



SAFETY PROGRAM

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SECTION 1

POLICY STATEMENT

Purpose

The safety of HARRINGTON ELECTRIC CO. employees is considered a vital concern. Recognizing its need and responsibilities for the safety of its employees, the Company considers accident prevention an important and integral part of efficient production and product quality.

Policy

Safety will be given primary importance in planning and operating all Company activities in order to protect employees against occupational injuries and illnesses, and to protect the Company against unnecessary financial burden and reduced efficiency.

Management and supervisors are responsible for the safety, well-being, and safe work conduct of all persons who report to or are assigned to them.

To carry out this policy, HARRINGTON ELECTRIC CO. will:

1. Maintain safe and healthful working conditions.
2. Furnish, within reason, the best available mechanical safeguards and personal protective equipment where, in its judgment, they are needed.
3. Maintain an active and aggressive program in which all members of management will participate to promote safety awareness among its employees.
4. Provide adequate medical and first aid facilities for work caused injuries and illnesses.
5. Maintain a continuous educational program in safe operating procedures.
6. Enforce that all employees observe established safety regulations and practices and use the safety equipment provided.

SECTION 2

SAFETY EDUCATION AND TRAINING

Safety Indoctrination of Employees

It is the responsibility of the Company management to instruct each employee to:

- Recognize, avoid and prevent unsafe and hazardous conditions connected with particular job assignments;
- Be aware of and understand those safety regulations applicable to particular work assignments; and
- Document incidents.

These instructional efforts are important to the loss control concept (i.e., tool box meetings, hazardous work permits, Lockout / tag-outs, etc.).

Regular Safety Educational Efforts

Safety meetings and training sessions are a visible measure of the Company's commitment to the Accident Prevention Program. Management can thus provide visual support by taking part in safety meetings within their area of control. The following topics should be discussed and reinforced through weekly safety training meetings:

- Explain any special conditions, hazards or work practices;
- Provide specialized equipment and protective equipment usage instructions as necessary;
- Review Company policy for disciplinary action;
- Discuss procedures for injury hazard reporting;
- Test operator's ability to handle equipment; and
- Check drivers' licenses of appropriate employees.

In addition, review the following: Major accidents, injuries or "near misses" and job safety coordination with subcontractors or other firms that may be working in and around Company operations.

Other items to cover, if applicable, are listed below:

Review any injury that occurred during the past week. Discuss what the injury was, how it happened, and how it could have been prevented.

Discuss the nature of the violation, the danger involved, and offer constructive criticism without naming anyone in particular.

Allow for full participation of everyone present at the meeting. Do not let the chair dominate; give everyone a reasonable amount of time to express their views. Observe parliamentary procedure when raising, discussing and concluding topics. Always keep the discussion to one topic at a time. Parliamentary procedure also means letting the minority be heard and letting the majority prevail.

It is the designated meeting chairman's responsibility to prepare a report of the meeting. Publicize all meetings and their results using bulletin boards, staff meetings and Company newsletters or memos.

Tool Box or Other Informal Meetings

Weekly or bi-weekly "tool box meetings" can be held by the Job Supervisor or lower-tier Supervisors. Questions and discussions are to be encouraged without introducing complaints or other such topics. Tool box meetings are to be:

Short --a maximum of 15 minutes;

Limited to one or two topics; and

Documented -- record the date, employees in attendance, topics discussed and any follow-up measures taken. The appropriate management personnel must sign and date such documentation. These reports are collected and retained within the company's on-line safety website. For more info: www.safetymeetingportal.com

Guidelines for Safety Training Meetings

Supervisors are responsible for preparing and conducting a safety training meeting on a weekly basis. These meetings are the backbone of the Company's Safety and Health Training Program. It is proven that those work locations at which good meetings are conducted attain better safety records than those with unstructured, unplanned or no safety meetings.

To assist in material preparation and the presentation of a safety training meeting, the following guidelines are provided:

Preparing for the Meeting

Select the topic for the meeting several days in advance so that you have a chance to become familiar with the subject. You should be able to present the talk in a convincing manner without reading it.

If possible, schedule the meeting at the same time every week and hold it in the work area. These meetings are generally 5 to 15 minutes long so seating is not important.

However, make sure everyone can easily see and hear you. A good time to hold the meeting is just after a shift begins or immediately following a lunch break.

Just before the meeting, gather all material and/or equipment you need. When possible, use actual demonstrations to illustrate your point. For example, if you're talking about fire extinguishers, have one to display and demonstrate its use. Have a mushroomed tool-head or a broken hammer handle to show how they can cause accidents. If necessary, get someone to help you.

Conducting the Meeting

Start on time. You may lose interest if unnecessary delays occur.

Make the meeting short and to the point. However, if you get a good discussion point, use discretion about ending it too soon.

Start the meeting by complimenting the employees on some recent good work.

Give the talk in your own words.

Get your employees to participate in the meeting. The purpose of these meetings is to get workers to think about safety problems. Encourage them to offer suggestions for improving safety in the work area or your craft.

Maintain control. Do not allow the meeting to develop into a wasteful, time consuming "bull session".

Suggested Safety Training Topics

What Employees Should Know

Company safety policies

Rights and responsibilities

Safety as a part of employee performance

Lockout/Tag out procedures

Health hazards

Electrical safety

Personal protective equipment

Hazard recognition and avoidance

Hazard Communication Program

Rigging and signaling

Parking and traffic patterns

Reporting unsafe acts and conditions

Reporting occupational injuries and illnesses

Suggested Safety Training Topics

What Supervisors Should Know

Company safety policy and procedures

Applicability of accident/injury statistics

Safety resources

Lockout/Tag out procedures

Reporting and correcting unsafe conditions/acts

Disciplinary process

Accident/injury investigation

Major work hazards

Written safety/accident reports

Job safety analysis

How to conduct safety meetings

Hazard recognition and avoidance

Hazard Communication Program.

Training procedures

SECTION 3

SAFETY GUIDELINE FOR SUPERVISORS

Supervisors

Your job in management places you in a unique position of trust. For not only does HARRINGTON ELECTRIC CO. rely on you, as the direct representative of management, to apply its policies wisely and fairly, but also entrusted to you is the obligation to safeguard the well-being of the workers in your charge.

1. You are a supervisor and thus, in a sense, have two families. Care for your people at work as you would care for your people at home. Be sure each of your employees understands and accepts his personal responsibility.
2. Know the rules of safety that apply to the work you supervise. Never let it be said that one of your employees was injured because you were not aware of the precautions required on his job.
3. Anticipate the risks that may arise from changes in equipment or methods. Make use of the expert safety advice that is available to help you guard against such new hazards.
4. Encourage your employees to discuss with you the hazards of their work. No job should proceed where a question of safety remains unanswered. When you are receptive to the ideas of your workers, you tap a source of firsthand knowledge that will help you prevent needless loss and suffering.
5. Instruct your employees to work safely, as you would guide and counsel your family at home -with persistence and patience.
6. Follow up your instructions consistently. See to it that workers make use of the safeguards provided them. If necessary, enforce safety rules by disciplinary action. Do not fail the Company, which has sanctioned these rules -or your workers who need them.
7. Set a good example. Demonstrate safety in your own work habits and personal conduct. Do not appear as a hypocrite in the eyes of your employees.
8. Investigate and analyze every' accident --however slight -that befalls any of your employees. Where minor accidents go unheeded, crippling injuries may later strike.
9. Cooperate fully with those in the organization who are actively concerned with employees' safety. Their dedicated purpose is to keep your employees fully able and on the job and to cut down the heavy personal toll of accidents.
10. Remember: Not only does accident prevention reduce human suffering and loss, but from the practical viewpoint, it is no more than good business. Safety, therefore, is one of your prime obligations --to your Company, your fellow managers and your fellow employees.

By leading your employees into *thinking safety* as well as *working safely* day by day, you will win their loyal support and cooperation; more than that, you will gain in personal stature. Good employees do good work for a good leader.

SECTION 4

NEW EMPLOYEE ORIENTATION

A new employee must be given an orientation prior to starting to work for HARRINGTON ELECTRIC CO. This may be done at the office, before the employee reports to the job site. It is the Job Site Supervisor's responsibility to determine if this has been done; if not, this Supervisor should give the orientation.

The orientation record sheet should be completed and signed by the new employee and the person giving the orientation. The form will be sent to the main office to become a part of the employee's personnel file.

Safety Indoctrination Lecture

1. Introduction

Before you start to work, I want to review our company's safety and health program with you.

This company's accident prevention policy is based on a sincere desire to eliminate personal injuries, occupational illness, equipment and property damage and to protect the general public.

We believe in adhering to rigid safety practices to prevent on-the-job accidents. In fact, there is no task that is so important that carelessness or disregard for proper operating procedures will be tolerated.

Your safety and health as related to your employment on this project are governed by federal, state and local rules and regulations and our own company regulations and work practices. Willful, repeated, or even a single serious violation of any safety rule can result in disciplinary action, which may include immediate termination of employment.

2. Safety Definitions

Before I give you any specifics, I want to define a couple of terms for you. We want you to clearly understand what we mean when we speak of accidents or safety.

First of all, an accident is an unplanned, unforeseen and unexpected event that interferes with or interrupts the orderly progress of work. It may involve injury to personnel, damage to equipment, loss in time and material or any combination of these items. Our definition of safety is the control of hazardous actions or conditions that can cause an accident. Safety is a rather relative term; at times it is difficult to define what is or is not safe. Nothing can be gained by arguing over the safety of a situation. The main point to consider is, "Can an accident occur, considering all practical conditions involved?"

3. Benefits of Good Safety

Good on-the-job safety results in both personal benefits to you as an employee and production benefits for the project.

a) Some personal benefits to the employee are listed below:

- No time is lost from work due to injury, thus ensuring a full paycheck instead of compensation on payments.
- Turnover and absenteeism are reduced due to better working conditions, high morale and fewer accidents.
- Through our Safety Training Program, we reduce injuries and conserve skilled workers like you.
- Our Safety Training Program improves the quality of supervision.
- Good safety improves human relations and results in better cooperation between you and your supervisor.
- By analyzing your job for safety and efficiency, we are better able to use your skills.
- An overall increase in safety awareness reduces off-the-job accidents.

b) Some production benefits are listed below:

- Fewer injured employees, better trained employees, regular inspections, better selection of tools and materials and better maintenance reduce the downtime of production machinery and cut down on maintenance costs.
- Better training and job analysis reduce set-up time.
- Safety meetings, inspections and investigations of accidents stimulate suggestions for more efficient operations.
- Consideration of the best and safest processing methods results in fewer accidents, while good housekeeping saves on materials.
- Client, public and community relations are improved.
- Production is increased by removing the fear factors. Employees are more self-confident, if adequate machinery guards, controls, guard rails, protective equipment, etc. are provided.
- There will be less opportunity for serious accidents or catastrophes.

c) The main points we wish to stress are:

- Accident prevention is important to you because it is a mark of an efficient and intelligent worker. A good safety record is important to your future with our company.
- Accident prevention is necessary to the company because we don't want our employees injured or our equipment damaged. Accidents are very costly for the company and for you.
- Finally, knowing the causes of accidents is essential to preventing them. Accidents don't just happen --they are caused --85 % by people and 15 % by conditions.

4) Reporting Accidents

It is very important that you report all accidents to your supervisor immediately. If you are injured, no matter how slightly, report to your supervisor or to first aid. The smallest cut or puncture can result in serious infection; a small sprain can get worse; a bad bruise could be a fractured bone.

Also, it is very important for you to document your injury for compensation purposes and it is important to us to keep accurate injury records.

5) Weekly Safety Training Meetings

Once a week your supervisor will conduct a short safety training meeting. Attendance is mandatory and is very much to your benefit. Company safety rules and regulations, safe working procedures, analysis of accidents and potential hazards will be discussed. These meetings provide you with an opportunity to point out any hazardous or unhealthy conditions or unsafe work practices you may have noticed. Also, any suggestions for improving our Accident Prevention Program are welcome at these meetings.

6) Review Hazards and Safe Work Methods

(The orientation instructor should review, in general, hazards and safe work methods fundamental to the new employee's assigned craft and indicate that the supervisor will give a more specific breakdown before the job begins.)

7) Equipment

Respect heavy equipment and moving machinery when working in their vicinity; be constantly alert. Stand in the clear where the operator can see you. The operator is occupied with his duties and cannot always see other personnel around his equipment. Stay out from under heavy loads and away from equipment travel patterns.

8) Team Effort Concept

In order to eliminate accidents with their resulting injuries and physical and financial suffering, safety must be a cooperative effort. Neither you nor the company can accomplish this alone. Help us' eliminate all accidents by staying alert, following safe work practices and obeying all safety rules and regulations.

SECTION 5

Field Safety Audit Sheet

Jobsite Location		Date		Time of Day	
Jobsite Foreman		Safety Rep			

Items Evaluated (check all that were evaluated during audit)

	Housekeeping & Light-levels		General Site Access (parking & building entry)		Site Forklift(s) & Boom lift(s)
	Administrative & Postings		Fall Protection (employee & site)		Working surfaces, Scaffolding & Scissor lifts
	Ladders & Stairs		Temporary Electrical (light & power)		Electrical Safety & Lockout/Tagout
	Personal Protective Equipment (PPE)		Respiratory Protection		Confined Spaces
	Excavations & Trenching		Rigging/Hoisting/Cranes		Tools & Equipment (use & condition)
	Fire Protection & Emergency Egress		Employee Health & Sanitation		
	Manual Material Handling & lifting		Material Storage and Material Access		

Audit Findings - Give specific, detailed information regarding each recorded finding

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Life Critical Hazards or Behaviors

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Serious Hazards or Behaviors

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Less-than-Serious Hazards or Behaviors

SECTION 6

Written Hazardous Communication Program

General Information

In order to comply with the Occupational Safety and Health Regulations, 29 CFR 1926.59, Hazard Communication Standard, the following written Hazard Communication Program has been established for HARRINGTON ELECTRIC CO.

All divisions and sections of the Company are included with this program. The written program will be available in the job trailer of HARRINGTON ELECTRIC CO. for review by any interested employee.

HARRINGTON ELECTRIC CO. will meet the requirements of this rule as follows:

Hazard Communication

HARRINGTON ELECTRIC CO: will rely on the Chemical Manufacturer's Material Safety Data Sheet (MSDS) for the hazard determination.

Note: Companies which manufacture hazardous chemicals or materials must develop a MSDS and must modify the above statement.

Container Labeling

The following labeling systems will be used by HARRINGTON ELECTRIC CO.:

- Chemical Manufacturer's labeling system.
- HMIS (if used)/NFPA .
- Any other type of system used such as color coding, etc.

Project Managers will verify that all containers received for use will:

- Be clearly labeled as to the contents.
- Note the appropriate warning.
- List the Name and Address of the Manufacturer.

It is the policy of this Company that no container will be released for use until the above data is verified.

The Project Managers at each job site will ensure that all secondary containers are labeled with either an extra copy of the original Manufacturer's label or with the generic labels which have a block for identity and blocks for the hazard warning. In addition, the Project Managers will ensure that all hazardous chemicals on their jobs will remain properly labeled. For help with labeling, please see the Project Managers.

Material Safety Data Sheets (MSDS)

Copies of the MSDS for all hazardous chemicals to which employees of this Company may be exposed will be kept in the job trailer.

MSDS's will be available to all employees in their work area for review during each work shift. If MSDS's are not available or new chemicals in use do not have MSDS's, please contact the Project Manager immediately.

Project Managers are responsible for ensuring that all MSDS's have been received and are current. If a MSDS is not received with the first shipment of a Hazardous chemical, the following methods will be used to obtain a MSDS:

- A letter requesting a MSDS will be sent to the manufacturer or distributor of the hazardous chemical (a copy of the letter will be kept" on file).
- A phone call will be made to the manufacturer or distributor requesting a MSDS (a log of all phone calls or emails requesting MSDS's will be kept).

Employee Training and Information

Project Managers are responsible for employee training.

Prior to starting work, each new employee (or transferring employee) of HARRINGTON ELECTRIC CO. will attend a Health and Safety Orientation and will receive information and training on the following:

- An overview of the requirements contained in the Hazard Communication Rules.
- Chemicals present in their workplace operations.
- Location and availability of our Written Hazard Program.
- Physical and health effects of the hazardous chemicals.
- Methods and observation techniques used to determine the presence or release of hazardous chemicals in the work area.
- How to lessen or prevent exposure to these hazardous chemicals through usage of control/work practices and personal protective equipment.
- Steps the Company has taken to lessen or prevent exposure to these chemicals.
- Safety emergency procedures to follow if they are exposed to these chemicals.
- How to read labels and review MSDS's to obtain appropriate hazard information.

After attending the training class, each employee will sign a form to verify that they attended the training, received our written materials and understands the Company's policies on Hazard Communication.

Prior to a new hazardous chemical being introduced into any section of this Company, each employee of the project will be given information as outlined above. The Project Managers are responsible for ensuring that MSDS's on any new chemicals are available.

Hazardous Non-Routine Tasks

Periodically, employees are required to perform hazardous non-routine tasks. Prior to starting work on such projects, each affected employee will be given information by his Project Manager about hazardous chemicals to which they may be exposed during such activity.

This information will include:

- Specific chemical hazards.
- Protective/safety measures the employee can take.
- Measures the Company has taken to lessen the hazards, including ventilation, respirators, presence of another employee and emergency procedures.

Chemicals in Unlabeled Pipes

Work activities are often performed by employees in areas where chemicals are transferred through unlabeled pipes. Prior to starting work in these areas, the employee shall contact the Project Managers for information regarding:

- The chemical in the pipes.
- Potential hazards.
- Safety precautions which should be taken.

Informing Subcontractors

It is the responsibility of Project Managers to provide Subcontractors (with employees) the following information:

- Hazardous chemicals to which they may be exposed while on the job site including availability of Material Safety Data Sheets (MSDS's).
- Precautions the employees may take to lessen the possibility of exposure by usage of appropriate protective measures.
- An explanation of the labeling system.

Require all Subcontractors

It is the responsibility of the Subcontractors to provide a Written Hazard Communication Program and Material Safety Data Sheets to their employees.

<i>Material</i>	<i>Hazardous Chemicals</i>	<i>Location</i>
Solder	Lead	All Areas
Power tool load	Lead/Tin/Rosin Flux	All Areas
Acetylene	Alkyne	All Areas
HEA	Vinyl Ester Resin	All Areas
HIT-CIOO Dowelling	Vinyl Ester Resin	All Areas
Cadweld-Welding Materials	Copper Oxide	All Areas
	Aluminum/Copper	
	Calcium Fluoride	
	Tin	
	Aluminum Vanadium	
Propane	Alkane	All Areas
Carbon Dioxide	Acid Anhydride	All Areas
Oxygen	Not Applicable	All Areas
Portland Cement	Silicon Dioxide	All Areas
	Iron Oxide	
	Calcium Oxide	
	Aluminum Oxide	
	Dicalcium	
	Chromium	
	Magnesium Oxide	
	Sulfur Trioxide	
	Alumina	
	Tricalcium	
	Tricalcium Aluminate	
Flame Safe Fire Retardant	Alunimosilicate	All Areas
PVC Solvent Cement	Ceramic Fiber	All Areas
(Carlon)	PVC Resin	
	Tetrahydrofuran	
<i>Material</i>	<i>Hazardous Chemicals</i>	<i>Location</i>
PVC Solvent Cement	Fumed Silica	All Areas
Cont.	Cyclohexanone	All Areas

Cutting Oil	Trichlorethane	All Areas
	Propane	
	Isobutane	
Cable Cleaner	1, 1, 2 Trichloro-1, 2, 2	All Areas
SpliceMaster	Trifluorethane	All Areas
	Acetone	
	Iso-Hexane	
	Ethanol	
	Nitromethane	
Polywater Lubricant J	None	All Areas
Polychlorinated Biphenyls	PCB's	All Areas
Rockite Cement-Pour Rock	Portland Cement	All Areas
	Mineral Fiber	
Chico Fiber	Mineral Oil	All Areas
And	Phenolic Resin	
Chico Sealing Compound	Aluminum Oxide	All Areas
	Calcium Oxide	
	Ferric Oxide	
	Ferrous Oxide	
	Silicon Dioxide	
	Titanium Dioxide	
Material	Hazardous Chemicals	Location
Spray Paint	Propane (propellant)	All Areas
(Acrylic Enamels)	2-Methylpropane	
	Mineral Spirits'	
	Toluene	
	Xylene	

	Acetone	
	Ethyl3-Ethoxyproplonate	
	Titanium Dioxide	
Firedam Caulk	Aluminum Hydroxide	All Areas
StraitLine Marking Chalks	Calcium Carbonate	
CC-2 Prep Kit	Petroleum Distillates	All Areas
(Cable Cleaner)	D-Limonene	
CC-3 Cable Cleaning Pads	Petroleum Distillates	All Areas
(Cable Cleaner)	D-Limonen	
Silicone Lubricant	Silicone Grease	All Areas
Scotchcast Brand Flame	Diphenylmethane	All Areas
Retardant Compound 2130	Polybutadiene	All Areas
Firestop Sealant and	Dimethylformadine	All Areas
Intumescent Wrap	Acetamido Silane	All Areas
Material	Hazardous Chemicals	Location
Drylock Fast Plug	Calcium Hydroxide	All Areas
	Silica, Quartz	
	Portland Cement	
AGA GAS, INC.	Oxygen	All Areas
	Propane	

Hilti Construction Chemicals	Acetone 2-Propanol Butane Propane	All Areas
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SECTION 6

Electrical Hot Work Program

Policy

It is the policy of Harrington Electric Co. and its affiliates to protect employees from electrical hazards through the effective lockout of circuits and the use of appropriate electrical and arc flash protective equipment and devices.

Scope and Purpose

This document applies to all Harrington Electric Co. employees and its affiliates and serves as a reference document for any sub-contractor to Harrington Electric Co. and/or its affiliates.

The purpose of this document is to provide specific guidance and expectations for conducting Electrical Hot Work for construction and service tasks.

This program applies to electrical hot work tasks greater than 50 volts.

Definitions

Arc Flash Hazard - is defined as a dangerous condition associated with the release of electrical, thermal and light energy from an electrical arc.

Lockout - is defined as the isolation of hazardous energy to circuits or equipment to prevent injury to a person repairing, inspecting, cleaning, or otherwise working on the equipment.

Hazardous energy - includes any energy that has the potential to cause serious injury and can be, but is not limited to, electrical, pneumatic, hydraulic, mechanical, radiation, thermal, or chemical.

The primary isolation device - is defined as the last control (switch, valve, disconnect, etc.) between the worker and the hazardous energy.

An affected employee - is one whose job requires him/her to operate or use a machine or equipment on which servicing or maintenance is being performed under lockout or Tagout, or whose job requires him/her to work in an area in which such servicing or maintenance is being performed.

An authorized employee - is one who is trained in Lockout and locks out or tags out machines or equipment in order to perform servicing or maintenance on that machine or equipment. An affected employee becomes an authorized employee when that employee's duties include performing servicing or maintenance covered under this section.

Energized (Live) - refers to any device or circuit which contains electrical voltage over 50 volts and is electrically connected to, or is a source of voltage.

Exposed - means that it is capable of being inadvertently touched or approached too closely by an unauthorized and unprotected person. Exposed electrical conductors are not protected and allow for free, unobstructed contact by a person

The verification of isolation - means that prior to starting work on machines or equipment that have been locked out or tagged out, the authorized employee shall verify that isolation and de-energization or energy control of the machine or equipment have been accomplished.

Personal lockout locks - will be provided to each trained and authorized employee. Each lock/tag shall be identified with the employee's name and warning information before it is used to lockout equipment. The locks shall be used only for controlling hazardous energy and shall not be used for any other purpose.

Qualified Person (as defined by Harrington Electric Co.) - is an Electrician or employee specially trained to work on specific electrical installation or equipment. A qualified person for each task or jobsite shall be designated by the Foreman, sub-Foreman or Superintendent.

General Requirements

1. Energized or live electrical circuits should be locked, tagged and verified to ensure that employees are not exposed to any electrical hazard over 50 volts to ground.
2. If a circuit or equipment **MUST** be serviced while electrically energized (Live), the following criteria shall be met before work commences.
 - a. There must be a significant and compelling reason to work on the equipment or circuit while energized.
 - b. Information about the circuits (size, load, rating, etc) must be available to the persons conducting the work.
 - c. All personnel must be trained and qualified to perform electrical hot work at the specific voltage present.
 - d. The Electrical Hot Work Assessment & Approval Form must be completed and approved by Supervision.
 - e. Personal Protective equipment necessary for the task is available and shall be used.
3. Persons conducting electrical hot work shall not be wearing any meltable fibers or clothing.
 - a. Cotton, wool and other natural fibers are acceptable for wearing under Arc Flash protective wear.

- b. Polyester, spandex, cotton blends, etc. are not acceptable to be worn while conducting electrical hot work.
4. All jewelry (including wedding bands). coins, unrestrained metal frame glasses and other metal or conductive objects shall be removed from the person conducting the electrical hot work.

Barricading & Work Spaces

1. All electrical hot work activities require sufficient barricading to prevent unauthorized access to the work area and to protect bystanders from a potential arc-flash injury.
2. The minimum barricading boundary is 10 feet; however, larger voltages or congested areas may require more of a barricading buffer boundary to ensure employee safety.
3. Minimum work space for persons conducting electrical hot work are specified below

Volt-to-ground, nom	*Condition 1	Condition 2	Condition 3
0-150	3 ft.	3 ft.	3 ft.
151-600	3 ft.	3.5 ft.	4 ft.
601-9000	4ft	5 ft.	6 ft
9001-2500	5ft	6 ft.	9 ft
* Conditions: (1) Exposed live parts on one side and no live or grounded parts on the other side of the working space. (2) Exposed live parts on one side and grounded parts on the other side. Concrete, brick, or tile walls must be considered as grounded. (3) Exposed live parts on both sides of the work space with the operator between			

4. When work spaces are smaller than specified above, protective measures need to be taken to ensure that conducting surfaces are insulated.
 - a. Concrete is considered a grounded surface.

Electrical Hot Work Tools

5. Reference the Arc Flash Hazard Assessment Chart to determine if rated tools are required for the task
6. Ensure that electrically rated tools are in good condition and rated for the voltage present.
7. Electrically rated tools will be marked with the following symbol.



8. Non-rated tools with electrical tape or other insulation are not considered suitable for electrical hot work where V-rated tools are specified in the Arc Flash Hazard Assessment Chart.

Personal Protective Equipment for Live Electrical Work

1. Personal protective equipment for live electrical work shall be in accordance with the Arc Flash Hazard Assessment Chart below.
2. Clothing and protective wear should be visually inspected before each use.
 - a. Ensure that voltage rated gloves have been tested within the past six (6) months.
 - b. If the insulating glove has been electrically tested but not issued for service, then it may not be placed into service unless it has been electrically tested with the previous (12) months.
 - c. Ensure that voltage rated matting have been tested within the past (12) months.

NFPA 70E has a simplified reference for some routine maintenance work:

Hazard/ Risk Category	Required minimum Arc rating of PPE	Examples of NFPA 70
Risk Category 0	up to 1.2 cal/cm2	→ operating an exposed breaker up to 240 volts → using a meter switch over 1000 volts
Risk Category 1	1.3 to 4 cal/cm2	→ voltage testing or installing a breaker in a live panel up to 240 volts. → Operating an exposed circuit breaker up to 600 volts
Risk Category 2	4.1 to 8 cal/cm2	→ Work on control circuits above 120 volts changing live breakers up to 600 volts. → Voltage testing and parts at or above 600 volts.
Risk Category 3	8.1 to 25 cal/cm2	→ Starter "buckets at 600volts
Risk Category 4	25.1 to 49 cal/cm2	→ Voltage testing and working on parts at or above 1000 volts. → Insertion or removal (racking) of CB's from cubicles, doors, opened or closed.

Required minimum standard for clothing or minimum Arc Rating of PPE based on energy protection required (cal/cm). Shirts must be long sleeved and pants must fully cover the workers legs. Electrical protective clothing cannot have any part made out of conductive materials. Conductive (metallic and some plastics) buttons, zippers, pins, eyelets and other decorative items must not be present.

Risk Category	Protective Clothing Required	Examples
0	Non-melting, flammable materials (i.e. untreated cotton, wool, rayon, or silk, or blends of these materials) with a fabric weight at least 4.5 oz/yd2.	→ 100% cotton slacks → Jeans → 100% cotton slacks
1	FR shirt and FR pants or FR coverall.	→ Nomex Clothing → FR pants → Denim jeans > 12oz yd2
2	Cotton underwear – conventional short sleeve and brief/shorts, plus FR shirt and FR pants Face shield with side protection, chin cups	Flash suits and Flash hoods must be rated above the flash energy levels expected and meet the Appropriate ASTM standard.
3	Cotton underwear plus FR Shirt and FR pants plus FR coverall and Flash hood, or cotton underwear plus two FR coveralls and Flash hood. or Flash suit and Flash hood.	
4	Cotton Underwear plus FR Shirt and FR Pants plus Multilayer flash suit. or Flash suit meeting ASTM F1506 and ASTM F2178	

PPE REQUIRED BY HAZARD CLASS (FOR LIVE ELECTRICAL WORK)

PPE LEVEL	REQUIRED MINIMUM ARC FLASH RATING OF PPE (CAL/CM²)	TYPICAL CLOTHING DESCRIPTION (2), (3)	CLOTHING LAYERS	V – RATED GLOVES	V – RATED TOOLS	SAFETY GLASSES	HARD HAT	FR – HARD HAT LINER	FACE SHEILD	SWITCHING HOOD	HEARING PROTECTION	LEATHER GLOVES (1)
0	N/A	UNTREATED COTTON LONG SLEEVE SHIRT AND LONG PANTS	1	Y	Y	Y						
1	4	FR LONG SLEEVE SHIRT AND LONG PANTS OR FR COVERALS OVER UNTREATED COTTON LONG SLEEVE SHIRT AND LONG PANT	1 OR 2	Y	Y	Y	Y					AS NEEDED
2	8	FR COVERALS OVER UNTREATED COTTON LONG SLEEVE SHIRT AND LONG PANT	2	Y	Y	Y	Y		Y		Y	Y
3	25	COTTON UNDERWEAR AND FR LONG SLEEVE SHIRT AND LONG PANTS AND COVERALLS	3	Y	Y	Y	Y	Y		Y	Y	Y
4	40	COTTON UNDERWEAR AND FR LONG SLEEVE SHIRT AND LONG PANTS AND MULTILAYER FLASH SUIT	3 OR MORE	Y	Y	Y	Y	Y		Y	Y	Y

(1) 1 VOLTAGE RATED RUBBER GLOVES ARE REQUIRED AND LEATHER PROTECTORS ARE WORN OVER THE RUBBER GLOVES, NO OTHER LEATHER GLOVES ARE REQUIRED.

(2) ALTERNATE CLOTHING MAY BE USED: HOWEVER THE OVERALL RATING MUST MEET OR EXCEED THE MINIMUM ARC FLASH RATING FOR PPE LEVEL.

(3) TYPICAL CLOTHING DESCRIPTION PER NFPA 70E, 2004 TABLE 130.7 (C) (11) PROTECTIVE CLOTHING CHARACTERISTICS

Electrical Hot Work Assessment and Approval Form

Complete ENTIRE Form & secure Approvals before attempting any Electrical Hot Work

Job location		Date	
Requestor		Foreman Name	

Task Details

Description of work	
Arc current (required)	Receiving distance (if available)
Supply voltage	Receiving distance (if available)
Class of Device (if available)	Cycles / Duration (if available)
Identify Electrical Hazard Category	(Use Electrical Hazard Category assessment chart)

Approval Support Questions

Explain why it is necessary to perform the work while energized:
List conditions that could increase the hazard of the task:
List all personal protective equipment to be used while performing this work (PPE list from Chart)
List all tools to be used while performing this work (rated tools required for work in accordance with chart)
List all persons expected to perform work on the energized equipment / circuit

SECTION 8

LOCKOUT/TAGOUT PROGRAM

Purpose

The purpose of this Program is to protect the safety and health of employees of HARRINGTON ELECTRIC CO. during servicing and maintenance of machines or equipment. The following procedures are designed to protect employees from the unexpected energizing or start-up of machines or equipment, or release of stored energy.

While any employee is exposed to contact with parts of fixed electrical equipment or circuits that have been de-energized, the circuits energizing the parts shall be locked out and tagged.

Only when disconnecting means or other devices are incapable of being locked out, and until lockout capability is provided, will a Tagout procedure (without lockout), be utilized.

HARRINGTON ELECTRIC CO. does not work on any energized equipment without completing a Hot Work Assessment and Authorization form.

The following procedures do not cover normal construction operations unless working on the following:

- Temporary Electrical – Distribution, Branch Service Panels or Temporary Lighting.
- An employee must remove or bypass a guard or other safety device.
- An employee is required to place any part of his or her body into an area on a machine or piece of equipment where work is actually performed upon the material being processed, or where an associated danger zone exists during a machine operating cycle.

Work on cord and plug connected equipment is not covered as long as the equipment is unplugged.

Compliance with this Program

All employees are required to comply with the restrictions and limitations imposed upon them during the use of LOCKOUT/TAGOUT. The authorized employees are required to perform the LOCKOUT/ TAGOUT in accordance with this procedure. All employees, upon observing a machine or piece of equipment which is locked out to perform servicing or maintenance shall not attempt to start, energize or use that machine or equipment. If you need a piece of equipment that is in Lock out / Tagout - ***DO NOT REMOVE LOCKS OR TAGS*** contact your supervisor and let them know; your supervisor will contact the person for removal.

Enforcement

Any employee who fails to follow these procedures will face disciplinary action in accordance with those listed in Safety Disciplinary Procedures.

Responsibility

Appropriate employees shall be instructed on the safety significance of the lockout procedure.

Each employee authorized to implement a lockout procedure shall receive training in the recognition of hazardous energy sources, the types and magnitude of the energy and the methods necessary for the isolation and control.

Definitions:

Authorized employee - a person who locks out machines or equipment in order to perform servicing or maintenance on that machine or equipment. An affected employee becomes an authorized employee when that employee's duties include performing servicing or maintenance that exposes him/her to potentially hazardous energy.

Affected employee - an employee whose job requires him/her to operate /use a machine or equipment or work in an area in which servicing or maintenance is being performed under lockout.

Energy isolating device - a mechanical device that physically prevents the transmission or release of energy, including but not limited to the following: A manually operated electrical circuit breaker; a disconnect switch; a manually operated switch by which the conductors of a circuit can be disconnected from all ungrounded supply conductors, and in addition, no pole can be operated independently; a line valve; a block; and any similar device used to block or isolate energy. **Push buttons, selector switches, and other control circuit type devices are not energy isolating devices.**

Group Lockout Foreman – is the person performing Group Lockout and is responsible for the accuracy of Group Lockout Checklist when using a group lock box. This person remains in control of Group Lockout until the lockout is complete or the responsibility has been passed on to another.

Hazardous Energy – Includes and energy that has the potential to cause serious injury and can be, but not limited to electrical, mechanical, pneumatic, hydraulic, radiation, thermal, and chemical.

Primary Isolation Device- is defined as the last control (switch, valve, disconnect, etc.) between the worker and the hazardous energy.

Secondary Isolation device (s) – are those devices upstream of the primary isolation devices.

Other employee - an employee whose work operations are or may be in an area where energy control procedures may be utilized.

Verification of Isolation – mean prior to starting work on machines or equipment that have been locked out or tagged out, the authorized employee shall verify that isolation and de-energization or energy control of the machine or equipment have been accomplished.

Lockout/Tagout Procedures

Lockout/ Tagout Procedure

1. Notify all affected employees that servicing or maintenance is required and will be performed on a machine or piece of equipment and that LOCKOUT/TAGOUT procedures will be in place.
2. Notification of Shutdown - It is the Supervisor's responsibility to inform all ***“affected employees”***. The area supervisor and or / the ***“affected employees”*** will be notified of the shutdown and the application of lockout devices and Tagout which states: **DO NOT OPERATE EQUIPMENT**
3. The Supervisor and ***“AUTHORIZED”*** employee(s) will determine what type and how much energy a machine or equipment utilizes, understand the hazards of the energy and shall know the methods to control the energy.
4. If the machine or equipment is operating, shut it down by the normal operating procedure; i.e., stop button, on-off switch, closing a valve.
5. Deactivate the energy supply for the machine or equipment.
6. Place individual LOCKOUT/TAGOUT device on the source.
7. **If Locks cannot control a system, or isolation point then contact the safety manager for assistance.**
8. Dissipate any stored residual energy (in capacitors, springs, flywheels, pneumatic or hydraulic pressure, etc.) by grounding, blocking or bleeding lines, etc.
9. After ensuring that no personnel are exposed, test the effectiveness of the energy disconnect by engaging the normal operating control(s). Return all controls to "OFF" position.
10. The LOCKOUT/TAGOUT is now complete.

Return to Service

1. Ensure that all personnel have completed their work and are away from the point of operation of the machine or equipment.
2. Make sure that all tools or other repair equipment has been removed and that the machine or equipment is operationally functional.
3. Verify that controls are in neutral.
4. Remove all LOCKOUT/TAGOUT devices from energy supply

Remove signs and notify ***“affected employees”*** that repairs/servicing are complete.

Group Lockout/Tagout Procedure

1. For larger projects and tasks where multiple Harrington Electric Co. employees work on the same project and are exposed to hazardous energy, the following procedure shall be used.
 - a. A single person (Foreman or Sub-Foreman) will be selected and designated as the Group Lockout Foreman and will be the responsible person for successful and safe lockout/Tagout of the system/Circuit/Equipment.
 - b. The Group Lockout Foreman must complete an area or job specific lockout checklist which includes all sources of energy and isolation points to be locked out.
 - c. The Group Lockout Foreman will provide a brief overview of the system and lockout/Tagout task to all Harrington Electric Co. employees expected to work on the system, including:
 - i. The system's energy control points
 - ii. The methods used to secure the hazardous energy
 - iii. The verification methods used to ensure the energy is not present.
 - iv. Harrington Electric Co. requirement to sign in and out with the Employee log sheet.
2. The Group Lockout Foreman shall take the following general steps when securing an energy source:
 - a. Notification of Shutdown: When a machine, system or equipment must be locked out by group lockout, then all affected employees shall be informed of the lockout task.
 - i. Notification shall be provided to affected employees and/or area supervision BEFORE locks are applied.
 - b. Preparation for shutdown: The Group Lockout Foreman must have adequate knowledge to safely isolate the system, to perform verification, and are familiar with any applicable specific equipment lockout requirements.
 - c. Machine, system or equipment shutdown: Machines, systems or equipment shall be shutdown and de-energized using normal operating procedures and performed in a safe and controlled manner.
 - d. Machine, System or Equipment Isolation: All energy isolation devices (switches, valves, disconnects, etc.) shall be secured in such a manner as to effectively control the hazardous energy.

- i. The Group Lockout Foreman will maintain the keys to the group lockout locks and lockout checklist in their possession while locking out the equipment.
- e. Lockout: The Group Lockout Foreman will place lockout locks and Tags on the equipment/system isolation points identified in the Group Lockout Checklist.
- f. Stored Energy: Following the application of the lock, all potentially hazardous stored or residual energy (capacitors, batteries, hydraulics, springs, etc.) shall be relieved, disconnected, restrained or otherwise rendered safe.
- g. The overall intent is to bring the machine, system, space or equipment to a zero mechanical state and to remain in a safe state through the entire lockout process and duration of the task.
- h. Verification of Isolation: Before a task is started after any lockout, the removal of hazardous energy shall be verified by the authorized employee.
 - i. Verification of effective lockout is essential to ensuring safety.
 - ii. Ensure operating controls are returned to the "Off" or "Safe" position after verifying the isolation of the equipment.
 - iii. After all parts of the machine, system or equipment have been isolated, the Group Lockout Verifier will obtain the checklist from the Group Lockout Foreman and verify that all points have been adequately isolated.
 - a. Any discrepancies must be reported to the Group Lockout Supervisor before the verification of isolation is considered complete.
- i. *Group Lockout/Tagout and Checklist Requirements:*
 - i. Once the verification of isolation is considered complete, the Group Lockout Foreman will secure the keys in a safe location (prefer on his person or within a locked enclosure where only he/she has the key)
 - ii. A copy of the Group Lockout Checklist used during the lockout operation is to be posted in a visible area.

- j. The Group Lockout Foreman will maintain the key(s) to the group lockout locks in their possession or control at all times.
- k. Joining the Group Lockout:
 - i. Employees (authorized employees) joining an existing group lockout job and who would potentially be exposed to hazardous energy must:
 - 1. Review the Group Lockout Checklist.
 - 2. Confirm the Group Lockout Foreman is aware that he has joined the authorized group.
 - 3. Receive a brief overview of the lockout task and specifics from the Group Lockout Foreman
 - 4. Sign in on the Employee Log to confirm his joining the group.
- l. *Additional Requirements for the Group Lockout Foreman:*
 - i. If the job is complete, then all other persons must sign out on the Employee Log BEFORE the Group Lockout Foreman removes his/her lock from an energy control point.
- m. *Additions to the Group Lockout Checklist*
 - i. Any additional lock out points shall be added to the Group Lockout Checklist and keys provided to the Group Lockout Foreman.
 - ii. Ensure any affected employees within the additional scope are notified of the lock out plans.
- n. Preparation for Release from Lockout and Testing: Before lockout devices are removed and energy restored to the machine system or equipment, the Group Lockout Foreman shall perform the following tasks:
 - i. Review the Employee Log to ensure all personnel are accounted for
 - ii. Inspect the work area to ensure all tools, personnel and non-essential items have been removed.
 - iii. Ensure all parts of the machine or equipment are operationally in-tact.
 - iv. All affected employees have been safely positioned or removed.

Energy Control Audit - Supervision or Safety Officer will conduct and annual audit of the Lockout / Tagout program to ensure the program is being followed.

- a. Safety officers, Coordinators\ or other Management Personnel may ask to see lockout checklists and other documentation during routine site inspections.

Single Plug Equipment - Single source, plug-in type equipment does not require an energy control device unless the plug cannot be immediately controlled by the person conducting the work or the single individual exposed to a potential hazard.

Lock Removal Procedure- In the event that a lockout lock has been left on after this is complete or after the employee has presumably left the job site, the lock can be forcibly removed only after the ALL of the following conditions have been satisfied and the **EMERGENCY LOCK REMOVAL FORM** is completed.

- 1) Methods to ensure employee safety in case a lock remains.
 - (a) Telephone and other reasonable means to make contact with the employee whose lock remains shall be attempted to ensure the individual does not remain on the work location. And;
 - (i) IF the person is located and is able to return and remove the lock by use of a key, then additional authorizations are not required.
 - (b) The site Superintendent or his/her designee has given authorization to remove the lockout device. and;
 - (c) A trained and authorized employee has inspected the area and the employee does not remain on the site or work area. and;
 - (d) A trained and authorized employee has inspected the locked out system and the system appears complete and ready to re-energize.
- 2) If the person has been contacted and cannot return to remove the lock, or it has been deemed safe to remove the lock without the key-holder's consent and the conditions are satisfactory for the removal of the lock, then the lock may be removed after the lock removal form has been completed.
- 3) All Emergency Lockout Removal Forms shall be retained on the project site and forwarded to the Safety Manager periodically upon completion of the project.

New Construction Energy Control Practices –

- Effective means shall be undertaken to ensure that all hazardous energy is securely controlled under all reasonable circumstances.
- Once a machine, system, or equipment has been energized, then energy control practices referenced above are required.
- Power distribution systems (panels, etc.) will be locked at all times. Authorized Access Only.

HARRINGTON ELECTRIC CO. LOCKOUT device will be a lock and hasp which will be used to secure the main electrical power supply in the OFF position. These locks will be **RED**, so that they can be easily distinguished from other locks in use at HARRINGTON ELECTRIC CO. job sites. Each employee will have their own lock and key.

Lockout Log

[illegible]

Lockout / Tagout Notification Form

Jobsite:	
Date:	
Foreman	

Person(s) Notified:

Location of Lockout/Tagout:

Description of Lockout / Tagout (When, How, Time, etc.)

Additional Details / Requirements / Constraints

Emergency Lock Removal Form

All information must be completed before lock is removed!

Employee Name:		Date:	
Location & equipment where work is being performed:			
Lock#		Assigned to:	
Is the authorized employee at the facility / site?			YES NO
If no has every reasonable effort been made to locate individual?			YES NO
Are all employees clear of the equipment / process?			YES NO
Has Supervision inspected the area for safe restart of equipment?			YES NO
Has authorized employee been notified of lock removal?			YES NO
If no, identify member of supervision accountable to notify employee prior to return to work & complete questions below			
Was Safety, Forman, or Designated Mgmt. representative notified for approval?			YES NO
Name of Person providing approval.			

Below person certifies that all reasonable attempts to contact individual have been made and that it is considered "safe" to remove the lock in question.

Foreman or Superintendent name		Date	
Foremen or Superintendent signature			

General Foreman Review

Date Employee was notified of lock removal and by whom		Date	
Signature			

Completed form is to be provided to Safety Officer or safety Coordinator at first reasonable opportunity.

SECTION 9

GENERAL FALL PROTECTION PLAN

Statement of Policy

HARRINGTON ELECTRIC CO. will provide each of its employees a safe and healthy work environment. It is as a matter of company policy as well as an important public program under the OSHA Act. We have implemented this Fall Protection Program as outlined herein.

Erik Scanlon, Safety Coordinator will have the overall responsibility for coordination of the program for HARRINGTON ELECTRIC CO. and copies of this program will be available at all jobsites and at the main office.

General Fall Protection Policy and Procedural Provisions

1. The company will initiate and maintain a Fall Protection Program. The program will provide for regular inspections of the jobsite to evaluate fall protection needs and areas of concern. This regular site inspection will evaluate all relevant types of fall protection systems, devices and equipment required by the program and OSHA standards to assure proper installation, maintenance and use.
2. Any defective fall protection items found shall be immediately corrected and/or tagged out of service and removed from the site. Any damaged or inadequate systems such as guardrails and covers shall be immediately repaired. Employees will be removed from the area of the fall protection hazard if the corrections cannot be made immediately.
3. All employees, including temporary employees, will be appropriately informed and trained on the requirements of this procedure and the OSHA standards relating to fall protection. This training and instruction will enable employees to recognize potential fall hazard conditions on site and the procedures to be followed in order to prevent fall to lower levels. Only employees who have been trained in proper use, wearing, application and inspection procedures of personal protective fall protection equipment will be allowed to work in locations where such equipment must be worn.

All employees will receive as a minimum training and instruction in the following areas, as applicable:

- The identification of fall hazards in the work area;
- The use and operation of guardrail systems, body belt harness systems, safety nets, and other fall protection systems;

The correct procedures for erecting, maintaining, disassembling, and inspecting the systems to be used;

The procedures contained in the fall protection program and all applicable OSHA standards or regulations.

All employees working at elevated locations in excess of 6' shall be protected by a fall protection system. Fall protection systems, different than that required by a specific OSHA standard must be selected by the company's representative (President/Owner, Safety Coordinator).

Fall Protection Equipment, Systems, and Devices

1. Lifelines, Safety Belts, and Lanyards

Lifelines, safety belts, and lanyards shall only be used for employee safeguarding. Any lifeline, safety belt or lanyard actually subjected to in-service loading shall be immediately removed from service.

Lifelines must always be secured above the point of operation to an anchor point capable of supporting a minimum dead weight of 5400.lbs.

Any lifelines used in areas in which they may be subjected to cutting or abrasion shall be a minimum 7/8" wire core manila rope. For any other application a minimum of 3/4" manila or equivalent, with a minimum breaking strength of 5400 lbs.

Any safety belt lanyard shall be a minimum 1/2" nylon rope or equivalent and of such rope length to protect a fall of greater than 6' and shall have a normal breaking strength of 5400 lbs.

Do not punch or cut extra holes in any belt or harness. If the item does not fit properly, replace it with one of the correct size.

Safety belts, harnesses, and lanyards are classified according to their intended use as follows:

CLASS I: Body belts (work belts-or safety belts), are to be used to restrain a person in a hazardous work position and to reduce the possibility of falls.

CLASS II: Chest harnesses, are used where there are only limited fall hazards (no vertical free fall hazard) and for retrieval purpose, such as removal of a person' from a tank or bin.

CLASS III: Body harnesses, used to arrest the most severe free falls.

CLASS IV: Suspension belts, independent work supports are used to suspend or support the worker.

Each belt and lanyard assembly shall be visually inspected for defects prior to each use. The assembly shall also be inspected according to the manufacturer's recommendations, not less than twice annually.

2. Safety Nets

Safety nets shall be provided when work places are more than 25' above the ground, water surface, or other surfaces where the uses of other fall protection systems or devices are impractical.

When safety nets are utilized, no operations shall be performed until the nets are in place. Nets shall extend 8 feet beyond the edge of the work surface where employees are exposed and be located as close under the work surface as practical, but in no case more than 25'. Nets shall be hung with sufficient clearance to prevent the user's contact with the surface of structure below and such clearances shall be determined by impact load testing.

3. Working Over or Near Water

Employees working over or near water, where the danger of drowning exists shall be provided with U.S. Coast Guard approved life jacket or buoyant vests. Prior to each use, the buoyant work vest or life preservers shall be inspected for defects and any defective units shall not be used.

Ring buoys with at least 90' of line shall be provided available for emergency rescue operations and the distances shall not exceed 200'.

At least one lifesaving jacket skiff shall be immediately at locations where employees are working over or adjacent to water.

Fall Protection Systems Requirements for Specific Areas and Operations

1. Material Storage Areas

Employees required to work on stored material in silos, hoppers, tanks and similar storage areas shall be equipped with lifelines and safety belts.

2. Scaffolds

Standard guardrails -shall be installed on all open sides and ends of scaffold platforms more than 10' above the ground however, scaffolds 4' to 10' in height, having a minimum horizontal dimension in either direction less than 45" shall also be equipped with standard guardrails on all open sides and ends.

Single-point adjustable suspension and Two-point suspension requires both the use of standard guardrails and lifeline/safety belt. The Boatswain's chair, Needle beam and Float scaffolds require the use of a lifeline/safety belt, while the Pump-jack scaffolding allows the use of either a lifeline/safety belt or standard guardrail.

3. Pitched Roofs and Built-up Roofing on Low-Pitched Roofs

Catch platforms protected by standard guardrail or equivalent must be utilized as required when working on roofs with a slope greater than 4" in 12" and a ground to eave height more than 16'.

Employees engaged only in built-up roofing work with a ground to eave height in excess of 16' with an unprotected roof parapet wall less than 3' must be protected by Motion-stopping Safety System (MSS system). Some exceptions to the MSS system are permitted with the use of warning line supplemented by MSS system of warning lines and/or safety monitor.

4. Walking and Working Surfaces

Floor opening, floor holes, ladderway floor openings, skylight opening, pit or trap-door openings, manhole floor openings and in areas where working above or adjacent to dangerous equipment must all be protected by standard guardrails or secured cover. Ladder way floor opening entrances must be provided with a swing gate or so offset that a person cannot walk directly into the opening.

Wall openings where there is a drop of more than 4', and the bottom of the opening is less than 3', above the working surface shall be protected by standard guardrail protection which will reduce the danger of falling.

Runways shall be guarded by a standard railing, or the equivalent on all open sides 4', or more above the floor ground level.

Every open-sided floor or platform 6' or more above the adjacent floor or ground level shall be guarded by standard guard railing, or the equivalent.

- Standard guardrail specifications shall consist of a top rail, intermediate rail, toe board, and posts, the top of the rail shall have a vertical height of approximately 42" plus or minus 3" from the floor, walk / work surface.
- Top rails shall not deflect more than the height of 39" above the floor when 200 lb. test weight is applied.
- The mid rail or intermediate rail shall be installed between the top of the rail and the floor, walk / work surface where there is no wall or parapet wall at least 21" high.
- No opening or gap larger than 19" wide is allowed in a guardrail system.
- Toe board's shall be a minimum of 3 ½" in height above the floor, walk/working surface with a maximum gap of ¼" above surface.
- The post or stanchion spacing must not exceed 8' in height.
- If Wire rope is used as top rail of guardrail system it shall be flagged at no more than every 6' with high visibility material.

5. Aerial Lifts, Extensible and Articulating Boom Platforms

A body harness shall be worn with a lanyard attaching to the boom or basket when working from an aerial lift.

Note as of January 1, 1998 a Body Belts is not an acceptable form of Personal Fall Arrest System.

Belting off to an adjacent pole, structure, or equipment while working from an aerial lift shall not be permitted.

6. Excavation Fall Protection

Each employee at the edge of an excavation 6 feet (1.8 m) or more in depth shall be protected from falling by guardrail systems, fences, or barricades when the excavations are not readily seen because of plant growth or other visual barrier;

Each employee at the edge of a well, pit, shaft, and similar excavation 6 feet (1.8 m) or more in depth shall be protected from falling by guardrail systems, fences, barricades, or covers.

7. Concrete and Masonry Construction Fall Protection

All protruding reinforcing steel (rebar), onto and into which employees could fall shall be guarded to eliminate the hazard of impalement.

Employees are not permitted to place or tie reinforcing steel without the use of safety belts or equivalent.

8. Steel Erection Fall Protection

Safety nets shall be installed as close as practicable under the walking/working surface on which employees are working, but in no case more than 30 feet (9.1 m) below such level. When nets are used on bridges, the potential fall area from the walking/working surface to the net shall be unobstructed.

Employees who are on a walking/working surface with an unprotected edge more than **15 feet above a lower level** must be protected by conventional fall protection.

When working on non-tiered structures or where you have perimeter exterior falls from tiered structural steel fall protection must be utilized for all elevated fall hazards above 10'.

All employees shall be protected from fall hazards as required for tiered and non-tiered structures.

Perimeters shall be protected by standard guardrails and floor opening shall be properly protected by standard guardrails or secured covers as the decking proceeds during the installation of deck units.

9. Stairways and Ladders

Stairways or ladders shall be provided at all points of access where there is a break in elevation of 19" or more, and no ramp, runway, sloped embankment, or personnel hoist is provided.

Stairways having four or more risers more than 30' whichever is less must be protected by standard stair railings on each unprotected side.

Side rails of ladders must extend at least 3' beyond the landing surface when rigid support grasping device or grab rail is not provided.

Fixed ladders where the top of the ladder is in excess of 24' must be provided with cages, wells, ladder safety climbing device, or self-retracting lifelines.

When personnel are working off portable ladders and their work position locates the employees adjacent and above standard guardrail protection, personal equipment or equivalent must be utilized.

10. Cranes and Suspended Personal Platforms

Riding on the crane load or hook is prohibited.

The use of a crane or derrick to hoist employees on a personnel platform is prohibited, except when the erection use and dismantling of conventional means of reaching the worksite would be more hazardous, or is not possible because of structural design or worksite conditions.

Suspended personal platforms shall be equipped with a standard guardrail system, and, shall be enclosed with either solid construction or expanded metal.

A grab rail shall be installed inside the perimeter of the personnel platform.

Except over water, employees occupying the suspended personnel platform shall use a body belt/harness system with lanyard appropriately attached to the lower load block or overhaul ball, or to a structural member within the personnel platform capable of supporting a fall impact for employees using the anchorage.

SECTION 10

SLING INSPECTION PROGRAM

Purpose

To describe the procedures and responsibilities regarding the inspection of wire rope and synthetic web slings.

Inspection Procedure with Wire Rope Slings

Wire rope is often used in slings because of its strength, durability, abrasion resistance and ability to conform to the shape of the loads on which it is used. Wire rope used in slings can be made of ropes with either Independent Wire Rope Core (IWRC) or a fiber-core. It should be noted that a sling manufactured with a fiber-core is usually more flexible but is less resistant to environmental damage. Conversely, a core that is made of a wire rope strand tends to have greater strength and is more resistant to heat damage. Due to the nature of use that wire rope slings are used under, inspection of all slings shall occur before each use.

1. Designate a *qualified person* to inspect slings and all fastenings and attachments each day before use for damage or defects.

The *qualified person* also performs additional periodic inspections where service conditions warrant, as determined on the basis of:

- Frequency of sling use,
 - Severity of service conditions,
 - Nature of the lifts being made, and
 - Experience gained during the service life of slings used in similar circumstances.
2. Make periodic inspections of wire rope slings at intervals no greater than 12 months. A good guide to follow includes:
 - Yearly for normal service use,
 - Monthly to quarterly for severe service use, and
 - As recommended by a qualified person for special and infrequent service use.

Although OSHA's sling standard does not require you to make and maintain records of inspections, the ASME standard contains provisions on inspection records. [See forms – Sling inspection form](#)

Make a thorough inspection of slings and attachments. Items to look for include:

Broken wires, - Recognized limits on the number of broken wires include:

- 1: For strand-laid and single-part slings, 10 randomly distributed broken wires in one rope lay, or 5 broken wires in one strand in one rope lay.
- 2: For cable-laid slings, 20 broken wires per lay.
- 3: For six-part braided slings, 20 broken wires per braid.
- 4: For eight-part braided slings, 40 broken wires per braid.

Severe localized abrasion or scraping,

Kinking, crushing, bird caging, or any other damage to the rope structure,

Evidence of heat damage,

Crushed, deformed, or worn end attachments,

Severe corrosion of the rope, end attachments or fittings,

Missing or illegible sling identifications, and

Other conditions that cause doubt as to continual safe use of the sling.

Wire rope shall be taken out of service when any of the following conditions exist:

In running ropes, six randomly distributed broken wires in one lay or three broken wires in one strand in one lay;

Wear of one-third the original diameter of outside individual wires. Kinking, crushing, bird caging, or any other damage resulting in distortion of the rope structure;

Evidence of any heat damage from any cause;

Reductions from nominal diameter of more than one-sixty-fourth inch for diameters up to and including five-sixteenths inch, one-thirty-second inch for diameters three-eighths inch to and including one-half inch, three-sixty-fourths inch for diameters nine-sixteenths inch to and including three-fourths inch, one-sixteenth inch for diameters seven-eighths inch to 1 inches inclusive, three-thirty-seconds inch for diameters 1¼ to 1½ inches inclusive;

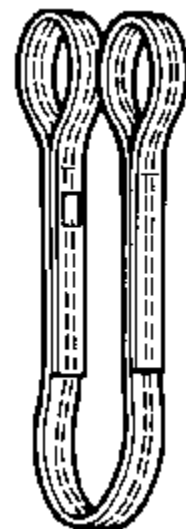
In standing ropes, more than two broken wires in one lay in sections beyond end connections or more than one broken wire at an end connection.

Wire rope safety factors shall be in accordance with American National Standards Institute B30.5-1968 or SAE J959-1966.

Inspection Procedures for Synthetic Web Slings

Synthetic Web Slings

Synthetic web slings offer a number of advantages for rigging purposes. The



most commonly used synthetic web slings are made of nylon, Dacron, and polyester. They have the following properties in common:

Strength - can handle load of up to 300,000 lbs.

Convenience - can conform to any shape.

Safety - will adjust to the load contour and hold it with a tight, non-slip grip.

Load protection - will not mar, deface, or scratch highly polished or delicate surfaces.

Long life - are unaffected by mildew, rot, or bacteria; resist some chemical action; and have excellent abrasion resistance.

Economy - have low initial cost plus long service life.

Shock absorbency - can absorb heavy shocks without damage.

Temperature resistance - are unaffected by temperatures up to 180°F.

Each synthetic material has its own unique properties. Nylon must be used wherever alkaline or greasy conditions exist. It is also preferable when neutral conditions prevail and when resistance to chemicals and solvents is important. Dacron must be used where high concentrations of acid solutions - such as sulfuric, hydrochloric, nitric, and formic acids - and where high-temperature bleach solutions are prevalent. (Nylon will deteriorate under these conditions.) Do not use Dacron in alkaline conditions because it will deteriorate; use nylon or polypropylene instead. Polyester must be used where acids or bleaching agents are present and is also ideal for applications where a minimum of stretching is important.

