Policy Statement

It is the policy of Pannier Corporation to protect all employees from electrical hazards, including shock, electrocution, arc flash, arc blast, and fires. All electrical work will be conducted in a manner consistent with existing regulations and with recognized safe work practices. This Plan establishes safe work practices for routine operations. Operations that involve high voltage and other unique hazards will need additional procedures for the specific situation.

Authority and Scope

Authority

This Plan complies with electrical safety regulations at 29 CFR 1910.331 to 1910.335

The Electrical Safety Plan covers electrical safe work practices for qualified persons (i.e., persons trained to avoid the electrical hazards of working on or near exposed energized parts) and unqualified persons (i.e., persons with little or no training) who work on or near machines, equipment, or circuits that have not been placed in an electrically safe work condition (i.e., not locked/tagged out). It applies to:

• Premise wiring (i.e., installations of electric conductors and equipment within or on buildings or other structures and on other premises such as yards, parking and other lots, and industrial substations)

• Wiring for connection to supply

• Installations of other outside conductors on the premises

• Installations of optical fiber cable where such installations are made along with electric conductors

This Plan does not apply to electrical generation, transmission, and distribution systems.

Program Administration

Program Contact Information

Function	Name, job title, or department	Contact Information
Plan Administrator	John Visconti	412-492-1400 ext. 310
Supervisor(s)	Bob Barker	412-492-1400 ext. 315
Supervisor	Bob Hallstein	412-492-1400 ext. 345
Purchasing Manager	Howard Langston	412-492-1400 ext. 334
EHS Manager	John Visconti	412-492-1400 ext. 310

Supervisor	Rick Paluka	412-492-1400 ext. 319
Safety Committee Chairperson	Norb Musher	412-492-1400 ext. 315

Plan Administrator. The Electrical Plan Administrator will provide safe work procedures and permits for electrical work as required, and provide and implement other critical procedures such as lockout/tagout, testing, and safety-related work practices as required by regulation. Specifically, the Administrator will:

• Ensure that employees who work or who may potentially work near exposed energized parts are trained and qualified.

• Ensure that approved, maintained, and tested personal protective equipment (PPE) and other electrical safety equipment are provided, available, and used properly.

• Establish, implement, and maintain procedures that will ensure electrical safe work practices.

• Establish and maintain records as required.

The Administrator will also ensure that workers of all disciplines and their immediate supervisors working with, or in proximity to, electrical equipment receive:

• Electrical safety awareness training

• General and job-specific training in safe electrical work practices

• Training in NFPA and ANSI codes and standards

Supervisor(s). Supervisors will:

• Complete applicable training.

• Ensure that employees follow all electrical safety practices and procedures.

• Ensure that employees receive required training at the prescribed times.

Maintenance Manager. The Maintenance Manager will develop and institute an electrical safety maintenance program, provide qualified persons, and review and approve live work permits to work on or near energized parts.

Purchasing Manager. The Purchasing Manager will specify that only electrical equipment and appliances that are listed by a nationally recognized testing laboratory (NRTL) such as Underwriters' Laboratories, Inc. (UL) are purchased.

EHS Manager. The EHS Manager will facilitate the administration of the Electrical Safety Plan, including performing periodic program audits.

Training Manager. The Training Manager will develop and oversee electrical safety training courses, including any site-specific electrical safety training courses, as required, and assist other managers with their employee training responsibilities.

Safety Committee Chairperson. The Safety Committee Chairperson and other Safety Committee members will assist the Plan Administrator with interpreting electrical codes and regulations.

Employees. All employees, including employees of contractors working at Pannier Corporation work sites, are responsible to comply with all safety rules and policies as directed by Pannier Corporation management that apply to their own actions and conduct, including immediate reporting to management of unsafe and unhealthful conditions.

On-Site Contractors and Subcontract

All references in the Plan to "employees" or "workers" apply to the employees of on-site contractors and subcontractors.

All on-site contractors and subcontractors will ensure that they and their employees:

• Have received electrical safety training corresponding to each employee's work requirements, and that such training is documented

• Report all electrical hazards to the Maintenance Manager.

• Report all electrical injuries, including but not limited to shocks, burns and arc flashes to the Plant Manager.

• Read, understand, and follow applicable electrical safety-related operating procedures prescribed by electrical safety regulations and by Pannier Corporation.

• Adopt and implement safe electrical work practices.

• Use appropriate PPE and electrical safety equipment. Communicate electrical safe work practices with the Quality Manager or Safety Committee Representatives.

Program Review and Update

Plan will be reviewed and updated periodically and whenever:

• New types of electrical utilization systems or equipment are introduced into the workplace

• Evaluations of workplace hazards, injuries, and near-misses demonstrate that the current plan is outdated or not effective.

• When regulatory or national consensus standards change that require this Plan to be updated

Definitions

Circuit breaker (600 volts nominal, or less)--a device designed to open and close a circuit by nonautomatic means and to open the circuit automatically on a predetermined overcurrent without injury to itself when properly applied within its rating.

Circuit breaker (over 600 volts, nominal)--a switching device capable of making, carrying, and breaking currents under normal circuit conditions, and also making, carrying for a specified time, and breaking currents under specified abnormal circuit conditions, such as those of short circuit.

Certified equipment--equipment that (a) has been tested and found by a nationally recognized testing laboratory to meet nationally recognized standards or to be safe for use in a specified manner, or (b) is of a kind whose production is periodically inspected by a nationally recognized testing laboratory, and (c) it bears a label, tag, or other record of certification.

Electrically safe work condition --a state in which the conductor or circuit part to be worked on or near has been disconnected from energized parts, locked/tagged in accordance with established standards, tested to ensure the absence of voltage, and grounded if determined necessary.

Equipment--material, fittings, devices, appliances, fixtures, and apparatus used as part of, or in connection with, an electrical installation.

Ground--a conducting connection, whether intentional or accidental, between an electrical circuit or equipment and the earth, or to some conducting body that serves in place of the earth.

Ground-fault circuit-interrupter (GFCI)--A device whose function is to interrupt the electric circuit to the load when a fault current to ground exceeds some predetermined value that is less than that required to operate the overcurrent protective device of the supply circuit

Qualified person--an employee familiar with the construction and operation of the equipment and the hazards involved.

Buddy--a person whose specific duties are to observe workers and operations that involve electrical work.

Unqualified person--an employee with no familiarization with or training in the construction and operation of the electrical equipment and hazards involved.

Utilization equipment--utilizes electric energy for mechanical, chemical, heating, lighting, or similar useful purpose, and includes laboratory and shop equipment, appliances, or other devices that operate from an electrical energy source.

Hazard Assessment

The Quality Manager and/or the Safety Committee has conducted an assessment of electrical hazards at this facility.

Accident Investigations

All electrical incidents that result in injury to workers, as well as near misses, regardless of their nature, will be reported and investigated. Investigations will be conducted by the Quality Manager or other competent person as soon after an incident as possible to identify the cause and means of prevention to eliminate the risk of reoccurrence.

In the event of an incident that results in serious injury, this Plan will be reevaluated by the Plant Manager to determine if additional controls, practices, procedures, or training is necessary to prevent similar future incidents.

Safe Work Practices

Basic Safety Practices

Exposed energized parts will first be deenergized, locked/tagged out, and tested by a qualified person to verify that an electrically safe work condition exists. If it is not feasible to deenergize, a written live work permit will first need to be prepared that establishes the safe work practices that must be followed.

Only a qualified person will deenergize, lock/tag out, and test electrical parts and equipment. Only a qualified person will work on or near exposed live parts following the requirements of the live work permit.

General Safe Work Practices

All employees working on or near electrical equipment will follow general safe work practices, including:

• Maintain good housekeeping procedures.

• Plan and analyze for safety in each step of a project.

• Document work.

• Use properly rated test equipment and verify its condition and operation before and after use.

• Practice applicable emergency procedures.

• Become qualified in cardiopulmonary resuscitation (CPR) and first aid and maintain current certifications.

• Always wear appropriate PPE when working on or near electrical equipment.

• Refer to system drawings and perform system walkdowns.

• Maintain electrical equipment in accordance with the manufacturer's instructions.

• Plan work projects through an approved work control process.

Housekeeping Duties

Where live parts present an electrical contact hazard, employees may not perform housekeeping duties at such close distances to the parts that there is a possibility of contact, unless adequate safeguards (such as insulating equipment or barriers) are provided. Electrically conductive cleaning materials (including conductive solids such as steel wool, metalized cloth, and silicon carbide, as well as conductive liquid solutions) may not be used in proximity to energized parts unless procedures are followed which will prevent electrical contact.

Conductive Materials and Equipment

Conductive materials and equipment that are in contact with any part of an employee's body will be handled in a manner that will prevent them from contacting exposed energized conductors or circuit parts. If an employee is expected to handle long dimensional conductive objects (such as ducts and pipes) in areas with exposed live parts, the following work practices will be implemented to minimize the hazard:

• Insulate the conductive objects

• Provide guarding against contact

• Implement material handling techniques

Portable ladders. Portable ladders will have nonconductive siderails if they are used where the employee or the ladder could contact exposed energized parts.

Flammable or Ignitable Materials

Where flammable materials are present only occasionally, electric equipment capable of igniting them will not be used, unless measures are taken to prevent hazardous conditions from developing. Such materials include, but are not limited to: flammable gases, vapors, or liquids; combustible dust; and ignitable fibers or flyings.

[Electrical installation requirements for locations where flammable materials are present on a regular basis are contained in 29 CFR 1910.307.]

Illumination

Adequate illumination will be provided to work areas that contain exposed energized parts to enable workers to perform their tasks safely.

Alerting Techniques

Safety signs and tags. Safety signs, safety symbols, or accident prevention tags will be used where necessary to warn employees about electrical hazards which may endanger them. Such signs and tags will be designed and used in accordance with regulations (29 CFR 1910.145).

Barricades. Barricades will be used in conjunction with safety signs where it is necessary to prevent or limit employee access to work areas exposing employees to uninsulated energized conductors or circuit parts. Conductive barricades may not be used where they might cause an electrical contact hazard.

Attendants. If signs and barricades do not provide sufficient warning and protection from electrical hazards, an attendant will warn and protect employees.

Portable Equipment and Extension Cords

Portable equipment will be handled in a manner that will not cause damage. Flexible electric cords connected to equipment may not be used for raising or lowering the equipment. Flexible cords may not be fastened with staples or otherwise hung in such a fashion as could damage the outer jacket or insulation.

Inspection. Portable cord and plug-connected equipment and flexible cord sets (extension cords) will be visually inspected before use on any shift for external defects (such as loose parts, deformed and missing pins, or damage to outer jacket or insulation) and for evidence of possible internal damage (such as pinched or crushed outer jacket). Cord and plug connected equipment and flexible cord sets (extension cords) which remain connected once they are put in place and are not exposed to damage need not be visually inspected until they are relocated.

If there is a defect or evidence of damage that might expose an employee to injury, the defective or damaged item will be removed from service, and no employee may use it until repairs and tests necessary to render the equipment safe have been made.

When an attachment plug is to be connected to a receptacle, the relationship of the plug and receptacle contacts will first be checked to ensure that they are of proper mating configurations.

Grounding-type equipment. A flexible cord used with grounding-type equipment will contain an equipment grounding conductor. Attachment plugs and receptacles may not be connected or altered in a manner that would prevent proper continuity of the equipment grounding conductor at the point where plugs are attached to receptacles. Additionally, these devices may not be altered to allow the grounding pole of a plug to be inserted into slots intended for connection to the current-carrying conductors. Adapters which interrupt the continuity of the equipment grounding connection may not be used.

Conductive work locations. Portable electric equipment and flexible cords used in highly conductive work locations (such as those inundated with water or other conductive liquids), or in job locations where employees are likely to contact water or conductive liquids, will be approved for those locations.

Connecting attachment plugs. Employees' hands may not be wet when plugging and unplugging flexible cords and cord and plug connected equipment, if energized equipment is involved. Energized plug and receptacle connections may be handled only with insulating protective equipment if the condition of the connection could provide a conducting path to the employee's hand (if, for example, a cord connector is wet from being immersed in water). Locking type connectors will be properly secured after connection.

Test Instruments and Equipment

Only qualified persons may perform testing work on electric circuits or equipment.

Visual inspection. 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 the equipment is used. If there is a defect or evidence of damage that might expose an employee to injury, the defective or damaged item will be removed from service, and no employee may use it until repairs and tests necessary to render the equipment safe have been made.

Rating of equipment. Test instruments and equipment and their accessories will be rated for the circuits and equipment to which they will be connected and will be designed for the environment in which they will be used.

Electric Power and Lighting Circuits

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. Cable connectors not of the load break type, fuses, terminal lugs, and cable splice connections may not be used for such purposes, except in an emergency.

Reclosing circuits after protective device operation. After a circuit is deenergized by a circuit protective device, the circuit may not be manually reenergized until it has been determined that the equipment and circuit can be safely energized. The repetitive manual reclosing of circuit breakers or reenergizing circuits through replaced fuses is prohibited. Note: When it can be determined from the design of the circuit and the overcurrent devices involved that the automatic operation of a device was caused by an overload rather than a fault condition, no examination of the circuit or connected equipment is needed before the circuit is reenergized.

Overcurrent protection modification. Overcurrent protection of circuits and conductors may not be modified, even on a temporary basis, beyond that allowed by the installation safety requirements for overcurrent protection. *[See regulation 29 CFR 1910.304(e) for more information about safe work practices for overcurrent protection.]*

Interlocks

Only a qualified person may defeat an electrical safety interlock, and then only temporarily while he or she is working on the equipment. The interlock system will be returned to its operable condition when this work is completed.

Overhead Lines

If work will be performed near energized overhead lines, either adequate clearance distance must be maintained, the lines must be deenergized and grounded, or other safety measures must be taken to protect all employees from electrical hazards. Protective measures may include:

• Keep vehicles, mechanical equipment, and unqualified persons at least 10 feet from overhead lines, adding 4 inches for every additional 10,000 volts. Qualified personnel must maintain approach distances as per OSHA Table S-5 (located in 29 CFR1910.333(c)(3)).

• Guard or place barriers between the lines and work areas.

• Have the lines insulated with brush guards by the company that supplies the power, and follow the company's requirements for working near the insulated lines.

Confined Spaces

Pannier Corporation will provide and employees will use approved protective shields, protective barriers, or insulating materials to protect employees from contact with energized parts when working in confined spaces. Doors, hinged panels, and other moveable objects that may move and push a person towards electrical hazards need to be secured.

Electrical Maintenance and Repair Operations

[Modify, add to, or delete the following list of safety practices as applicable to your facility.]

Only qualified persons will perform repair or maintenance work on electrical conductors or circuits. If an electrical hazard is discovered while repairs or maintenance work is performed, any further work must be suspended until the hazard is addressed and corrective actions instituted.

Qualified persons performing such tasks as electrical repairs, modifications, and tests on energized conductors and circuit, parts, and equipment will comply with the following work practices.

Energized Parts and Equipment

• All circuits and equipment are considered energized until opened, locked/tagged out, and tested by a qualified person who verifies with an approved testing device that it is deenergized.

• Energized parts to which an employee might be exposed will first be deenergized and locked/tagged out unless Pannier Corporation can demonstrate that deenergizing introduces additional or increased hazards or is infeasible due to equipment design or operational limitations. If live work is demonstrated, the live work permit needs to be completed.

Lockout/Tagout

Before repair or maintenance work is performed on electrical equipment, the electrical energy isolating device will be turned off, and locked/tagged. See the **Lockout/Tagout Plan** for information about lockout/tagout procedures used at the facility.

Tools

• Electrically insulated-rated tools and insulated protective equipment, such as gloves, blankets, sleeves, and mats, will be used while working on energized circuits. Employees will use tools and protective equipment with the proper rating for the task (see NFPA 70E standard). Tools will be inspected and tested according to the manufacturers' specifications.

• Electrical tools will be plugged into ground fault circuit interrupter (GFCI) receptacles.

• Extension cords are for temporary use with portable appliances, tools, and similar equipment that are not normally used at one specific location. Extension cords will not to be used as a substitute for fixed wiring. The Maintenance Manager will install receptacles when needed for new equipment.

• Any employee who is unsure if a hazard exists will contact the Maintenance Manager or a supervisor before using electrical tools or equipment.

Reporting Injuries

Any electrical injury, such as shocks and burns, will be reported immediately to a supervisor and to the Plant Manager.

Preventive Maintenance

The Maintenance Manager will establish an electrical preventive maintenance program to ensure safe and reliable operation of electrical wiring, protection devices, and operating equipment such as switches, circuit breakers, utilization equipment, flexible cords, and appliances. The manager will ensure that adequate resources are available to provide for compliance with applicable codes and standards. In addition, the manager will ensure that:

• Procedures are established for EPM intervals, inspections, tests, and servicing requirements.

• Records are maintained of all tests, inspections, servicing, and inventories.

• Documentation, tests, test intervals, and procedures are guided by the recommendations of NFPA 70B, manufacturer's recommendations, industry standards, or Pannier Corporation -adopted standards or regulations.

• Copies of all manufacturer's installation, operating, and maintenance instructions are maintained in a department file.

• Electrical preventive maintenance work is performed only by qualified persons.

Personal Protective Equipment

All managers and supervisors will ensure that adequate resources are available to provide employees with PPE in compliance with applicable codes and standards. Furthermore, they will ensure that employees use the appropriate PPE for their assigned task.

Job Hazard Analysis (JHA)

The Safety Committee will conduct a JHA for each electrical task to determine the type and level of PPE needed to adequately protect workers from shock, burns, or electrocution. JHAs will be conducted according to *[NFPA 70E Electrical Hazard Analysis (EHA) standards, or other JHA procedures]*.

Selection and Use

Personnel will wear or use PPE and protective clothing that is appropriate for safe performance of work. Qualified workers will use appropriate arc-fault PPE whenever they work near electrical equipment that could create an arc flash hazard.

Managers and supervisors will ensure that:

• Employees are trained in PPE use in accordance with documented procedures.

• Procedures are established and implemented for documented controls of PPE such as inventory, storage, maintenance, inspection, and testing.

• PPE requirements and usages are specified in the safe operating procedures.

• PPE is inspected prior to each use.

• Flame resistant clothing and other PPE rated for the specific arc flash category that will be worked in are inspected.

• Electrical insulating PPE and other protective equipment will be inspected before each use, and tested as per the manufacturers' and OSHA requirements (1910.137).

• Specialized PPE for voltage equipment will be inspected prior to each use according to appropriate recognized standards

Inspection

All PPE will be inspected by employees prior to initial use for a work task. Employees will visually inspect rubber-insulated PPE at the beginning of each workday prior to use and after any work performed that could damage the equipment.

Other Electrical Equipment

Grounding equipment, cables, clusters, and sticks will be inspected annually and prior to each use.

Storage

Electrical insulating and protective clothing and equipment should be stored lying flat, undistorted, right-side out, and unfolded, as appropriate, in protective containers. Blankets may be stored rolled provided the inner diameter of the roll is at least 2 in. Rubber goods will be stored in a location as cool, dark, and dry as possible. The location must be as free as practicable from ozone, chemicals, oils, solvents, damaging vapors and fumes, and away from electrical discharges and sunlight. Rubber gloves should be stored cuff-down in a bag, box, or container designed for rubber glove storage. Rubber gloves may be kept inside of leather protectors.

Cleaning and Electrical Testing

Rubber-insulated PPE issued for use will receive periodic cleaning and electrical testing in accordance with the requirements of *[list the standard, e.g., ANSI/ASTM standards, used for cleaning and testing PPE]*. The intervals of retest for rubber goods issued for service will not be more than 6 months for gloves and 12 months for sleeves and blankets. Gloves or sleeves that have been electrically tested but not issued for service will not be placed into service unless they have been electrically tested within the previous 12 months.

All testing methods, apparatus, and facilities shall meet the applicable ANSI/ASTM Standard. The method used and the results of such tests shall be documented and made available for inspection. Testing apparatus will be operated and maintained by personnel trained for such work.

Retested rubber-insulated PPE will be identified to indicate the date of the latest test or date of retest in accordance with the appropriate standard. Manufacturer's recommendations will be followed on the type of paint or ink to be used.

Conductive Apparel

Emergency Procedures

In the event of a medical emergency, the person(s) requesting assistance will contact the Plant Manager.

The emergency contact list is located at each phone location.

If there is a person nearby trained in first aid, he or she will be contacted immediately to give assistance.

Emergency Removal of Tag and Lock

In the event of an emergency in which the person responsible for removing the tag and lock cannot be located, the Maintenance Manager may remove the device. Details for removal are provided in the Lockout/Tagout Safety Document.

Electrical Code Compliance

The Maintenance Manager will ensure that Pannier Corporation complies with all applicable electrical requirements of Pannier Corporation orders, the NFPA, ANSI C2, and the respective parts of 29 CFR 1910 and 29 CFR 1926.

Inspectors

Inspectors will be qualified in:

• National Electrical Code (NFPA 70)

• Standard for Electrical Safety in the Workplace (NFPA 70E)

• National Electrical Safety Code (ANSI C2)

• 29 CFR 1910, Subpart S.

Utilization Equipment

Utilization equipment is subject to the same approval and acceptance requirements as that of electrical equipment. To be acceptable for installation and use, utilization equipment will be listed or labeled by a nationally recognized testing laboratory. Utilization equipment that is not listed or labeled will meet one of the requirements of 29 CFR 1910.399, Acceptable, (i)(ii), or (iii). Utilization equipment that is not listed or labeled will be examined, accepted, and documented by a qualified person. Utilization equipment will be used in accordance with its listing and labeling requirements.

Training

Qualified persons will be trained before they are permitted to perform work on electrical utilization systems or equipment. Unqualified persons will be trained before they work near electrical utilization systems or equipment.

Qualified persons

Electrical training for qualified persons will include on-the-job demonstrations, exercises, and classroom sessions. Qualified employees will be trained on:

• Safety-related work practices, including proper selection and use of PPE, that pertain to their respective job assignments

• Skills and techniques necessary to distinguish exposed live parts from other parts of electrical equipment

• Skills and techniques necessary to determine the nominal voltage of exposed live parts, clearance distances, and the corresponding voltages to which the qualified person will be exposed

• The clearance distances specified by regulation (29 CFR 1910.333(c)) and the corresponding voltages to which the qualified person will be exposed

• Procedures on how to perform their jobs safely and properly

• How to lockout/tagout energized electrical circuits and equipment safely

[The following additional training topics are recommended; modify the list as applicable to the activities of workers at your facility.]

• National Electrical Code (NFPA 70) (2005)

• National Electrical Safety Code (ANSI C2) (2002)

• Standard for Electrical Safety in the Workplace (NFPA 70E) (2004)

• Use of temporary protective grounding equipment

• Use of testing equipment

• Work permit and work authorization procedures

• Use, inspection, and care of personal protective equipment

• Proper clothing and other PPE required for arc flash or arc blast protection

• First-aid, CPR, and AED training

[29 CFR 1910.332 also requires training for persons other than qualified persons if their job assignments bring them close enough to exposed parts of electrical circuits operating at 50 V or more to ground for a hazard to exist.]

Safety employees designated to support electrical safety programs will be knowledgeable and trained at levels commensurate with their duties.

Unqualified persons

Unqualified employees will be trained in and familiar with the safety-related work practices that pertain to their respective job assignments.

Any employees who are at risk of electric shock but who are not qualified persons will be trained in:

• Electricity-related safety practices that pertain to their job and work area

• Any electricity-related safety practices not specifically addressed in the OSHA rule but that are necessary for their safety

Refresher Training

Refresher training will be given to qualified and unqualified persons at least once every year to provide an update on new regulations and electrical safety criteria. Additional training will be provided whenever:

• New types of electrical utilization systems or equipment are introduced to the workplace

• A new hazard is identified

• New electrical tasks are created

• Electrical injuries occur

Recordkeeping

Training for all qualified and unqualified persons will be documented. Training records will be kept at Pannier Corporation for 3 years.

Injury Recordkeeping

The Quality Manager will maintain comprehensive accident/ injury records and will maintain records of all accident investigation reports and data for 3 years.