the equipment when it is in an elevated position.


6.7 Warning cones and/or barricades shall be placed around the mobile equipment after it is parked and prior to the elevation of the equipment.

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ATTACHMENT 4.0

EXAMPLES OF ARC FLASH SIGNS

1.0 Standard Arc Flash and Shock Hazard Sign per 2010 Arc Flash Study:

	
Arc Flash and Shock Hazard Appropriate PPE Required	
480 VAC Shock Hazard When Covers Removed Or Doors Opened	
2	NFPA-70E Hazard Risk Category
40 Inches	Calculated Arc Flash Protection Boundary
4.4 cal/cm²	Calculated Incident Energy at 18 Inches
3.5 Feet	Limited Approach Boundary
1 Foot	Restricted Approach Boundary
Min. Arc Rating = 8 (See PPE Clothing Chart)	PPE
	Glove Class
Location: ROSS DRYER 1ST FLOOR SOUTH END	Equipment #: MCC U51-5A
If enclosure is closed & latched - No Arc Flash PPE required	
Date of Survey: 4/2015	

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2.0 480 V Welding Plugs & Safety Disconnect Switches:



3.0 Lighting Panels:

