

SAFETY MANUAL

METRO ELECTRIC CO., INC.

P.O. Box 71228, 3350 Meeting Street Road

Charleston, SC 29415-1228

Phone: 843-554-0621

Fax: 843-554-0625

www.metroelec.net



Metro Electric Co., Inc.
SAFETY MANUAL
Table of Contents



	<u>Page</u>
Letter from the President	1
Message from the Safety Director	2
Safety Introduction	3
Safety Objective	4
Accident/Incident/Near-Miss Investigation Policy	6
<i>Employee Report of Accident Form</i>	8
<i>Supervisor's Report of Accident Form</i>	9
<i>Safety Committee Accident Investigation Report</i>	11
Accident Prevention Plan	12
Aerial Lift Safety	29
Arc Flash Safety (NFPA 70E)	38
<i>Table 1-Approach Boundaries to Live Parts for Shock Protection</i>	49
<i>Table 2-Hazard Risk Category Classifications</i>	50
<i>Table 3-Protective Clothing & PPE Matrix</i>	53
<i>Table 4-Protective Clothing Characteristics</i>	54
Asbestos Awareness Program	55
Asbestos Safety Program	58
Automotive Safety	75
Behavior-Based Job Safety Observations	78
<i>Job Safety Observation Form</i>	84
Benzene Protection Program	85
Bloodborne Pathogens	98
Cable Pulling Safety	105
Confined Space Entry Program	107
<i>Pre-Entry Checklist for Confined Spaces</i>	118
<i>Confined Space Entry Permit</i>	121
Discipline in Support of Safety	124
<i>Appendix A-Tracking of Individual Safety Disciplinary Actions</i>	129
<i>Appendix B-Five Step Discipline System</i>	130
<i>Co-Worker Warning Reprimand Form</i>	131

Driver Requirements & Safe Driving Procedures	132
Electrical Hot Work Policy	137
<i>Utility Sources-Work Normally Performed by Qualified Electrician</i>	140
<i>Energized Electrical Work Permit</i>	150
Electrical Safety	152
Emergency Action Plan	161
Environmental Policy	164
Excavation/Trenching/Shoring Safety Program	165
Eye Protection	177
Fall Protection Equipment	178
Fire Protection Program	191
First Aid, CPR & Emergency Medical Response	198
<i>Min. Requirements for Workplace First Aid Kits</i>	202
<i>Emergency Procedure for a Severed Body Part</i>	205
<i>Appendix 1-Emergency Phone List</i>	206
Fit for Duty	207
Forklift Safety	208
<i>Forklift Safety Inspection Form</i>	215
<i>Forklift Training Certificate</i>	217
<i>Forklift Safety Training Record</i>	218
<i>Forklift Performance Evaluation</i>	219
<i>Forklift Operator's Daily Equipment Checklist</i>	220
<i>Official List of Authorized Forklift Operators</i>	221
General Waste Management	222
Ground Fault Circuit Interrupters (GFCI) & Assured Grounding	224
Hand & Power Tool Safety	230
Hard Hats	240
Hazard Communication Program	241
Hazard Identification & Risk Assessment	248
Hazardous (HOT) Work Policy	252
Hearing Conservation	254
Horseplay	261
Hydrogen Sulfide Safety	262
<i>Table I-Potential Health Effects of Hydrogen Sulfide</i>	264
<i>Appendix I-Physical & Chemical Properties of Hydrogen Sulfide</i>	272
Incident Investigation & Reporting	273
Industrial Hygiene Program	278
Injury & Illness Prevention Program	282
Job Competency	288

Ladder Safety Program	290
Lead Safety	293
Lockout & Tagout/Control of Hazardous Energy	311
Manual Material Handling Policy	329
Mobile Cranes, Hoists & Rigging Safety	333
Personal Protective Equipment	351
<i>Eye & Face Protection Selection Chart</i>	356
Powder Activated Tools	359
Preventive Inspection & Maintenance	360
Process Safety Management	362
Respiratory Protection Program	384
Riders	408
Rigging Policy	409
Safety Covers for Floor Openings	411
Scaffold Safety	412
<i>Scaffolding Inspection Report</i>	420
<i>Scaffold Safety & Compliance Test</i>	422
Short Service Employee Program	432
Site Safety Inspections	435
Stop Work Authority Program	436
Subcontractor Safety Management Plan	439
Subcontractor Selection Policy	442
<i>Subcontractor Safety Program Evaluation Form</i>	443
Temporary Stair Railings & Guard Rails	446
Tugger Safety	447
Welding Safety & Hot Work	448
<i>Appendix 1-Fire Watch & Fire Protection Training</i>	458
<i>Fire Watch Test</i>	463
Working Alone	465

Metro Electric Co., Inc.
A Letter from the President



Metro Electric Co., Inc. intends to perform its work in the safest possible manner, consistent with sound construction practices. To achieve this goal, an effective safety program will be implemented at each project location. The quality of project management relates directly to our effort to promote safety and to provide a safe working environment. Supervisors should direct employees toward safe work practices with the same vigor with which they direct the construction activities.

Accidents are mostly preventable. They usually result from unsafe or inefficient procedures, physical conditions, equipment or unsafe personal acts. Accident prevention is the responsibility of everyone in the organization, from the President to the individual craftsman in the field. It's important to our success that each employee develops a sense of safety and health awareness and develops safe work habits as well. Your cooperation in this endeavor would be greatly appreciated.

Cordially,

Mike Gunther

S. Michael Gunther
President

Metro Electric Co., Inc.
Message from the Safety Director



No phase of an operation or administration is more important than accident prevention. Accidents resulting in personal injury or damage to property and equipment are a needless waste of resources and produce a negative effect on morale and productivity of employees.

The passage of the Occupational Safety and Health Act of 1970 (OSHA) and even more recently, the possible criminal prosecution of supervisors by injured employees has expanded the scope of corporate and individual liability providing a new dimension to the commitment to safety.

Accordingly, this program has been developed to promote the art of planning and executing work in a manner which will improve the protection and preservation of life, health and property.

The success of Metro Electric's Construction Safety Program depends upon the participation and cooperation of supervisors, subcontractors and craftsmen. It also depends upon everyone working as a team in carrying out the safety procedures formulated and recommended.

The result of successfully implementing these procedures will be zero injuries and increased efficiency because of fewer production interruptions resulting from accidents.

Cordially,

Winfield Scott

Winfield F. Scott
Safety Director

Metro Electric Co., Inc.

Safety Introduction



Accident prevention and industrial health are as important to Metro Electric as is quality and production. At Metro Electric, safety is never sacrificed for production. Accordingly, Metro Electric complies with the following standards:

- Complies with all federal, state and local laws and regulations pertaining to safety and health in the construction industry.
- Conducts all operations with good sense and safe practices consistent with the varied conditions, locations and circumstances of the projects.
- Provides and maintains a healthy and safe workplace.
- Always protects the public.

As a condition of employment, all employees must follow Company safety policies and rules.

In addition, all subcontractors, service contracts and purchase orders issued must comply with the requirements of our safety policy, rules and procedures. Other contractor activities must never endanger Metro Electric's employees. Employees are asked to immediately report hazardous activities or conditions to their foremen or supervisors.

Prior to beginning work involving any of the safety considerations listed in the table of contents, please review the safety material in that subject heading to be thoroughly familiar with the safety procedures to be observed.

With your support and observance of all safety procedures, Metro Electric will continue its excellent record of freedom from accidents and injuries.

Metro Electric Co., Inc.

Safety Objective



Metro Electric's objective is to provide a safe and healthy workplace for its employees. The Company will conduct business within the boundary of existing safety and health regulations and work diligently to eliminate accidents and reduce illnesses.

The Company will enlist its employees to discover and eliminate procedures or conditions which may contribute to injuries, work interruptions or damage to or destruction of equipment, material or property.

Responsibility for accomplishing this objective is assigned as follows:

Administration:

- Provides the means to carry out the above policy.
- Enforces the above policies and provides sanctions for non compliance.
- Conducts safety inspections and maintains written reports.
- Investigates accidents and maintains written reports.
- Establishes procedures for treatment of injuries.
- Develops and provides safety training for personnel.

Safety Director and Superintendents:

- Conduct weekly safety meetings at all job sites.
- Bear responsible for work safety.
- Provide necessary personal protective equipment.
- Instruct foremen individually regarding their safety responsibilities.
- Diligently maintain safety requirements at each job site.
- Review accidents with personnel involved, files reports and invokes necessary corrective action.
- Maintain current copies of federal and state safety regulations.
- Maintain familiarity with current safety regulations.

Job Foremen:

- Direct responsibility for safety at the job site.
- Monitor subordinates for compliance with safety practices.
- Daily monitor the job site for unsafe conditions .
- Responsibility for providing necessary protective equipment.
- Instruct personnel in safety procedures, requirements and compliance as a group and individually.

- Responsibility for treatment and care of injuries.
- Responsibility for accident investigation, filing reports and correcting hazards.
- Maintain familiarity with current federal and state safety regulations.

All Personnel:

- Observe all safety practices as posted and instructed while working.
- Refrain from unsafe acts that may be hazardous to other workers.
- Wear safety devices required for employee's protection.
- Report unsafe acts or situations to a foreman or superintendent immediately.
- Assume responsibility if you cause injury.
- Be an advocate of safety on and off the job.

Metro Electric Co., Inc.

Accident/Incident/Near-Miss Investigation Policy



All work-related accidents and incidents that result in personal injury, equipment, materials, environment or property damage and incidents that have a high potential for the aforementioned must be reported to the Safety Director. All accidents and incidents with high potential to result in an accident must be investigated to identify facts, determine the underlying or root cause(s), implement corrective action, and communicate to applicable people “lessons learned”.

Purpose

To ensure an adequate reporting system is in place for reporting, follow-up and investigation of injuries or incidents. Investigations are completed to describe what happened, determine the real causes, determine associated risk, develop controls to prevent recurrence, define trends, demonstrate concern, and communicate “Lesson Learned”.

Reporting Accidents and Incidents

All accidents and incidents must be reported. It is the responsibility of the supervisor to ensure that this is carried out promptly and properly. The supervisor will call the Safety Director and the Project Manager immediately or as soon as reasonably possible.

Responsibilities

The responsibilities for investigations are as follows:

1. Employee Responsibilities:

- Immediately reports to his supervisor any work-related injury/illness. This includes immediate incidents (acute injuries) such as cuts, puncture wounds, sprains, and burns as well as those that are of gradual onset (chronic) i.e., back pain or repetitive strain.
- Immediately reports to this supervisor any “near-miss” events and/or unsafe work situations and provide necessary details to the supervisor.
- Employees must assist with the investigation and completion of the accident/incident investigation report by his supervisor when requested.

2. Supervisor Responsibilities:

- The supervisor’s first priority is to ensure the well-being of his employees. Upon first becoming aware of the accident, evaluate the seriousness and nature of the accident. Where circumstances warrant an urgent response, proceed to the accident scene immediately.
- Ensure that medical attention is provided to the injured employee. The supervisor will escort the employee to the nearest facility to be met by the Safety Director. At no time is the injured employee to be sent by his/her self to the doctor without the supervisor.

- The supervisor will complete the supervisor's report of accident form and assist the employee in filling out the employee report of accident form. The supervisor will give these forms to the Safety Director.

3. Safety Director:

- The Safety Director will review all accident/incident investigation reports to ensure information is complete, understandable, and based on factual evidence.
- Maintain all accident/incident reports. Report all findings to the project managers at the weekly management meeting, safety committee meeting, and employee safety meeting. A copy of the safety committee meeting minutes will be in the company newsletter distributed to all employees with their paychecks.
- The Safety Director will train all safety committee members in accident/incident investigation procedures and investigation techniques including root cause analysis.
- The Safety Director will make all corrective measures to assure that accidents are not repeated. Serious injuries or incidents may require new policies to be written. The Safety Director will confirm completion of corrective actions.

4. Project Managers:

- All project managers are responsible for the actions of their supervisor and employees. They will review all accident/incident investigation reports.
- Project managers shall ensure that corrective measures are taken to prevent recurrence. They shall ensure that immediate and underlying causes are found, recommendations are pertinent to the accident/incident seriousness, the supervisor has signed off the investigation and prompt reporting of the accident/incident is made to the Safety Director.

5. Appendices:

We have attached the following appendices to ensure better understanding of this plan:

- Employee Report of Accident
- Supervisor's Report of Accident
- Safety Committee Accident Investigation Report

EMPLOYEE REPORT OF ACCIDENT

Instructions: Please print. Fill in all blanks. If a blank does not pertain to your accident, injury or illness please write "N/A". When completed, return this form to your supervisor.

Name: _____

Address: _____ Phone No.: _____

Date of Employment:	Time in Present Job:
Job Title:	Supervisor/Foreman:
Job Site:	Date & Time of Accident:
Location of Accident:	Task Being Performed:
Name of Witness #1:	Name of Witness #2:
Describe how the accident happened.	
What caused the accident?	
What could have prevented this accident?	
Date & time you first sought medical attention?	
Name of hospital and/or doctor?	
Were you using required safety equipment?	
Additional comments/remarks.	

The information I have provided either in my own writing or verbally for the purpose of this form is true and correct. I understand that providing false or misleading information or omission of information on this report or any other form relating to this claim of injury/accident may result in termination of my employment.

Signature of Employee: _____

Date: _____

Signature of Witness: _____

SUPERVISOR'S REPORT OF ACCIDENT

Basic Rules for Accident Investigation

- Find the cause to prevent future accidents - Use an unbiased approach during investigation.
- Interview witnesses & injured employees at the scene - Conduct a walk through of the accident.
- Conduct interviews in private - Interview one witness at a time.
- Get signed statements from all involved.
- Take photos or make a sketch of the accident scene.
- What hazards are present - What unsafe acts contributed to accident?
- Ensure hazardous conditions are corrected immediately.

Date & Time		Location	
Tasks Performed		Witnesses	
Resulted In	<input type="checkbox"/> Injury <input type="checkbox"/> Fatality <input type="checkbox"/> Property Damage	Describe Property	
Injured		Injured	
Describe Accident Facts & Events:			
Supervisor's Incident Cause Analysis <i>Check ALL that apply to this accident.</i>			
Unsafe Acts		Unsafe Conditions	
Improper work technique		Poor workstation design	
Safety rule violation		Unsafe operation method	
Improper PPE or PPE not used		Improper maintenance	
Operating without authority		Lack of direct supervision	
Failure to warn or secure		Insufficient training	
Operating at improper speeds		Lack of experience	
By-passing safety devices		Insufficient knowledge of job	
Protective equipment not in use		Slippery conditions	
Improper loading or placement		Excessive noise	
Improper lifting		Inadequate guarding of hazards	
Servicing machinery in motion		Defective tools/equipment	
Horseplay		Poor housekeeping	
Drug or alcohol use		Insufficient lighting	
Unsafe acts require a written warning and retraining before the employee resumes work.			
DATE		DATE	
Retraining Assigned		Unsafe Condition Guarded	
Retraining Completed		Unsafe Condition Corrected	
Supervisor Signature		Safety Director Signature	

Incident Report Review

Supervisor _____

Date _____

Safety Director _____

Date _____

Project Manager _____

Date _____

Management Comments:

SAFETY COMMITTEE ACCIDENT INVESTIGATION REPORT

Employee Name	Time	Date
Job Site/Location	Job #	Foreman
What happened?		
Why did it happen?		
What should be done?		
What has been done thus far?		
How will this improve operations?		
Investigated by	Date	
Safety Director Signature	Date	
Number of injuries for this employee in the last 12 months:		

Metro Electric Co., Inc.

Accident Prevention Plan



This Plan explains how the Company's Safety & Health Programs will be established, implemented, managed and maintained.

1. Statement of Company Safety Policy

1.1 Our Policy

1.1.2 Metro Electric is committed to the continuous improvement of environmental, health and safety performance to help achieve the greatest benefit for all our Clients. It is our policy to meet or exceed applicable environmental, health and pipeline safety laws and regulations, and to facilitate full and open discussion to address responsible standards and practices where laws and regulations do not exist. Accordingly, this Environmental, Health and Safety Policy is a standard by which Company employees are continually measured.

1.2 Our goals under this policy:

1.2.1 Operations

1.2.1.1 Integrate environmental, health and safety stewardship into our core business activities.

1.2.1.2 Make environmental, health and safety considerations a core component in existing operations and in the planning, design and construction of new and expanded facilities, including the integration of physical risk management into our business and decision processes.

1.2.1.3 Establish a system for total employee involvement in environmental, health and safety processes and a means to measure that participation.

1.2.2 Communications

1.2.2.1 Promote environmental, health and safety awareness among clients, customers and in the communities where we operate.

1.2.2.2 Provide environmental, health and safety training and promote awareness among all employees.

1.2.2.3 Cooperate and coordinate, in the spirit of partnership, with local, state and federal authorities on environmental, health and safety matters and incident response.

1.2.3 Evaluation

- 1.2.3.1 Incorporate critical environmental, health and safety performance metrics into our existing management reporting systems.
- 1.2.3.2 Include the achievement of high environmental, health and safety standards of excellence as a component of the performance review process for each employee.
- 1.2.3.3 Perform environmental, health and safety process assessments and independent compliance audits at a frequency appropriate to the size and nature of the operations and facilities, and implement corrective action.
- 1.2.3.4 Perform evaluations of incidents and near misses through formal investigation including the identification of basic and root causes and steps to prevent reoccurrence of a similar event.
- 1.2.3.5 Assess environmental, health and safety risks of existing operations, new business ventures and acquisitions.

- 2. Each employee is responsible for compliance with this policy and for implementing the policy within his or her area of responsibility.
- 3. The leadership of each business unit is responsible for implementing management systems with appropriate standards and procedures to carry out this policy.

President of the Company

2. Authority & Accountability

- 2.1 The President of the Company will accept the responsibility for providing resources and guidance for the development and implementation of the Safety & Health Program; selecting and designating the Company Safety Coordinator; and establishing management policies and procedures toward effective implementation of the Safety & Health Program.
- 2.2 The Safety Coordinator will be responsible for the overall implementation of the working plan. The President will have the authority to delegate portions of the Program as he deems appropriate to subordinates. However, the President will be responsible for the implementation of the Plan.
- 2.3 Company Supervisors will have the duty and authority to approve and carry out all disciplinary actions for those who violate the policies, procedures and/or rules and regulations relating to this Safety & Health Program. Supervisor responsibilities and duties relating to this safety and health program are also explained in greater detail on the following pages.

- 2.4 Each Employee will be responsible for abiding by the policies, procedures, rules, regulations and orders set forth by this Safety & Health Program. Each Employee should become actively involved in this program to assist the Company in maintaining a safe and healthful workplace environment for all involved. Individual Employee Responsibilities relating to safety and health are explained in greater detail on the following pages.
- 2.5 Contractors that perform work at a Company location are responsible for ensuring that their personnel perform this work in a manner that complies with Company safety standards, as well as federal occupational safety and health requirements and other pertinent safety and health regulations.
- 2.6 The Company Accident Prevention Plan and Safety & Health Program will be made available to all contractors for review. Likewise, each contractor will provide to the Safety Coordinator a copy of its written safety and health programs relating to work that will be performed on the Company premises.

3. **Safety Coordinator Responsibilities**

- 3.1 The President will designate an individual to serve as Safety Coordinator for Metro Electric.
- 3.2 The Safety Coordinator will be responsible for the overall implementation of the Company's Safety & Health Program. This will include taking steps to identify workplace hazards and conditions that are unsanitary, unhealthy or dangerous to Employees. When such hazards or conditions are identified, the Safety Coordinator will have responsibility to initiate timely and appropriate corrective actions.
- 3.3 The Safety Coordinator will be knowledgeable about general workplace safety and health issues. This knowledge will be gained through training and experience.
- 3.4 The Safety Coordinator will monitor and report directly to the President results of safety and health programs, training and accident prevention activities as measured by criteria such as:
 - 3.4.1 Records of new hire safety orientations and ongoing safety training activities
 - 3.4.2 The tracking of accident and "near miss" incidents
 - 3.4.3 Injury and illness incidents that are recordable on the OSHA 300 form
 - 3.4.4 Workers' compensation injury and illness initial and ongoing reports
 - 3.4.5 Insurance company loss runs and statistical analysis
- 3.5 Safety Coordinator responsibilities include, but will not be limited to:
 - 3.5.1 Conduct or schedule to be conducted, safety inspections, surveys, audits and assessments throughout the Company workplace.
 - 3.5.2 Review safety inspection reports and unsafe or unsanitary conditions that are reported by Supervisors, Employees or others. Obtain corrective actions as needed.

- 3.5.3 Resolve questions, approve and/or recommend necessary expenditures to correct unsafe conditions.
- 3.5.4 Actively support and promote Company safety and health programs and activities.
- 3.5.5 Plan, coordinate, perform and/or delegate safety training of Supervisors and Employees.
- 3.5.6 Maintain appropriate training and testing records for each Employee.
- 3.5.7 Report unsafe Employee practices and/or behaviors to their respective Supervisors.
- 3.5.8 Review and monitor any disciplinary actions and/or remedial training.
- 3.5.9 Conduct or delegate regular safety meetings with Supervisors and Employees to promote safety awareness and compliance with the Safety & Health Program.
- 3.5.10 Investigate or cause the investigation of at-work accidents, injuries, illnesses and “near miss incidents. Assist as needed when these investigations are performed by Supervisors or others.
- 3.5.11 Review investigation reports to determine possible preventative actions. Take immediate corrective actions as required.
- 3.5.12 Ensure that reportable injuries are being documented on applicable state workers’ compensation forms and OSHA forms 300A, 301 and 300 as required.
- 3.5.13 Review the safety and health programs of contractors before they perform work on a Company premises. Contractor safety and health programs must meet OSHA requirements. They should be effective in protecting contractor personnel and also Company Employees who may be exposed to hazards associated with work performed by contractors.

4. Supervisor Safety Responsibilities

- 4.1 Supervisors will be responsible for following and promoting safety rules, policies and safe work procedures throughout the Company workplace.
- 4.2 For purposes of this program, the term “Supervisors” will be defined as any Employee who has the authority to direct the work of other Employees.
- 4.3 Supervisors will be concerned about the safety and welfare of fellow Employees in the Company workplace. Consequently, if a Supervisor observes a hazard or safety violation in an area outside of his or her direct authority, he or she will report this to the Supervisor in charge of the work area and then to the Safety Coordinator.

- 4.4 If the hazard or violation presents an immediate danger to life or health, the Supervisor observing the danger will intervene immediately to the extent necessary to prevent injury or harm to persons without causing danger to him or herself. This protection of persons is of primary importance! Preventing damage to Company facilities and/or property is a secondary priority.
- 4.5 Any observed hazard requiring corrective action that is outside the Supervisor's authority and/or ability to correct or eliminate, will be immediately reported to the Safety Coordinator.
- 4.6 Supervisor job responsibilities include:
 - 4.6.1 Help ensure compliance with Company safety rules and safe work procedures through daily supervision of Employees. Take corrective and disciplinary action as needed.
 - 4.6.2 Conduct and/or assist in the safety orientation of new hires about department safe work practices and potentially hazardous conditions within the assigned work area. This includes ensuring that personal protective equipment (PPE) is either issued or available to new hires and re-assigned Employees. Initial safety training of new and re-assigned Employees will be completed before they begin duties in the Company workplace.
 - 4.6.3 When possible, correct unsafe conditions anywhere they are observed in the workplace. If the situation involves another Supervisor's area of responsibility, or if additional authorization or resources are required, inform the Safety Coordinator or, in the Safety Coordinator's absence the senior Supervisor in charge of overall Company operations.
 - 4.6.4 Help ensure that all accidents, injuries and "near miss" incidents are reported by Employees.
 - 4.6.5 Investigate reported accidents and "near miss" incidents in accordance with Company policies and procedures.
 - 4.6.6 If an injury requires more than self-administered first aid, make sure that the Employee receives first aid and medical attention as needed. This may include taking the injured Employee to the Company's designated medical provider, or arranging for transportation. Report any such incident to the site Safety Representative immediately.
 - 4.6.7 In emergency situations, alert and cooperate with emergency medical, fire and/or police. Notify the Company Safety Coordinator promptly after meeting immediate needs of the emergency.
- 4.7 All Supervisors will work to develop and support safety awareness throughout the workplace. This includes maintaining an open and responsive attitude when Employees ask about or raise safety issues.
- 4.8 All Supervisors will set a good example with respect to safety by their personal behavior. This includes wearing personal protective equipment in areas where it is required, and personally complying with Company safety policies and safe work procedures.

5. Employee Safety Responsibilities

- 5.1 Management considers the health and safety of each Employee to be a Company core value. All Employees will share and respect this Company value.
- 5.2 Employees must assume primary responsible for their own safety because no other person can fulfill this role. Employees must make every initiative to protect their own safety and that of their fellow workers.
- 5.3 Employees will learn, understand and follow Company safety rules and safe work procedures. This includes maintaining an awareness of the potential hazards pertaining to their work assignment. Safety compliance is a condition of employment at the Company.
- 5.4 Employees are not required to perform any task that they believe to be dangerous or unsafe.
- 5.5 Below are other individual Employee safety responsibilities:
 - 5.5.1 Employees will perform those duties assigned by the Company through its Supervisors.
 - 5.5.2 Employees will utilize personal protective equipment (PPE) when it is required.
 - 5.5.3 Before beginning special work or new assignments, Employees will review applicable and appropriate safety rules.
 - 5.5.4 If an Employee has any question about how a task should be done safely, he or she must suspend work on the task until he or she has discussed the situation with his or her Supervisor. Together, the employee and the Supervisor will determine the safest way to accomplish the task.
 - 5.5.5 After discussing a safety situation with his or her Supervisor and site Safety Representative, if the Employee still has questions or concerns regarding the task, he or she will be permitted to notify the Company Safety Coordinator. Unsatisfactory answers and/or additional concerns will be directed to the President of the Company.
 - 5.5.6 If an Employee observes what he or she believes is a hazardous condition, unsafe work practice, defective machine, tool, vehicle, facility or equipment in the workplace, he or she will report this immediately to his or her Supervisor.
 - 5.5.7 If the Supervisor is not immediately available, Employees will take action as necessary to protect others from what they believe is the hazard. This may include taking a malfunctioning machine or tool out of service so that it is not used by someone else. The Employee then will notify a Supervisor or the site Safety Representative at his or her earliest opportunity, and no later than the end of the day's shift.

6. **Safety Meetings**

- 6.1 Meetings with Employees will be conducted periodically to discuss safety, health, environmental and security issues concerning Company operations. The primary function of these meetings is to promote safety awareness and communication throughout the workplace.
- 6.2 Employees and Supervisors will attend safety meetings. Safety meetings will be conducted by the site Safety Representative, Supervisor or some other person designated by the Safety Representative or management.
- 6.3 Should a scheduled meeting have to be postponed, it will be held later on a date and at a time determined by the Safety Representative.
- 6.4 Safety meetings will include ongoing Employee safety training and discussions to encourage safety awareness. Meetings will also address specific safety issues raised by Employees.
- 6.5 A written attendance record, signed by each Employee, will be maintained as documentation for every safety meeting.

7. **Employees Reporting a Hazard Are Protected**

- 7.1 The purpose of this section is to state Company policy and procedure regarding protection for Employees who report a safety hazard. It affects all organizational units of Company operations.
- 7.2 Policy & Procedures
 - 7.2.1 It is the policy and philosophy of the Company that every Employee must feel secure and comfortable in reporting a known or perceived safety hazard to his or her Supervisor, to higher management within the Company, and to any appropriate governmental authority.
 - 7.2.2 To this end, and to protect the legitimate rights, health and safety of every Employee, it is the policy of the Company that no person will discharge or in any manner discriminate against any Employee who reports or calls to the attention of management what he or she believes to be a safety or health hazard; or any unsafe, unhealthy condition or situation in the workplace.
 - 7.2.3 Furthermore, no person will discharge or in any manner discriminate against any Employee because such Employee has filed any complaint, instituted or caused to be instituted any proceeding under or related to state or federal occupational health and safety law, has testified or is about to testify in any such proceeding, or because of the exercise by such Employee on behalf of himself or others of any right afforded by state or federal law.
 - 7.2.4 Any Employee who feels he or she has been discriminated against for any of the above reasons should report this directly to the Company Safety Coordinator or an appointed alternate.
 - 7.2.5 The intention of this policy is to support legitimate Employee comments, suggestions and complaints, and to ensure protection against illegal discrimination.

- 7.2.6 At the same time, the Company will take appropriate action in response to the filing of a false claim, or a claim with little merit that Company management judges to have been filed primarily to harass the Company, an individual Employee or Supervisor.

8. Access to Employee Exposure & Medical Records

- 8.1 Employees and former Employees of the Company who are, have been or may be exposed to toxic substances or harmful physical agents, have direct access to exposure and medical records maintained by the Company, as required by OSHA Standard 1910.1020.
- 8.2 Company Employees will be informed of the existence, location and availability of these records. Employees will be informed of their rights to have to access to these records. Request for these records will be made in writing.
- 8.3 "Access" will mean the right and opportunity to examine and copy. Access to Employee medical and exposure records will be provided in a reasonable manner and place. Access will be provided as promptly as possible. If access cannot be provided within 15 days after the Employee's request, the Company will state the reason for the delay and the earliest date that the records will be made available.
- 8.4 Responses to initial requests, and new information that has been added to the initial request, will be provided without cost to the Employee or their designated representative. At the sole discretion of the Company, Employees requesting access will be given records and the use of mechanical copying facilities so that the Employee may copy the records; or lend Employees their records for copying off the premises. Additionally, medical and exposure records will be made available, on request, to authorized OSHA representatives to examine and copy.
- 8.5 Regarding exposure records, if no such records exist for the Employee making written request, the Company will provide records (if such exist) of other Employees who have job duties/environment similar to those of the requesting Employee. Medical records relevant to the Employee requesting access will be provided to this Employee, their designated representative, or to authorized representatives of OSHA, under guidelines and provisions contained in 1910.1020(e)(2)(ii). Access to the medical records of another Employee will be provided ONLY if specific written consent can be obtained from that Employee.
- 8.6 The Employee requesting access, their designated representative, or OSHA will also have access to analyses (if any such exist) that were developed using information from exposure or medical records about the Employee's working conditions or workplaces. Personal identities, such as names, addresses, social security and payroll numbers, age, race and sex will be removed from the data analyses prior to access.
- 8.7 A copy of 29 CFR 1910.1020 is maintained by the Company for general reference and review by Employees. It is available to any Employee upon request.

9. Safety & Health Self-Inspections

9.1 The Company has implemented a program to identify, correct and control hazards on an ongoing basis.

9.1.1 Safety & Health Self-Inspections

9.1.1.1 Supervisors in each department and job site will conduct scheduled "in-house" safety and health self-inspections at least monthly in their area(s) of responsibility. Inspection will include, but will not be limited to: any tools, equipment, machinery, operating procedures and any existing and/or potential hazards on the work site, or working conditions that are unsanitary, hazardous or dangerous to Employees.

9.1.1.2 Each department/location will develop and maintain one or more self-inspection checklists specific to its operation. The list will be developed utilizing a general inspection checklist and will be evaluated and updated with hazards that are identified during the inspections, and from other pertinent data (injury reports, "near misses," Employee observations and suggestions) as such information is acquired.

9.1.1.3 Contents of checklists will be reviewed on a regular basis to ensure that they are current and updated. Checklists will become a part of the permanent record of the inspection and will serve as one confirmation of the self-inspection.

9.1.1.4 Each checklist will indicate the location or specific site or area surveyed, name and title of the inspector, date and time of the inspection, corrective action(s) taken for specific hazards or violations, and specific person(s) either initially informed or assigned to make sure that corrective actions are effectively implemented.

9.1.1.5 The self-inspection report will be forwarded to the Company Safety Coordinator for use in trend analysis and recordkeeping.

9.1.1.6 Employees will be notified of any hazard that poses an immediate threat of physical harm or property damage, and be informed of measures or steps taken to eliminate, correct or control the hazard.

9.1.1.7 The Safety Coordinator will review self-inspection checklists to confirm that any required corrective action has been completed.

10. Accident Reporting & Investigations

10.1 The Company will investigate all work-related accidents, injuries and near miss incidents involving Employees or other persons; or significant damage to Company property. The company will ensure all equipment and materials need to conduct a proper investigation will be readily available. This investigation will be used to develop preventive measures and implement corrective actions.

10.2 Reporting

10.2.1 All Employees are required to report any of the following to their immediate Supervisor as quickly as possible and without delay:

10.2.1.1 Accidents or incidents resulting in injury or illness of any magnitude (including first aid related cases); Employees who could be first responders should be trained and qualified in first aid techniques.

10.2.1.2 Accidents or incidents resulting in significant property or equipment damage; and

10.2.1.3 Any near miss incidents that could potentially have resulted in injury or illness to an Employee, or damage to property.

10.2.1.4 After injured personnel are attended to maintenance personnel should be summoned to assess integrity of buildings and equipment, engineering personnel to evaluate the need for bracing of structures.

10.3 Accident Investigation

10.3.1 The site Supervisor and Safety Representative will be responsible for conducting accident investigations that occur in areas that affect Employees under their supervision. Upon notification of an accident or near miss incident, the Safety Representative and/or Supervisor, will begin an investigation to determine the following:

10.3.1.1 How the accident or incident occurred;

10.3.1.2 Reporting of the incident must occur in a specified manner and the reporting sequence must be posted. For example, in the event of an incident, the following are contacted in order: 911, department supervisor, section manager, company physician, security, human resources, safety department, and other organizations as required. The employer must also verbally report required incidents to OSHA within 8 hours of their discovery. Incidents must also be reported to the Owner Client as soon as possible or in a timely manner (OSHA requires reporting of work related incidents resulting in the death of an employee or the hospitalization of three or more employees. within 24 hours of incident).

10.3.1.3 Special circumstances involved;

10.3.1.4 Underlying, indirect or associated causes; and

10.3.1.5 Corrective actions or preventive measures and controls indicated by investigation results.

10.3.2 Accidents and incidents involving situations where multiple Supervisors are affected, such as an Employee of one area injured in another area, will be investigated as a joint effort directed and overseen by the Company Safety Coordinator.

10.4 Documentation

10.4.1 All activities and findings of the investigations will be documented and recorded for review by the Safety Coordinator.

10.4.2 Accident and incident investigation documentation will record, as a minimum, the following information:

10.4.2.1 Date of occurrence;

10.4.2.2 Name of person(s) involved, job title, area assigned and length of experience in the Company with this job;

10.4.2.3 Location of occurrence;

10.4.2.4 Nature and severity of injury or illness;

10.4.2.5 Name of Supervisor(s) involved in the investigation;

10.4.2.6 Job assignment or duties being performed at time of incident;

10.4.2.7 A list of any Personal Protective Equipment and/or operator certification(s) required for this job or assignment, and whether the person(s) involved were using this PPE and/or held current certifications as required;

10.4.2.8 Special circumstances or encumbrances;

10.4.2.9 Details of how the accident or incident occurred;

10.4.2.10 Equipment affected or involved;

10.4.2.11 Written statements shall be of the person(s) injured or directly involved (unless unavailable due to injury);

10.4.2.12 Names and written statements of witnesses;

10.4.2.13 All evidence such as photos witness statements shall be kept secure.

10.4.2.14 Apparent direct cause;

10.4.2.15 Apparent indirect, underlying or contributing factors – “root causes” (including fault or failure in Safety & Health Program elements); and

10.4.2.16 Incident investigations should result in corrective actions, individuals should be assigned responsibilities relative to the corrective actions, and

these actions should be tracked to closure. Lessons learned should be reviewed and communicated to prevent reoccurrence or similar events.

11. Analysis & Review

- 11.1 Company management and the Safety Coordinator will periodically review and analyze records and documentation pertaining to ongoing implementation of the Safety & Health Program, accidents, injuries and near miss incidents.
- 11.2 Management will also ensure Personnel be trained in their roles and responsibilities for incident response and incident investigation techniques. Training requirements relative to incident investigation and reporting (Awareness, First Responder, Investigation, and training frequency) should be identified in the program.
- 11.3 This review will focus on hazard analysis and recognition of any developing trends.
- 11.4 Trend analysis will identify recurring accidents and near miss incidents resulting in, or potentially involving injury, illness or property damage.
- 11.5 The analysis also will be used to identify deficiencies in program components so that enhancements can be made as needed.
- 11.6 This process will include review of Employee training records to ensure that new hire and safety procedures training are being accomplished in accordance with Company requirements.

12. Orientation & Training

- 12.1 The Company will provide initial safety and health orientation and related ongoing training to Employees at all levels of the organization.
- 12.2 The Safety Coordinator will develop, implement and maintain the safety and health orientation and training programs. These are intended to educate and familiarize Employees with safety and health procedures, rules and safe work practices established for Company operations.
- 12.3 Management will encourage and require participation of all Employees.
- 12.4 Management will support the safety orientation and training programs with sufficient allocations of time and funding for effective implementation.
- 12.5 Training & Development
 - 12.5.1 Safety and health orientations and training will be developed to inform Employees about:
 - 12.5.1.1 Potential hazards associated with the work area;
 - 12.5.1.2 Potential hazards associated with specific job or task assignments;
 - 12.5.1.3 Emergency procedures;

- 12.5.1.4 Personnel Protective Equipment (PPE) required for specific tasks or assignments;
 - 12.5.1.5 Hazard Communication Standard (Right-to-Know) information about chemicals used in the workplace;
 - 12.5.1.6 Specific equipment operations and/or competent person training related to Employee tasks or job assignments;
 - 12.5.1.7 Company safety rules and safe work procedures;
 - 12.5.1.8 Employee reporting requirements regarding safety hazards, accidents, injuries and near miss incidents;
 - 12.5.1.9 Accident investigation procedures and requirements; and
 - 12.5.1.10 Personnel health monitoring requirements as applicable to a task or job assignment.
- 12.5.2 Employee safety and health training will be implemented in three ways -- New Hire Safety & Health Orientation; Reassigned Personnel Safety and Health Orientation; and Ongoing / Annual Safety & Health Training.
- 12.5.2.1 New Hire Safety & Health Orientation
 - 12.5.2.1.1 New Hire Safety Orientation Training will be administered to all new Employees prior to the initial work assignment.
 - 12.5.2.1.2 The orientation will consist of all required training programs as well as job and site-specific safety and health information.
 - 12.5.2.1.3 New Hire Orientation includes an overview of the Safety & Health Program, plus explanation of Individual Employee Safety Responsibilities; the written Hazard Communication Standard (Right-to-Know) Program; General Safe Working Procedures; Job-Specific and Site-Specific Safety and Health Procedures (including special training about Company safety and safe work procedures); Fire Extinguisher Training and Emergency Response Procedures.
 - 12.5.2.1.4 All New Hires will be given a tour of the facility/job site and an opportunity to pose questions to the site Safety Representative or Supervisor as needed to help the new Employee understand safety and health information, rules, policies and procedures.

12.5.2.2 Reassigned Personnel Safety & Health Orientation

12.5.2.2.1 Personnel who are given a new work assignment will receive an orientation on safety rules and safe work procedures relating to these new duties.

12.5.2.2.2 This is referred to as the REASSIGNED PERSONNEL SAFETY ORIENTATION. In addition to job specific safety training, reassigned personnel will receive information/training on the chemical hazards and emergency procedures for the reassigned work area.

12.5.2.3 Ongoing Safety & Health Training

12.5.2.3.1 Employees will participate and be involved in ongoing safety and health training at the Company. This type of activity provides both refresher training and reinforcement of safe work procedures. It also helps communicate new information and general safety awareness.

12.5.2.4 Annual Safety & Health Training

12.5.2.4.1 Annual training and re-certification training will be developed and/or reviewed by the Safety Coordinator.

12.5.2.4.2 Annual training topics may include, but may not be limited to the following:

12.5.2.4.2.1 Hazard Communication

12.5.2.4.2.2 Proper Selection and Use of Personal Protective Equipment

12.5.2.4.2.3 Responding to Injuries and Illnesses at Work – First Aid and CPR Options

12.5.2.4.2.4 Blood borne Pathogens Awareness

12.5.2.4.2.5 Fire Safety, Prevention and Response

12.5.2.4.2.6 Electrical Safety

12.5.2.4.2.7 Control of Hazardous Energy – Lockout and Tagout

12.5.2.4.2.8 Emergency Response, Evacuation and Shelter In Place Procedures

12.5.2.4.2.9 Housekeeping for Safety / Safe Walking and Working Surfaces

- 12.5.2.4.2.10 Material Handling/Preventing Back Injuries
- 12.5.2.4.2.11 Machine Guarding and Safe Operations of Powered Equipment
- 12.5.2.4.2.12 Ergonomics in the Company Workplace
- 12.5.2.4.2.13 Preventing Violence In The Workplace
- 12.5.2.4.2.14 Heat Related Illnesses
- 12.5.2.4.2.15 Stairs and Ladder Safety / Fall Protection
- 12.5.2.4.2.16 Office Safety

12.5.2.5 Documentation Of Training

- 12.5.2.5.1 The Safety Coordinator will maintain a written record of safety training taken by each Employee during the year.
- 12.5.2.5.2 Employee safety and health training will be documented with at least the following information:
 - 12.5.2.5.2.1 Date of training session;
 - 12.5.2.5.2.2 Provider (name of person conducting training and affiliation, if not an Employee of the Company);
 - 12.5.2.5.2.3 Subject matter;
 - 12.5.2.5.2.4 Legible name of attendee(s) and supplemental identification if needed or required;
 - 12.5.2.5.2.5 Printed name and signature of Employee as acknowledgment of attendance.
- 12.5.2.5.3 Individual training records will be maintained for the duration of employment plus three years.

13. Concepts About General Safety & Specific Duty Training

- 13.1 The Safety & Health Program is designed to provide detailed information to Employees about the Company's safety related policies, as well as to serve as a training guide and reference source.
- 13.2 The program presents GENERAL SAFETY TRAINING to Employees about health and safety subject matter that pertains to all Company operations.

- 13.3 Job-specific or task-specific safety and health orientation is presented as SPECIFIC DUTY TRAINING. It is provided to Employees who are assigned to work in jobs or at tasks that require specialized safety/health knowledge, understanding and proficiency.
- 13.4 Examples of these types of assignments include operation of heavy equipment, cranes and hoists; forklift operator safety training and certification; performance of lockout and tagout procedures for authorized persons; excavation safety training and certification; confined space entry safety training and certification; use of powered equipment and tools; and vehicle operations when in the course and scope of employment with the Company.
- 13.5 Employees will receive both types of training based upon and before they begin a job assignment.

14. Recordkeeping

- 14.1 The Company believes that the only valid means of reviewing and identifying trends and deficiencies in a safety program is through an effective Recordkeeping Program. The recordkeeping element is also essential in tracking the performance of duties and responsibilities under the Program.

The Company is committed to implementing and maintaining an active, up-to-date Recordkeeping Program. Therefore, all documents and records applicable to the Company will be submitted and maintained on file for verification purposes at the address given below:

Metro Electric Co., Inc.
Attn: Recordkeeping
3350 Meeting Street Road
Charleston, SC 29506

14.2 Injury & Illness Data

- 14.2.1 The Personnel Department will maintain records of all work-related Employee injuries and illnesses.
- 14.2.2 The following records are applicable only to work-related injuries and illnesses:
 - 14.2.2.1 OSHA 300 Log or Recordable Injuries and Illnesses, or equivalent if required;
 - 14.2.2.2 OSHA 301 Injury and Illnesses Incident Report, or equivalent if required;
 - 14.2.2.3 OSHA 300A Summary of Work-Related Injuries and Illnesses, or equivalent if required; and
 - 14.2.2.4 State workers' compensation and insurance carrier forms (as appropriate)
- 14.2.3 The OSHA 300 Log, an Annual Log of Recordable Injuries and Illnesses, or an equivalent record, will be maintained at each job site for not less than five (5) years. The OSHA 301 Injury and Illness Incident Report, or an acceptable equivalent, will be established bearing a case number correlating with the case identifier on the

OSHA 300 Log and all pertinent and required information. The information contained or entered on these records will be made current within six working days of a recordable incident.

14.2.4 A copy of the completed and signed OSHA 300 annual summary must be posted in each establishment in a conspicuous place or places where notices to Employees are customarily posted. The Company will ensure that the posted annual summary is not altered, defaced or covered by other material.

14.2.5 The completed and signed OSHA 300 annual summary will be posted no later than February 1 of the year following the year covered by the records. The posting will remain in place until April 30.

14.3 Other Safety-Related Records

14.3.1 The Company will maintain and review records of safety audits and inspections that are conducted within or that affect the Company, employees or facilities.

14.3.2 The Company will document and maintain records of safety and health related Employee training. This documentation will be maintained as proof of attendance and for review to assist in determining the need for additional or recurring training for Employees on an individual basis.

14.3.3 The Company will maintain records and documentation of accident and incident investigations.

14.3.4 The Company will maintain records and data pertaining to equipment and maintenance programs performed at each workplace. Applicable forms and records are:

14.3.4.1 Routine inspection and maintenance records;

14.3.4.2 Documentation of services performed by contract agreement; and

14.3.4.3 Documentation of repair and replacement of parts or equipment.

15. Annual Review & Revision of Program Elements

15.1 At least yearly, the Safety Coordinator, management and other designated Company personnel will review and revise the components of the Accident Prevention Plan and the Safety & Health Program for effective implementation.

15.2 Specific attention will be devoted to the introduction of new procedures, processes and equipment, as well as indications that a program component needs revision or updating.

15.3 Information for this review process will be solicited from Supervisors and Employees.

Metro Electric Co., Inc.

Aerial Lift Safety



Applicable OSHA Standards: 29 CFR 1926.453 and 1910.67

1. Purpose

- 1.1 This program establishes the minimum requirements for the safe operation of aerial lifts by Metro Electric Co., Inc. and contractor personnel in a Company workplace.
- 1.2 This program also establishes requirements for the training and certification of personnel who are authorized by the Company to operate aerial lifts; and requires that such training, certification and authorization take place BEFORE individual employees or contractor personnel perform any type of operation involving the use of aerial lifts at a work location. This will be done to prevent accidents, injuries and damages caused by the unsafe operation of this equipment.

2. Scope

- 2.1 Company and contractor personnel designated under these procedures will be instructed in the safety significance, priority, rules and safe work practices for safe operations of aerial lifts.
- 2.2 Each new or transfer-affected employee who is required to operate aerial lifts in the workplace will be trained, certified and authorized by the Company in the manner established by this program.

3. Responsibilities

- 3.1 This program establishes specific responsibilities for designated personnel. As the individual who has ultimate authority over all operations in a Company workplace or job site, the Site Supervisor is responsible for ensuring that this Aerial Lift Safety program is implemented as explained herein.
- 3.2 The Site Supervisor will designate individuals within the Facility organization to assist in this implementation. Delegations include:
 - 3.2.1 Company supervisors will be responsible: for initial proficiency training for the operation of aerial lifts; for authorization of specific individuals who are determined by the supervisor to be trained and proficient in aerial lift operations; and for implementation of all Aerial Lift Safety policies and procedures established under this program throughout their respective areas of supervisory responsibility.
 - 3.2.2 Individuals who have demonstrated to their supervisor competency to operate aerial lifts and scissor lifts to which they will be assigned to do work will be required to successfully complete Aerial Lift Safety Training presented by the Company Safety Representative.

- 3.2.3 Company supervisors may designate specific personnel under their management authority to assist in the implementation of these responsibilities.
- 3.2.4 The Company Safety Representative is responsible for either providing or obtaining specific safety training to personnel who have been designated by Company supervisors to serve as aerial lift operators. The manner of individual safety training, testing and operator observation will be as established by this program.

4. Aerial Lift Specifications

- 4.1 Aerial lifts acquired for use on or after January 22, 1973 will be designed and constructed in accordance with American National Standards for "Vehicle Mounted Elevating and Rotating Work Platforms," ANSI A92.2-1969, including appendix.
- 4.2 Aerial lifts acquired before January 22, 1973 which do not meet these requirements will not be used unless they have been modified and conform to applicable design and construction requirements of ANSI A92.2-1969.
- 4.3 When aerial lift equipment has an obstructed view to the rear, the vehicle will have either a reverse signal alarm that is audible above the surrounding noise level or, an observer will be utilized to signal the operator when it safe to back up.

5. Safety Training

- 5.1 Only trained and authorized operators will be permitted to operate aerial lifts. Methods will be devised to train operators in the safe operation of this equipment. This training will include:
- 5.2 Information about federal Occupational Health and Safety (OSHA) regulations contained in 29 CFR-1910.67 (Vehicle-mounted elevating and rotating work platforms).
 - 5.2.1 Basic principles and safe work procedures about aerial lifts.
 - 5.2.2 Pre-work or pre-task operator inspection procedures for aerial lifts.
 - 5.2.3 Safe work procedures for utilization of aerial lifts by authorized personnel.
 - 5.2.4 Safe operations procedures regarding aerial lift operations in proximity to other personnel, pedestrians, electrical sources, obstructions and other situations that have the potential to present hazards or cause complications to the task.
 - 5.2.5 Aerial lift and other related safety procedures that pertain to specific work assignments at customer/host employer work locations.
 - 5.2.6 Recognizing hazards that specifically relate to aerial lift operations.
- 5.3 Individual participants in Aerial Lift Safety Training will be given written materials that follow information presented during classroom instruction, and will complete a written test given immediately following classroom instruction. To successfully complete this safety training, participants will pass this test with a score that is acceptable to the Company Safety Coordinator.

6. Certification Process

- 6.1 Basic Competency at Aerial Lift Operations: Determined by the on-site Company supervisor after sufficient direct observation and, as required, basic training on the operation of aerial lift so that, in the opinion of the supervisor, the individual Operator is ready to complete the Safety Training requirements.
- 6.2 Safety Training Classroom Instruction: This is the portion of the certification process involving a Safety Trainer designated by the Company Safety Coordinator. This Trainer will present Classroom Instruction and then give each Class Participant a written test to help confirm basic understanding of the information presented. The Trainer will issue written certification for each Participant who successfully completes the Classroom Instruction and passes the Test (at a minimum score determined by the Safety Coordinator).
- 6.3 Direct Observation for Certification: This will be conducted by the instructor or someone specifically designated by the Safety Coordinator. The Site Supervisor will concur with the certification of each individual Powered Lift Operator. Operators certified by the Company will be issued a written certification that identifies them as a Company-certified Aerial Lift Operator.

7. Certification Documentation

- 7.1 The Company will use written documentation of a certificate, wallet card and/or badge to readily identify individuals who are certified to operate specified types of powered equipment.
- 7.2 Operators of aerial lifts, who are designated and authorized by their Company supervisor and have successfully completed Aerial Lift Safety Training as specified in this program, will be issued such documentation to be worn or carried on their person when using this equipment in a Company workplace.

8. Qualifications of Aerial Lift Operators

- 8.1 Only trained and authorized persons will be permitted to operate aerial lifts. Operators of aerial lifts will be qualified as to visual, auditory, physical, and mental ability to operate the equipment safely.
- 8.2 Only those employees determined by the Company supervisor to be competent by reason of training and experience to operate aerial lifts will be permitted to operate such equipment. Exception: Employees being trained and supervised by a designated person may operate such machinery and give signals to operators during training.
- 8.3 No employee known to have defective uncorrected eyesight or hearing, or to be suffering from heart disease, epilepsy, or other ailments which may suddenly incapacitate him, will be permitted to operate an aerial lift.
- 8.4 The primary responsibility of the operator is to use aerial lifts safely following the instructions given in the training program.
- 8.5 Unsafe or improper operation of an aerial lift can result in: death or serious injury to the operator or others; damage to product, facilities or other property.

9. General Requirements of Operation for Aerial Boom Lifts

- 9.1 Operators will be trained and authorized in accordance with this program before they are permitted to use aerial lift equipment.
- 9.2 A malfunctioning lift will be shut down until repaired.
- 9.3 The controls will be plainly marked as to their function.
- 9.4 Lift controls will be checked and tested each day prior to use to determine that they are in safe operating condition.
- 9.5 All personnel in the platform will wear an approved safety harness with lanyard attached to the platform attachment point. The lanyard selected will be of a restraint-type system that allows for positioning so that the operator cannot “bounce” or fall from the basket; or be rigged in such a way that the operator can neither free fall more than 6 feet, nor contact any lower level.
- 9.6 Selection of fall protection will be made to comply with these requirements while the personnel basket is at any level during raising and lowering – not just the maximum height of the task.
- 9.7 The manufacturer’s specified load limits for booms and baskets will not be exceeded.
- 9.8 Instruction on warning placards must be legible.
- 9.9 Aerial lifts will be used only as intended by the manufacturer. Lifts will not be “field modified” for uses other than those intended by the manufacturer unless such modifications have been approved and certified by the manufacturer or an equivalent authority.
- 9.10 Aerial lifts will not be used near electric power lines unless the lines have been de-energized or adequate clearances are maintained. For electrical lines rated 50 kV or below, the minimum clearance distance between the lines and any part of the lift or any extension is 10 feet. A safe distance of 10 to 35 feet or more between the lift and power lines will be determined as appropriate to allow for swaying power lines and/or platform movement.
- 9.11 Employees using aerial lifts will be instructed on how to recognize and avoid unsafe conditions and hazards.
- 9.12 Ground controls will not be operated unless permission has been obtained from personnel in the platform (except in case of emergency).
- 9.13 Daily inspection of the area lift will be performed.
- 9.14 Personnel will always stand on the floor of the platform (not on boxes, planks, railing, or other devices).

10. **Driving/Towing**

- 10.1 Always post a lookout when driving in areas where vision is restricted.
- 10.2 Assure that machine is in stowed position and turntable is secured when towing.

- 10.3 Beware of clearances when traveling or towing.
- 10.4 Always position boom in line with direction of travel.
- 10.5 Always secure turntable prior to any extended traveling.
- 10.6 Keep your eyes and mind fixed on the direction of travel.
- 10.7 Do not permit personnel on machine or in platform when towing.
- 10.8 Machine must be mechanically assisted when traveling grades exceed 15 degrees.
- 10.9 Do not travel or drive machine on soft or uneven surfaces as tipping can occur.
- 10.10 Assure steer/tow selector valve pulled out; drive hubs disconnected prior to starting tow operations. Special Note: Towing permitted only for emergency travel on job site. No highway towing permitted.

11. Operation

- 11.1 Maintain safe clearance from electrical lines and apparatus. You must allow for platform sway and rock or sag in electrical lines.
- 11.2 This machine is not electronically insulated.
- 11.3 You must maintain a clearance of at least ten feet between any part of the machine or its load and any electrical line or apparatus carrying up to 50,000 volts. One foot additional clearance will be given for each additional 30,000 volts.
- 11.4 Allow only persons who are authorized and qualified to operate the machine. These are individuals who have demonstrated that they understand proper operation maintenance of the unit.
- 11.5 Do not mechanically block the platform foot switch.
- 11.6 Do not use the boom for any purpose other than positioning personnel (people) and their tools and equipment.
- 11.7 Check clearances above and on sides and bottom of platform when raising, lowering, swinging and telescoping boom.
- 11.8 Check tail swing (counterweight) clearance before swinging turntable.
- 11.9 Keep mud, oil, grease and slippery substances cleared from your footwear and/or the platform deck.
- 11.10 To avoid falling, use extreme caution when entering and leaving the platform. Enter and exit through gate only.
- 11.11 Know your weight (people and tools). Do not exceed manufacturer's rated platform capacity. Refer to capacity indicator, on boom or mounted in platform control console.

- 11.12 Do not operate a malfunctioning machine. If a malfunction occurs, shut down machine and notify proper authorities.
- 11.13 Do not allow ground personnel in areas around and under the raised platform.
- 11.14 Approved hard hats will be worn by all operating and ground personnel.
- 11.15 Make sure machine is positioned on a firm, level, and uniform supporting surface before raising or extending the boom, if not, tipping can occur.
- 11.16 Read and obey all warnings, cautions, and operating instructions on the machine and in the individual lift operation and safety manufacturer's manual.
- 11.17 Be familiar with locations and operation of all safety and override controls.
- 11.18 Machine should always be shut off when refueling. No smoking is permitted. Do not refuel during an electrical storm. Be sure that caps are closed and secure at all other times.
- 11.19 Do not attempt to free the machine by lifting it off the ground with the boom.
- 11.20 Do not attach wire, cable, or any similar items to a platform for lifting purposes.
- 11.21 When riding in or working from platform, both feet must be firmly positioned on the deck floor. Do not sit or climb on rails or the edge of the basket.
- 11.22 Do not use ladders, boards or other component placed on the rails or deck floor to raise the working surface higher than the deck floor. This can compromise fall protection provided by the height of the railing or basket containment.
- 11.23 Always use a safety harness as fall protection when working in an aerial lift. Secure the harness lanyard to the proper attachment point on the platform -- NEVER to an adjacent object or structure.
- 11.24 Do not use the drive or telescope features of the machine to move either the machine or other objects.
- 11.25 Do not operate any machine on which danger, warning, caution or instruction placards or decals are missing or not readable.
- 11.26 Do not pull the machine or other objects by attaching wire, cable or similar means to the platform, then retracting and extending the boom.
- 11.27 Do not attempt to use the boom for crane functions.
- 11.28 Do not "walk the boom" to gain access to or leave the platform.
- 11.29 Do not slam the control lever through neutral to the opposite direction. Return lever to neutral, stop and then proceed.
- 11.30 Do not position ladders, steps, or similar items in the platform to provide additional reach for any purpose.

11.31 Always operate controls with slow, even pressure.

11.32 Stow the boom and shut off all power before leaving the machine.

12. Scissor Lifts

12.1 Pre-start Inspection.

12.2 Conduct a walk around inspection at the beginning of each shift prior to using a scissor lift. This inspection should include the following:

12.2.1 Check scissor end joints for cracks and broken weld points.

12.2.2 Check the hydraulic cylinders, hoses and fittings.

12.2.3 Check drive axles, wheels and hubs for loose, damaged or missing parts.

12.2.4 Check tires for cracks, cuts, bulges and proper inflation.

12.2.5 Check the battery for cables that might be frayed or have broken insulation.

12.2.6 Make sure that the terminal posts are not loose on the battery.

12.2.7 Check for corrosion and cracking around the battery terminals.

12.2.8 On propane or diesel powered lifts, check the fuel tank for cracks, broken welds or any damage.

12.2.9 Checks on fuels systems should always be conducted outdoors, not indoors.

12.2.10 Make sure there is a fire extinguisher on hand, in the event of a fire.

12.2.11 Check outriggers, stabilizers and guardrails.

12.2.12 Read the rating capacity, and the placard.

12.3 After conducting the walk around inspection, test to make sure the lift is working correctly by elevating it from the ground controls. This test should be conducted for any lift that has been in service for three months or 150 hours. Any lift that has been out of service for three months or longer should be inspected by a qualified mechanic prior to use.

12.4 Control boxes should be readily accessible to the operator. If a control box is not permanently attached, its normal location should be clearly marked.

12.5 Check the controls prior to operation of the lift. The movement controls should automatically return to “off” or “neutral” when released. Upper controls should be protected against accidental operation from ground level. Ground level controls should have some type of device to prevent someone from operating the device from ground level while workers are in the lift, operating controls from the control box.

- 12.6 The operator must know the rating capacity.
- 12.7 The lift must be equipped with a capacity brake that will prevent it from moving while on a slope.

13. Training Specific to Scissor Lifts

- 13.1 All new employees whose job requires them to operate a scissor lift must be trained on the functions and hazards of the scissor lift prior to being authorized to operate one.
- 13.2 Operators should always read the manufacturer's manual prior to his or her first use of the equipment.
- 13.3 Scissor lift operators must understand the concept of stability which includes factors such as height, weight and conditions.
- 13.4 Inspect the work area for hazards such as drop offs, bumps, debris or other obstacles on the floor.
- 13.5 Check for areas with high voltage or any overhead obstructions before proceeding with driving the scissor lift or raising or lowering the platform.
- 13.6 Be alert for any electrical hazard and always keep a distance of 10 to 35 feet between the lift and any power lines. Add more distance to account for swaying power lines and/or platform movement.

14. Fall Protection Relating to Scissor Lifts

- 14.1 Fall protection is mandatory when working on or operating a scissor lift. Follow these basic rules regarding fall protection while operating or working on a scissor lift.
- 14.2 Make sure that guard rails are in place.
- 14.3 Make sure you are tied off to the lift, not to an adjacent structure.
- 14.4 Do not place a load on the platform that is heavier than the capacity rating provided by the manufacturer and posted on the unit.
- 14.5 Ensure that all loads, including tools, are evenly distributed on the platform.
- 14.6 When driving the lift to the work site, make sure the route to the work area is not obstructed.
- 14.7 Watch out for other traffic on the job site.
- 14.8 Make sure pedestrians are at least 6 feet away from the lift.
- 14.9 Do not drive the lift on a slope or grade that exceeds the level indicated on the placard.
- 14.10 Do not drive the lift in a confined area, or in reverse, and do not operate at high speeds on a grade.

- 14.11 Yield the right of way if another lift or vehicle is traveling close by.
- 14.12 Position the lift chassis upon arriving at the work location.
- 14.13 Check the overhead, side and below to determine the clearance available when raising or lowering the lift.
- 14.14 Do not climb on the scissor arms in order to get on the platform.
- 14.15 Do not stand on boxes, ladders, planks or railings on the platform.
- 14.16 Platforms must be within one foot of the adjacent structure before attempting to enter the structure.
- 14.17 Do not leave cords from power tools hanging off the platform.
- 14.18 The lift operator is responsible for all machine operations on the lift.
- 14.19 Before raising or lowering the platform, make sure other employees on the lift with you are aware that the platform is going to move. Check the equipment and structures before raising or lowering.
- 14.20 Retract the stabilizers and leveling jacks prior to moving the lift.

Metro Electric Co., Inc.

Arc Flash Safety (NFPA 70E)



Applicable Standards: NFPA 70E (the "Standard for Electrical Safety in the Workplace", 2004) and OSHA CFR 1910.135, 1910.303, 1910.335, 1910.333, 1910.5 and 1926 Subpart K

1. Purpose, Scope & Implementation

- a. Metro Electric Co., Inc. has established this policy to outline and implement measures to be taken to ensure protection electrical shock, arc flash and arc blast exposure.
- 1.2 This program applies to all Company-controlled worksites where Qualified and Non-Qualified personnel work on or near energized electrical equipment or systems (50 volts or more). This Program is not intended to address all of the regulatory requirements or applicable guidelines of the Company's written Electrical Safety Program for Qualified and Non-Qualified employees.
- 1.3 The Company Safety Coordinator is responsible for implementation of program components and safe work procedures; proper selection and use of protective equipment; training of employees who may encounter electrical hazards during their work routine (specifically for those performing electrical work); and making program updates and modifications as required.

2. Definitions

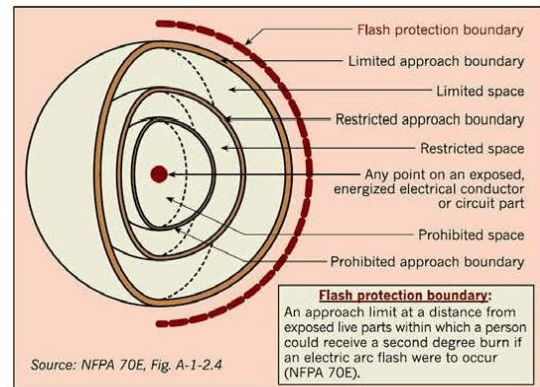
- 2.1 Arc Flash Hazard - a dangerous condition associated with the possible release of energy caused by an electric arc.
- 2.2 Arc Flash Hazard Analysis - a study investigating a worker's potential exposure to arc flash energy, conducted for the purpose of injury prevention and the determination of safe work practices, arc flash protection boundary, and the appropriate levels of PPE.
- 2.3 Arc Flash Protection Boundary - an approach limit (distance) from an energized part within which a person could receive a second degree burn if an arc would occur.
- 2.4 Arc Flash Suit - a complete FR clothing and equipment system that covers the entire body, except for the hands and feet. This includes pants and jacket, and beekeeper-type hood fitted with a face-shield.
- 2.5 Arc Rating - the value attributed to materials describing their protective performance when exposed to an arc flash (in cal/cm²).
- 2.6 Barricade - a physical obstruction such as tapes, cones, or A-frame-type wood or metal structures intended to provide a warning about and to limit access to a hazardous area
- 2.7 De-energized - free from any electrical connection to a source of potential difference and from electrical charge; not having a potential different from that of the earth
- 2.8 Electrical Equipment or Systems - equipment or systems operating at 50 volts or more

2.9 Electrical Hazard - a dangerous condition such that contact or equipment failure can result in electric shock, arc flash burn, thermal burn, or blast

2.10 Energized Parts - electrically connected to or having a source of voltage

2.11 Flame Resistant (FR) - the property of a material which prevents, terminates, or inhibits combustion when a source of ignition is applied

2.12 Flash Protection Boundary - an approach limit at a distance from exposed live parts within which a person could receive a second degree burn if an electrical arc flash were to occur



2.13 High Risk Operations - OSHA considers contact with over 300 volts a high risk operation

2.14 High Voltage Electrical Work - work on associated electrical conductors and equipment operating at or intended to operate at a sustained voltage of more than 600 volts between conductors

2.15 Limited Approach Boundary - an approach limit at a distance from an exposed live part within which a shock hazard exists

2.16 Live Parts - exposed energized electrical conductor or circuit part

2.17 Non-Qualified Personnel - personnel who may be exposed to electrical hazards or work within limited approach boundaries but who are not authorized as Qualified Personnel or Qualified Electrical Workers

2.18 Personal Protective Equipment (PPE) - includes, but is not limited to electrically rated or FR head protection, eye and face protection, gloves, sleeves, leather protectors, footwear, work clothing, rain gear, hot sticks with fittings, personal safety grounds, barriers, mats, insulated blankets, insulated tools, and face protective products

2.19 Prohibited Approach Boundary - an approach limit at a distance from an exposed live part within which work is considered the same as making contact with the live part

2.20 Qualified Electrical Worker - a Qualified person with a minimum of two years of training and experience with high-voltage circuits and equipment under the supervision of another Qualified electrical worker and who has demonstrated by performance familiarity with the work to be performed and the hazards involved.

They must be able to distinguish exposed live parts, determine their nominal voltage, maintain approach distances, properly use energy isolation procedures and special precautionary techniques, and properly use PPE, insulating and shielding materials, insulated tools, grounding devices, and test equipment.

2.21 Qualified Personnel - one who has skills and knowledge related to the construction and operation of the electrical equipment and installations and has received safety training on the hazards involved.

- 2.22 Restricted Approach Boundary - an approach limit from an exposed live part exposing Qualified Personnel to increased risk of shock.

3. Specific Responsibilities & Requirements

- 3.1 The Company Safety Coordinator, supported by Supervisors and assisted as required by designated individuals trained and knowledgeable in arc flash hazards, NFPA 70E requirements and electrical safety, will fulfill the following responsibilities:
- 3.1.1 Develop and implement a written electrical safety program as required for Company facilities, projects and site-specific situations.
 - 3.1.2 Implement a permit program for all work on live parts (other than testing, troubleshooting and voltage measuring by Qualified Personnel) with affected Employees.
 - 3.1.3 Develop baseline training for Non-Qualified employees regarding arc flash hazard recognition and safe work procedures in accordance with NFPA 70E.
 - 3.1.4 Ensure that the program elements are incorporated into subcontractor safety requirements as part of subcontractor review and selection processes.
 - 3.1.5 Identify Qualified Personnel, Qualified electrical workers, and Non- Qualified Personnel.
 - 3.1.6 Identify high risk operations and locations where work on energized parts could occur over 300 volts.
 - 3.1.7 Complete a written electrical safety program as required for work assignments, projects and site-specific situations.
 - 3.1.8 Implement a permit program for work on live parts other than testing, troubleshooting, and voltage measuring by Qualified Personnel.
 - 3.1.9 Provide baseline training for Qualified Personnel, Qualified Electrical Workers, and Non-Qualified personnel.
 - 3.1.10 Identify and provide appropriate personal protective equipment (PPE) for Qualified Personnel and Qualified Electrical Workers, and require its use.
 - 3.1.11 Provide for and monitor the use of PPE and other protective safety devices.
 - 3.1.12 Complete an arc flash hazard analysis and update as the system, work assignment or project requires.
 - 3.1.13 Label all equipment and components in Company facilities that present arc flash hazards. At host employer facilities or work locations, identify and communicate to assigned personnel equipment and components that have been labeled as electrical arc hazards.

- 3.1.14 Identify limited, flash protection, prohibited and restricted approach boundaries in Company facilities. At host employer facilities or work locations, identify and communicate to assigned personnel equipment and components that have been labeled as arc flash hazards.
 - 3.1.15 As required for the work assignment, ensure that consultants provide training on electrical arc hazard analysis to all electrical workers.
 - 3.1.16 Determine the frequency for reassessing electrical equipment and components.
 - 3.1.17 For Company facilities, provide surveillance of program elements including training, hazard assessment and labeling on an ongoing basis.
- 3.2 As required by the work assignment or project, Qualified Personnel and Qualified electrical workers will:
- 3.2.1 Ensure that unqualified persons do not enter spaces where only Qualified employees are allowed access except when electrical sources, equipment, contacts and conductors in that area are either de-energized or in an electrically safe work condition.
 - 3.2.2 Ensure that Qualified electrical workers are the only employees who may perform high voltage work (600 volts or more).
 - 3.2.3 Ensure that two Qualified electrical workers are present during high voltage work (600 volts or more).
 - 3.2.4 At Company facilities, establish limited, prohibited and restricted approach boundaries with barricades, which provides flash protection boundaries. At host employer facilities or work locations, identify and communicate to assigned personnel the location of any such established boundaries in their respective work area(s).
 - 3.2.5 Employees will avoid limited approach boundaries unless supervised by Qualified Personnel or a Qualified electrical worker; and, always wear flash protection while maintaining prohibited, and restricted approach boundaries.
 - 3.2.6 Only qualified persons will be allowed to complete tasks such as testing, troubleshooting, and voltage measuring within the limited approach boundary.
- 3.3 When working at a host employer facility or work location, the Company Safety Coordinator or Site Supervisor will notify the host contact person about any arc flash hazard discovered and not previously anticipated pertaining to the assignment. This includes any arc flash hazard discovered that the host employer did not communicate prior to start of work.
- 3.4 Upon notification by a host employer of an arc flash hazard or potential, the Site Supervisor will communicate abatements or mitigations to the host's designated contact or safety representative. The Company Safety Coordinator will be contacted and assist in consideration of any such reported hazard and development of the abatement and/or mitigation. This will be done to correct existing hazard(s) and to prevent a reoccurrence.

4. Training

- 4.1 Training represents one of the most important aspects of any safety program. Electrical safety training should occur as either classroom or on-the-job training. However, the specialized nature of the field requires that an electrician or someone working in the electrical field conduct a large portion of the training.
- 4.2 The Company Safety Coordinator can assist in coordinating the training with the specialist, and can cover many Non-specialty training elements, such as: regulatory requirements, injury potential, emergency procedures, Non-Qualified Personnel training, and basic elements of training for Qualified Personnel and Qualified electrical workers.
- 4.3 Any trainer, consultant or provider conducting this training must document all employees' attendance (by printed name and signature); training date and location; successful completion of training; and demonstration of proficiency. They will provide the Company Safety Coordinator with a copy of these records.
- 4.4 Training documentation and records will be maintained at least for the duration of the employee's tenure.
- 4.5 Training curriculum, content and presentation will be based on the type of employee work for which training is required. Training elements will be:
 - 4.5.1 Non-Qualified Personnel Training Elements
 - 4.5.1.1 Limited approach boundaries (See Table 1 below)
 - 4.5.1.2 Types of electrical injuries.
 - 4.5.1.3 Recognition of electrical hazards.
 - 4.5.2 Qualified Personnel Training Elements.
 - 4.5.2.1 Completion of all training elements for Non-Qualified Personnel.
 - 4.5.2.2 Specific hazards associated with electrical energy and how they relate to injury potential and injury types.
 - 4.5.2.3 Safety-related work practices.
 - 4.5.2.4 Procedural requirements to determine voltage of exposed live parts and to differentiate them from other parts.
 - 4.5.2.5 How to distinguish exposed energized electrical conductors and circuit parts from other parts of electrical equipment.
 - 4.5.2.6 How to determine the nominal voltage of exposed energized electrical conductors and circuit parts.

- 4.5.2.7 Limited approach, flash protection, prohibited and restricted approach boundaries requirements as explained in Table 1 below.
- 4.5.2.8 Decision-making factors for determining the degree and extent of the hazard and personal protective equipment
- 4.5.2.9 Decision tree for planning the work.
- 4.5.2.10 How to select and properly use voltage meters and detectors with hands-on demonstrations to confirm capabilities and limitations for verifying absence of voltage.
- 4.5.2.11 Task specific hazards, precautions, and arc flash potential. Tasks performed less than once per year require re-training prior to performing the task. Refer to Job Safety Analysis (JSA) for specific task.
- 4.5.2.12 Barricade requirements.
- 4.5.2.13 Lockout/Tagout procedures.
- 4.5.2.14 Use of PPE, insulating and shielding materials, and insulated tools and test equipment based on the hazard.
- 4.5.2.15 Emergency procedures.
- 4.5.2.16 Methods to release victims from contact with exposed energized electrical conductors or circuit parts.
- 4.5.2.17 Recognizing signs and symptoms of electric shock, heart fibrillation, electric burns, and proper first aid protocols for these conditions.
- 4.5.2.18 CPR training.
- 4.5.3 Qualified Electrical Worker Training Elements.
 - 4.5.3.1 Completion of all training elements for Qualified Personnel.
 - 4.5.3.2 Minimum of two years of training and experience with high-voltage circuits and equipment.
 - 4.5.3.3 Demonstration by performance familiarity with the work to be performed and the hazards involved. Tasks performed less than once per year require re-training prior to performing the task.

4.6 Retrain employees on any required element when:

- 4.6.1 They are not complying with safety-related work practices.

- 4.6.2 Changing work conditions require safety-related work practices different than those that are normally used.
- 4.6.3 The employee must use safety-related work practices not normally used during regular job duties.
- 4.6.4 Not to exceed 3 years from previous training.
- 4.7 Completion of arc flash analysis triggers the following training:
 - 4.7.1 A two-day training session for Qualified Personnel and Qualified Electrical Workers, supervisors, and safety personnel.
 - 4.7.2 A half-day session for Non-Qualified Personnel and management.

5. Program Elements

- 5.1 Hazard/Risk Evaluation - Employees shall identify the hazards through a risk evaluation and analysis process before they work within Limited Approach Boundaries or with any electrical hazards. Evaluation will include assessment of the severity of the arc hazard, as well as likelihood and methods necessary to mitigate. This evaluation will be used to determine the level and type(s) of protection required.
- 5.2 Electrical Safety Auditing - Management shall audit all elements of the electrical safety program at a risk-based frequency to ensure that the principles and procedures are being followed. Management shall make the appropriate program revisions based on those observations and/or conclusions.
- 5.3 Operation Verification - Employees performing work under these standards shall verify operation of the test instrument before and after test instruments are used for the testing of voltage on conductors or circuit parts operating at 50 volts or more. This is to confirm that test equipment and accessories meet ANSI/ISA-61010-1 requirements for rating and design requirements for voltage measurement and test instruments designed for use on electrical systems of 1000 volts and less.
- 5.4 Electrical Work Permit - A written work permit will be used whenever electrically energized components, conductors or circuit parts are not in a zero-energy state. Any such work situation will be considered as energized electrical work and conducted only under a written permit procedure.
- 5.5 Lockout/Tagout (LOTO) -- Hazardous energy appears in the workplace in the form electrical, mechanical, pneumatic, hydraulic and thermal energy and includes chemical, water, steam and gaseous energy systems. LOTO procedures prevent the unexpected energizing, start up or release of stored energy that could cause injury to employees working on said equipment. The Company has established a LOTO Program to safeguard employees from hazardous energy while they are performing service or maintenance on machines and equipment. The purpose of this program is to identify the practices and procedures necessary to shut down and LOTO machines and equipment. It requires that employees receive training in the LOTO program and requires that periodic inspections be conducted to maintain and enhance the program.

- 5.6 Personal Protective Equipment (PPE) -- PPE used for electrical work shall comply with the standards given in Table 130.7 (C) (8) of NFPA 70E, Standard for Electrical Safety in the Workplace (see Table 2 below). PPE used for electrical insulation will be inspected prior to each use. Insulating gloves also will be tested by holding the sleeve closed and squeezing each glove to check for "pin hole" leaks of air that could allow electrical entry. Additionally, whenever an incident occurs that has the potential to damage PPE, the equipment will be re-tested.
- 5.7 PPE will be inspected and tested on the following schedule:
- 5.7.1 Insulating blankets - prior to issue and every 12 months thereafter;
 - 5.7.2 Insulating gloves - prior to issue and every six months thereafter;
 - 5.7.3 Insulating sleeves - prior to issue and every 12 months thereafter.
 - 5.7.4 Covers and line hose - whatever damage or defect is observed, or there is a reason to suspect that insulating value has been compromised.
- 5.8 A flash hazard analysis shall form the basis of PPE selection or NFPA 70E Table 130.7 (C) (10). See Table 2.
- 5.9 Prior to beginning work with arc flash hazard potential, a safety meeting will be conducted with all Company employees and subcontractor personnel involved. Presentation and discussion will include:
- 5.9.1 Identification of the specific arc flash hazards anticipated;
 - 5.9.2 What PPE is required;
 - 5.9.3 How electrical sources are controlled; and
 - 5.9.4 Task-specific safety work procedures.
- 5.10 Qualified Personnel normal work clothing will include:
- 5.10.1 FR long-sleeve shirt (minimum arc rating of 4) worn over an untreated cotton T-shirt with FR pants (minimum arc rating of 8); or,
 - 5.10.2 FR coveralls (minimum arc rating of 4) worn over untreated cotton T-shirt (or an untreated natural fiber long sleeve-shirt) with untreated natural fiber pants.
- 5.11 Qualified Personnel and Qualified Electrical Workers shall not wear Non-FR clothing that will ignite or melt when exposed to an arc flash.
- 5.12 Approach Boundaries to Live Parts (NFPA 70E, 130.2).
- 5.12.1 A properly trained employee shall not approach or take any conductive object closer to exposed live parts (operating at 50 volts or more) than the Restricted Approach Boundary listed in Table 1 below unless ANY of the following apply:

- 5.12.1.1 The properly trained employee is insulated or guarded from the live parts operating at 50 volts or more and no un-insulated part of the employee's body crosses the Prohibited Approach Boundary listed in Table 1 below, or
- 5.12.1.2 The live part operating at 50 volts or more is insulated from the employee and from any other conductive object at a different potential.
- 5.12.2 Approach by untrained persons: When an untrained person is working at or close to the Limited Approach Boundary, the supervisor in charge of the job shall advise the untrained person of the electrical hazard.
- 5.13 Adequate illumination to perform work safely will be provided and utilized as required.
- 5.14 Employees will not go into a location where there is an electrical hazard when illumination is not adequate for working safely.
- 5.15 If inadequate illumination or obstructed vision prevents observation of work, no work will be performed inside the Limited Approach Boundary where energized electrical conductors or circuit parts at 50 volts or greater, or if there is an electrical hazard.

6. Coordination with OSHA Compliance (based on OSHA interpretations)

- 6.1 Although the NFPA 70E consensus standard has not been adopted as an OSHA standard, it is relevant as evidence that arc flash is a recognized hazard, and that PPE is necessary to protect against that hazard. Application of other OSHA standards and requirements will be taken into account to ensure safety of employees from arc flash. Other potentially applicable OSHA regulations include the General Duty Clause, personal protective equipment (PPE), electrical safety and other requirements. OSHA standards and interpretations will be considered when planning for and executing safety planning and implementations.
- 6.2 No employee will be permitted to work in such proximity to any part of an electric power circuit that he or she could contact the electric power circuit in the course of work, unless the employee is protected against electric shock by de-energizing the circuit and grounding it or by guarding it effectively by insulation or other means.
- 6.3 While OSHA Subpart K does not address the hazard that an arc flash poses to employees, compliance with Subpart K requirements have the effect of reducing the likelihood of an arc flash.
- 6.4 29 CFR 1926.95(a) provides that protective equipment, including personal protective equipment for eyes, face, head, and the extremities, protective clothing, respiratory devices, and protective shields and barriers, shall be provided, used, and maintained in a sanitary and reliable condition wherever it is necessary by reason of hazards of processes or environment, which the Company has determined includes arc flash.
- 6.5 NFPA 70E's Table 130.7(C)(9)(a), Hazard/Risk Category Classifications (referenced above and included as Table 2 below) lists the task, "Work on energized parts, including voltage testing" and assigns it a "Hazard/Risk Category" of "1" or higher.

Under Table 130.7(C)(10), included below as Table 3, that categorization triggers various PPE provisions, including non-melting clothing, flame-resistant clothing, and other protective equipment. (See also Table 4 below, Protective Clothing Characteristics.)

Consequently, NFPA 70E is evidence that the industry recognizes the hazard of arc flash, that this hazard is present when testing voltage, and that, when present, it is necessary for PPE to be used to protect the employee from it.

- 6.6 Because arc flash hazard varies with site-specific factors, NFPA 70E will be used for assessing the factors in a specific situation and determining what protection to use.
- 6.7 A defective circuit breaker can cause an arc flash. If an employee may be exposed to risk when fixing a defective breaker or turning it on or off, NFPA 70E calls for a flash hazard analysis (or use of PPE under its table of tasks) to be performed in order to determine the risk level and the appropriate PPE.
- 6.8 NFPA 70E 130.3 states: A flash hazard analysis shall be done in order to protect personnel from the possibility of being injured by an arc flash. The analysis shall determine the Flash Protection Boundary and the personal protective equipment that people within the Flash Protection Boundary shall use.
- 6.9 Flash Protection Boundary. For systems that are 600 volts or less, the Flash Protection Boundary shall be 4.0 ft, based on the product of the clearing times of 6 cycles (0.1 second) and the available bolted fault current of 50 kA or any combination not exceeding 300 kA cycles (5000 ampere seconds). For clearing times and bolted fault currents other than 300 kA cycles, or under engineering supervision, the Flash Protection Boundary shall alternatively be permitted to be calculated in accordance with the following general formula:

$$D_c = [2.65 \times MVA_{bf} \times t]^{1/2} \text{ or}$$

$$D_c = [53 \times MVA \times t]^{1/2}$$

Where:

D_c = distance in feet from an arc source for a second-degree burn

MVA_{bf} = bolted fault capacity available at point involved (in mega volt-amperes)

MVA = capacity rating of transformer (mega volt-amperes). For transformers with MVA ratings below 0.75 MVA, multiply the MVA transformer rating by 1.25

t = time of arc exposure (in seconds)

Once the risk of exposure is assessed, the employer must then provide PPE in accordance with the results of the analysis. NFPA 70E §130.3(B) states, "...The flash hazard analysis shall determine, and the employer shall document, the incident energy exposure of the worker (in calories per centimeter).

"Flame-resistant (FR) clothing and personal protective equipment (PPE) shall be used by the employee based on the incident energy exposure associated with the specific task."

As an alternative, the PPE requirements of 130.7(C)(9) shall be permitted to be used in lieu of the detailed flash analysis approach described in 130.3(A).

As provided in the last sentence of section 130.3(B), NFPA 70E also provides an alternative analysis to determine PPE requirements.

If the task to be performed has a high probability of arc flash occurrence, the charts under 130.7(C)(9) and (10) can be used to determine the appropriate PPE.

Section 130.7(C)(9)(a) states in part, "When selected in lieu of the flash hazard analysis of 130.3(A), Table 130.7(C)(9)(a) shall be used to determine the hazard/risk category for a task. The assumed short-circuit current capacities and fault clearing times for various tasks are listed in the text and notes to Table 130.7(C)(9)(a).

For tasks not listed, or for power systems with greater than the assumed short-circuit current capacity or with longer than the assumed fault clearing times, a flash hazard analysis shall be required in accordance with 130.3".

Although this analysis uses a worst case scenario to determine the need for PPE, if the breaker has more than the assumed short-circuit current capacity or longer than the assumed fault clearing times, the charts will be of no use, and the flash hazard analysis under 130.3 would need to be done.

The employer must consider several factors in determining which analysis to perform. The risk of injury largely depends on the amount of energy available to the breaker, how old it is, how well it was maintained, and the task that is to be performed, among other factors.

For example, a house with 240-volt service and a well-maintained breaker may typically have 10,000 amps available; in most such situations, there will be little arc flash risk when simply turning the switch on or off.

In contrast, a commercial building with an equally well-maintained breaker typically will have 40,000 amps, which poses greater risk.

In addition, switching a breaker on may carry more risk than turning a breaker off.

In sum, arc flash can be a significant danger under certain circumstances, and the provisions above are evidence of its recognition by the industry.

One way for an employer to meet its obligations under 1926.95(a)⁴ would be to use the NFPA 70E method of measuring the risk and determining the appropriate PPE.

When using the arc flash hazard analysis approach, the employer may determine in some circumstances that, when turning off a breaker, there is little risk and no PPE is needed.

However, all the relevant factors, including those referred to above, need to be considered.

Alternatively, the employer may use the NFPA table instead of conducting the analysis, in which case some PPE would be required, even for the voltages below 240 V.

TABLE 1
Approach Boundaries to Live Parts for Shock Protection
NFPA 70E Table 130.2 (C)

Nominal System Voltage Range, Phase to Phase	Limited Approach Boundary		Restricted Approach Boundary	Prohibited Approach Boundary
	<i>For Exposed Movable Conductor</i>	<i>For Exposed Fixed Circuit Part</i>		
Less than 50V	Not specified	Not specified	Not specified	Not specified
50 to 300V	10 ft. 0 in.	3 ft. 6 in.	Avoid Contact	Avoid Contact
301 to 750V	10 ft. 0 in.	3 ft. 6 in.	1 ft. 0 in.	0 ft. 1 in.
751V to 15KV	10 ft. 0 in.	5 ft. 0 in.	2 ft. 2 in.	0 ft. 7 in.
15.1KV to 36KV	10 ft. 0 in.	6 ft. 0 in.	2 ft. 7 in.	0 ft. 10 in.

TABLE 2
Hazard/Risk Category Classifications
NFPA 70E Table 130.7 (C)(10)

Task (Assumes equipment is energized, and work is done within the flash protection boundary.)	Hazard/Risk Category	V-rated Gloves	V-rated Tools
<i>Panelboards Rated 240V & Below - Notes 1 & 3</i>			
Circuit breaker (CB) or fused switch operation with covers on	0	N	N
CB or fused switch operation with covers off	0	N	N
Work on energized parts, including voltage testing	1	Y	Y
Remove/install CBs or fused switches	1	Y	Y
Removal of bolted covers (to expose bare, energized parts)	1	N	N
Opening hinged covers (to expose bare, energized parts)	0	N	N
<i>Panelboards or Switchboards Rated >240V & up to 600V (with molded case or insulated case circuit breakers) - Notes 1 & 3</i>			
CB or fused switch operation with covers on	0	N	N
CB or fused switch operation with covers off	1	N	N
Work on energized parts, including voltage testing	2*	Y	Y
<i>600V Class Motor Control Centers (MCCs) - Notes 2 (except as indicated) and 3</i>			
CB or fused switch or starter operation with encl. doors closed	0	N	N
Reading a panel meter while operating a meter switch	0	N	N
CB or fused switch or starter operation with enclosure doors open	1	N	N
Work on energized parts, including voltage testing	2*	Y	Y
Work on control circuits with energized parts 120V or below, exposed	0	Y	Y
Work on control circuits with energized parts >120V, exposed	2*	Y	Y
Insertion or removal of individual starter "buckets" from MCC- Note 4	3	Y	N
Application of safety grounds, after voltage test	2*	Y	N
Removal of bolted covers (to expose bare, energized parts)	2*	N	N
Opening hinged covers (to expose bare, energized parts)	1	N	N
<i>600V Class Switchgear (with power circuit breakers or fused switches) - Notes 5 & 6</i>			
CB or fused switch operation with enclosure doors closed	0	N	N
Reading a panel meter while operating a meter switch	0	N	N
CB or fused switch operation with enclosure doors open	1	N	N
Work on energized parts, including voltage testing	2*	Y	Y
Work on control circuits with energized parts 120V or below, exposed	0	Y	Y
Work on control circuits with energized parts >120V, exposed	2*	Y	Y
Insertion or removal (racking) of CBs from cubicles, doors open	3	N	N
Insertion or removal (racking) of CBs from cubicles, doors closed	2	N	N
Application of safety grounds, after voltage test	2*	Y	N
Removal of bolted covers (to expose bare, energized parts)	3	N	N
Opening hinged covers (to expose bare, energized parts)	2	N	N

Task (Assumes equipment is energized, and work is done within the flash protection boundary.)	Hazard/ Risk Category	V-rated Gloves	V-rated Tools
<i>Other 600V Class (277V thru 600V, nominal equip.) - Note 3</i>			
Lighting or small power transformers (600V, maximum)	--	--	--
Removal of bolted covers (to expose bare, energized parts)	2*	N	N
Opening hinged covers (to expose bare, energized parts)	1	N	N
Work on energized parts, including voltage testing	2*	Y	Y
Application of safety grounds, after voltage test	2*	Y	N
Revenue meters (kW-hour, at primary voltage and current)	--	--	--
Insertion or removal	2*	Y	N
Cable trough or tray cover removal or installation	1	N	N
Miscellaneous equipment cover removal or installation	1	N	N
Work on energized parts, including voltage testing	2*	Y	Y
Application of safety grounds, after voltage test	2*	Y	N
<i>NEMA E2 (fused contactor) Motor Starters, 2.3 Kv thru 7.2 kV</i>			
Contactors operation with enclosure doors closed	0	N	N
Reading a panel meter while operating a meter switch	0	N	N
Contactors operation with enclosure doors open	2*	N	N
Work on energized parts, including voltage testing	3	Y	Y
Work on control circuits with energized parts 120V or below, exposed	0	Y	Y
Work on control circuits with energized parts >120V, exposed	3	Y	Y
Insertion or removal (racking) of starters from cubicles, doors open	3	N	N
Insertion or removal (racking) of starters from cubicles, doors closed	2	N	N
Application of safety grounds, after voltage test	3	Y	N
Removal of bolted covers (to expose bare, energized parts)	4	N	N
Opening hinged covers (to expose bare, energized parts)	3	N	N
<i>Metal Clad Switchgear, 1 kV and Above</i>			
CB or fused switch operation with enclosure doors closed	2	N	N
Reading a panel meter while operating a meter switch	0	N	N
CB or fused switch operation with enclosure doors open	4	N	N
Work on energized parts, including voltage testing	4	Y	Y
Work on control circuits with energized parts 120V or below, exposed	2	Y	Y
Work on control circuits with energized parts >120V, exposed	4	Y	Y
Insertion or removal (racking) of CBs from cubicles, doors open	4	N	N
Insertion or removal (racking) of CBs from cubicles, doors closed	2	N	N
Application of safety grounds, after voltage test	4	Y	N
Removal of bolted covers (to expose bare, energized parts)	3	N	N
Opening hinged covers (to expose bare, energized parts)	3	N	N
Opening voltage transformer or control power transformer compartments	4	N	N

Task (Assumes equipment is energized, and work is done within the flash protection boundary.)	Hazard/ Risk Category	V-rated Gloves	V-rated Tools
<i>Other Equipment 1kV and Above</i>			
Metal clad load interrupter switches, fused or unfused	--	--	--
Switch operation, doors closed	2	N	N
Work on energized parts, including voltage testing	4	Y	Y
Removal of bolted covers (to expose bare, energized parts)	4	N	N
Opening hinged covers (to expose bare, energized parts)	3	N	N
Outdoor disconnect switch operation (hookstick operated)	3	Y	Y
Outdoor disconnect switch operation (gang-operated, from grade)	2	N	N
Insulated cable exam, in manhole or other confined space	4	Y	N
Insulted cable exam, in open area	2	Y	N

Note:

V-rated Gloves are gloves rated and tested for the maximum line-to-line voltage upon which work will be done.

V-rated Tools are tools rated and tested for the maximum line-to-line voltage upon which work will be done.

2* means that a double-layer switching hood and hearing protection are required for this task in addition to the other Hazard/Risk

Category 2 requirements of Table 130.7(C)(10).

Y - Yes (required)

N - No (not required)

Notes:

1. 25 kA short circuit current available, 0.03 second (2 cycle) fault clearing time.
2. 65 kA short circuit current available, 0.03 second (2 cycle) fault clearing time.
3. For 10kA short circuit current available, the hazard/risk category required may be reduced by one number.
4. 65 kA short circuit current available, 0.33 second (20 cycle) fault clearing time.
5. 65 kA short circuit current available, up to 1.0 second (60 cycle) fault clearing time.
6. For 25 kA short circuit current available, the hazard/risk category required may be reduced by one number.

**TABLE 3
Protective Clothing &
Personal Protective Equipment (PPE) Matrix**

Protective Clothing & Equipment	Protective Systems for Hazard/Risk Category						
	Hazard/Risk Category Number	-1 (Note 3)	0	1	2	3	4
Non-melting (according to ASTM F 1506-00) or Untreated Natural Fiber							
a. T-shirt (short-sleeve)	X				X	X	X
b. Shirt (long-sleeve)		X					
c. Pants (long)	X	X	X (N4)	X (N6)	X	X	X
FR Clothing (Note 1)							
A. Long-sleeve shirt			X	X	X (N9)	X	
B. Pants			X (N4)	X (N6)	X (N9)	X	
C. Coverall			(N5)	(N7)	X (N9)	(N5)	
D. Jacket, parka or rain wear			AN	AN	AN	AN	
FR Protective Equipment							
A. Flash suit jacket (multilayer)						X	
B. Flash suit pants (multilayer)						X	
C. Head protection	--	--	--	--	--	--	
1. Hard hat			X	X	X	X	
2. FR hard hat liner					AR	AR	
D. Eye protection	--	--	--	--	--	--	
1. Safety glasses	X	X	X	AL	AL	AL	
2. Safety goggles				AL	AL	AL	
E. Face & head area protection	--	--	--	--	--	--	
1. Arc-rated face shield or flash suit hood				X (N8)			
2. Flash suit hood					X	X	
3. Hearing protection (ear canal inserts)				X	X	X	
F. Hand protection	--	--	--	--	--	--	
1. Leather gloves (Note 2)			AN	X	X	X	
G. Foot protection	--	--	--	--	--	--	
1. Leather work shoes			AN	X	X	X	

- AN = As needed
- AL = Select one in group
- AR = As required
- X = Minimum required

NOTES:

- N1 See Table 130.7(C)(11). Arc rating for a garment is expressed in cal/cm2.
- N2 If voltage-rated gloves are required, the leather protectors worn external to the rubber gloves satisfy this requirement.
- N3 Hazard/Risk Category Number "-1" is only defined if determined by Notes 3 or 6 of Table 130.7(C)(9)(a).
- N4 Regular weight (minimum 12 oz/yd² fabric weight), untreated, denim cotton blue jeans are acceptable in lieu of FR pants. The FR pants used for Hazard/Risk Category 1 shall have a minimum arc rating of 4.

- N5 Alternate is to use FR coveralls (minimum arc rating of 4) instead of FR shirt and FR pants.
- N6 If the FR pants have a minimum arc rating of 8, long pants of non-melting or untreated natural fiber are not required beneath the FR pants.
- N7 Alternate is to use FR coveralls (minimum arc rating of 4) over non-melting or untreated natural fiber pants and T-shirt.
- N8 A face shield with a minimum arc rating of 8, with wrap-around guarding to protect not only the face, but also the forehead, ears, and neck (or, alternatively, a flash suit hood), is required.
- N9 Alternate is to use two sets of FR coveralls (the inner with a minimum arc rating of 4 and outer coverall with a minimum arc rating of 5) over non-melting or untreated natural fiber clothing, instead of FR coveralls over FR shirt and FR pants over non-melting or untreated natural fiber clothing.

TABLE 4
Protective Clothing Characteristics

Hazard/Risk Category	Clothing Description (Typical number of clothing layers is given in parentheses)	Required Minimum Arc Rating of PPE [J/cm² (cal/cm²)]
0	Non-melting, flammable materials (i.e., untreated cotton, wool, rayon, or silk, or blends of these materials) with a fabric weight of at least 4.5 oz/yd ² (1)	N/A
1	FR shirt and FR pants or FR coverall (1)	16.74 (4)
2	Cotton underwear - conventional short sleeve and brief/shorts, plus FR shirt and FR pants (1 or 2)	33.47 (8)
3	Cotton underwear plus FR shirt and FR pants plus FR coverall, or cotton underwear plus two FR coveralls (2 or 3)	104.6 (25)
4	Cotton underwear plus FR shirt and FR pants plus multilayer flash suit (3 or more)	167.36 (40)

Note: Arc rating is defined in Article 100 and can be either ATPV or EBT. ATPV is defined in ASTM F 1959-99 as the incident energy on a fabric or material that results in sufficient heat transfer through the fabric or material to cause the onset of a second-degree burn based on the Stoll curve. EBT is defined in ASTM F 1959-99 as the average of the five highest incident energy exposure values below the Stoll curve where the specimens do not exhibit break-open. EBT is reported when ATPV cannot be measured due to FR fabric break-open.

Metro Electric Co., Inc.

Asbestos Awareness Program



Applicable OSHA Standards: 29 CFR 1926.1101, 29 CFR 1910.1001

1. Purpose

- 1.1 The purpose of this program is to make employees of Metro Electric aware of asbestos health hazards and to prevent exposure to asbestos in the workplace.
- 1.2 This program is for awareness only. It specifically does NOT provide the necessary or required training for personnel to perform asbestos work, or activities for which state or other regulatory licensing requirements apply.

2. Scope

- 2.1 This program applies to all locations controlled by Metro Electric, where employees or subcontract personnel work in areas that contain or may contain asbestos. The information presented below is intended as background only so that personnel will have a better understanding of important issues regarding occupational exposure to asbestos.

3. Introduction & Potential Locations for Asbestos

- 3.1 Throughout history, asbestos has provided a durable, readily-adaptable heat and fire retardant material used in a range of industrial applications and for architectural design aesthetics.

However, in the late 1970s numerous clinical studies clearly linked asbestos exposure with such diseases as lung and colon cancer, asbestosis and mesothelioma. As a result, EPA and OSHA prescribed regulations in 1983 and again in 1986 specifying work practices and rules governing the handling and disposal of asbestos-containing material, restricting the use of asbestos products in new buildings and establishing minimum employee exposure levels.

- 3.2 To help understand where contact with asbestos is most likely to occur, consider that the incombustible, chemical-resistant and fibrous mineral has been used in the fabrication of construction materials and manufacturing of heat-resistant products including:

- Fire-resistant drywall, wallboard and transite siding
- Pipeline wrap
- Boiler and piping insulation
- Insulation board
- Roofing felts
- Ceiling and floor tiles
- Spray-on ceiling and wall applications (frequently on beams, in crawl spaces and between walls)
- Acoustical plaster, soundproofing pads, panels and materials
- Textile wall coverings
- Specialty cement

- Heat-resistant clothing
- Automotive brake and clutch linings
- Asbestos-cement pipe and sheet

4. General Classifications of Asbestos

4.1 Asbestos is generally classified into two types – friable and non-friable:

4.1.1 Friable means that the material can be crumbled with hand pressure and is more likely to emit fibers. Examples of friable material are the fibrous or fluffy sprayed-on products used for fireproofing, insulation or sound proofing. Friable asbestos-containing is more likely to readily release airborne asbestos fibers if it is disturbed.

4.1.2 Non-friable asbestos-containing material generally does not emit airborne fibers unless it is sanded, sawed or abraded. Examples of non-friable materials are vinyl-asbestos floor tile and roofing felts. Asbestos-cement pipe or sheet also can emit airborne fibers if the materials are cut, sawed or abraded, or if they are broken during demolition operations.

5. Employee Information and Training

5.1 The company requires that Asbestos Awareness Training be given to employees who work in areas that contain or may contain asbestos. These are individuals whose work activities may involve contact with, but not disturbance of, Asbestos Containing Material (ACM) or Presumed Asbestos Containing Material (PACM).

5.2 This individual training will be documented with: date, time and place of training; the instructor's name; a copy or description of training presented; and a sign-in sheet with the name of each person who receives this training.

6. Health Effects of Asbestos Exposure

6.1 Breathing in asbestos fibers has been associated with increased risks of developing several diseases.

6.2 Asbestosis, lung cancer, and mesothelioma are the primary diseases caused by asbestos exposure. Others include but are not limited to pleural plaques, pleural effusion, pleural thickening, cancer of the gastrointestinal tract and kidney cancer.

6.3 The relationship between smoking and asbestos exposure is called a synergistic effect since exposure to both greatly increase the risk of disease. Workers who smoke cigarettes and are exposed to asbestos are 50 to 90 times more likely to get lung cancer than nonsmoking, non-exposed workers.

7. Obey Warnings About Asbestos

7.1 Employees and subcontractors will obey any posted warning, label or sign, or any verbal warning or safety instruction regarding asbestos in the work area.

- 7.2 Asbestos warning postings, signs and labels should identify the material present; where it is located; and appropriate work practices.
- 7.3 Employees and subcontractors will perform work in accordance with posted work instructions to ensure that Asbestos Containing Material (ACM) and/or Presumed Asbestos Containing Material (PACM) will not be disturbed.
- 7.4 Site supervisors at work locations that are adjacent to regulated areas will make sure that employees have read and understand the asbestos warning signs and work instructions.

8. Asbestos Safety at Multi-Contractor Work Locations

- 8.1 Employees will be protected at all times from asbestos exposure while working at a multi-contractor work location.
- 8.2 In the event that employees are working immediately adjacent to Class 1 asbestos work and are exposed to asbestos due to inadequate containment of dust or debris, the site supervisor will remove them from the area immediately until the enclosure breach is repaired or the exposure source is effectively contained. As an alternative, the site supervisor can initiate performance of an initial exposure assessment in accordance with 29 CFR) Asbestos - 1926.1101 (f).
- 8.3 Class 1 asbestos work means activities involving the removal of thermal system insulation (TSI) and surfacing ACM and PACM.

Metro Electric Co., Inc.

Asbestos Safety Program



Applicable OSHA Standards: 29 CFR 1910.1001 and 29 CFR 1926.1101

1. Purpose

- 1.1 The purpose of this program is to establish safe work procedures for employees of Metro Electric and subcontractors retained by the Company who have an occupational exposure to airborne asbestos in a work assignment.
- 1.2 Company employees and subcontractors will perform any such work in accordance with this program, training requirements and safe work procedures contained herein when performing work where there is an exposure or potential exposure to airborne asbestos.
- 1.3 Where work involving asbestos requires state or other regulatory licensing, only personnel who are currently and properly licensed, trained and authorized by the Company will perform such an assignment.
- 1.4 When work involving exposure to airborne asbestos is performed by a subcontractor retained by the Company, this written program will be used as a basis for comparison and confirmation to ensure that the subcontractor's own written asbestos safety program conforms with Company safety and OSHA requirements.

2. Scope

- 2.1 This program applies to all locations controlled by Metro Electric when employees or subcontract personnel are involved in work where there is or may be exposure to airborne asbestos.

3. Introduction & Potential Locations for Asbestos

- 3.1 Throughout history, asbestos has provided a durable, readily-adaptable heat and fire retardant material used in a range of industrial applications and for architectural design aesthetics.

However, in the late 1970s numerous clinical studies clearly linked asbestos exposure with such diseases as lung and colon cancer, asbestosis and mesothelioma. As a result, EPA and OSHA prescribed regulations in 1983 and again in 1986 specifying work practices and rules governing the handling and disposal of asbestos-containing material, restricting the use of asbestos products in new buildings and establishing minimum employee exposure levels.

- 3.2 To help understand where contact with asbestos is most likely to occur, consider that the incombustible, chemical-resistant and fibrous mineral has been used in the fabrication of construction materials and manufacturing of heat-resistant products including:

- Fire-resistant drywall, wallboard and transite siding
- Pipeline wrap
- Boiler and piping insulation

- Insulation board
- Roofing felts
- Ceiling and floor tiles
- Spray-on ceiling and wall applications (frequently on beams, in crawl spaces and between walls)
- Acoustical plaster, soundproofing pads, panels and materials
- Textile wall coverings
- Specialty cement
- Heat-resistant clothing
- Automotive brake and clutch linings
- Asbestos-cement pipe and sheet

4. General Classifications of Asbestos

4.1 Asbestos is generally classified into two types – friable and non-friable:

4.1.1 Friable means that the material can be crumbled with hand pressure and is more likely to emit fibers. Examples of friable material are the fibrous or fluffy sprayed-on products used for fireproofing, insulation or sound proofing. Friable asbestos-containing is more likely to readily release airborne asbestos fibers if it is disturbed.

4.1.2 Non-friable asbestos-containing material generally does not emit airborne fibers unless it is sanded, sawed or abraded. Examples of non-friable materials are vinyl-asbestos floor tile and roofing felts. Asbestos-cement pipe or sheet also can emit airborne fibers if the materials are cut, sawed or abraded, or if they are broken during demolition operations.

5. Definitions

5.1 "Asbestos" includes chrysolite, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, actinolite asbestos, and any of these minerals that have been chemically treated and/or altered.

5.2 "Asbestos-containing material (ACM)" means any material containing more than 1% asbestos.

5.3 "Assistant Secretary" means the Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor, or designee.

5.4 "Authorized person" means any person authorized by the employer and required by work duties to be present in regulated areas.

5.5 "Building/facility owner" is the legal entity, including a lessee, which exercises control over management and record keeping functions relating to a building and/or facility in which activities covered by this standard take place.

5.6 "Certified Industrial Hygienist (CIH)" means one certified in the practice of industrial hygiene by the American Board of Industrial Hygiene.

5.7 "Director" means the Director of the National Institute for Occupational Safety and Health, U.S. Department of Health and Human Services, or designee.

- 5.8 "Employee exposure" means that exposure to airborne asbestos that would occur if the employee were not using respiratory protective equipment.
- 5.9 "Fiber" means a particulate form of asbestos 5 micrometers or longer, with a length-to-diameter ratio of at least 3 to 1.
- 5.10 "High-efficiency particulate air (HEPA) filter" means a filter capable of trapping and retaining at least 99.97 percent of 0.3 micrometer diameter mono-disperse particles.
- 5.11 "Homogeneous area" means an area of surfacing material or thermal system insulation that is uniform in color and texture.
- 5.12 "Industrial hygienist" means a professional qualified by education, training, and experience to anticipate, recognize, evaluate and develop controls for occupational health hazards.
- 5.13 "PACM" means presumed asbestos containing material.
- 5.14 "Presumed asbestos containing material" means thermal system insulation and surfacing material found in buildings constructed no later than 1980. The designation of a material as "PACM" may be rebutted pursuant to paragraph (j)(8) of this section.
- 5.15 "Regulated area" means an area established by the employer to demarcate areas where airborne concentrations of asbestos exceed, or there is a reasonable possibility they may exceed, the permissible exposure limits.
- 5.16 "Surfacing ACM" means surfacing material which contains more than 1 percent asbestos.
- 5.17 "Surfacing material" means material that is sprayed, troweled-on or otherwise applied to surfaces (such as acoustical plaster on ceilings and fireproofing materials on structural members, or other materials on surfaces for acoustical, fireproofing, and other purposes).
- 5.18 "Thermal System Insulation (TSI)" means ACM applied to pipes, fittings, boilers, breeching, tanks, ducts or other structural components to prevent heat loss or gain.
- 5.19 "Thermal System Insulation ACM" means thermal system insulation which contains more than 1 percent asbestos.

6. **Permissible Exposure Limit (PEL)**

6.1 Time-weighted average limit (TWA)

- 6.1.1 No Company employee or subcontract worker will be exposed to an airborne concentration of asbestos in excess of 0.1 fiber per cubic centimeter of air as an eight (8)-hour time-weighted average (TWA). Monitoring will be performed in accordance with Company safety and OSHA requirements.

6.2 Excursion limit.

- 6.2.1 No Company employee will be exposed to an airborne concentration of asbestos in excess of 1.0 fiber per cubic centimeter of air (1 f/cc) as averaged over a sampling period of 30 minutes. Sampling will be performed in accordance with Company safety and OSHA requirements.

7. **Exposure Monitoring**

- 7.1 Employee exposure to airborne asbestos will be determined from sampling taken from breathing zone air samples representative of the 8-hour TWA and 30-minute short-term exposures of each affected employee.
- 7.2 Representative 8-hour TWA employee exposures will be determined based on one or more samples representing full-shift exposures, for each shift for each employee, in each job classification in each work area.
- 7.3 Representative 30-minute short-term employee exposures will be determined on the basis of one or more samples representing 30 minute exposures associated with operations that are most likely to produce exposures above the excursion limit for each shift for each job classification in each work area.

8. **Exposure Monitoring**

- 8.1 When employees or subcontract personnel will be potentially exposed to airborne asbestos during a work assignment, initial monitoring will be performed of employees who are, or may reasonably be expected to be exposed to airborne concentrations at or above the TWA permissible exposure limit and/or excursion limit.
- 8.2 Where objective data demonstrates that asbestos is not capable of being released in airborne concentrations at or above the TWA permissible exposure limit and/or excursion limit under the expected conditions of processing, use, or handling, then no initial monitoring is required.
- 8.3 Following initial monitoring, samples will be taken at such frequency and pattern to represent with reasonable accuracy employee exposure levels. Such sampling will be taken every six months or more frequently where employee exposures may reasonably be anticipated to exceed the TWA permissible exposure limit and/or excursion limit.
- 8.4 If either initial or periodic monitoring statistically indicates that employee exposures are below the TWA permissible exposure limit and/or excursion limit, the Company may discontinue monitoring of these employees.
- 8.5 The Company will initiate or re-initiate exposure monitoring as required in this program and in accordance with OSHA requirements when there has been a change in production methods, process, control equipment, personnel or work practices that may result in new or additional exposures above the TWA permissible exposure limit and/or excursion limit, or when the Company has reason to suspect that a change may result in new or additional exposures above the PEL and/or excursion limit.
- 8.6 All monitoring for airborne asbestos will be by taking personal samples collected following the procedures specified in Appendix A, 29 CFR Asbestos. - 1910.1001.

- 8.7 All monitoring samples taken will be evaluated using the OSHA Reference Method (ORM) specified in Appendix A, 29 CFR Asbestos. - 1910.1001, or an equivalent counting method.
- 8.8 If an equivalent method to the ORM is used, the method will meet the following criteria:
 - 8.8.1 Replicate exposure data used to establish equivalency are collected in side-by-side field and laboratory comparisons; and
 - 8.8.2 The comparison indicates that 90% of the samples collected in the range 0.5 to 2.0 times the permissible limit have an accuracy range of plus or minus 25 percent of the ORM results at a 95% confidence level as demonstrated by a statistically valid protocol; and
 - 8.8.3 The equivalent method is documented and the results of the comparison testing are maintained.
- 8.9 Monitoring analysis will be performed by a laboratory that has instituted quality assurance programs in accordance with OSHA requirements.
- 8.10 Each affected employee will be notified of lab results of monitoring within 15 working days after receipt. Notification may be made individually in writing, or by posting the results in an appropriate location accessible to the affected employees. If monitoring results show that the TWA and/or excursion limit had been exceeded, the written notification will include any corrective action being taken by the Company to reduce employee exposure to or below the TWA and/or excursion limit.

9. Regulated Areas

- 9.1 The Company will establish regulated areas wherever airborne concentrations of asbestos and/or PACM exceed the TWA and/or excursion limit for airborne asbestos.
- 9.2 Regulated areas will be identified and separated from the rest of the workplace in any manner that minimizes the number of persons who will be exposed to asbestos.
- 9.3 Access to regulated areas will be limited to authorized persons.
- 9.4 Each person entering a regulated area will be supplied with and required to use a respirator at no cost to the employee. Selection and use of the respirator will be in accordance with the Company's written Respiratory Protection Program. Employees will not eat, drink, smoke, chew tobacco or gum, or apply cosmetics in a regulated area.

10. Engineering Controls and Safe Work Practices

- 10.1 Engineering controls and work practices will be used to reduce and maintain employee exposure to or below the TWA and/or excursion limit when feasible.
- 10.2 Wherever feasible engineering controls and work practices are not sufficient to reduce employee exposure to or below the TWA and/or excursion limit, these controls will be used to reduce employee exposure to the lowest levels achievable. Engineering controls then will be supplemented by respiratory protection, selected and used in accordance with the Company's written Respiratory Protection Program.

- 10.3 Local exhaust ventilation and dust collection systems, when utilized, will be designed, constructed, installed and maintained in accordance with good practices such as those found in the American National Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems, ANSI Z9.2-1979.
- 10.4 All hand-operated and power-operated tools which would produce or release fibers of asbestos (such as, but not limited to, saws, scorers, abrasive wheels, and drills), will be provided with local exhaust ventilation systems that comply with OSHA requirements.
- 10.5 Where practicable, asbestos will be handled, mixed, applied, removed, cut, scored, or otherwise worked in a wet state sufficient to prevent the emission of airborne fibers to a level that exposes employees and exceeds the TWA and/or excursion limit.
- 10.6 No asbestos cement, mortar, coating, grout, plaster, or similar material containing asbestos, will be removed from bags, cartons, or other containers without being either wetted, enclosed or ventilated in a manner that effectively prevents release of airborne fibers.
- 10.7 Compressed air will not be used to remove asbestos or materials containing asbestos unless the compressed air is used in conjunction with a ventilation system that effectively captures the dust cloud created by the compressed air.
- 10.8 Sanding of asbestos-containing flooring material is prohibited.

11. Written Compliance Program

- 11.1 Where the TWA and/or excursion limit is exceeded in a workplace, any work performed by employees will be performed in accordance with this written Asbestos Safety Program. The purpose of this program is to reduce employee exposure to or below the TWA and to or below the excursion limit by means of engineering and work practice controls, and by the use of respiratory protection where required or permitted.
- 11.2 This program will be reviewed and updated as necessary to reflect significant changes in the status of Company and subcontractor operations. The program also will be modified or supplemented as needed based on results of inspections, incident investigations, feedback and suggestions.
- 11.3 The program is available upon request for examination and copying to the Assistant Secretary, the Director, affected employees and designated employee representatives.
- 11.4 Employee rotation will not be used as a means of compliance with the TWA and/or excursion limit.

12. Respiratory Protection

- 12.1 Affected employees under this program will be provided appropriate respirators. Selection and use of respirators will be in accordance with the Company's written Respiratory Protection Program. Respirators will be used during:
 - 12.1.1 Periods necessary to install or implement feasible engineering and work-practice controls.

- 12.1.2 Work operations, such as maintenance and repair activities, for which engineering and work-practice controls are not feasible.
- 12.1.3 Work operations for which feasible engineering and work-practice controls are not yet sufficient to reduce employee exposure to or below the TWA and/or excursion limit.
- 12.1.4 Emergencies.

13. Respirator Program

- 13.1 Selection and use of respirators will be in accordance with the Company's written Respiratory Protection Program and this Asbestos Safety Program.
- 13.2 Each affected employee will be provided with a tight-fitting, powered air-purifying respirator (PAPR) instead of a negative pressure respirator, when the employee chooses to use a PAPR and it provides adequate protection to the employee.
- 13.3 Employees will use respirators only after examination by a physician and the most recent determination by a physician is that the employee can function normally using a respirator, and that the safety and health of the employee will not be impaired by the use of a respirator.
- 13.4 The Company will select and provide to affected employees an appropriate respirator, with the exception that a filtering face piece respirator will not be used for protection against asbestos fibers.
- 13.5 HEPA filters will, be provided to employees for powered and non-powered air-purifying respirators.

14. Protective Work Clothing and Equipment

- 14.1 If an employee is exposed to asbestos above the TWA and/or excursion limit, or where the possibility of eye irritation exists, the Company will provide at no cost to the employee appropriate protective work clothing and equipment. Affected employees are required to wear and/or use this protective clothing and equipment.
- 14.2 Protective clothing and equipment includes, but is not limited to:
 - 14.2.1 Coveralls or similar full-body work clothing;
 - 14.2.2 Gloves, head coverings, and foot coverings; and
 - 14.2.3 Face shields, vented goggles, or other appropriate protective equipment.
- 14.3 Employees will remove work clothing contaminated with asbestos only in change rooms and in accordance with change room procedures.
- 14.4 No employee will take contaminated work clothing out of the change room, except those employees authorized to do so for the purpose of laundering, maintenance, or disposal.
- 14.5 Contaminated work clothing will be placed and stored in closed containers which prevent dispersion of the asbestos outside the container.

- 14.6 Containers of contaminated protective devices or work clothing will be labeled in accordance with this program.
- 14.7 The Company will clean, launder, repair or replace protective clothing and equipment to maintain their effectiveness when used by affected employees.
- 14.8 Clean protective clothing and equipment will be provided at least weekly to each affected employee.
- 14.9 Removal of asbestos from protective clothing and equipment by blowing or shaking is prohibited.
- 14.10 Laundering of contaminated clothing will be done in a way that prevents the release of airborne fibers of asbestos in excess of the permissible exposure limits.
- 14.11 When contaminated clothing is delivered to another person or service provider for laundering, this person or service provider will be informed of safety and OSHA requirements for effectively preventing the release of airborne fibers of asbestos in excess of the permissible exposure limits.
- 14.12 The Company will inform any person or service provider who launders or cleans protective clothing or equipment contaminated with asbestos of the potentially harmful effects of exposure to asbestos.
- 14.13 Contaminated clothing will be transported in sealed impermeable bags, or other closed, impermeable containers, and labeled in accordance with this program.

15. Hygiene Facilities and Practices

- 15.1 The Company will provide clean change rooms for employees who work in areas where their airborne exposure to asbestos is above the TWA and/or excursion limit.
- 15.2 Change rooms will be equipped with two separate lockers or storage facilities, separated to prevent contamination of the employee's street clothes from his protective work clothing and equipment.
- 15.3 The Company will provide appropriate shower facilities and ensure that employees who work in areas where their airborne exposure is above the TWA and/or excursion limit, shower at the end of the work shift.
- 15.4 Employees who are required to shower will not leave the workplace wearing any clothing or equipment worn during the work shift.
- 15.5 The Company will provide lunchroom facilities for employees who work in areas where their airborne exposure is above the TWA and/or excursion limit.
- 15.6 Lunchroom facilities will have a positive pressure, filtered air supply, and will be readily accessible to employees.
- 15.7 Employees who work in areas where their airborne exposure is above the PEL and/or excursion limit will wash their hands and faces prior to eating, drinking or smoking.

- 15.8 Employees and other persons will not enter lunchroom facilities with protective work clothing or equipment unless surface asbestos fibers have been removed from the clothing or equipment by vacuuming or other method that removes dust without causing the asbestos to become airborne.
- 15.9 Employees will not smoke in work areas where they are occupationally exposed to asbestos because of activities in that work area.

16. Communication of Asbestos Hazards to Employees

- 16.1 This section applies to the communication of information concerning asbestos hazards in general industry to facilitate compliance with this standard. Asbestos exposure in general industry occurs in a wide variety of industrial and commercial settings.
- 16.2 Host employers, pipeline operators, building and facility owners will determine the presence, location, and quantity of ACM and/or PACM at the work site. The Company will communicate with host employers, pipeline operators, building and facility owners to exercise due diligence in complying with Company safety and OSHA these requirements so that employees can be reliably informed about the presence and location of ACM and PACM.
- 16.3 Host employers, pipeline operators, building and facility owners will maintain records of all information required to be provided and/or otherwise known to the host concerning the presence, location and quantity of ACM and PACM in the building or facility. Such records will be kept for the duration of ownership and will be transferred to successive owners.
- 16.4 Host employers, pipeline operators, building and facility owners will inform the Company, and the Company will inform employees and subcontractors who will perform work activities in areas which contain ACM and/or PACM of the presence and location of ACM and/or PACM in such areas where contact may be made during such activities.

17. Warning Signs

- 17.1 Warning signs will be provided and displayed at each regulated area. In addition, warning signs will be posted at all approaches to regulated areas so that an employee may read the signs and take necessary protective steps before entering the area.
- 17.2 The warning signs required by paragraph (j)(3) of this section will bear the following information:

**DANGER
ASBESTOS
CANCER AND LUNG DISEASE
HAZARD
AUTHORIZED PERSONNEL ONLY**

- 17.3 In addition, where the use of respirators and protective clothing is required in the regulated area, the warning signs will include the following:

**RESPIRATORS AND PROTECTIVE CLOTHING
ARE REQUIRED IN THIS AREA**

- 17.4 The Company will ensure that employees working in and contiguous to regulated areas comprehend the warning signs required to be posted. Means to ensure employee comprehension may include the use of foreign languages, pictographs and graphics.
- 17.5 At the entrance to mechanical rooms or areas in which employees reasonably can be expected to enter and which contain ACM and/or PACM, the host employer or building owner will post signs which identify the material which is present, its location, and appropriate work practices which, if followed, will ensure that ACM and/or PACM will not be disturbed.
- 17.6 The Company will ensure, to the extent feasible, that employees who come in contact with these signs can comprehend them. Means to ensure employee comprehension may include the use of foreign languages, pictographs, graphics, and awareness training.

18. Warning Labels

- 18.1 Warning labels will be affixed to all raw materials, mixtures, scrap, waste, debris, and other products containing asbestos fibers, or to their containers.
- 18.2 When a host employer, owner or Company employee identifies previously installed ACM and/or PACM, labels or signs will be affixed or posted so that employees will be notified of what materials contain ACM and/or PACM.
- 18.3 The Company will attach such labels in areas where they will clearly be noticed by employees who are likely to be exposed to airborne asbestos. Signs may be posted in lieu of labels so long as they contain information required for labeling.
- 18.4 Labels will comply with requirements of 29 CFR 1910.1200(f) of OSHA's Hazard Communication standard, and will include the following information:

**DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD**

19. Employee Information and Training

- 19.1 The Company will train each employee who is exposed to airborne concentrations of asbestos at or above the PEL and/or excursion limit in accordance with the requirements of this section. This includes instituting a training program and ensuring employee participation in the program.
- 19.2 Training will be provided prior to or at the time of initial assignment and at least annually thereafter.

- 19.3 Training will be conducted in a manner which the employee is able to understand.
- 19.4 Each affected employee will be informed of the following:
 - 19.4.1 The health effects associated with asbestos exposure;
 - 19.4.2 The relationship between smoking and exposure to asbestos producing lung cancer:
 - 19.4.3 The quantity, location, manner of use, release, and storage of asbestos, and the specific nature of operations which could result in exposure to asbestos;
 - 19.4.4 The engineering controls and work practices associated with the employee's job assignment;
 - 19.4.5 The specific procedures implemented to protect employees from exposure to asbestos, such as appropriate work practices, emergency and clean-up procedures, and personal protective equipment to be used;
 - 19.4.6 The purpose, proper use, and limitations of respirators and protective clothing, if appropriate;
 - 19.4.7 The purpose and a description of the medical surveillance program;
 - 19.4.8 The content of the Asbestos Standard 1910.1001, including appendices.
 - 19.4.9 The names, addresses and phone numbers of public health organizations which provide information, materials, and/or conduct programs concerning smoking cessation. A list of organizations is included at the end of this program to comply with this requirement.
 - 19.4.10 The requirements for posting signs and affixing labels and the meaning of the required legends for such signs and labels.

20. Access to Information and Training Materials

- 20.1 A copy of the OSHA Asbestos Standard and its appendices will be readily available without cost to all affected employees.
- 20.2 All materials relating to the employee information and training program will be provided to the Assistant Secretary and the training program to the Assistant Secretary and the Director.
- 20.3 All affected employees will be informed concerning the availability of self-help smoking cessation program material. Upon employee request, the Company will distribute such material, consisting of NIH Publication No. 89-1647, or equivalent self-help material.

21. Housekeeping

- 21.1 All surfaces will be maintained as free as practicable of ACM waste and debris and accompanying dust.

- 21.2 All spills and sudden releases of material containing asbestos will be cleaned up as soon as possible.
- 21.3 Surfaces contaminated with asbestos will not be cleaned by the use of compressed air.
- 21.4 HEPA-filtered vacuuming equipment will be used for vacuuming asbestos containing waste and debris. The equipment will be used and emptied in a manner which minimizes the reentry of asbestos into the workplace.
- 21.5 Shoveling, dry sweeping and dry clean-up of asbestos may be used only where vacuuming and/or wet cleaning are not feasible.
- 21.6 Waste, scrap, debris, bags, containers, equipment, and clothing contaminated with asbestos consigned for disposal, will be collected, recycled and disposed of in sealed impermeable bags, or other closed, impermeable containers.

22. Medical Surveillance

- 22.1 The Company will institute a medical surveillance program for all employees who are or will be exposed to airborne concentrations of fibers of asbestos at or above the TWA and/or excursion limit.
- 22.2 Under this program, all medical examinations and procedures will be performed by or under the supervision of a licensed physician, and will be provided without cost to the employee and at a reasonable time and place.
- 22.3 Persons other than licensed physicians, who administer the pulmonary function testing required by this section, will complete a training course in spirometry sponsored by an appropriate academic or professional institution.
- 22.4 Before an employee is assigned to work where he or she is exposed to airborne concentrations of asbestos fibers at or above the TWA and/or excursion limit, a pre-placement medical examination will be provided or made available by the Company.
- 22.5 Such examination will include, as a minimum, a medical and work history; a complete physical examination of all systems with emphasis on the respiratory system, the cardiovascular system and digestive tract; completion of the respiratory disease standardized questionnaire in Appendix D to the Asbestos Standard, Part 1; a chest roentgenogram (posterior-anterior 14 x 17 inches); pulmonary function tests to include forced vital capacity (FVC) and forced expiratory volume at 1 second (FEV(1.0)); and any additional tests deemed appropriate by the examining physician. Interpretation and classification of chest roentgenogram will be conducted in accordance with Appendix E to the Asbestos Standard.
- 22.6 Periodic medical examinations will be made available annually. The scope of the medical examination will be in conformance with the protocol established in the Asbestos Standard.
- 22.7 The Company will provide, or make available, a termination of employment medical examination for any employee who has been exposed to airborne concentrations of fibers of asbestos at or above the TWA and/or excursion limit. The medical examination will be in accordance with the requirements of the Asbestos Standard.

- 22.8 No medical examination is required of any employee, if adequate records show that the employee has undergone the required examination within the past one year period. A pre-employment medical examination may be used to meet program requirements so long as the Company paid the cost of the exam.
- 22.9 The following information will be provided to the examining physician by the Company:
- 22.9.1 A copy of the Asbestos Standard with Appendices D and E.
 - 22.9.2 A description of the affected employee's duties as they relate to the employee's exposure.
 - 22.9.3 The employee's representative exposure level or anticipated exposure level.
 - 22.9.4 A description of any personal protective and respiratory equipment used or to be used.
 - 22.9.5 Information from previous medical examinations of the affected employee that is not otherwise available to the examining physician.
- 22.10 The Company will obtain a written signed opinion from the examining physician. This written opinion will contain the results of the medical examination and will include:
- 22.10.1 The physician's opinion as to whether the employee has any detected medical conditions that would place the employee at an increased risk of material health impairment from exposure to asbestos;
 - 22.10.2 Any recommended limitations on the employee or upon the use of personal protective equipment such as clothing or respirators;
 - 22.10.3 A statement that the employee has been informed by the physician of the results of the medical examination and of any medical conditions resulting from asbestos exposure that require further explanation or treatment; and
 - 22.10.4 A statement that the employee has been informed by the physician of the increased risk of lung cancer attributable to the combined effect of smoking and asbestos exposure.
- 22.11 The Company will instruct the physician not to reveal in the written opinion given to the employer specific findings or diagnoses unrelated to occupational exposure to asbestos.
- 22.12 The Company will provide a copy of the physician's written opinion to the affected employee within 30 days from its receipt.

23. Recordkeeping

- 23.1 The Company will keep an accurate record of all measurements taken to monitor employee exposure to asbestos as required.
- 23.2 This record will include at least the following information:

- 23.2.1 The date of measurement;
 - 23.2.2 The operation involving exposure to asbestos which is being monitored;
 - 23.2.3 Sampling and analytical methods used and evidence of their accuracy;
 - 23.2.4 Number, duration, and results of samples taken;
 - 23.2.5 Type of respiratory protective devices worn, if any; and
 - 23.2.6 Name, social security number and exposure of the employees whose exposure are represented.
- 23.3 The Company will maintain this record for at least thirty (30) years, in accordance with 29 CFR 1910.1020.
- 23.4 The Company will establish and maintain an accurate record for each employee subject to medical surveillance in accordance with 29 CFR 1910.1020. The record will include at least the following information:
- 23.4.1 The name and social security number of the employee;
 - 23.4.2 Physician's written opinions;
 - 23.4.3 Any employee medical complaints related to exposure to asbestos; and
 - 23.4.4 A copy of the information provided to the physician as required.
- 23.5 The Company will ensure that this record is maintained for the duration of employment plus thirty (30) years, in accordance with 29 CFR 1910.1020.
- 23.6 The Company will maintain all employee training records for one year beyond the last date of employment of that employee.
- 23.7 Upon written request, the Company will make available all records required to be maintained to the Assistant Secretary and the Director for examination and copying.
- 23.8 Upon request, the Company will make available any required exposure records for examination and copying to affected employees, former employees, designated representatives and the Assistant Secretary.
- 23.9 Upon request, the Company will make available required employee medical records for examination and copying to the subject employee, to anyone having the specific written consent of the subject employee, and the Assistant Secretary.
- 23.10 The Company will comply with the requirements concerning transfer of records as set forth in 29 CFR 1910.1020(h).
- 23.11 In the event that the Company ceases to conduct business and there is no successor employer to receive and retain the records for the prescribed period, the Company will notify the

Director at least 90 days prior to disposal of records and, upon request, transmit them to the Director.

24. Observation of Monitoring

- 24.1 The Company will provide affected employees or their designated representatives an opportunity to observe any monitoring of employee exposure to asbestos conducted in accordance with this program.
- 24.2 When observation of the monitoring of employee exposure to asbestos requires entry into an area where the use of protective clothing or equipment is required, the observer will be provided with and be required to use such clothing and equipment and will comply with all other applicable safety and health procedures.

Attachment

Regulations (Standards - 29 CFR)

Smoking Cessation Program Information For Asbestos - Non-Mandatory. - 1910.1001 App I

- Part Number: 1910
- Part Title: Occupational Safety and Health Standards
- Subpart: Z
- Subpart Title: Toxic and Hazardous Substances
- Standard Number: 1910.1001 App I
- Title: Smoking Cessation Program Information For Asbestos - Non-Mandatory.

The following organizations provide smoking cessation information and program material.

1. The National Cancer Institute operates a toll-free Cancer Information Service (CIS) with trained personnel to help you. Call 1-800-4-CANCER to reach the CIS office serving your area, or write: Office of Cancer Communications, National Cancer Institute, National Institutes of Health, Building 31, Room 10A24, Bethesda, Maryland 20892.

2. American Cancer Society, 3340 Peachtree Road, NE, Atlanta, Georgia 30062, (404)320-3333.

The American Cancer Society (ACS) is a voluntary organization composed of 58 divisions and 3,100 local units. Through "The Great American Smokeout" in November, the annual Cancer Crusade in April, and numerous educational materials, ACS helps people learn about the health hazards of smoking and become successful ex-smokers.

3. American Heart Association, 7320 Greenville Avenue, Dallas, Texas 75231, (214)750-5300.

The American Heart Association (AHA) is a voluntary organization with 130,000 members (physicians, scientists, and laypersons) in 55 state and regional groups. AHA produces a variety of publications and audio-visual materials about the effects of smoking on the heart. AHA also has developed a guidebook for incorporating a weight-control component into smoking cessation programs.

4. American Lung Association, 1740 Broadway, New York, New York 10019, (212)245-8000.

A voluntary organization of 7,500 members (physicians, nurses, and laypersons), the American Lung Association (ALA) conducts numerous public information programs about the health effect of smoking. ALA has 59 state and 85 local units. The organization actively supports legislation and information campaigns for smokers who want to quit, for example, through "Freedom From Smoking," a self-help smoking cessation program.

5. Office on Smoking and Health, U.S. Department of Health and Human Services, 5600 Fishers Lane, Park Building, Room 110, Rockville, Maryland 20857.

The Office on Smoking and Health (OSH) is the Department of Health and Human Services' lead agency in smoking control. OSH has sponsored distribution of publications on smoking-related topics, such as free flyers on relapse after initial quitting, helping a friend or family member quit smoking, the health hazards of smoking, and the effects of parental smoking on teenagers.

In Hawaii, on Oahu call 524-1234 (call collect from neighboring islands).

Spanish-speaking staff members are available during daytime hours to callers from the following areas: California, Florida, Georgia, Illinois, New Jersey (area code 210), New York, and Texas. Consult your local telephone directory for listings of local chapters.

Metro Electric Co., Inc.

Automotive Safety



Several employees are provided with Company owned or Company leased vehicles for business purposes. In some cases the vehicles are in the employee's control around the clock. Employees are required to operate Company vehicles safely and legally at all times.

The following "Rules of Personal Use" are in effect and must be obeyed whenever operating a Company supplied vehicle for personal reasons.

- Company owned or leased vehicles may only be operated by employees or their spouses who have been pre-qualified to operate the vehicles. An exception may be if injury and/or death is imminent and the emergency requires others to operate the vehicle.
- Personal use of Company vehicles should be kept to a minimum. Company vehicles will not be used for vacation trips or other extended, non-business trips unless specific prior approval has been granted.
- A Company vehicle used for personal activity must be operated under the same rules as for business activity.
- Fines, defense costs and other legal penalties arising out of ticketed offenses are the sole responsibility of the driver.

Company Vehicle Rules of the Road

Pre-Trip

Prior to starting a vehicle, drivers are required to inspect the vehicle exterior and the area around the vehicle. Check tires, leaks, body condition and clearances to other vehicles and objects. Any defects should be reported immediately.

Drivers are responsible to ensure that all required documents are in the vehicle (Registration, Insurance Card and Accident Reporting Forms).

On the Road

Speed

Company equipment is to be operated at speeds within the posted speed limit on the highway or street being traveled with due regard to safety at all times.

Following Distance

Do not tailgate! Follow in a line of traffic, allowing sufficient distance from the vehicle ahead, to safely come to a full stop within 3 seconds.

Passing or Being Passed

Observe all traffic laws while passing. Do not cross the yellow line on your side of the road. Observe "no passing signs" and make sure oncoming traffic is visible and sufficiently distant to provide adequate time. **Prior to passing, look to the left side to be sure no one is passing you at the same time. When you're being passed do not increase speed!**

Other Rules

- Do not operate a vehicle if your ability is impaired, affected or influenced by alcohol, illegal drugs, medication, illness, fatigue or injury.
- Drivers may not possess or permit possession of alcohol or illegal drugs in a vehicle used for business purposes.
- Drivers are responsible for locking all doors while the vehicle is in motion or left unattended.
- Drivers are required to keep headlights on while operating the vehicle.
- Only authorized or approved passengers (those with a business relationship with the Company) are permitted in the vehicles during business operations.
- Drivers will not pick up hitchhikers.
- Drivers will not accept payment for carrying passengers or materials except as directed by Management.
- Drivers shall not use any radar detector, laser detector or similar device.
- Drivers shall not transport flammable liquids and gasses unless a DOT or UL approved container is used and only in limited quantities as approved by Management.
- Drivers shall not push or pull another vehicle or tow a trailer without authorization.
- Do not transport or use ignitable or burning flares. The preferred method is the use of reflective triangles.
- Drivers shall not assist disabled motorists or accident victims beyond the level of their medical training: EMT, CPR, Basic First-Aid, etc. If a driver is not qualified to provide the above services, he/she must restrict his/her assistance to calling the proper authorities.

Post Trip

- All accidents, vehicle problems or defects must be reported immediately to your immediate supervisor. Reporting will include completing any forms required by your supervisor.
- Drivers are required to notify their supervisor of any tickets, accidents or other violations they have received while driving. Notification must be as soon as reasonably possible but no later than the next scheduled driving assignment.

Seat Belts

Metro Electric Co., Inc. requires all employees, operators and passengers in Company vehicles to wear seat belts.

The use of seat belts in the state of South Carolina is mandatory. Choose to always fasten your seat belt! We, as well as your family, are counting on you!

Metro Electric Co., Inc.

Behavior-Based Job Safety Observations



Applicable OSHA Standards: Supplemental and supportive of general safety and compliance.

1. Purpose

- 1.1 Metro Electric Co., Inc. has established written safety rules and safe work procedures as one method of helping safeguard employees, host employer personnel and property from accidents, injuries, damages and business interruptions. Company policy also requires compliance with federal and state occupational safety and health laws and regulations, as well as the safety and health requirements of host employers.
- 1.2 At the same time, the Company, as a long-experienced employer, recognizes that regulatory and technical safety compliance frequently does not fully address how unsafe individual behaviors cause accidents both on and off the job.
- 1.3 For this reason Metro Electric Co., Inc. has developed and implemented a behavior-based Job Safety Observation (JSO) program. This program acknowledges and utilizes established fundamentals of human psychology, motivation and response toward identifying critical behaviors in the workplace and then applying the modification of antecedents toward conversion of observable "unsafe" or "at-risk" behaviors into "safe" behaviors.

2. Scope

- 2.1 This policy applies to all employees and subcontractors working within Company controlled work sites.

3. Overview

- 3.1 Studies indicate that most workplace injuries or near misses are caused by unsafe behaviors, not unsafe conditions. At the same time, unsafe conditions -- known to management and left uncorrected -- affect behaviors.
- 3.2 The Company's Job Safety Observation program is intended to encourage employees and management to correct hazardous conditions and change unsafe behaviors through positive reinforcement in the context of "real life" daily activities.
- 3.3 When the employee has received positive reinforcement through work observation and BBS processes, he or she is encouraged toward safe behaviors that become a habit and, eventually, a personal value.
- 3.4 Employees will then help reinforce this value in their co-workers and encourage them when they demonstrate safe behavior.
- 3.5 The BBS program is intended to achieve the following benefits for employees and the Company:

- 3.5.1 Safer work environment
- 3.5.2 Frequency and severity of injuries decreases
- 3.5.3 Safe behaviors increase, and at-risk behaviors decrease
- 3.5.4 Employee participation in Company "safety culture" increases
- 3.5.5 Reporting of near-misses increases
- 3.5.6 Acceptance of responsibility and accountability increases

4. Methods

- 4.1 Metro Electric Company Inc has established an in-house team and retained consulting support to assist in developing the Job Safety Observation (JSO) and BBS program. The Company is dedicated to building a program that is employee-based and involves individuals at all levels of the Company in a process specific to our unique work operations.
- 4.2 The Company Safety Coordinator will be responsible for organization of the JSO Development and Process Team and ongoing support for program implementation.
- 4.3 The following steps generally describe the basic process adopted for the Company JSO and BBS program:

5. Design & Development Team

- 5.1 A process development team consisting of the Safety Coordinator, individual supervisors and individual employees was organized and consulted regarding decisions and fundamental elements for developing and implementing this program.

6. Identify Critical Behaviors

- 6.1 Critical behaviors are those that have the potential to cause injury and incidents. In the Company's experience and on advice from our consultant the development team will consider that a small number of unsafe behaviors may well be responsible for a majority of injuries and incidents in the workplace. These critical behaviors will be identified and given primary initial focus for positive modification.
- 6.2 These have been and, in future JSO activities will continue to be identified through a process of Critical Behavior Analysis.
- 6.3 The following processes and methods were used to identify critical behaviors and initiate a behavior-based corrective approach:
 - 6.3.1 Look at incident trends to determine what processes are causing the most incidents.
 - 6.3.2 Conduct a hazard evaluation of job sites to determine the areas that have the greatest risk for an incident.

- 6.3.3 Look at tasks that have the potential for serious injury or death.
- 6.3.4 Once the critical behaviors have been identified, implement effective engineering and/or administrative controls when and where possible. Eliminating the hazard should always be the first priority.
- 6.3.5 Determine if employees have been properly trained. Unsafe behaviors may be the result of the employee not knowing proper procedures for performing work tasks.
- 6.3.6 Rank behaviors identified in the above steps and concentrate on the most critical first.

7. Pinpoint Those Practices

- 7.1 After the behaviors have been identified, break down each step in the process. The steps identified should be detailed enough so that independent observers evaluating the same employee will get similar results.
- 7.2 As an example, one of the items on the checklist may be to observe the use of personal protective equipment (PPE). Be specific on the PPE required. Do not leave it up to the observer to determine what PPE is needed.
- 7.3 To begin with, break down the task into the following four critical practices:
 - 7.3.1 PPE - Determine what personal protective equipment is required to perform the task. Again, be specific.
 - 7.3.2 Housekeeping - The observer will evaluate the work area and document its condition.
 - 7.3.3 Using Tools and Equipment - The observer needs to know the appropriate tools and equipment that are to be used while performing this task. They should also understand how the tools are to be used safely.
 - 7.3.4 Body Positioning / Protection - The observer will determine if the employee is performing the task in such a way as to protect himself from strains, falling objects, exposure to a sudden release of chemicals or hazardous energy, etc.

8. Develop a Job Safety Observation Checklist and BBS Observer Process

- 8.1 Observations provide direct, measurable information on employees' work practices. The observer uses the checklist to document employees performing their routine tasks.
- 8.2 The observer records both safe and unsafe behaviors on the checklist. This information will be used to provide feedback and measure progress toward goals.
- 8.3 Use the critical behaviors and practices identified earlier to develop the checklist.

9. **Develop Observation & Feedback Procedures**

- 9.1 Observation and feedback are the most important components of the JSO and BBS process.
- 9.2 Observation provides the data that makes this process uniquely effective. Frequent, objective, positive feedback is essential in maintaining any safe behavior.
- 9.3 The employee is provided positive feedback on the safe behaviors, and non-threatening, instructive feedback on how to correct unsafe behaviors.
- 9.4 All unsafe behaviors and hazardous conditions shall be prioritized and corrective action tracked to completion.
- 9.5 The safety department or company representative shall ensure all corrective actions are completed in a timely manner depending on severity and probability at the condition.

10. **Finalize the checklist, and then follow these steps to design the observation and feedback procedures:**

- 10.1 Determine who will conduct observations.
- 10.2 Determine the frequency of observations.
- 10.3 Develop observation procedures.
- 10.4 Determine who will provide feedback and when.
- 10.5 Give training on conducting observations and providing feedback.

11. **Determine Who Will Conduct Observations**

- 11.1 Observers should include members of the design team and additional volunteers. Whether employees (peers), supervisors or members of management are used depends on the culture of the organization.
- 11.2 If employees trust supervisors and managers to observe and not to use the observations for disciplinary reasons, then they can function effectively as observers. If not, it is probably better to use employees' peers.
- 11.3 Observers should be committed to safety. Each observer must be willing to undergo basic training and continue to observe their colleagues' safety performance as an ongoing safety activity.
- 11.4 Metro Electric Co., Inc.'s goal is that ALL EMPLOYEES are trained and able to participate as observers.
- 11.5 Management must allow observers and other design team members the time needed to participate in this process.

- 11.6 All employees should receive initial training on the observation process initially as new hires, and receive refresher training at least annually. All employees must be advised that they may be observed at any time.

12. Determine the Frequency of Observations

- 12.1 What gets measured gets done. That is why employees should observe their peers' safety behaviors on a regular basis. The greater the number of observations, the more reliable the data and the more likely it is that safe behavior will improve.
- 12.2 It has been noted that the very act of observing and measuring people's safety behavior alters the behavior of both parties.
- 12.3 The frequency of observations is very important. The risks associated with the task should determine whether the observations are performed daily, weekly, or monthly. If the task is high risk, the observations should be conducted more frequently.
- 12.4 Different levels of management may also conduct observations at different intervals. Peers may conduct observations weekly, supervisor's biweekly, and management monthly. Having management periodically conduct observations will help with quality control.

13. Develop the Observation Procedures

- 13.1 The observer will watch the other employee work, and will use the checklist to record the number of safe and unsafe behaviors the employee performs.
- 13.2 Under the program's initial methods, each observation should take no longer than 5-10 minutes to complete.

14. Identify and Set Improvement Goals

- 14.1 Setting improvement goals increases the effectiveness of feedback and the success of the JSO and BBS process. These goals should be based on the workers' perceptions of their work practices and how they can improve.
- 14.2 Action plans are then developed to support their efforts and help them achieve their goals.

15. Develop Procedures for Providing Positive Reinforcement

- 15.1 Providing positive reinforcement when employees improve or attain goals is a key to a successful BBS process. Positive reinforcement usually takes one of these forms:
 - 15.1.1 Immediate verbal feedback
 - 15.1.2 Graphical feedback placed in strategic locations in the workplace
 - 15.1.3 Weekly/monthly briefings during which the observation scores are analyzed to provide detailed feedback about specific behaviors

- 15.1.4 In combination, these forms of feedback are motivational, self-reinforcing and help keep focus on improvements.

16. Measure Success

- 16.1 Individual departments, as well as the Company as a whole, will compare these measurements. Sharing successes with employees is another form of positive feedback that can contribute to continued success.
- 16.2 The Company will track JSO and BBS results by a computer-based method so that numerical and statistical comparisons can be made over time.

Metro Electric Co., Inc. Job Safety Observation Form



Job Task: _____

Date: _____ Time: _____

Employee Name: _____

Supervisor Name: _____

Written Procedure (JSA or SOP) Utilized? Yes No
Correct Procedure Followed? Yes No

Unsafe Acts or Unsafe Conditions Noted:

Job Observation Reviewed With Employee? Yes No

Corrective Actions Recommended:

Supervisor's Signature

Date

Metro Electric Co., Inc.

Benzene Protection Program



Applicable OSHA Standards: 29 CFR 1910.1028, 1926.1128

1. Purpose

- 1.1 The following written Benzene Protection Program has been established for Metro Electric employees who, in the course and scope of their work, may be in an area where benzene is, or could be present; or in the event of an accidental exposure to benzene.
- 1.2 When any such exposures are over the PEL, this Benzene Protection Program will be implemented and followed to reduce employee exposure to or below the PEL primarily by means of engineering and work practice controls in accordance with requirements of 1910.1028.
- 1.3 A specific benzene safety program based upon requirements of 29 CFR 1910.1028 and 1926.1128 and this Benzene Protection Program will be written for each project that presents an exposure to benzene. Each such project-specific program will include a schedule for development and implementation of the engineering and work practice controls. These plans will be reviewed and revised as appropriate based on the most recent exposure monitoring data for the project, to reflect the current status of each program.
- 1.4 Written compliance programs will be furnished upon request for examination and copying to the Assistant Secretary of the U.S. Department of Labor; the Director of the National Institute for Occupational Safety and Health, U.S. Department of Health and Human Services, or designee; affected employees and designated employee representatives.

2. Scope

- 2.1 The written Benzene Protection Program will apply to all Metro Electric employees and employees of subcontractors. This program will be considered the minimum requirements and if conflicts arise between customer/client programs or applicable regulatory requirements, the most stringent will apply.

3. Definitions

- 3.1 Action Level: Means an airborne concentration of benzene of 0.5 ppm calculated as an 8-hour time weighted average.
- 3.2 Authorized Person: Means any person specifically authorized by the employer whose duties require the person to enter a regulated area, or any person entering such an area as a designated representative of employer, for the purpose of exercising the right to observe monitoring and measuring procedures.

- 3.3 Benzene (C₆H₆) Means Liquefied or Gaseous Benzene: It includes benzene contained in liquid mixtures and the benzene vapors released by these liquids. It does not include trace amounts of un-reacted benzene contained in solid materials, unless vapor concentration exceeds the action level.
- 3.4 Employee Exposure: Means exposure to airborne benzene, which would occur if the employee were not using respiratory protective equipment.

4. Responsibilities

- 4.1 The Project Manager or Site Supervisor will be responsible for disciplinary action resulting from failure to follow the guidelines as set forth in this program.
- 4.2 The company Safety Coordinator or designee will be responsible for the monitoring and guidance for the implementation of this program.
- 4.3 The First Line Supervisor, Foreman, or Leadsperson of record will be responsible for the implementation and training of the benzene program.
- 4.4 When the Company performs work in a host facility where benzene is used, employees will be notified about the location of benzene in the facility, as well as procedures to follow if a leak or accidental release is suspected.
- 4.5 Employees also will be informed about any safety rules, contingency or emergency plans and procedures in place specifically for benzene.

5. Potential Exposure Locations & Situations

- 5.1 Employees have potential for exposure to benzene in situations where they may come in contact with gasoline products during pipeline repair and maintenance operations.
- 5.2 Potential locations where foreseeable exposure may occur are:
 - 5.2.1 Gasoline and petroleum pipelines
 - 5.2.2 Pipeline valve assemblies
 - 5.2.3 Tank repair, maintenance and cleaning operations at plant and pipeline facilities
 - 5.2.4 Field maintenance operations
 - 5.2.5 Refinery operations
 - 5.2.6 Marine, rail, bulk terminals and service station operations

6. Characteristics and Health Effects of Benzene

- 6.1 Benzene is toxic. It has a clear, colorless liquid with a pleasant, sweet odor.
- 6.2 The odor of benzene does not provide adequate warning of its hazard.

- 6.3 Benzene can seriously affect a person's health if it is swallowed, inhaled, or if it comes in contact with the skin or eyes.
- 6.4 Short-term (acute) overexposure to high concentrations of benzene (well above the levels where its odor is first recognizable) can cause someone to feel breathless, irritable, euphoric or giddy. There may be irritation in the eyes, nose and respiratory tract. Other symptoms may include headache, feeling dizzy, nauseated or intoxicated. Severe exposures may lead to convulsions and loss of consciousness.
- 6.5 Long-term (chronic) exposure to benzene (repeated or prolonged) can occur even at relatively low concentrations. Chronic exposure may result in various blood disorders ranging from anemia to leukemia -- an irreversible and potentially fatal disease. Many blood disorders associated with benzene exposure may occur without symptoms.
- 6.6 Benzene liquid is highly flammable. Its vapors can form explosive mixtures.
- 6.7 Benzene vapors are heavier than air and can travel along the ground. Consequently, accidental ignition by sparks or an open flame can occur at locations remote from the site where the benzene is being handled.
- 6.8 Benzene does not dissolve in water.
- 6.9 Hazardous decomposition products of benzene are toxic gases and vapors (such as carbon monoxide).

7. Safe Work Procedures

- 7.1 Site-specific safe work procedures will be developed as required based on requirements of this program and other related company safety and health requirements (i.e. proper selection and use of PPE, respiratory protection, fire safety, responding to a leak or spill).
- 7.2 Because benzene liquid is highly flammable and its vapors form explosive mixtures in the air, smoking, open flames and other potential sources of ignition are prohibited in areas where benzene is being handled or where there is a benzene exposure.
- 7.3 Fire extinguishers will be readily available by trained employees in areas where there is exposure to benzene.
- 7.4 Host employers have the responsibility to inform Company personnel of any benzene exposures in a job site or facility prior to work commencing. Site-specific planning for benzene exposures will be coordinated with host employer safety procedures, planning and protocols. Company employees performing work will be notified and informed about host employer benzene safety and health procedures.

8. Medical Surveillance

- 8.1 Medical surveillance will be performed for all Company employees who may be exposed to benzene, at or above the action level 30 or more days per year, or employees who are or may be exposed to benzene at or above the permissible exposure limits for 10 or more days per year, or for employees who have been exposed to more than 10 ppm of benzene for 30 days

or more in a year prior to the effective date of the standard when employed by their current employer.

8.2 All medical examinations and procedures will be performed by or under the supervision of a licensed physician.

8.3 An accredited laboratory will conduct all laboratory tests.

8.4 All cost for physicals and laboratory work etc. will be paid by Metro Electric.

8.5 Initial Exam

8.5.1 The Company will provide employees who work in an area where he/she could be exposed to benzene, a medical examination to include the following:

8.5.1.1 Detailed occupational history which includes:

8.5.1.1.1 Post work exposure to benzene or other hematological toxins.

8.5.1.1.2 A family history of blood diseases includes hematological neoplasms.

8.5.1.1.3 A history of blood diseases including genetic hemoglobin abnormalities, bleeding abnormalities, abnormal function of formed blood elements.

8.5.1.1.4 A history of renal or liver dysfunction.

8.5.1.1.5 A history of medical drugs routinely taken.

8.5.1.1.6 A history of previous exposure to ionizing radiation.

8.5.1.1.7 Exposure to marrow toxins outside of the current work situation.

8.5.1.2 Complete Physical Examination

8.5.1.3 Laboratory Test

8.5.1.4 Complete blood count, including a leukocyte counts with differential.

8.5.1.4.1 Quantitative thrombocyte counts

8.5.1.4.2 Hematocrit

8.5.1.4.3 Hemoglobin

8.5.1.4.4 Erythrocyte counts

8.5.1.4.5 The results of the above laboratory tests will be reviewed by the examining physician.

8.6. Periodic Examinations

8.6.1 The Company will provide each employee a medical examination annually. This examination will include the following:

- 8.6.1.1 A brief history regarding any new exposure.
- 8.6.1.2 Changes in medical drugs used.
- 8.6.1.3 Appearance of physical signs relating to blood disorders.
- 8.6.1.4 A complete blood count including:
 - 8.6.1.4.1 Leukocyte counts with differential
 - 8.6.1.4.2 Quantitative thrombocyte counts
 - 8.6.1.4.3 Hemoglobin
 - 8.6.1.4.4 Hematocrit
 - 8.6.1.4.5 Erythrocyte counts
 - 8.6.1.4.6 Erythrocyte indices (MCV, MCH, MCHC)

8.6.2 If an employee develops signs or symptoms commonly associated with toxic exposure to benzene, the Company will provide the employee with an additional examination, which will include those elements considered appropriate by the examining physician.

8.7 Post Employment Examination

8.7.1 At the conclusion of a job that required benzene physicals each employee will have a complete physical examination before the employee is ROF or transferred to another job-site that has no benzene hazard. This physical will include:

- 8.7.1.1 Complete blood count, including a leukocyte counts with differential.
- 8.7.1.2 Quantitative thrombocyte counts.
- 8.7.1.3 Hematocrit
- 8.7.1.4 Hemoglobin
- 8.7.1.5 Erythrocyte counts

8.8 Emergency Examinations

- 8.8.1 In addition to the surveillance required, if an employee is exposed to benzene in an emergency situation the Company will have the employee provide a urine sample and have a Phenol Test performed on the sample. The urine specific gravity will be corrected to 1.024.
- 8.8.2 If the result of the urinary phenol test is below 75mg Phenol level of urine, no further testing is required.
- 8.8.3 If the result of the urinary phenol test is equal to or greater than 75mg the Company will provide the employee with a complete blood count, leukocyte count, with differential and thrombocyte count at monthly intervals for duration of three months.
- 8.8.4 If conditions warrant after three months and a physician deems necessary, the Company will provide its employee with additional physicals per physician's direction.

8.9 Additional Examinations and Referrals

- 8.9.1 Where the results of the complete blood count required for the initial and periodic examinations indicate any of the following abnormal conditions exist, then the blood count will be repeated within 2 weeks.
- 8.9.2 The hemoglobin level or the hematocrit falls below the normal limit [outside the 95% confidence interval (C.I.)] as determined by the laboratory for the particular geographic area and/or these indices show a persistent downward trend from the individual's pre-exposure norms; provided these findings cannot be explained by other medical reasons.
- 8.9.3 The thrombocyte (platelet) count varies more than 20% below the employee's most recent values or falls outside the normal limit (95% C.I.) as determined by the laboratory.
- 8.9.4 The leukocyte count is below 4,000 per mm³ or there is an abnormal differential count.
 - 8.9.4.1 If the abnormality persists, the examining physician will refer the employee to a hematologist or an internist for further evaluation unless the physician has good reason to believe such referral is unnecessary.
 - 8.9.4.2 The employer will provide the hematologist or internist with the information required to be provided to the physician.
 - 8.9.4.3 The hematologist's or internist's evaluation will include a determination as to the need for additional tests, and the employer will assure that these tests are provided.

8.10 Information provided to the Physician

8.10.1 The employer will provide the following information to the examining physician.

8.10.1.1 A copy of this regulation and its appendices.

8.10.1.2 A description of the affected employee's duties as they relate to the employee's exposure.

8.10.1.3 The employee's actual or representative exposure level.

8.10.1.4 A description of any personal protective equipment used or to be used.

8.10.1.5 Information from previous employment related medical examinations of the affected employee, which is not otherwise available to the examining physician.

8.11 Physician's Written Opinions

8.11.1 For each examination under this section, the Company will obtain and provide the employee with a copy of the examining physician's written opinion within 15 days of the examination. The written opinion will be limited to the following information.

8.11.2 The occupationally pertinent results of the medical examination and tests.

8.11.3 The physician's opinion concerns whether the employee has any detected medical conditions, which would place the employee's health at greater than normal risk of material impairment from exposure to benzene.

8.11.4 The physician's recommended limitations upon the employee's exposure to benzene or upon the employee's use of protective clothing or equipment and respirators.

8.11.5 A statement that the employee has been informed by the physician of the results of the medical examination and any medical conditions resulting from benzene exposure which require further explanation or treatment.

8.11.6 The written opinion obtained by the employer will not reveal specific records, findings and diagnosis that have no bearing on the employee's ability to work in a benzene-exposed workplace.

8.12 Medical Removal Plan

8.12.1 When a physician makes a referral to a hematologist/internist as required under this section, the employee will be removed from areas where exposures may exceed the action level until such time as the physician makes a determination.

8.12.2 Following the examination and evaluation by the hematologist/internist, a decision to remove an employee from areas where benzene exposure is above the action level or to allow the employee to return to areas where benzene exposure is above

the action level will be made by the physician in consultation with the hematologist/internist. This decision will be communicated in writing to the employer and employee. In the case of removal, the physician will state the required probable duration of removal from occupational exposure to benzene above the action level and the requirements for future medical examinations to review the decision.

- 8.12.3 For any employee who is removed pursuant to this section, the Company will provide a follow-up examination. The physician, in consultation with the hematologist/internist, will make a decision within 6 months of the date the employee was removed as to whether the employee will be returned to the usual job or whether the employee should be removed permanently.
- 8.12.4 Whenever an employee is temporarily removed from benzene exposure pursuant to this section, the Company will transfer the employee to a comparable job for which the employee is qualified (or can be trained for in a short period) and where benzene exposures are as low as possible, but in no event higher than the action level. The Company will maintain the employee's current wage rate, seniority and other benefits. If there is no such job available, the Company will provide medical removal protection benefits until such a job becomes available or for 6 months, whichever comes first.
- 8.12.5 Whenever an employee is removed permanently from benzene exposure based on a physician's recommendation pursuant to this section, the employee will be given the opportunity to transfer to another position which is available, or later becomes available, for which the employee is qualified (or can be trained for in a short period) and where benzene exposures are as low as possible but in no event higher than the action level. The employer will assure that such employee suffers no reduction in current wage rate, seniority or other benefits as a result of the transfer.

8.13 Medical Removal Protection Benefits

- 8.13.1 The Company will provide to an employee six months of medical removal benefits immediately following each occasion an employee is removed (from exposure to benzene because of hematological findings from exposure to benzene) unless the employee has been transferred to a comparable job where benzene exposures are below the action level. For the purposes of this section, the requirement that an employer provide medical removal protection benefits means that the employer will maintain the current wage rate, seniority and other benefits of an employee as though the employee had not been removed.
- 8.13.2 The Company's obligation to provide medical removal protection benefits to a removed employee will be reduced to the extent that the employee received compensation for earnings lost during the period of removal either from a publicly or employer funded compensation program, or from employment with another employer made possible by virtue of the employee's removal.

9. Recordkeeping for Health Hazard Compliance Program

9.1 General

9.1.1 The company is required to keep all records of an employee's exposure to benzene and medical surveillance for a period of duration of employment plus (+) thirty (30) years, or, forty (40) years whichever is the longer.

9.1.2 Specific records to be kept include:

9.1.2.1 All records associated with monitoring, the results of individual monitoring and acknowledgment that the employee was informed of the results of the monitoring.

9.1.2.2 All records pertaining to medical surveillance and the acknowledged results of all examinations.

9.2 Storage

9.2.1 All records subject to these provisions will be stored in the affected employee's personnel jacket/folder maintained at the Corporate Office(s).

9.2.2 This is necessary since our projects do not normally have safe and secure storage facilities onsite.

9.2.3 Any records can be made available to proper authorities from this office.

9.3 Copies

9.3.1 Copies of pertinent records will be made available only to the individual, a duly authorized representative of the individual, or the individual's personal physician (in case of medical records) and then by written request to the Corporate Office only.

10. Use of Respirators

10.1 When employees use respirators as required by this program, the company will provide respirators that comply with the requirements of 1910.1028(g)(1). Respirators must be used during:

10.1.1 Periods necessary to install or implement feasible engineering and work-practice controls.

10.1.2 Work operations for which the company establishes that compliance with either the TWA or STEL through the use of engineering and work-practice controls is not feasible. (For example, some maintenance and repair activities, vessel cleaning, or other operations for which engineering and work-practice controls are infeasible because exposures are intermittent and limited in duration).

10.1.3 Work operations for which feasible engineering and work-practice controls are not yet sufficient, or are not required by OSHA standards to reduce employee exposure to or below the PELs.

10.1.4 In emergency situations.

11. Respiratory Protection Program

11.1 The company will supply approved respirators and filters for all benzene hazards which an employee would encounter at the job-site at no cost to the employee.

11.1.1 The company will train all employees operating under the Benzene Protection Program in the proper use, maintenance and limitation of the respirator they will be using.

11.1.2 The company will provide medical physical examination and fit testing for all employees required to wear a respirator (refer to the company's Respiratory Protection Program).

11.2 The company has established and implemented a written Respiratory Protection Program in accordance with 29 CFR 1910.134. Any use of respirators relating to benzene exposure will be done in compliance with the company's Respiratory Protection Program.

11.3 For air-purifying respirators, the company will replace the air-purifying element at the expiration of its service life or at the beginning of each shift in which such elements are used, whichever comes first.

11.4 If NIOSH approves an air-purifying element with an end-of-service-life indicator for benzene, such an element may be used until the indicator shows no further useful life.

12. Respirator Selection

12.1 Selection of respirators will be based on airborne concentrations of benzene or conditions where respirators will be used. The company supervisor in charge of a project where respirators will be used due to benzene exposure will select the appropriate respirator from Table 1 of section 1910.1028 (g)(3).

12.2 Any employee who cannot use a negative-pressure respirator will be allowed to use a respirator with less breathing resistance, such as a powered air-purifying respirator or supplied-air respirator.

12.3 All respirators selected will be approved by NIOSH.

13. Protective Clothing and Equipment

13.1 Personal protective equipment will be utilized as needed to prevent liquid benzene contact with the eyes and to limit skin exposure.

13.2 Protective clothing (such as barrier overalls, aprons, sleeves, gloves, boots, etc.) will be worn over any parts of an affected employee's body that could be exposed to liquid benzene.

- 13.3 Protective clothing and equipment will be provided by the company at no cost to the employee. The company, through its supervisors, will assure proper use of protective clothing and equipment where appropriate.
- 13.4 Employees will wear splash-proof safety goggles if it is possible that benzene may get into the eyes. In addition, employees will wear a face shield if the face could be splashed with liquid benzene.
- 13.5 PPE must meet the requirements of 29 CFR 1910.133 and provided at no cost to the employees.

14. Notes to Exposure Model

- 14.1 Less than 0.5 ppm
 - 14.1.1 Upon implementation of this Benzene Compliance Program and annually thereafter, project evaluations will be made to determine the presence of benzene on this project, as applicable.
 - 14.1.2 All employees will be presented the company's Benzene Training Program including respiratory protection and placed on the Authorized Persons Listing.
 - 14.1.3 If benzene is present on a project, initial monitoring will be conducted to determine the degree of exposure of our people to benzene.
 - 14.1.4 The initial medical surveillance will be performed on all employees who have the possibility of benzene exposure.
 - 14.1.5 This medical surveillance will be repeated if the employee during the previous year has had any opportunity to be exposed to benzene.
 - 14.1.6 In addition, annual monitoring will be conducted to determine if the project in general is exposing our people to less than 0.5 PPM over an eight-hour time weighted average.
- 14.2 Equal to or Greater than 0.5 PPM, but less than 1.0 ppm.
 - 14.2.1 All exposed employees will be placed in our initial medical surveillance program.
 - 14.2.2 All employees will be presented our Benzene Training Program including respiratory protection and placed upon Authorized Persons Listing.
 - 14.2.3 Medical surveillance will be repeated on a semi-annual basis.
 - 14.2.4 Monitoring will be completed on a quarterly basis until such time that two consecutive personnel monitoring programs show that the employee has been exposed to less than 0.5 PPM.
 - 14.2.5 If quarterly monitoring results indicate that exposure levels are below 0.5 ppm, the project will then only be required to repeat the monitoring and medical surveillance on an annual basis.

- 14.2.6 Any change in the project that could cause exposures to increase over the 0.5 ppm, the requirements for 0.5 ppm or greater will be followed.
- 14.3 Equal to, or Greater than 1.0 ppm-to Equal to 10.0 ppm.
 - 14.3.1 Employees working in areas where benzene exposure is greater than 1.0 ppm (up to 10.0 ppm) will be equipped with a chemical cartridge respirator with an organic vapor cartridge and half mask or any type of supplied air respirator with half mask. They will not be allowed to work in any area containing more than 1.0 ppm benzene without proper respiratory equipment.
 - 14.3.2 All employees will be presented our Benzene Training Program including respiratory protection and placed upon Authorized Persons Listing.
 - 14.3.3 Respiratory protective program will be presented and a follow-up made to be certain that our employees are complying with such program.
 - 14.3.4 Medical surveillance will be completed within thirty days of implementation of this program or the discovery of benzene environments greater than 1.0 ppm.
 - 14.3.5 All medical surveillance will be repeated semi-annually.
 - 14.3.6 Monitoring program will be repeated on a monthly basis until such time that two consecutive months show that the exposure level is less than 1.0 ppm.
 - 14.3.7 In addition, all other parts of compliance of this program will be followed including authorized persons list and sign in and sign out of the area.
- 14.4 Greater than 10.0 ppm, but less than or equal to 50 ppm.
 - 14.4.1 When exposure levels have been found to be this high, immediate steps should be taken to withdraw company employees from the area except those necessary to establish engineering and work practice controls to reduce the exposure levels to below 10.0 ppm and preferably below 1.0 ppm.
 - 14.4.2 While working in areas performing engineering and work practice controls, our employees will be equipped and required to wear chemical cartridge respirators with organic vapor cartridge and full-face piece, or any supplied air with full-face piece or any organic gas mask, or any self-contained breathing apparatus with full-face piece.
 - 14.4.3 Prior to admittance to the area, these employees will have completed all training programs, medical surveillance programs, and respiratory protection program, and will be placed on authorized persons list and will be required to sign in and out of the restricted area.
- 14.5 Benzene Exposure greater than 50.0 ppm but equal to or less than 1000 ppm.
 - 14.5.1 Company employees will be allowed in this area only for the purpose of establishing engineering and work practice controls.

- 14.5.2 They will be equipped with supplied air respirator with half mask and positive pressure mode.
- 14.5.3 Prior to admittance into the area, all employees will be instructed in our training respiratory protective programs and have completed all medical surveillance and been placed on our authorized persons list. In addition, they will sign in and out while in the area to perform engineering controls.
- 14.6 Benzene Exposure greater than 1000 ppm but equal to or less than 2000 ppm.
 - 14.6.1 Company employees will be equipped with supplied air respirators with full-face piece, helmet or hood and positive pressure mode. All requirements as established above will be followed.
- 14.7 Greater than 2000 ppm but equal to or less than 10,000 ppm.
 - 14.7.1 Company employees, if allowed in this area, will be allowed only to shut off valves and to perform emergency operations. They will be equipped with a supplied air respirator and auxiliary self-contained breathing apparatus with full-face piece and positive pressure mode.
 - 14.7.2 In addition, all other requirements as outlined above will be followed.

15. Escape

- 15.1 Since benzene can be fatal in only a very short period of time at concentrations greater than 10,000 ppm, anyone exposed to areas of such high concentration will use any organic vapor gas mask or self-contained breathing apparatus with full face piece for purposes of escape from the area.
- 15.2 This escape will be undertaken immediately upon the sensing of vapors or an alarm of vapors being this high.
- 15.3 EMERGENCY SITUATION: Equal to or greater than 100 ppm.
 - 15.3.1 Where an employee is exposed to a massive release of benzene (100 ppm) due to some type of failure, the employee will be required to participate in special medical tests program.
 - 15.3.2 Special tests will be provided by the end of the employee's work shift.
 - 15.3.3 If the results of the tests are positive, additional tests will be provided as soon as practicable and repeated one month later.

Metro Electric Co., Inc.

Bloodborne Pathogens



Applicable OSHA Standards: 29 CFR 1910.1030

1. Purpose & Scope

- 1.1 Metro Electric is committed to providing a safe and healthful work environment. In pursuit of this endeavor, the following Exposure Control Plan (ECP) is provided to eliminate or minimize occupational exposures to bloodborne pathogens.
- 1.2 This program applies to all employees who have an occupational exposure to bloodborne pathogens. The program also ensures that these employees will be trained regarding preventing and responding to bloodborne pathogens exposures prior to assignment, with training, providing personal protective equipment and other elements of implementation at no cost to the employee. The company Safety Representative shall be responsible for effective implementation and management of this program.
- 1.3 The basis of this Plan is to comply with the OSHA Bloodborne Pathogens Standard, Title 29 Code of Federal Regulations 1910.1030. It will provide protection for employees through the use of "Universal Precautions" as a major component of the Plan. Because individuals generally cannot know whether blood, body fluids or detached tissues are infected with bloodborne pathogens, Universal Precautions assumes that ALL blood and body fluids are infectious and must be treated accordingly.
- 1.4 All employees will have access to and the opportunity to review this plan at any time during their work shifts by contacting their Supervisor or the company's Safety Representative. Employees seeking copies of the Plan may contact the Safety Representative. A copy of the Plan is available at no charge and within 15 days of the request. The Exposure Control Plan shall also be used as a basis for training.
- 1.5 The Safety Representative will also be responsible for reviewing and updating the ECP annually or sooner if necessary. To reflect any new or modified tasks and procedures which affect occupational exposure, and to reflect new or revised employee posters with occupational exposure.

2. Employee Exposure Determination

- 2.1 Occupational exposure to blood and body fluids is limited to our designated first aid responders as they are needed for a worksite where professional emergency medical services are not readily available within an acceptable response time.
- 2.2 When professional emergency medical services are readily available within an acceptable response time, company personnel are not required as part of their employment to provide first aid or CPR to another person.
- 2.3 Although this Exposure Control Plan includes considerations and provisions for the proper selection and use of personal protective equipment, such implementation shall be performed without consideration of whether personal protective equipment is utilized.

- 2.4 Our facility has decided to offer the hepatitis B pre-exposure vaccination to each first aid provider at the time they are so designated and prior to their commencement of these responsibilities.
- 2.5 In the event of a first aid incident if blood or other potentially infectious materials are present, the affected first aid responder(s) is instructed to report to the Safety Representative before the end of his or her work shift.
- 2.6 The Safety Representative will maintain a report that includes the name of the first aide responder, as well as the date, time and description of the incident. The Safety Representative will ensure that any first aid responder that desires the vaccine series after an incident will receive it as soon as possible, but not later than twenty four hours after the incident.
- 2.7 The Safety Representative will train first aid providers on the specifics of the reporting procedures and all other training associated with bloodborne pathogen requirements.

3. Engineering Controls and Work Practices

- 3.1 Engineering controls and work practice controls will be used to prevent or minimize exposure. Hand washing facilities are available at all jobsites. Employees will wash after administering first aid. In the event that hand washing facilities are not available, disposable “one use” towelettes that utilize disinfecting and sanitizing products shall be provided and used by affected personnel until proper hand washing is possible. All equipment used or contaminated during first aid assistance will be decontaminated in a proper manner or discarded in appropriate containers.
- 3.2 Engineering controls and work practices shall be reviewed as needed, and at least annually, to ensure that procedures continue to be effective in preventing employee exposures.
- 3.3 Additionally, in the event of a reported “near miss” incident involving potential exposure to bloodborne pathogens, engineering controls and work practices shall also be reviewed and revised as needed.

4. Personal Protective Equipment

- 4.1 First aid responders will use personal protective equipment appropriate for administering the first aid required. All jobsite first aid kits contain gloves, eye protection, resuscitation bags and one-way CPR mouthpiece devices.
- 4.2 PPE is provided by the company at no charge or cost to employees. PPE may include items such as latex medical-type gloves, splash goggles, face shields and body protection such as aprons, depending on the anticipated situations for providing first response in a medical emergency. PPE shall be provided in various types and sizes to facilitate ease of use. Additionally, PPE shall be replaced, decontaminated or repaired as necessary.
- 4.3 Life-threatening situations may require immediate action before personal protective equipment can be obtained – for example, beginning CPR without a one-way CPR mask, or applying direct pressure to a hemorrhaging wound or amputation. In this situation, it is always the employee’s choice and at their discretion to render assistance without use of PPE until proper PPE can be obtained.

- 4.4 In such situations and when an employee chooses to render aid without proper PPE, they should take advantage of whatever barrier protection that may be immediately available. For example, regular safety glasses with side shields and standard work gloves usually will provide some level of additional barrier protection in comparison to not utilizing safety glasses and regular work gloves.

5. Labeling

- 5.1 Biohazard warning labels displaying the biohazard symbol will be placed on all containers for wastes, which may be contaminated with blood or body fluids, and red leak proof bags will be used as required.



Biohazard Symbol

6. Housekeeping

- 6.1 If a first aid incident occurs, the first aid responders will take precautions to decontaminate work surfaces, tools and equipment. Personal protective equipment will be used during cleanup.
- 6.2 Mechanical means such as tongs, forceps or a brush and a dust pan will be used to pick up contaminated broken glassware. The waste will be treated as regulated waste and disposed of in closable and labeled or color coded containers.
- 6.3 When storing, handling, transporting or shipping, place other regulated waste in containers that are constructed to prevent leakage. The waste will be discarded according to federal, state, and local regulations.
- 6.4 In the event of a first aid incident in which the first aid responders' clothes become contaminated, the following actions will be taken:
- 6.5 Contaminated laundry will be handled as little as possible and with a minimum of agitation. Appropriate personal protective equipment will be worn when handling contaminated laundry.
- 6.6 Contaminated laundry will be placed in color coded bags at its location of use, and taken by a commercial launderer. The launderer will be given the appropriate warnings.

