ARC FLASH – NFPA 70E POLICY AND TRAINING

SUMMARY

This document outlines the safety measures and responsibilities for Company employees working on or near energized parts, including clothing requirements, training, and procedures for handling electrical hazards.

- **Communication with Host Employer**: The Company will inform the host employer of any unique or unanticipated hazards and the measures taken to correct them to prevent recurrence.
- **Minimum Approach Distances**: Employees must adhere to established minimum approach distances when working near exposed energized parts unless specific insulation measures are in place.
- **Incident Heat Energy Calculations**: The Company will obtain incident heat energy calculations from the host employer to estimate potential exposure to electric arcs for each employee.
- **Protective Clothing Requirements**: Employees exposed to electric arcs must wear protective clothing with an arc rating greater than or equal to the estimated heat energy, with exceptions for hands, feet, and head under certain conditions.
- **Prohibited Clothing Materials**: Clothing made from materials that could melt or ignite, such as acetate, nylon, polyester, rayon, and polypropylene, is prohibited unless treated to withstand conditions.
- **Maintenance of Protective Garments**: The Company is responsible for ensuring that fire-retardant and arc-rated garments are adequately maintained and laundered to retain their protective properties.

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- **Employee Training**: Employees receive additional training if they are not complying with safety practices, new technology or procedures are introduced, or they need to use different safety practices.
- **Safety Practices and Assessments**: Employees are trained in safety practices, including hazard identification, risk assessments, and the use of personal protective equipment. Regular audits and job briefings are conducted to ensure compliance.

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POLICY

The Company will advise the host employer of:

- Any unique hazards presented by our work;
- Any unanticipated hazards found during our work that the host employer did not mention; and
- The measures we took to correct any hazards reported by the host employer to prevent such hazards from recurring in the future.

The Company employees will abide by the established minimum approach distances while working on host employer property. The Company ensures that no employee approaches or takes any conductive object closer to exposed energized parts than the host the Company's established minimum approach distance, unless:

- The employee is insulated from the energized part (rubber insulating gloves or rubber insulating gloves and sleeves) or
- The energized part is insulated from the employee and from any other conductive object at a different potential, or
- The employee is insulated from any other exposed conductive object.

For each employee exposed to hazards from electric arcs while working on the host employer's site, The Company will obtain incident heat energy calculations of existing equipment our employees will be working on from the host employer, to make a reasonable estimate of the incident heat energy to which the employee would be exposed.

CLOTHING

The Company ensures that each employee exposed to hazards from electric arcs wears protective clothing and other protective equipment with an arc rating greater than or equal to the estimated heat energy whenever that estimate exceeds 2.0 cal/cm2. This protective equipment will cover the employee's entire body, except as follows: .

- Arc-rated protection is not necessary for the employee's hands when the employee is wearing rubber insulating gloves with protectors or, if the estimated incident energy is no more than 14 cal/cm2, heavy-duty leather work gloves with a weight of at least 407 gm/m2 (12 oz/yd2),
- Arc-rated protection is not necessary for the employee's feet when the employee is wearing heavy-duty work shoes or boots,
- Arc-rated protection is not necessary for the employee's head when the employee is wearing head protection meeting § 1926.100(b)(2) if the estimated incident energy is less than 9 cal/cm2 for exposures involving single-phase arcs in open air or 5 cal/cm2 for other exposures,
- The protection for the employee's head may consist of head protection meeting § 1926.100(b)(2) and a faceshield with a minimum arc rating of 8 cal/cm2 if the estimated incident energy exposure is less than 13 cal/cm2 for exposures involving single-phase arcs in open air or 9 cal/cm2 for other exposures, and

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- For exposures involving singlephase arcs in open air, the arc rating for the employee's head and face protection may be 4 cal/cm2 less than the estimated incident energy

The Company ensures that each employee who is exposed to hazards from flames or electric arcs does not wear clothing that could melt onto his or her skin or that could ignite and continue to burn when exposed to flames or the estimated heat energy. Clothing made from acetate, nylon, polyester, rayon and polypropylene, either alone or in blends, is prohibited unless the Company demonstrates that the fabric has been treated to withstand the conditions that may be encountered by the employee or that the employee wears the clothing in such a manner as to eliminate the hazard involved. .

The Company understands its responsibility to ensure that protective clothing such as Fire Retarding (FR) and arc-rated garments are adequately maintained in a reliable condition such that if the FR garment is challenged in a flash fire, the garment will perform as designed.

The Company understands its responsibility for ensuring that FR garments are laundered such that contaminants (e.g. dirt, oils, etc.) will not affect the performance of the garment when it is in use.

Employees using home laundering of the clothing must:

- Use any typical home laundry detergent that does NOT contain bleach, chlorine bleach, hydrogen peroxide, or animal fats.
- Never wash the clothing using soap, starch, fabric softener or dryer sheets.
- Wash separately in a ‘normal’ or ‘cotton’ cycle.
- Ensure wash water temperature do not exceed 120º-140ºF.
- Turn garments inside out before washing to reduce streaking from abrasion.
- Fill the washer no more than 2/3 full and use high water level.
- Ensure that all soils and other contaminants are completely removed from garments during the wash process. This may require the use of stain removal products, such as Shout®, Spray 'n Wash®, or Zout®; or presoaking garments prior to washing.
- The use of hot water can often make detergents more effective in the removal of soils.
- Dry on a low setting.
- Immediately notify the Company if all contaminants cannot be removed in home laundering or if they become contaminated with flammable substances. If garments become contaminated with flammable substances, they should not be used and replaced with clean FR apparel. Either home or industrial laundering may successfully remove most types of both flammable and non-flammable soils. However, home laundry detergents may not successfully remove some types of soil found in industry, especially heavy greases and oily soils. If flammable soils are not completely removed, the flame resistance of the garment may be compromised.
- Always consult the garment manufacturer for detailed instructions and precautions.
- Never spray DEET on FR garments as DEET is highly flammable.

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The Company will inspect FR and arc-rated clothing on a regular basis to ensure that it is not in need of repair or replacement.

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TRAINING

Company employees receive additional training (or retraining) under any of the following conditions:

- If the 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; or
- If he or she will employ safety-related work practices that are not normally used during his or her regular job duties

Unqualified persons are not permitted to enter spaces that are required to be accessible to qualified employees only, unless the electric conductors and equipment involved are in an electrically safe work condition.

Employees are trained in the skills and techniques to: distinguish exposed energized electrical conductors and circuit parts from other parts of electrical equipment, to determine the nominal voltage of exposed energized electrical conductors and circuit parts, the approach distances specified in Tables 130.4(D)(a) and 130.4(D)(b), and 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.

Retraining is performed at intervals not to exceed 3 years.

Program elements include: evaluations, anticipating unexpected events, all electrical parts are considered live until proven otherwise, work permits, electrical flash arc hazard analysis.

Our Risk Assessment contains event severity, frequency, probability and avoidance to determine the level of safe practices employed.

Arc flash risk assessments include determining appropriate safety related work practices, the arc flash boundary requirements, and the PPE required to minimize the risk of electric shock. Assessments are documented and equipment field marked with a label. These assessments are reviewed at least every five years if the incident energy analysis method is used in the assessment.

A field work audit is performed every year to ensure the requirements in the written program are being performed by the employees. The written program is updated if auditing determines that employees are not following it or if another issue is identified with potential hazardous exposure.

A job briefing will be held before starting each job and include all employees involved. The briefing will cover hazards associated with the job, work procedures involved,

special precautions, energy source controls, PPE requirements, and the information on the energized electrical work permit, if required. Additional job briefings will be held if changes that might affect the safety of employees occur during the course of work

Only qualified persons perform tasks such as testing, troubleshooting, and voltage measuring within the limited approach boundary of energized electrical conductors or circuit parts operating at 50 volts or more or where an electrical hazard exists.

Only qualified employees may work in areas containing unguarded, uninsulated energized lines or parts of equipment operating at 50 volts or more.

When an employee performs work within reaching distance of exposed energized parts of equipment, the Company ensures that the employee removes or renders nonconductive all exposed conductive articles, such as keychains or watch chains, rings, or wrist watches or bands, unless such articles do not increase the hazards associated with contact with the energized parts. .

The Company ensures that each employee, to the extent that other safety-related conditions at the worksite permit, works in a position from which a slip or shock will not bring the employee's body into contact with exposed, uninsulated parts energized at a potential different from the employee's. When an employee performs work near exposed parts energized at more than 600 volts, but not more than 72.5 kilovolts, and is not wearing rubber insulating gloves, being protected by insulating equipment covering the energized parts, performing work using live-line tools, or performing live-line barehand work, the employee will work from a position where he or she cannot reach into the minimum approach distance established by the Company .

Test instruments, equipment, and their accessories will meet the requirements of ANSI/ISA-61010-1-Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use -Part 1 General Requirements, for rating and design requirements for voltage measurement and test instruments intended for use on electrical systems 1000 Volts and below.

When test instruments are used for the testing for 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.

The Company ensures that devices used by employees to open circuits under load conditions are designed to interrupt the current involved and devices used by employees to close circuits under load conditions are designed to safely carry the current involved.

All insulating PPE will be inspected before each day's use and immediately following any incident that can reasonably be suspected of having caused damage. Insulating gloves will be given an air test, along with the inspection. Such tests include: 1) Blankets-before first issue/every 12 months thereafter, 2) Gloves-before first issue and

every 6 months, 3) Sleeves before first issue and every 12 months. Covers and Line hose will be testing if insulating value is suspect.

All PPE used meets the requirements found in applicable laws and regulations. These PPE requirements apply to many different kinds of PPE: arc rated apparel, insulating aprons, general eye and face protection, arc rated face protection, fall protection, testing methods and specifications for footwear, glove and sleeve testing and care, hard hats, arc rated rainwear, visual inspections of rubber protective products and sleeves.

Electric lines and equipment will be considered and treated as energized unless they have been deenergized.

Work on energized electrical conductors or circuit parts that are not placed in an electrically safe work condition, will be considered energized electrical work and will be performed by written permit only.
Employees do not enter spaces containing electrical hazards unless illumination is provided enabling the employees to perform the work safely. Where lack of illumination or an obstruction precludes observation of the work to be performed, employees will not perform any task within the Limited Approach Boundary of energized electrical conductors or circuit parts operating at 50 volts or more or where an electrical hazard exists.

Employees are trained in safety-related work practices and procedural requirements as necessary to provide protection from the electrical hazards associated with their respective jobs. Employees will be trained to identify and understand the relationship between electrical hazards and possible injury.

Employees are alerted of potential hazards. Alerting techniques include safety signs and tags, barricades, and attendants. Safety signs meet the requirements of applicable state, federal, or local codes and standards. Barricades are used in conjunction with safety signs and never by themselves. Any technique used does not increase the potential for employee injury.

Documentation is done when the employee demonstrates proficiency, be maintained for the duration of the employee's employment, and contain the content of the training, each employee's name, and date of training.

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DISCLAIMERS

Even OSHA's own website has a disclaimer:

- These regulations and related materials are … continually under development. The user should be aware that, while we try to keep the information on our Web site timely and accurate, there will often be a delay between official publication of the materials and their appearance or modification on these pages. The Company will make every effort to correct errors brought to our attention.

Company Disclaimer:

- The following has been developed to reduce hazards likely to cause injuries to our employees.
- Some of the following policies may not be applicable to our operations. This manual serves as a guideline and is subject to change or modification as particular circumstances warrant.
- Employees should contact their immediate supervisor or senior management with questions.
- **If there are conflicts with local, state or federal regulations or the Company's Employee Handbook or other Company documents, the local, state or federal regulations, the Company Employee Handbook or other Company documents will prevail.**

Agency Risk Management's Disclaimer:

- The information contained is not the complete OSHA standard.
- The information contained is for informational purposes only.
- Agency Risk Management makes no guarantee the information in this document is true, correct, precise or accurate.
- Agency Risk Management has no influence on how the information in this document is used.
- No one employed by or connected to Agency Risk Management takes any responsibility for the results or consequences of error or for any loss or damage suffered by users of any of the information in this document or attached to it, and such information does not form any basis of a contract with users of it.

Reference OSHA Standards:

- **Refer to the OSHA standards and updates issued by OSHA for the most accurate information.**
- **This document is based on OSHA's Training Requirements in OSHA Standards document.**
- **When there is a conflict between the contents in this document and, as applicable, OSHA 29 CFR Part 1926 Safety and Health Regulations for Construction or OSHA 29 CFR Part 1910 Safety and Health Regulations for General Industry, the OSHA standards and other regulatory updates will prevail.**