Due to the nature of use that synthetic web slings are used under, inspections of all slings should occur before each use. Conditions such as the following should be sufficient reasons for consideration for sling replacement and/or removal from service:

Acid or caustic burns,

Melting or charring of any part of the surface,

Snags, punctures, tears, or cuts,

Broken or worn stitches,

Wear or elongation exceeding the amount recommended by the manufacturer, or

Distortion of fittings. If each sling is not marked or coded to show the rated capacities of each type of hitch and type of web material.

If slings contain webs that are not uniform in thickness and width and/or salvage edges are split from the webbing width.

Fittings that are not free of sharp edges or do not have a minimum breaking strength equal to that of the sling.

Slings that are exposed to fumes, vapors, sprays, mists. or liquids containing chemicals such as acids, phenolics, or caustics.

Nylon or polyester slings exposed to temperature above 200° F.

Exposure of red core yams.

Inspection Procedure for Chain Slings

Due to the nature of use that chain slings are used under, inspections of all slings should occur before each use. Conditions such as the following should be sufficient reasons for consideration for sling replacement and/or removal from service:

Any visible evidence of stretching.

Any evidence of excessive wear, nicks, or gouges.

Any evidence of structural cracking in the links or attachments.

If a sling has stretched and is now more than 3% longer than it was when new.

Heavily rusted or corroded links or members.

SECTION 11

MINIMUM LADDER SAFETY RECOMMENDATIONS

Ladders

Probably the most widely used tool is the ladder. We all tend to become complacent about those things we are most familiar with and ladders are no exception. The leading cause of OSHA citations involves the improper care and use of ladders. Both citations and injuries as a result of falls from ladders are easy to avoid. Here are the simple rules of ladder safety:

1. Before using any ladder, take a minute to check it for defects. Look for missing or damaged rungs or hardware, cracks in the side rails, corrosion in metal ladders. Repair or replace damaged ladders.
2. As soon as a ladder goes up, it must be tied off at the top and firmly placed at the bottom. Don't put ladders on top of boxes, drums, etc.
3. In placing the ladder, be certain that the side rails extend 36" above the roof line. Usually, this means placing the third rung even with the roof edge.
4. Ladders should be placed so that the distance from its foot to the wall is 1/4 the length to the roof edge. If you count the number of rungs from the ground to the roof edge, this will be the same as the number of feet long the ladder is. This will allow you to estimate the height of the building.
5. Extension ladders must be overlapped a minimum of 3 rungs. Check to be sure the hardware is fully engaged.
6. When using the ladder, be sure that your boots are relatively clean, with no large amounts of mud on the soles. Face the ladder and use both hands for climbing. ***DO NOT CARRY THINGS UP AND DOWN A LADDER.*** Only one person should use a ladder at a time.
7. ***Do not place ladders near power lines.***

These rules seem like simple common sense and, indeed, they are. We must all work continuously to make these common sense rules part of our daily routine on this crew. There is no need for accidents involving ladders. Let's work to avoid them.

SECTION 12

CONFINED SPACE ENTRY PROGRAM

SCOPE

This section contains requirements for practices and procedures to protect Harrington Electric Co. employees from the hazards of entry into permit-required confined spaces.

DEFINITIONS

- Acceptable entry conditions - the conditions that must exist in a permit space to allow entry and to ensure that employees involved with a permit-required confined space entry can safely enter into and work within the space.
- Attendant - an individual stationed outside one or more permit spaces who monitors the authorized entrants and who performs all attendant's duties assigned in the employer's permit space program.
- Authorized entrant - an employee who is authorized by the employer to enter a permit space.
- Blanking or blinding - the absolute closure of a pipe, line, or duct by the fastening of a solid plate (such as a spectacle blind or a skillet blind) that completely covers the bore and that is capable of withstanding the maximum pressure of the pipe, line, or duct with no leakage beyond the plate.
- Confined space - a space that:
 1. Is large enough and so configured that an employee can bodily enter and perform assigned work; and
 2. Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of Entry.);and
 3. Is not designed for continuous employee occupancy.
- Double block and bleed - the closure of a line, duct, or pipe by closing and locking or tagging two in-line valves and by opening and locking or tagging a drain or vent valve in the line between the two closed valves.
- Emergency - any occurrence (including any failure of hazard control or monitoring equipment) or event internal or external to the permit space that could endanger entrants.

- Engulfment - the surrounding and effective capture of a person by a liquid or finely divided (flowable) solid substance that can be aspirated to cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.
- Entry - the action by which a person passes through an opening into a permit-required confined space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.
- Entry permit (permits) - the written or printed document that is provided by Harrington Electric Co. to allow and control entry into a permit space. See confined Space Permit in this program.
- Entry Foreman/Sub-foreman - the person (such as the employer, Foreman, or Superintendent) responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required by this section.

NOTE: An entry Foreman/Sub-foreman also may serve as an attendant or as an authorized entrant, as long as that person is trained and equipped as required by this section for each role he or she fills. Also, the duties of entry Foreman/Sub-foreman maybe passed from one individual to another during the course of an entry operation.

- Hazardous atmosphere - an atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (that is, escape unaided from a permit space), injury, or acute illness from one or more of the following causes:
 1. Flammable gas, vapor, or mist in excess of 10 percent of its lower flammable limit (LFL);
 2. Airborne combustible dust at a concentration that meets or exceeds its LFL;

NOTE: This concentration may be approximated as a condition in which the dust obscures vision at a distance of 5 feet (1.52 m) or less.

3. Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent;
4. Any other atmospheric condition that is immediately dangerous to life or health.

NOTE: For air contaminants for which OSHA has not determined a dose or permissible exposure limit, other sources of information, such as Material Safety Data Sheets that comply with the Hazard Communication Standard can provide guidance in establishing acceptable atmospheric conditions.

- Hot work permit - the employer's written authorization to perform operations (for example, riveting, welding, cutting, burning, and heating) capable of providing a source of ignition.

- Immediately dangerous to life or health (IDLH) - any condition that poses an immediate or delayed threat to life or that would cause irreversible adverse health effects or that would interfere with an individual's ability to escape unaided from a permit space.
- Inerting - the displacement of the atmosphere in a permit space by a noncombustible gas (such as nitrogen or argon) to such an extent that the resulting atmosphere is noncombustible.

NOTE: This procedure produces an IDLH oxygen-deficient atmosphere.

- Isolation - the process by which a permit space is removed from service and completely protected against the release of energy and material into the space by such means as: blanking or blinding; misaligning or removing sections of lines, pipes, or ducts; a double block and bleed system; lockout or tagout of all sources of energy; or blocking or disconnecting all mechanical linkages.
- Line breaking - the intentional opening of a pipe, line, or duct that is or has been carrying flammable, corrosive, or toxic material, an inert gas, or any fluid at a volume, pressure, or temperature capable of causing injury.
- Non-permit confined space - a confined space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm. Harrington Electric Co. requires that all Confined Spaces be treated as Permit required spaces.
- Oxygen deficient atmosphere - an atmosphere containing less than 19.5 percent oxygen by volume.
- Oxygen enriched atmosphere - an atmosphere containing more than 23.5 percent oxygen by volume.
- Permit-required confined space (permit space) - a confined space that has one or more of the following characteristics:
 1. Contains or has a potential to contain a hazardous atmosphere;
 2. Contains a material that has the potential for engulfing an entrant;
 3. Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or
 4. Contains any other recognized serious safety or health hazard.

- Permit-required confined space program (permit space program) - the employer's overall program for controlling, and, where appropriate, for protecting employees from, permit space hazards and for regulating employee entry into permit spaces.
- Permit system - the employer's written procedure for preparing and issuing permits for entry and for returning the permit space to service following termination of entry.
- Prohibited condition - any condition in a permit space that is not allowed by the permit during the period when entry is authorized.
- Rescue service - the personnel designated to rescue employees from permit spaces.
- Retrieval system - the equipment (including a retrieval line, chest or full-body harness, wristlets, if appropriate, and a lifting device or anchor) used for non-entry rescue of persons from permit spaces.
- Testing - the process by which the hazards that may confront entrants of a permit space are identified and evaluated. Testing includes specifying the tests that are to be performed in the permit space.

GENERAL REQUIREMENTS

Employees (Foremen) shall evaluate the workplace to determine the hazards associated with the permit-required confined space(s). The Foreman shall have the final determination of the hazards associated with the permit-required confined space (s).

The Safety Director should be notified immediately if there are any questions regarding a confined space or the contents of this procedure.

Refer to the Permit-Required Confined Space Decision Flow Chart in this section of the safety manual.

If the workplace contains permit spaces, the Foreman, sub-foreman shall inform exposed employees, by posting danger signs or by any other equally effective means, of the existence and location of and the danger posed by the permit spaces.

A sign reading: DANGER -- PERMIT-REQUIRED CONFINED SPACE, DO NOT ENTER or using other similar language would satisfy the requirement for a sign.

If the Foreman/Sub-foreman decides that its employees will not enter permit spaces, the Foreman/Sub-foreman shall take effective measures to prevent Harrington Electric Co. employees from entering the permit spaces.

If the Foreman/Sub-foreman decides that its employees will enter permit spaces, the Foreman/Sub-foreman shall implement the Harrington Electric Co. permit space program.

The following requirements apply to entry into permit spaces:

- Any conditions making it unsafe to remove an entrance cover shall be eliminated before the cover is removed.
- When entrance covers are removed, the opening shall be promptly guarded by a railing, temporary cover, or other temporary barrier that will prevent an accidental fall through the opening and that will protect each employee working in the space from foreign objects entering the space. Before an employee enters the space, the internal atmosphere shall be tested, with a CALIBRATED direct-reading instrument, for the following items in the order that they appear below. (Any employee, or authorized representative, who enters the space shall be provided an opportunity to observe the pre-entry testing required.)
- Oxygen content,
- Flammable gases and vapors, and
- Potential toxic air contaminants.

There may be no hazardous atmosphere within the space whenever any employee is inside the space.

Continuous forced air ventilation shall be used, as follows:

- An employee may not enter the space until the forced air ventilation has eliminated any hazardous atmosphere;
- The forced air ventilation shall be so directed as to ventilate the immediate areas where an employee is or will be present within the space and shall continue until all employees have left the space;
- The air supply for the forced air ventilation shall be from a clean source and may not increase the hazards in the space.
- The atmosphere within the space shall be periodically tested as necessary to ensure that the continuous forced air ventilation is preventing the accumulation of a hazardous atmosphere.

If a hazardous atmosphere is detected during entry:

- Each employee shall leave the space immediately;
- The space shall be evaluated to determine how the hazardous atmosphere developed; and
- Measures shall be implemented to protect employees from the hazardous atmosphere before any subsequent entry takes place.

Ensure that all lines containing harmful agent, such as supply, discharge, overflow, vent, drain or similar connections entering the space are physically separated or blocked by means of blinds or other devices, capable of insuring complete closure except fire suppressants and extinguishing systems.

Establish that fixed mechanical devices or equipment, the operation of which might endanger the employee or cause additional hazards, shall be rendered inoperable by disconnecting electrical service equipment (excluding lighting) and shall be padlocked or tagged.

The Foreman/Sub-foreman shall verify that space is safe for entry and shall document the following in writing through a certification (permit) that contains the date, the location of the space, and the signature of the person making the determination:

- That required pre-entry measures have been taken.
- The basis for determining that all hazards in a permit space have been eliminated

NOTE: Control of atmospheric hazards through forced air ventilation does not constitute elimination of the hazards.

If hazards arise within a permit space each employee in the space shall exit the space. The Foreman/Sub-foreman shall then reevaluate the space and determine the cause of the hazard before reentry.

ADDITIONAL REQUIREMENTS

When an employer (host employer / GC) arranges to have employees of another employer (Harrington Electric Co. / Subcontractor) perform work that involves permit space entry, the host employer shall:

- Inform the contractor that the workplace contains permit spaces and that permit space entry is allowed only through compliance with a permit space program.
- Apprise the contractor of the elements, including the hazards identified and the host employer's experience with the space, that make the space in question a permit space.
- Apprise the contractor of any precautions or procedures that the host employer has implemented for the protection of employees in or near permit spaces where contractor personnel will be working;
- Coordinate entry operations with the contractor, when both host employer personnel and contractor personnel will be working in or near permit spaces.
- Debrief the contractor at the conclusion of the entry operations regarding the permit space program followed and regarding any hazards confronted or created in permit spaces during entry operations.

In addition to complying with the permit space requirements that apply to all employers, each contractor who is retained to perform permit space entry operations shall:

- Implement the measures necessary to prevent unauthorized entry;
- Identify and evaluate the hazards of permit spaces before employees enter them;
- Develop and implement the means, procedures, and practices necessary for safe permit space entry operations, including, but not limited to, the following:
- Specifying acceptable entry conditions;
- Providing each authorized entrant or that employee's authorized representative with the opportunity to observe any monitoring or testing of permit spaces;
- Isolating the permit space;
- Purging, inerting, flushing, or ventilating the permit space as necessary to eliminate or control atmospheric hazards;

- Providing pedestrian, vehicle, or other barriers as necessary to protect entrants from external hazards; and

- Verifying that conditions in the permit space are acceptable for entry throughout the duration of an authorized entry.
- Provide the following equipment to employees, maintain that equipment properly, and ensure that employees use that equipment properly:
 - Testing and monitoring equipment
 - Ventilating equipment needed to obtain acceptable entry conditions;
 - Communications equipment
 - Personal protective equipment insofar as feasible engineering and work practice controls do not adequately protect employees;
 - Lighting equipment needed to enable employees to see well enough to work safely and to exit the space quickly in an emergency.

LIGHTING

Temporary lights shall be equipped with guards to prevent accidental contact with the bulb, except that guards are not required when the construction of the reflector is such that the bulb is deeply recessed.

Temporary lights shall be equipped with heavy-duty electric cord with connections and insulation maintained in safe condition. Temporary lights may not be suspended by their electric cords unless cords and lights are designed for this means of suspension. Splices shall have insulation equal to that of a cable.

Working spaces, walkways, and similar locations shall be kept clear of cords so as not to create a hazard to employees.

Portable electric lighting used in moist or other hazardous locations (for example, drums, tanks, and vessels) shall be operated at a maximum of 12 volts.

EQUIPMENT

All equipment necessary for the safe ingress and egress into the confined space shall be available at the site prior to entry into the space.

- Rescue and emergency equipment needed except to the extent that the equipment is provided by rescue services.
- Atmospheric testing equipment.
- Ventilation equipment.
- Any other equipment necessary for safe entry into and rescue from permit spaces.

OPERATIONS

Additionally, Foreman/Sub-foreman will evaluate permit space conditions as follows when entry operations are conducted:

- Test conditions in the permit space to determine if acceptable entry conditions exist before entry is authorized to begin, except that, if isolation of the space is infeasible because the space is large or is part of a continuous system (such as a sewer), pre-entry testing shall be performed to the extent feasible before entry is authorized and, if entry is authorized, entry conditions shall be continuously monitored in the areas where authorized entrants are working;
- Test or monitor the permit space as necessary to determine if acceptable entry conditions are being maintained during the course of entry operations; and
- When testing for atmospheric hazards, test first for oxygen, then for combustible gases and vapors, and then for toxic gases and vapors.
- Provide each authorized entrant or that employee's authorized representative an opportunity to observe the pre-entry and any subsequent testing or monitoring of permit spaces;
- Reevaluate the permit space in the presence of any authorized entrant or that employee's authorized representative who requests that the employer conduct such reevaluation because the entrant or representative has reason to believe that the evaluation of that space may not have been adequate;
- Immediately provide each authorized entrant or that employee's authorized representative with the results of any testing conducted.
- The Foreman/Sub-foreman will provide at least one attendant outside the permit space into which entry is authorized for the duration of entry operations;

EACH CONFINED SPACE WILL HAVE ·AT LEAST ONE ATTENDANT WHILE OPERATIONS ARE ONGOING.

- Designate the persons who are to have active roles (as, for example, authorized entrants, attendants, entry Foreman/Sub-foreman, or persons who test or monitor the atmosphere in a permit space) in entry operations, identify the duties of each such employee, and ENSURE each such employee has the proper training.
- Develop and implement procedures for summoning rescue and emergency services, for rescuing entrants from permit spaces, for providing necessary emergency services to rescued employees, and for preventing unauthorized personnel from attempting a Rescue;
- Develop and implement a system for the preparation, issuance, use, and cancellation of entry permits as required by this section;
- Develop and implement procedures to coordinate entry operations when employees of more than one employer are working simultaneously as authorized entrants in a permit space, so that employees of one employer do not endanger the employees of any other employer;
- Develop and implement procedures (such as closing off a permit space and canceling the permit) necessary for concluding the entry after entry operations have been completed;

Review entry operations when the Foreman/Sub-foreman has reason to believe that the measures taken under the permit space program may not protect employees and revise the program to correct deficiencies found to exist before subsequent entries are authorized.

Examples of circumstances requiring the review of the permit space program are:

- any unauthorized entry of a permit space,
- the detection of a permit space hazard not covered by the permit,
- the detection of a condition prohibited by the permit,
- the occurrence of an injury or near-miss during entry,
- a change in the use or configuration of a permit space,
- any employee complaints about the effectiveness of the program.

SAFETY NOTE: Harrington Electric Co. Safety Dept may perform a single annual review covering all entries performed during a 12-month period on any site. If no entry is performed during a 12-month period, no review is necessary.

PERMIT SYSTEM

- Before entry is authorized, the FOREMAN/SUB-FOREMAN shall document the completion of measures required by preparing an entry permit.
- Before entry begins, the entry Foreman/Sub-foreman identified on the permit shall sign the entry permit to authorize entry.
- The completed permit shall be made available at the time of entry to all authorized entrants or their authorized representatives, by posting it at the entry portal or by any other equally effective means, so that the entrants can confirm that pre-entry preparations have been completed.
- The duration of the permit may not exceed the time required to complete the assigned task or job identified on the permit.
- The entry Foreman/Sub-foreman shall terminate entry and cancel the entry permit when:
 1. The entry operations covered by the entry permit have been completed.
 2. A condition that is not allowed under the entry permit arises in or near the permit space.
- The PROJECT SITE shall retain each canceled entry permit for at least 1 year to facilitate the review of the permit-required confined space program. Any problems encountered during an entry operation shall be noted on the pertinent permit so that appropriate revisions to the permit space program can be made.

ENTRY PERMIT

(Refer to the Confined Space Entry Permit form contained in this section of the Safety Manual)

The entry permit that documents compliance with this section and authorizes entry to a permit space shall identify:

- The permit space to be entered;
- The purpose of the entry;

- The date and the authorized duration of the entry permit;

- The authorized entrants within the permit space, by name for the duration of the permit and which authorized entrants are inside the permit space;
- the personnel, by name, currently serving as attendants;
- The individual, by name, currently serving as entry Foreman/Sub-foreman, with a space for the signature or initials of the entry Foreman/Sub-foreman who originally authorized entry;
- The hazards of the permit space to be entered;
- The measures used to isolate the permit space and to eliminate or control permit space hazards before entry;

NOTE: Those measures can include the lockout or tagging of equipment and procedures for purging, inerting, ventilating, and flushing permit spaces.

Acceptable entry conditions;

- The results of initial and periodic tests performed, accompanied by the names or initials of the testers and by an indication of when the tests were performed;
- The rescue and emergency services that can be summoned and the means (such as the equipment to use and the numbers to call) for summoning those services;
- The communication procedures used by authorized entrants and attendants to maintain contact during the entry;
- Equipment, such as personal protective equipment, testing equipment, communications equipment, alarm systems, and rescue equipment, to be provided.
- Any other information whose inclusion is necessary, given the circumstances of the particular confined space, in order to ensure employee safety; and any additional permits, such as for hot work, that have been issued to authorize work in the permit space.

TRAINING

- Harrington Electric Co. shall provide training so that all employees acquire the understanding, knowledge, and skills necessary for the safe performance of the duties assigned while to a CONFINED SPACE environment.
- Whenever there is a change in permit space operations that presents a hazard about which an employee has not previously been trained the Foreman/Sub-foreman will brief the employees on those changes.
- Whenever the Foreman/Sub-foreman has reason to believe either that there are deviations from the permit space entry procedures or that there are inadequacies in the employee's knowledge or use of these procedures that employee shall be removed from the activity until retraining has occurred.
- The training will be updated to introduce new or revised procedures, as necessary.
- Each employee will be certified to work in a confined space prior to starting that work. The certification shall contain each employee's name, the signatures or initials of the trainers, and the dates of training. The certification shall be available for inspection by employees and their authorized representatives.

DUTIES AND RESPONSIBILITIES

Duties of authorized entrants:

The employer shall ensure that all authorized entrants:

- Know the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure.
- Properly use all equipment required.
- Communicate with the attendant as necessary to enable the attendant to monitor entrant status and to enable the attendant to alert entrants of the need to evacuate the space if required.
- Alert the attendant whenever:
 1. The entrant recognizes any warning sign or symptom of exposure to a dangerous situation, or
 2. The entrant detects a prohibited condition; and
- Exit from the permit space as quickly as possible whenever:
 1. An order to evacuate is given by the attendant or the entry Foreman/Sub-foreman,
 2. An evacuation alarm is activated.

Duties of attendants:

The employer shall ensure that each attendant:

- Knows the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure;
- Is aware of possible behavioral effects of hazard exposure in authorized entrants;
- Continuously maintains an accurate count of authorized entrants in the permit space
- Remains outside the permit space during entry operations until relieved by another attendant;

NOTE: THE ATTENDANT WILL NOT ENTER THE SPACE EVEN FOR RESCUE CONDITIONS

- Communicates with authorized entrants as necessary to monitor entrant status and to alert entrants of the need to evacuate the space.
- Monitors activities inside and outside the space to determine if it is safe for entrants to remain in the space and orders the authorized entrants to evacuate the permit space immediately under any of the following conditions;
 1. If the attendant detects a prohibited condition;
 2. If the attendant detects the behavioral effects of hazard exposure in an authorized entrant;
 3. If the attendant detects a situation outside the space that could endanger the authorized entrants; or

- If the attendant cannot effectively and safely perform all the duties required.
 1. Summon rescue and other emergency services as soon as the attendant determines that authorized entrants may need assistance to escape from permit space hazards;
- Takes the following actions when unauthorized persons approach or enter a permit space while entry is underway:
- Warn the unauthorized persons that they must stay away from the permit space;
- Advise the unauthorized persons that they must exit immediately if they have entered the permit space; and
- Inform the authorized entrants and the entry Foreman/Sub-foreman if unauthorized persons have entered the permit space.
- Performs non-entry rescues as specified by site rescue procedure.
- Performs no duties that might interfere with the attendant's primary duty to monitor and protect the authorized entrants.

Duties of entry Foreman/Sub-foreman: The employer shall ensure that each entry Foreman/Sub-foreman:

- Knows the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure.
- Verifies, by checking that the appropriate entries have been made on the permit, that all tests specified by the permit have been conducted and that all procedures and equipment specified by the permit are in place before endorsing the permit and allowing entry to begin.
- Terminates the entry and cancels the permit if procedures are not being followed.
- Verifies that rescue services are available and that the means for summoning them are operable.
- Removes unauthorized individuals who enter or who attempt to enter the permit space during entry operations.
- Determines, whenever responsibility for a permit space entry operation is transferred and at intervals dictated by the hazards and operations performed within the space, that entry operations remain consistent with terms of the entry permit and that acceptable entry conditions are maintained.

RESCUE AND EMERGENCY SERVICES

A site foreman will establish rescue and emergency procedures by contacting the Safety Department and developing a plan to contact local and municipal agencies to assist in the rescue:

Selection will be based on a non-entry rescue team or service evaluation that:

- Has the capability to reach the victim(s) within a time frame that is appropriate for the permit space hazard(s) identified;

- Is equipped for and proficient in performing the needed rescue services;

Harrington Electric Co. employees will be designated to provide emergency service backup and shall take the following measures:

- Provide affected employees with the personal protective equipment (PPE) needed to conduct permit space rescues safely and train affected employees so they are proficient in the use of that PPE.
- Train affected employees to perform assigned rescue duties.
- Train affected employees in basic first-aid and cardiopulmonary resuscitation (CPR) and that at least one member of the team holding a current certification in first aid and CPR is available.

To facilitate non-entry rescue, retrieval systems or methods shall be used whenever an authorized entrant enters a permit space, unless the retrieval equipment would increase the overall risk of entry or would not contribute to the rescue of the entrant

Each authorized entrant shall use a full body harness, with a retrieval or life line attached at the center of the entrant's back near shoulder level, above the entrant's head, or at another point which the employer can establish presents a profile small enough for the successful removal of the entrant.

The other end of the retrieval line shall be attached to a mechanical device or fixed point outside the permit space in such a manner that rescue can begin as soon as the rescuer / attendant becomes aware that rescue is necessary. A mechanical device shall be available to retrieve personnel from vertical type permit spaces more than 5 feet (1.52 m) deep.

If an injured entrant is exposed to a substance for which a Material Safety Data Sheet (MSDS) or other similar written information is required to be kept at the worksite, that MSDS or written information shall be made available to the medical facility treating the exposed entrant.

EMPLOYEE PARTICIPATION

Harrington Electric Co. will continuously consult with affected employees and their authorized representatives on the development and implementation of all aspects of the Confined space program.

NON PERMITTED CONFINED SPACE

SCOPE

The following is the Harrington Electric Co. procedure for the reclassification of a Confined Space to a Non Permitted Confined Space (NPCS) with regards to OHSA's definition.

"Non-permit confined space" means a confined space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm.

The attached Non Permit Confined Space form must be filled out completely for each location that a Confined Space Hazard exists; this form will show justification for re-classing to a Non Permit Confined Space.

Procedure

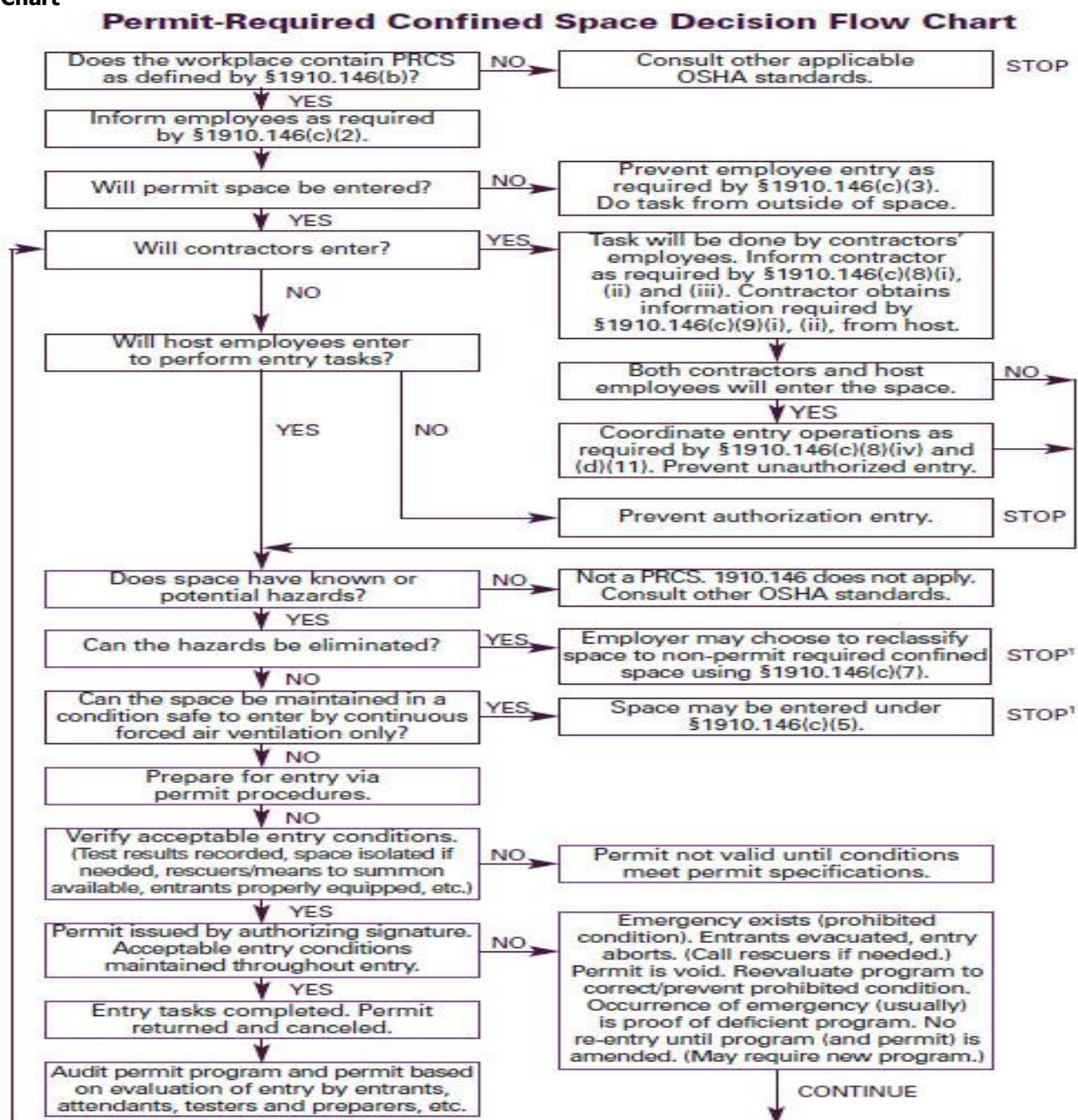
A space classified by the employer as a permit-required confined space may be reclassified as a non-permit confined space under the following procedures:

- All Hazardous can be eliminated without entry (e.g., Lock out / tagout).
- Before entry is permitted into the space verification of the atmosphere must be performed by testing – metering.
 - If the permit space poses no actual or potential atmospheric hazards and if all hazards within the space are eliminated without entry into the space, the permit space may be reclassified as a non-permit confined space for as long as the non-atmospheric hazards remain eliminated.
 - If it is necessary to enter the permit space to eliminate hazards, such entry shall be performed under Normal Confined Space Entry Program. If testing and inspection during that entry demonstrate that the hazards within the permit space have been eliminated, the permit space may be reclassified as a non-permit confined space for as long as the hazards remain eliminated.
 - If hazards arise within a permit space that has been declassified to a non-permit space, each employee in the space shall exit the space. The employer shall then reevaluate the space and determine whether it must be reclassified as a permit space, in accordance with other applicable provisions of this section.
- Non Permit Confined Space – evaluation of the space must be performed by person able to recognize hazards related to Confined Space Entry.

- **Continuous forced air ventilation shall be used, as follows:**
- An employee may not enter the space until the forced air ventilation has eliminated any hazardous atmosphere;
- The forced air ventilation shall be so directed as to ventilate the immediate areas where an employee is or will be present within the space and shall continue until all employees have left the space;
- The air supply for the forced air ventilation shall be from a clean source and may not increase the hazards in the space.
- The atmosphere within the space shall be periodically tested as necessary to ensure that the continuous forced air ventilation is preventing the accumulation of a hazardous atmosphere. Any employee, who enters the space, or that employee's authorized representative, shall be provided with an opportunity to observe the periodic testing required by this paragraph.

If conditions are not met, entry is prohibited. If occupied, the space must be immediately evacuated.			
Oxygen	Minimum 19.5% and Maximum 23.5%	Engulfment hazards	No engulfment hazards may be present
Flammable gases	No greater than 10% LFL	Hazardous flows	Secured and locked out
Hydrogen sulfide	No greater than 10 ppm	Hazardous energies	Secured and locked out
Carbon monoxide	No greater than 50 ppm	External hazards	Must be controlled
Other toxic substances		No greater than PEL for substances	

Permit-Required Confined Space Decision Flow Chart



¹ Spaces may have to be evacuated and reevaluated if hazards arise during entry.

Source: 29 CFR 1910.146 Appendix A.

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CONFINED SPACE CLASSIFICATION FORM

To be completed by Entry Supervisor

Description/Location of Confined Space: _____

Entry Date/Time _____

Expiration Date/Time _____

Work to be performed: _____

IF TASKS CHANGE PERMIT MUST BE RE-EVALUATED:

CONFINED SPACE HAZARD EVALUATION

	Yes	No
Oxygen Level OK? (19.5 - 23.5)	_____	_____
Flammable Gas or Vapor?	_____	_____
Combustible Dust?	_____	_____
Toxic gas/vapor?	_____	_____
Mechanical hazard?	_____	_____
Electrical hazard?	_____	_____
Toxic solids/liquids?	_____	_____
Engulfment hazard?	_____	_____
Other hazards?	_____	_____

AMBIENT AIR

EQUIPMENT REQUIRED FOR ENTRY AND WORK

	Yes	No
Respirator CADWELD	_____	_____
Harness/retrieval equip - fall	_____	_____
Protection	_____	_____
protective clothing	_____	_____
Hearing protection	_____	_____
Glasses/Face shield	_____	_____
Low voltage tools/equip.	_____	_____
Communication Aid	_____	_____
Monitoring Equipment	_____	_____
INITIAL	_____	_____
Fire Extinguisher	_____	_____

Test Results: *Oxygen %* _____ *LEL* % _____

Atmospheric test required:

Continuous

Periodic

Toxics
Tested:
Initial

CO

H₂S

Periodic Air

Testing

Time													
O ₂													
H ₂ S													
CO													
LEL													

Comments/ Known Hazards: _____

Pre-Entry Checklist (YES, NO, N/A)

<i>Employees informed of specific confined space hazards</i>	_____	<i>Space cleaned/ drained/ purged, lines blinded</i>	_____
<i>Task procedures reviewed with associates?</i>	_____	<i>Energy sources Locked-Tagged Out</i>	_____
<i>Atmospheric test complete?</i>	_____	<i>Other departments/areas notified</i>	_____
<i>Ventilation provided?</i>	_____	<i>Sewers/Catch basins isolated</i>	_____
	_____	<i>Personnel training verified</i>	_____

****AUTHORIZED PERSONNEL MUST BE TRAINED****

Authorized

Entrants:

Authorized

Attendants

ENTRY / EXIT LOG

<u>ENTRANT</u>	<u>IN</u>	<u>OUT</u>	<u>IN</u>	<u>OUT</u>	<u>IN</u>	<u>OUT</u>
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

Entry Supervisor

Name (print)

Signature

Date/ Time

Confined Space Entry Close-Out

Confined Space work completed? Date _____ Time: _____ am / pm

Were any hazards encountered? YES NO If YES, explain in detail and attach to form.

Entry

Supervisor: _____

**KEEP COMPLETED FORM - MUST BE MAINTAINED ON JOB SITE UNTIL COMPLETION –
FORWARD TO SAFETETY**

Non-permit Confined Space Entry Form Hazard Assessment

Reason for entry (<i>specify</i>): _____ _____ _____	Start date: _____ Start time: _____ End date: _____ End time: _____
Work Location: _____	
Have the current safety and health hazards been evaluated? <input type="checkbox"/> No <input type="checkbox"/> Yes	
Are conditions appropriate for a NPRCS entry? <input type="checkbox"/> No <input type="checkbox"/> Yes	
Note: A NPCS entry requires that the answer to both questions is "Yes" .	
Evaluate if new hazards will be created by the planned work	
<input type="checkbox"/> No <input type="checkbox"/> Yes	Will any activities that could create a hazard be conducted inside the confined such as welding or breaking a line.
<input type="checkbox"/> No <input type="checkbox"/> Yes	Will any chemicals that could create a hazard be brought into the space? Examples would be solvents and adhesives.
<input type="checkbox"/> No <input type="checkbox"/> Yes	Are there any conditions in or around this space that could adversely affect anyone who enters it?
Note: A NPCS entry requires that the answer to all three is "No"	

Entrants and Support (Minimum of two workers required)

	Entrant	Support
Print Name	<input type="checkbox"/>	<input type="checkbox"/>
Print Name	<input type="checkbox"/>	<input type="checkbox"/>

Confirmation (must be signed before work begins)

I confirm that the named Confined Space and planned work meet the requirements of a NPCS Entry
Print Name:
Signature:

SECTION 13

RESPIRATOR PROTECTION POLICY

HARRINGTON ELECTRIC CO. will provide NIOSH approved respirators when it is necessary to protect the health of the employees. The guidelines for this program are designed to help reduce employee exposures to Occupational Dust, fumes, mists, gases and vapors. The primary goal is to objective is to prevent the excessive exposure to these containments. This is accomplished as feasible by accepted engineering and work control measures. When effective engineering controls are not feasible, or are being implemented or evaluated, respiratory protection may be required to achieve this goal. In these situations the company will provide Respiratory protection at no charge to the employee. Employees are expected to wear respiratory protection as required and follow the Respiratory Protection Program.

All respirators shall be approved by the National Institute for Occupational Safety and health (NIOSH).

An assessment of the work area will be made to ensure the respirator issued provides sufficient protection. We will utilize the protection factors generally recognized by the scientific community for a particular class of respirators in selecting the appropriate respirator. Exposure monitoring may be necessary to ensure the selection of a particular respirator class is appropriate.

Medical surveillance will be offered to ensure the employee is physically capable to wear a respirator. Using a respirator may place a burden on the user, depending on the condition of the work place, the type of respirator worn and the condition of the employee. As a result, completion of a medical evaluation is required for individual use of all respirators, except the filtering facemask (dust mask) and only if implemented as Voluntary. If a filtering facemask is required then testing will also be required.

- The Company Management will provide the necessary training to assure employees are familiar with the proper use, selection and care of respirators.
- The Company Management shall enforce the use of respirators where required. Management and the Respirator Program Administrator shall make routine inspections and evaluations of the Respirator Program.
- The employee shall USE AND WEAR the respiratory protection provided in accordance with the instructions and training they have received.
- The employee shall guard against damage to the respirator.
- The employee shall-report all problems related to any malfunction, damage or any difficulty involving the use of a particular respirator.
- The employee shall check the fit of a respirator, after donning the respirator, using a positive or negative test and ensure facial hair and other factors do not interfere with the face.
- The employee shall clean and maintain the respirator as instructed.

The employee shall report any change in medical status which may impact the employee's ability to safely wear a respirator or any difficulties experienced while wearing a respirator to Safety Coordinator for necessary follow up.

SECTION 14

HEARING CONSERVATION PROGRAM

Purpose

To establish and define the policy on implementing an effective Hearing Conservation Program where noise levels may exceed 85 dBA.

General

Employee Hearing Conservation is an important objective in an overall Employee Protection Program. A major goal is to reduce continuous noise levels below 90 dBA and also reduce impact noises where feasible through engineering and administrative controls.

Definitions

Hearing Protection Device: Personal hearing-protective equipment .that is worn over the ear (earmuffs) or in the ear (earplugs) to attenuate noise.

dB (A): Sound level in decibels read on the A-scale of a sound-level meter. A unit of measurement of a sound level corrected to the A-weighted scale.

Standard Threshold Shift: A change in hearing threshold relative to the baseline audiogram.

Program Elements

Noise Level Monitoring:

- A periodic survey shall be conducted to ascertain work areas where noise levels are in excess of an 8-hour TWA of 85 dBA's.
- All purchase agreements for high level noise generating equipment will contain a provision requiring the manufacturer to reduce the noise level below 85 dBA where technically or economically feasible.

Audiometric Testing: Audiometric testing will be available to employees who have an average exposure level of 85 dBA for 8-hour TWA.

The elements of the Audiometric Testing Program will include:

- Baseline audiograms
- Annual audiograms
- Training
- Follow-up monitoring of any threshold shifts

The Program will be under the Supervision of a professional audiologist or a physician specializing in diagnosis and treatment of ear disorders.

If any Standard Threshold Shift (STS) is identified, all pertinent measures will be address to identify and/or correct negative conditions.

Noise Abatement:

All available and practical engineering and administrative controls will be employed to eliminate or control excessive noise at its source. This will include, but not be limited to, alternative processes or procedures, equipment modification where technically or economically feasible, or providing appropriate hearing protection.

Training Programs:

All employees exposed to a TWA of 85 dBA or more will attend a training program that covers:

- The effect of noise on hearing.
- The purpose of hearing protectors; the advantages, disadvantages and attenuation of various types; and instructions on selection, fitting, use and care.

SECTION 15

EXCAVATIONS / TRENCHING

IMPORTANT!!!

Harrington Electric Co. will consider all excavations to be Type "C" soil unless the Safety Department or a qualified engineer from the excavation company can certify the soil classification as other than Type "C". A written document must be provided to this effect before any Harrington Electric Co. employees start excavation.

DEFINITIONS

Accepted engineering practices - those requirements, which are compatible with standards of practice required by a registered professional engineer.

Aluminum Hydraulic Shoring - a pre-engineered shoring system comprised of aluminum hydraulic cylinders (crossbraces) used in conjunction with vertical rails (uprights) or horizontal rails (wales). Such system is designed specifically to support the sidewalls of an excavation and prevent cave-ins.

Bell-bottom pier hole - a type of shaft or footing excavation, the bottom of which is made larger than the cross section above to form a belled shape.

Benching (Benching system) - a method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.

Cave-in - the separation of a mass of soil or rock material from the side of an excavation, or the loss of soil from under a trench shield or support system, and its sudden movement into the excavation, either by falling or sliding, in sufficient quantity so that it could entrap, bury, or otherwise injure and immobilize a person.

Competent person - one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

Cross braces - the horizontal members of a shoring system installed perpendicular to the sides of the excavation, the ends of which bear against either uprights or wales.

Excavation - any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.

Faces or "sides" - the vertical or inclined earth surfaces formed as a result of excavation work.

Failure - the breakage, displacement, or permanent deformation of a structural member or connection so as to reduce its structural integrity and its supportive capabilities.

Hazardous atmosphere - an atmosphere which by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic, or otherwise harmful, may cause death, illness, or injury.

Kickout - the accidental release or failure of a cross brace.

Protective system - a method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.

Ramp - an inclined walking or working surface that is used to gain access to one point from another, and is constructed from earth or from structural materials such as steel or wood.

Registered Professional Engineer - a person who is registered as a professional engineer in the state where the work is to be performed. However, a professional engineer, registered in any state is deemed to be a "registered professional engineer" within the meaning of this standard when approving designs for "manufactured protective systems" or "tabulated data" to be used in interstate commerce.

Sheeting - the members of a shoring system that retain the earth in position and in turn are supported by other members of the shoring system.

Shield (Shield system) - a structure that is able to withstand the forces imposed on it by a cave-in and thereby protect employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. Additionally, shields can be either pre-manufactured or job-built. Shields used in trenches are usually referred to as "trench boxes" or "trench shields."

Shoring (Shoring system) - a structure such as a metal hydraulic, mechanical or timber shoring system that supports the sides of an excavation and which is designed to prevent cave-ins.

Sides- See Faces.

Sloping (Sloping system) - a method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.

Stable rock - natural solid mineral material that can be excavated with vertical sides and will remain intact while exposed. Unstable rock is considered to be stable when the rock material on the side or sides of the excavation is secured against caving-in or movement by rock bolts or by another protective system that has been designed by a registered professional engineer.

Structural ramp - a ramp built of steel or wood, usually used for vehicle access. Ramps made of soil or rock are not considered structural ramps.

Surface Encumbrances - Above the surface anything that impedes, equipment, lights, trees. Etc...

Subsurface Encumbrances include underground utilities, foundations, streams, water tables, transformer vaults, and geological anomalies.

Support system - a structure such as underpinning, bracing, or shoring, which provides support to an adjacent structure, underground installation, or the sides of an excavation.

Tabulated data - tables and charts approved by a registered professional engineer and used to design and construct a protective system.

Trench (Trench excavation) - a narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15 feet (4.6 m). If forms or other structures are installed or constructed in an excavation so as to reduce the dimension measured from the forms or structure to the side of the excavation to 15 feet (4.6 m) or less (measured at the bottom of the excavation), the excavation is also considered to be a trench.

Trench box- See Shield.

Uprights - the vertical members of a trench shoring system placed in contact with the earth and usually positioned so that individual members do not contact each other. Uprights placed so that individual members are closely spaced, in contact with or interconnected to each other, are often called "sheeting."

• **Wales** - horizontal members of a shoring system placed parallel to the excavation face whose sides bear against the vertical members of the shoring system or earth.

SURFACE ENCUMBRANCES

All surface encumbrances that are located so as to create a hazard to employees shall be removed or supported, as necessary, to safeguard employees.

UNDERGROUND INSTALLATIONS

The estimated location of utility installations, such as sewer, telephone, fuel. Electric, water lines, or any other underground installations that reasonably may be expected to be encountered during excavation work, shall be determined prior to opening an excavation. Utility companies or owners shall be contacted within established or customary local response times. Advised of the proposed work, and asked to establish the location of the utility underground installations prior to the start of actual excavation. When utility companies or owners cannot respond to a request to locate underground utility installations within 24 hours (unless a longer period is required by state or local law), or cannot establish the exact location of these installations, the supervisor will contact their project manager and formally send a letter of delay when

excavation operations approach the estimated location of underground installations, the exact location of the installations shall be determined by safe and acceptable means.

While the excavation is open, underground installations shall be protected, supported or removed as necessary to safeguard employees.

ACCESS AND EGRESS / STRUCTURAL RAMPS

- A competent person shall design structural ramps that are used solely by employees as a means of access or egress from excavations. Structural ramps used for access or egress of equipment shall be designed by a competent person qualified in structural design, and shall be constructed in accordance with the design.
- Ramps and runways constructed of two or more structural members shall have the structural members connected together to prevent displacement.
- Structural members used for ramps and runways shall be of uniform thickness.
- Cleats or other appropriate means used to connect runway structural members shall be attached to the bottom of the runway or shall be attached in a manner to prevent tripping. Structural ramps used in lieu of steps shall be provided with cleats or other surface treatments the top surface to prevent slipping.
- Means of egress from trench excavations - A stairway, ladder, ramp or other safe means of egress shall be located in trench excavations that are 4 feet (1.22 m) or more in depth so as to require no more than 25 feet (7.62 m) of lateral travel for employees.
- Exposure to vehicular traffic - Employees exposed to public vehicular traffic shall be provided with, and shall wear; warning vests or other suitable garments marked with or made of reflective type or high-visibility material.
- Exposure to falling loads. No employee shall be permitted underneath loads handled by lifting or digging equipment. Employees shall be required to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials. Operators may remain in the cabs of vehicles being loaded or unloaded when the vehicles are equipped, to provide adequate protection for the operator during loading and unloading operations.
- Warning system for mobile equipment. When mobile equipment is operated adjacent to an excavation, or when such equipment is required to approach the edge of an excavation, and the operator does not have a clear and direct view of the edge of the excavation, a warning system shall be utilized such as barricades, hand or mechanical signals, or stop logs. If possible, the grade should be away from the excavation.

HAZARDOUS ATMOSPHERES

- Where oxygen deficiency (atmospheres containing less than 19.5 percent oxygen) or a hazardous atmosphere exists or could reasonably be expected to exist, such as in excavations in landfill areas or

excavations in areas where hazardous substances are stored nearby, the atmospheres in the excavation shall be tested before employees enter excavations greater than 4 feet (1.22 m) in depth.

- Adequate precautions shall be taken to prevent employee exposure to atmospheres containing less than 19.5 percent oxygen and other hazardous atmospheres. These precautions include providing proper respiratory protection or ventilation.
- Adequate precaution shall be taken such as providing ventilation, to prevent employee exposure to an atmosphere containing a concentration of a flammable gas in excess of 20 percent of the lower flammable limit of the gas.
- When controls are used that are intended to reduce the level of atmospheric contaminants to acceptable levels, testing shall be conducted as often as necessary to ensure that the atmosphere remains safe.
- The safety director shall be consulted prior to any work in an excavation with a potential for a hazardous atmosphere.

EMERGENCY RESCUE EQUIPMENT

- Only properly trained employees shall assist with trench rescue.
- Emergency rescue equipment, such as breathing apparatus, a safety harness and line, or a basket stretcher, shall be readily available where hazardous atmospheric conditions exist or may reasonably be expected to develop during work in an excavation. This equipment shall be attended when in use.
- Employees entering bell-bottom pier holes, or other similar deep and confined footing excavations, shall wear a harness with a lifeline securely attached to it. The lifeline shall be separate from any line used to handle materials, and shall be individually attended at all times while the employee wearing the lifeline is in the excavation.

PROTECTION FROM HAZARDS ASSOCIATED WITH WATER ACCUMULATION

- Employees shall not work in excavations in which there is accumulated water, or in excavations in which water is accumulating, unless adequate precautions have been taken to protect employees against the hazards posed by water accumulation. The precautions necessary to protect employees adequately vary with each situation, but could include special support or shield systems to protect from cave-ins, water removal to control the level of accumulating water, or use of a safety harness and lifeline.
- If water is controlled or prevented from accumulating by the use of water removal equipment, a competent person to ensure proper operation shall monitor the water removal equipment and operations.

- If excavation work interrupts the natural drainage of surface water (such as streams), diversion ditches, dikes, or other suitable means shall be used to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation. Excavations subject to runoff from heavy rains will require an inspection by a competent person prior to entry.

INSPECTIONS

- Daily inspections of excavations, the adjacent areas, and protective systems shall be made by a competent person for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. An inspection shall be conducted by the competent person prior to the start of work and as needed throughout the shift. Inspections shall also be made after every rainstorm or other hazard increasing occurrence. These inspections are only required when employee exposure can be reasonably anticipated
- Where the competent person finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed employees shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.

FALL PROTECTION

- Walkways shall be provided where employees or equipment are required or permitted to cross over excavations. Guardrails shall be provided where walkways are 6 feet (1.8 m) or more above lower levels.

PROTECTION OF EMPLOYEES IN EXCAVATIONS

Each employee in an excavation shall be protected from cave-ins by an adequate protective system except when:

- Excavations are made in entirely stable rock or
- Excavations are less than 5 feet (1.52 m) in depth and examination of the ground by a competent person provides no indication of a potential cave-in.
- Protective systems shall have the capacity to resist without failure all loads that are intended or could reasonably be expected to be applied or transmitted to the system.

DESIGN OF SLOPING AND BENCHING SYSTEMS

The slopes and configurations of sloping and benching systems shall be selected and

Constructed by Sub Contractors of Harrington Electric Co. and shall be in accordance with the all federal, state, local and project requirements. Harrington Electric Co personnel shall consider all soils to be class C and therefore shall use the maximum allowable slope (1.5: 1) or have any excavation deeper than 4 feet supplied with proper shoring equipment. Only the Safety Department or a qualified competent person from the excavation company can certify the soil classification as other then Type "C". A written document must be provided to this effect before any Harrington Electric Co. employees start excavation. Any excavation greater than 20' will be designed by register professional engineer - option (3).

Option (1) - Allowable configurations and slopes

- Excavations shall be sloped at an angle not steeper than one and one-half horizontal to one vertical (34 degrees measured from the horizontal), unless the supervisors uses one of the other options listed below.

Option (2) - Determination of slopes and configurations

- Maximum allowable slopes, and allowable configurations for sloping and benching systems, shall be determined in accordance with the conditions and requirements set forth by soil type. Harrington Electric Co personnel will consider all soil types Class C.

Option (3) - Design by a registered professional engineer

- Harrington Electric Co personnel shall never design sloping/benching systems.
- Sloping and benching systems not utilizing Option (1) or Option (2) of this section shall be approved by a registered professional engineer.
- Designs shall be in written form and shall include at least the following:
 - The magnitude of the slopes that were determined to be safe for the particular project;
 - The configurations that were determined to be safe for the particular project;
 - The identity of the registered professional engineer approving the design.

At least one copy of the design shall be maintained at the jobsite while the slope is being constructed. After that time the design need not be at the jobsite, but a copy shall be made available to the Secretary upon request.

Design of support systems, shield systems, or other protective systems that are drawn from manufacturer's tabulated data shall be in accordance with all specifications, recommendations, and limitations issued or made by the manufacturer.

Deviation from the specifications, recommendations, and limitations issued or made by the manufacturer shall only be allowed after the manufacturer issues specific written approval.

Manufacturer's specifications, recommendations, and limitations, and manufacturer's approval to deviate from the specifications, recommendations, and limitations shall be in written form at the jobsite during construction of the protective system.

Soil Type	Height / Depth Ratio	Slope Angle
Stable Rock	Vertical	90 ⁰
Type A	¾ :1	53 ⁰
Type B	1:1	45 ⁰
Type C	1 ½ :1	34 ⁰

All temporary Spoil piles, equipment or materials, are to be at least 2' Minimum away from back from the opening of the excavation or the use of retaining devices that are sufficient to prevent materials or equipment from falling into hole.

MATERIALS AND EQUIPMENT

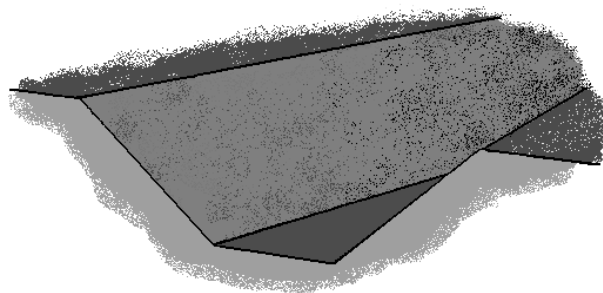
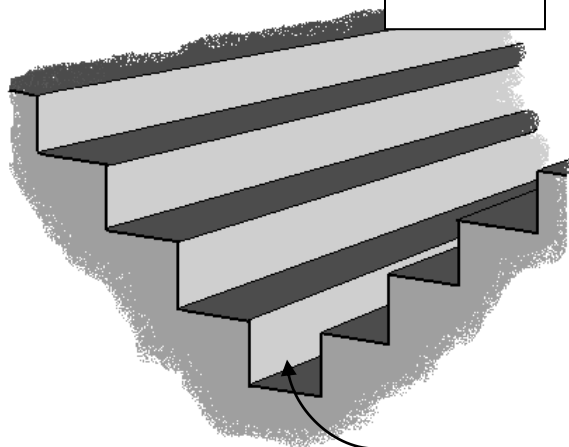
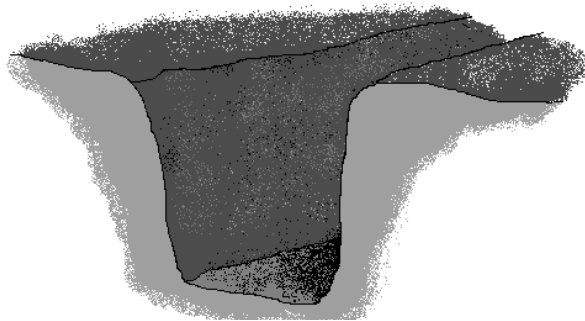
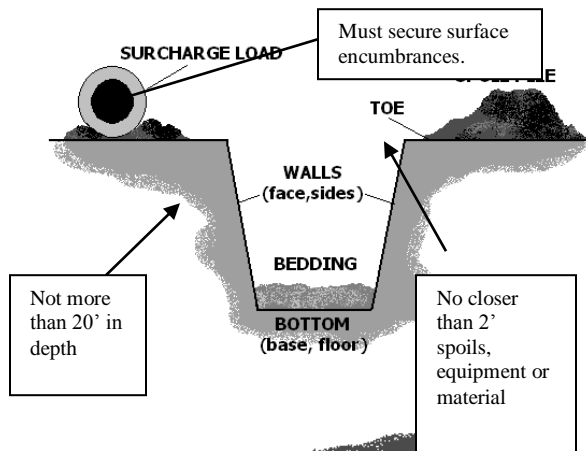
- Materials and equipment used for protective systems shall be free from damage or defects that might impair their proper function.
- Manufactured materials and equipment used for protective systems shall be used and maintained in a manner that is consistent with the recommendations of the manufacturer, and in a manner that will prevent employee exposure to hazards.
- When material or equipment that is used for protective systems is damaged, a competent person shall examine the material or equipment and evaluate its suitability for continued use. If the competent person cannot assure the material or equipment is able to support the intended loads or is otherwise suitable for safe use, then such material or equipment shall be removed from service, and shall be evaluated and approved by a registered professional engineer before being returned to service.

Coupler Safety

- Use caution around excavating equipment that utilize quick couplers. Harrington Electric Co. Sub contractor has responsibility to ensure that program is in place that will identify any wear issues related couplings and the training required to recognize such hazards associated with these devices.
- Operators shall follow a procedure to ensure the bucket is attached prior to use.
- Operators shall never swing a bucket over workers; furthermore, they shall not let workers under the bucket.
- Never operate a bucket with a defective or unsafe coupling; furthermore, never operate a bucket without the safety device in place.

Benching. There are two basic types of benching, simple and multiple. The type of soil determines the horizontal to vertical ratio of the benched side.

As a general rule, the bottom vertical height of the trench must not exceed 4 ft (1.2 m) for the first bench. Subsequent benches may be up to a maximum of 5 ft (1.5 m) vertical in Type A soil and 4 ft (1.2 m) in Type B soil to a total trench depth of 20 ft (6.0 m). All subsequent benches must be below the maximum allowable slope for that soil type. For Type B soil the trench excavation is permitted in cohesive soil only.

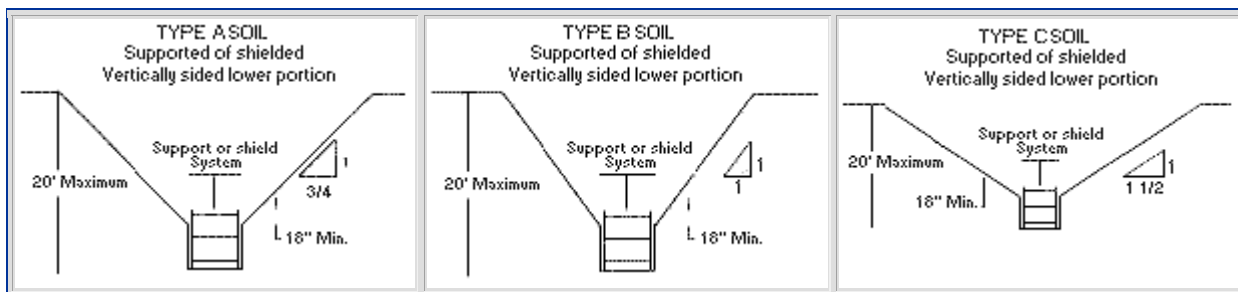


20' feet maximum depth of trench

Type "B" stepped trench no deeper than 4'

Type "C" - sloped 1 1/2 to 1

As a general rule, the bottom vertical height of the trench must not exceed 4 ft (1.2 m) for the first bench. Subsequent benches may be up to a maximum of 5 ft (1.5 m) vertical in Type A soil and 4 ft (1.2 m) in Type B soil to a total trench depth of 20 ft (6.0 m).



SECTION 16

DISCIPLINARY ACTION

The following actions shall be taken when any of the preceding safety rules have been violated:

First Time:

An oral warning will be given by the Supervisor and noted.

Second Time:

A written warning signed by both the employee and Supervisor will be entered into the file.

Third Time:

A one to three day suspension will be given to the employee.

Fourth Time:

Termination could result.

Each violation will be kept on disciplinary record for a period of one year following the infraction.

Please do your part to keep HARRINGTON ELECTRIC CO. a safe and pleasant place to work.

Remember a clean job site is a good expression of the quality of our product and is very impressive to our customers and the general public.

SAFETY DISCIPLINARY PROCEDURES

The following actions will be initiated for violation of safety rules and regulations or good safety practices as outlined by federal and state requirements: Circle the offense being issued.

First Offense:

Verbal warning (with notation)

Second Offense:

Written warning

Third Offense:

One to three day suspension

Fourth Offense:

Dismissal

Every step of the disciplinary procedure, will be fully documented with a copy placed in the job site file plus a copy sent to the Company Safety Coordinator. Reprimands for safety violations may be issued by the Foreman, the Job Superintendent, the Project Manager, any HARRINGTON ELECTRIC CO. official, and the Company Safety Coordinator. ***NO ONE shall be exempt from being issued a safety reprimand.***

All offenses will be recorded and filed in the employee's folder. Any refusal to obey safety regulations or rules will result in immediate dismissal.

DISCIPLINARY ACTION

PROJECT _____ NUMBER _____

I _____ acknowledge counseling

On this date _____ for the following reasons:

ACTION TAKEN _____

EMPLOYEE COMPANY REPRESENTATIVE _____