7. Training

- 7.1 All designated first aid responders will receive training conducted by the Safety Representative or a qualified instructor designated by the Safety Representative. The bloodborne pathogens training program will cover, at a minimum, the following elements:
 - 7.1.1 A copy and explanation of the standard.
 - 7.1.2 Epidemiology and symptoms of bloodborne pathogens.
 - 7.1.3 Modes of transmission.
 - 7.1.4 The Exposure Control Plan and a way to obtain a copy.
 - 7.1.5 Methods to recognize exposures related to specific tasks, situations and other activities that may involve exposure to blood.
 - 7.1.6 Use and limitations of engineering controls, safe work practices, and PPE.
 - 7.1.7 PPE types, use, location, removal, handling, decontamination, disposal and basis for selection.
 - 7.1.8 Hepatitis B Vaccine offered free of charge. Training will be given prior to vaccination on its safety, effectiveness, benefits, and method of administration.
 - 7.1.9 Emergency procedures for blood and other potentially infectious materials. Exposure incident procedures post exposure evaluation and follow up signs and labels.
- 7.2 Training for employees who are determined to be occupationally exposed to bloodborne pathogens will be conducted initially on hiring or assignment, with annual re-training (i.e. training to take place within one year of initial training).
- 7.3 Training records will be maintained for 3 years from the date of training, and must include the dates and contents of training along with the names and job titles of employees attending the training.
- 7.4 All medical records of employees must be maintained and stored for the duration of employment by the employee plus 30 years.
- 7.5 The employee may consent to having medical records released to a representative of the employee by written consent.
 - 7.5.1 The Assistant Secretary or director may also request the medical records for examination or copying.
 - 7.5.2 All medical records must be transferred to and maintained by any successors to the business, or the employee must be notified if there is no successor at least 3 months prior to being destroyed.

8. Hepatitis-B Virus (HBV) Vaccinations

- 8.1 Employees who are required to provide first aid or emergency response duties or medical care on a routine basis will be offered Hepatitis-B Virus (HBV) vaccinations at company expense and with no charge or cost to the employee. Employees who transfer to a job, or if their job is reclassified to include exposure to bloodborne pathogens will be offered HBV vaccinations within 10 working days of the transfer or reclassification.
- 8.2 The choice for HBV vaccination is not mandatory. If affected employees choose not to have the vaccination at the initial offering, they will have the opportunity to be vaccinated when they are ready. The company will document the offer, acceptance or declination, and vaccination dates using written formats as required by OSHA.

9. Post Exposure Evaluation And Follow Up

- 9.1 If an exposure incident occurs, contact the Safety Representative immediately. A confidential medical evaluation and follow up will be conducted by the company's designated medical provider. The following will be performed:
 - 9.1.1 Document the routes of exposure and how exposure occurred.
 - 9.1.2 Identify and document source individual, unless infeasible or prohibited by state or local law.
 - 9.1.3 Obtain consent and test source individual's blood, document the source's blood test results.
 - 9.1.4 If the source individual is known to be infected, testing need not be repeated.
 - 9.1.5 Provide the exposed employee with the source individual's test results, and if information about applicable disclosure laws and regulations concerning the source identity and infectious status.
 - 9.1.6 After obtaining consent, collect exposed employee's blood as soon as feasible after the exposure incident and test blood for HBV and HIV serological status.
 - 9.1.7 If the employee does not give consent for HIV serological testing during the collection of blood for baseline testing, preserve the baseline blood sample for at least 90 days.

10. Post Exposure Evaluation

- 10.1 The circumstances of exposure incidents will be reviewed to determine if procedures, protocols and/or training need to be revised.

11. Health Care Professionals

- 11.1 Health care professionals responsible for employee's HB vaccination, post exposure evaluation and follow up will be given a copy of the OSHA Bloodborne Standard. The health care professional evaluating an employee after an exposure incident will also receive the following:
 - 11.1.1 A description of the employee's job duties relevant to the exposure incident.

- 11.1.2 Route(s) of exposure.
- 11.1.3 Circumstances of exposure.
- 11.1.4 If possible, a result of the source individual's blood test.
- 11.1.5 Relevant employee medical records, including vaccination status.

12. Health Care Professional's Written Opinion

- 12.1 The designated Health Care Professional will provide the employee with a copy of the evaluating health care professional's written opinion within 15 days after completion of the evaluation.

The written opinion for post exposure evaluation and follow up will be limited to whether or not the employee has been informed of the results of the medical evaluation and any medical conditions which may require further evaluation and treatment for HB vaccinations.

- 12.2 The opinion will be limited to whether the employee required or received the vaccine. All other diagnoses must remain confidential and not be included in the written report.

13. Recordkeeping

- 13.1 Medical Records:

- 13.1.1 Medical records are maintained for each employee with exposure in accordance with 29 CFR-1910.1020. In addition to the requirements of 29 CFR 1910.1020, the medical record will include:

- 13.1.1.1 The name, social security number, job designation of employee.

- 13.1.1.2 Date(s) of bloodborne pathogens training, written acknowledgment of training and a record of the training curriculum utilized and the job assignment(s) or classifications of the personnel so trained.

- 13.1.1.3 A copy of the employee's Hepatitis B vaccinations and any medical records relative to the employee's ability to receive vaccination.

- 13.1.1.4 A copy of all results of examinations, medical testing, and follow up procedures as required.

- 13.1.1.5 A copy of all health care professional written opinion(s) as required by the standard.

- 13.1.2 Employee medical records will be kept confidential and will not be disclosed or reported without the employee's express written consent except as required by OSHA or other law. Employee medical records shall be maintained for at least the duration of employment and, in the case of records regarding bloodborne pathogens program compliance, at least an additional 30 years.

- 13.1.3 Employee medical records shall be provided (within 15 working days) upon written request of the employee or to anyone having written consent of the employee.
- 13.2 Training Records:
 - 1.3.2.1 Bloodborne pathogen training records will be maintained by the Safety Representative at the Company's main office.
 - 13.2.2 Each record will give an accurate report of training for individual employees who are determined to have an occupational exposure to bloodborne pathogens.
 - 13.2.3 Each training record will include the date of training, curriculum, the instructor's name, and the names and job assignments or titles of the individuals trained. These records will be maintained for three years from the date of training.
- 13.3 Transfer of Records:
 - 13.3.1 If the company ceases to do business and there is not a successive employer, the employer shall notify the Director of the National Institute for Occupational Safety and Health (NIOSH) at least three months prior to scheduled records disposal, and prepare to transmit them to the Director.

14. Supplemental Information

- 14.1 Designated First Aid Providers: Foreman or Site Supervisor for work location
- 14.2 Medical Evaluations Performed By: Local Physician as selected for project location
- 14.3 Designated Health Care Professional: Nearest Emergency Facility
- 14.4 Location of Training Records: Metro Electric Co., Inc.

Metro Electric Co., Inc.

Cable Pulling Safety



This policy is intended to familiarize electricians who work for Metro Electric Co., Inc. with the operations, safety and procedure associated with cable pullers, tuggers, rollers, ropes, slings and any other equipment involved in making a safe cable pull. Metro Electric recognizes the fact that cable puller applications are unlimited in number and depend upon variables such as specific wiring lay-outs, the state of the surrounding structures, cable pull strategy, cable type and the cables or wires already present in the raceways. Because specific application instructions are not possible this policy strives to provide general principles which will aide electricians in safely solving particular installation problems.

Cable pulling involves a system. Such systems usually consist of cable reels, reel stands or dispensers, wire or cable grips, pulling rope, lubricant, a cable puller, sheaves and cable rollers. The cable puller, which is one component in the overall system that is always the main focus in any cable pull.

Safe Operating Practices

A. **Safety First**

- Operator's Manuals for all equipment must be read and understood before operating cable pullers.
- The safety director shall instruct each employee in the recognition and avoidance of unsafe conditions and the regulations applicable to his work environment to control or eliminate any hazards or other exposure to illness or injury.
- When using electric tools, such as a cable puller, basic safety precautions should always be followed to reduce the risk of fire, explosions from sparks, electric shock and personnel injury.

B. **Plan the Pull**

- Keep pulling rope confined to conduit wherever possible. Exposed rope can whip violently when broken.
- Always operate cable pullers in well lit areas.
- Do not operate in hazardous or combustible environments as a fire or explosions could result from sparks or other means.
- All components used in the pulling systems must be able to withstand the maximum pull force. Use only the properly rated components.
- Never stand directly under a vertical pull. Keep that area clear of all personnel.
- Inspect all pulling system components before installation begins. Never use a worn, defective or incomplete component.
- Always re-check the security of the vise chain hold down devices prior to each pull making sure the long vise chain pins are held deeply into the chain pockets. The use of cheaters, when mounting and tightening the vise chains could cause the tugger to break away under load causing serious injury or death.
- Use caution when mounting vise chains around square corners. The vise chains must be uniformly tight at all points.
- Rope at the capstan can crush a hand. Do not operate with loose clothing, hands and/or body on or near the rotating capstan.

- Do not stand directly behind the load side of the rope. Position yourself and other personnel so that injury will not occur if any pulling system component would break loose during a pull.

C. **Tugger Rope Handling**

- Use only rope rated for pulling force required, checking it's condition frequently for damage. Damaged rope may break, causing eye injury, loss of balance and bodily injury.
- The rope should not approach the puller at an angle from left to right or more than 5°.
- Components other than rope contacting capstan could cause breakage resulting in eye injury, loss of balance and bodily injury.
- Do not hold a lead or maintain a stationary rope on the moving capstan. The heat generated may cause the rope to break suddenly.
- Never allow the rope to wrap around your hands, arms or body. This could prevent quick release of the rope.
- Inspect all pulling rope before using. Use of any defective (e.g., frayed or cut) or worn rope to complete a pull can result in a break.

Metro Electric Co., Inc.

Confined Space Entry Program



Applicable OSHA Standard: 29 CFR 1910.146, 1926.21(b)(6)

1. Purpose & Scope

- 1.1 This program contains requirements for practices and procedures for Metro Electric to protect employees in general industry from the hazards of entry into permit-required confined spaces.
- 1.2 This program applies to all employees and subcontractors working within Company controlled worksites.

2. Definitions

- 2.1 "Attendant" means an individual stationed outside a permit-required confined space who monitors the authorized entrants and who performs all attendants' duties assigned in the employer's permit-required confined space program.
- 2.2 "Authorized entrant" means an employee who is authorized by the Company to enter a permit space.
- 2.3 "Confined space" means a space that:
 - 2.3.1 Is large enough and so configured that an employee can bodily enter and perform assigned work; and
 - 2.3.2 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
 - 2.3.3 Is not designed for continuous employee occupancy
 - 2.3.4 Or has inadequate ventilation
- 2.4 "Entry" means 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.
- 2.5 "Entry supervisor" means the person (such as the foreman, or crew chief) 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 Company.
- 2.6 "Isolation" means 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.

3. General Requirements

- 3.1 The Site Supervisor will evaluate the workplace to determine if any spaces are permit-required confined spaces. The client may provide a list when working at remote locations.
- 3.2 If the workplace contains permit spaces, the Project Superintendent in conjunction with the Site Safety Supervisor/Representative and the client, will 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.

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

- 3.3 If the Site Supervisor decides that Company employees will not enter permit spaces, effective measures will be taken to prevent employees from entering the permit spaces.
- 3.4 If the Site Supervisor decides that Company employees will enter permit spaces, a site specific written permit space program will be developed and implemented in accordance and compliance with the Company's and client's confined space entry procedures. The written program will be available for inspection by employees.
- 3.5 When there are changes in the use or configuration of a non-permit confined space that might increase the hazards to entrants, the employer will reevaluate that space and, if necessary, reclassify it as a permit-required confined space.
- 3.6 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:
- 3.7 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.
- 3.8 If it is necessary to enter the permit space to eliminate hazards, such entry will be performed under requirements of this 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.
- 3.9 The employer will document the basis for determining that all hazards in a permit space have been eliminated, through a certification that contains the date, the location of the space, and the signature of the person making the determination. The certification will be made available to each employee entering the space or to that employee's authorized representative.
- 3.10 If hazards arise within a permit space that has been declassified to a non-permit space, each employee in the space will exit the space. The employer will then reevaluate the space and determine whether it must be reclassified as a permit space, in accordance with other applicable provisions.

- 3.10.1 When entrance covers are removed, the opening will 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.
- 3.10.2 If the Site Supervisor has reason to believe that the measures taken under the permit space program may not protect employees, the supervisor will revise the program to correct deficiencies found to exist before subsequent entries are authorized. The Company Safety Representative will be informed about any such action and assist the Site Supervisor as needed in the revisions.
- 3.11 Examples of circumstances requiring the review of the permit space program include:
 - 3.11.1 Any unauthorized entry of a permit space,
 - 3.11.2 The detection of a permit space hazard not covered by the permit,
 - 3.11.3 The detection of a condition prohibited by the permit,
 - 3.11.4 The occurrence of an injury or near-miss during entry,
 - 3.11.5 A change in the use or configuration of a permit space, and / or
 - 3.11.6 Employee complaints about the effectiveness of the program.

4. Site Specific Written Program

- 4.1 Before entry into any confined space at any Company controlled worksite, a site specific written program must be developed.
- 4.2 The Site Supervisor will develop the site specific written program. The written program will be approved by the Company Safety Representative.
- 4.3 The site specific written program will comply with OSHA 29 CFR 1910.146 and contain the following elements:
 - 4.3.1 Measures necessary to prevent unauthorized entry;
 - 4.3.2 Methods used to identify and evaluate the hazards of permit spaces before employees enter them;
 - 4.3.3 Specify acceptable entry conditions;
 - 4.3.4 Methods used in isolating the permit space;
 - 4.3.5 Purging, inerting, flushing, or ventilating the permit space as necessary to eliminate or control atmospheric hazards;
 - 4.3.6 Providing pedestrian, vehicle, or other barriers as necessary to protect entrants from external hazards;

- 4.3.7 Methods used to verify that conditions in the permit space are acceptable for entry throughout the duration of an authorized entry.
- 4.3.8 Identify testing and monitoring equipment needed to comply with the Company's written confined space entry safety program.
- 4.3.9 Identification of authorized entrants, attendants and entry supervisors.
- 4.3.10 Ventilating equipment needed to obtain acceptable entry conditions;
- 4.3.11 Communications equipment necessary.
- 4.3.12 Personal protective equipment insofar as feasible engineering and work practice controls do not adequately protect employees;
- 4.3.13 Lighting equipment needed to enable employees to see well enough to work safely and to exit the space quickly in an emergency;
- 4.3.14 Equipment, such as ladders, needed for safe ingress and egress by authorized entrants;
- 4.3.15 Rescue and emergency services provided.
- 4.3.16 Training provided to entry supervisors, authorized entrants and attendants.

5. **Entry Procedure Guidelines**

- 5.1 The following guidelines are provided to assist the Site Supervisor in preparing the site specific written program.
- 5.2 Any conditions making it unsafe to remove an entrance cover will be eliminated before the cover is removed.
- 5.3 Lockout /Tag out procedures must be followed during a permit-required confined space entry.
- 5.4 All entrants must wear a safety harness with retrieval rope attached to the d-ring on the back of the harness.

Note: More often, it is the responsibility of the client to prepare a confined space for entry. Procedures must be developed to ensure that information concerning the preparation of confined spaces by the client is communicated to Company personnel.

- 5.5 When entrance covers are removed, the opening will 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.
- 5.6 Before an employee enters the space, the internal atmosphere will be tested, with a calibrated direct-reading instrument, for the following conditions in the order given:

- 5.6.1 Oxygen content,
 - 5.6.2 Flammable gases and vapors, and
 - 5.6.3 Potential toxic air contaminants.
- 5.7 The entry supervisor who performs monitoring of the confined space will notify entrants of the potential hazards and monitoring results. Entrants will be involved and participate in the process of reviewing the written permit and signing of the permit.
- 5.8 Employees or their representatives are entitled to request additional monitoring at any time during the confined space entry operation.
- 5.9 Individuals will not enter a confined space that is immediately hazardous to life or health. Initial testing to determine potential hazards that require entry will have an approved and documented Standard Operating Procedure with a two-level approval -- one of which must be the Site Superintendent and the other the Company Safety Representative.
- 5.10 There will be no hazardous atmosphere within the space whenever any employee is inside the space.
- 5.11 An employee may not enter the space until the forced air ventilation has eliminated any hazardous atmosphere. The forced air ventilation will be so directed as to ventilate the immediate areas where an employee is or will be present within the space and will continue until all employees have left the space. The air supply for the forced air ventilation will be from a clean source and may not increase the hazards in the space.
- 5.12 The atmosphere within the space will be continually tested to ensure that the continuous forced air ventilation is preventing the accumulation of a hazardous atmosphere and providing sufficient oxygen to the worker.
- 5.13 If a hazardous atmosphere is detected during entry, each employee will leave the space immediately. The space will be evaluated to determine how the hazardous atmosphere developed and measures will be implemented to protect employees from the hazardous atmosphere before any subsequent entry takes place.
- 5.14 The entry supervisor will verify that the space is safe for entry and that the pre-entry measures required by this Company program have been taken, through a written certification that contains the date, the location of the space, and the signature of the person providing the certification. The certification will be made before entry and will be made available to each employee entering the space. This can be accomplished by means of an entry permit provided by the client.
- 5.15 The Site Supervisor will designate the persons who are to have active roles (as, for example, authorized entrants, attendants, entry supervisors, or persons who test or monitor the atmosphere in a permit space) in entry operations, identify the duties of each such employee, and provide each such employee with the training required by this Company program.
- 5.16 This Company will provide at least one attendant outside the permit space into which entry is authorized for the duration of entry operations.

- 5.17 If multiple spaces are to be monitored by a single attendant, include in the permit program the means and procedures to enable the attendant to respond to an emergency affecting one or more of the permit spaces being monitored without distraction from the attendant's responsibilities under this program;
- 5.18 The Site Superintendent in conjunction with the Company Safety Representative and the client will 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. Emergency equipment must be inspected prior to any entrance into the confined space.
- 5.19 If an entrant is in need of rescue, the attendant's sole responsibility is to sound the alarm to evacuate any other entrants and summon emergency personnel. Under no circumstance will an attendant enter the confined space by himself.
- 5.20 Before entry begins, the entry supervisor identified on the permit will sign the entry permit to authorize entry.
- 5.21 The completed permit will be made available at the time of entry to all authorized entrants, 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.
- 5.22 All entrants must be signed in and out by the attendant every time they enter or exit the confined space.
- 5.23 The duration of the permit may not exceed the time required to complete the assigned task or job identified on the permit.
- 5.24 The entry supervisor will terminate entry and cancel the entry permit when:
 - 5.24.1 The entry operations covered by the entry permit have been completed; or
 - 5.24.2 A condition that is not allowed under the entry permit arises in or near the permit space.
 - 5.24.3 The work area emergency system is activated
- 5.25 When the Company arranges to have employees of another employer (contractor) perform work that involves permit space entry, the Company will:
 - 5.25.1 Inform the contractor that the workplace contains permit spaces and that permit space entry is allowed only through compliance with a permit space program meeting the requirements of this Company program;
 - 5.25.2 Apprise the contractor of the elements, including the hazards identified and the Company's experience with the space, that makes the space in question a permit space;
 - 5.25.3 Apprise the contractor of any precautions or procedures that the Company has implemented for the protection of employees in or near permit spaces where contractor personnel will be working;

- 5.25.4 Coordinate entry operations with the contractor, when both Company personnel and contractor personnel will be working in or near permit spaces; and
- 5.25.5 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.

6. Training

- 6.1 The Company will provide training so that all employees whose work is regulated by Company and OSHA safety requirements for entering and working in confined spaces will acquire the understanding, knowledge, and skills necessary for the safe performance of the duties assigned under this section.
- 6.2 The training will establish employee proficiency in the duties required by this section and will introduce new or revised procedures, as necessary, for compliance with this program.
- 6.3 The employer will certify that the training required by this program has been accomplished. The certification will contain each employee's name, the signatures or initials of the trainers, and the dates of training. The certification will be available for inspection by employees and their authorized representatives.
- 6.4 The Company Safety Representative will ensure that training is provided so that all employees whose work is regulated by this Company program acquire the understanding, knowledge, and skills necessary for the safe performance of the duties assigned under this section.
- 6.5 Training will be provided to each affected employee:
 - 6.5.1 Before the employee is first assigned duties under this Company program;
 - 6.5.1.1 Before there is a change in assigned duties;
 - 6.5.1.2 Whenever there is a change in permit space operations that presents a hazard about which an employee has not previously been trained;
 - 6.5.1.3 Whenever the Site Supervisor has reason to believe either that there are deviations from the permit space entry procedures required by this Company program or that there are inadequacies in the employee's knowledge or use of these procedures; and
 - 6.5.1.4 At least annually thereafter.
 - 6.5.2 The training will establish employee proficiency in the duties required by this Company program and will introduce new or revised procedures, as necessary, for compliance with this section.
 - 6.5.3 The Site Supervisor will certify that the training required by this Company program has been accomplished. The certification will contain each employee's name, the signatures or initials of the trainers, and the dates of training. The certification will be available for inspection by employees.

6.5.4 The training will include the following:

6.5.4.1 Duties of authorized entrants:

- 6.5.4.1.1 Know the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure;
- 6.5.4.1.2 Properly use equipment as required by the permit.
- 6.5.4.1.3 Communication method used 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.
- 6.5.4.1.4 Alert the attendant whenever the entrant recognizes any warning sign or symptom of exposure to a dangerous situation, or the entrant detects a prohibited condition;
- 6.5.4.1.5 Exit from the permit space as quickly as possible whenever an order to evacuate is given by the attendant or the entry supervisor, the entrant recognizes any warning sign or symptom of exposure to a dangerous situation, the entrant detects a prohibited condition, or an evacuation alarm is activated.

6.5.4.2 Duties of attendants:

- 6.5.4.2.1 Knows the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure;
- 6.5.4.2.2 Is aware of possible behavioral effects of hazard exposure in authorized entrants;
- 6.5.4.2.3 Continuously maintains an accurate count of authorized entrants in the permit space and ensures that the means used to identify authorized entrants who are in the permit space is accurate;
- 6.5.4.2.4 Remains outside the permit space during entry operations until relieved by another attendant;
- 6.5.4.2.5 Communicates with authorized entrants as necessary to monitor entrant status and to alert entrants of the need to evacuate the space.
- 6.5.4.2.6 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:

- 6.5.4.2.6.1 If the attendant detects a prohibited condition;
- 6.5.4.2.6.2 If the attendant detects the behavioral effects of hazard exposure in an authorized entrant;
- 6.5.4.2.6.3 If the attendant detects a situation outside the space that could endanger the authorized entrants; or
- 6.5.4.2.6.4 If the attendant cannot effectively and safely perform all the duties required under this Company program.
- 6.5.4.2.7 Summon rescue and other emergency services as soon as the attendant determines that authorized entrants may need assistance to escape from permit space hazards;
- 6.5.4.2.8 Takes the following actions when unauthorized persons approach or enter a permit space while entry is underway:
 - 6.5.4.2.8.1 Warn the unauthorized persons that they must stay away from the permit space;
 - 6.5.4.2.8.2 Advise the unauthorized persons that they must exit immediately if they have entered the permit space;
 - 6.5.4.2.8.3 Inform the authorized entrants and the entry supervisor if unauthorized persons have entered the permit space;
 - 6.5.4.2.8.4 Performs non-entry rescues as specified by the site specific written program rescue procedure; and
 - 6.5.4.2.8.5 Performs no duties that might interfere with the attendant's primary duty to monitor and protect the authorized entrants.
- 6.5.4.3 Duties of entry supervisors:
 - 6.5.4.3.1 Knows the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure;
 - 6.5.4.3.2 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;

- 6.5.4.3.3 Terminates the entry and cancels the permit as required;
- 6.5.4.3.4 Verifies that rescue services are available and that the means for summoning them are operable;
- 6.5.4.3.5 Removes unauthorized individuals who enter or who attempt to enter the permit space during entry operations; and
- 6.5.4.3.6 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.

7. Emergency Response & Rescue

- 7.1 The Site Supervisor will confirm in advance the availability of rescue and emergency services for immediate danger to life and health situations (IDLH) and have phone numbers available at the work location.
- 7.2 The Site Supervisor will also ensure that there is a reliable method of communication available at the work location (land-line telephone, cellular telephone, two-way radio) for summoning rescue and emergency services should they be needed.
- 7.3 If rescue and emergency personnel are not able to respond to a call for assistance in a timely manner, the Site Supervisor will obtain competent confined space rescue personnel to standby at the work location while confined space operations are being performed under IDLH conditions.
- 7.4 Rescue personnel will be trained, properly equipped and authorized by the Site Supervisor to perform this service. Unauthorized personnel will be prohibited from attempting a rescue.
- 7.5 When third-party rescue services are utilized for standby at the work location, service personnel will be allowed to survey the confined space work location, select and obtain specialized equipment as required, and decline the standby assignment if that is their choice.
- 7.6 When rescue and emergency services are being provided by the host employer, this must be stipulated and specified in the written contract that the host employer has accepted and signed.
- 7.7 All personal protective equipment required when authorized and qualified employees perform rescue and emergency services will be provided by the Company at no cost to the individual employees assigned to this duty.
- 7.8 When authorized and qualified Company employees provide rescue and emergency services at confined space entry work locations, these individuals will be provided with training and hands-on practice rescues at least annually.

8. Written Program Review

- 8.1 The Company Safety Representative will review the permit space program, using the canceled permits retained within one year after each entry and revise the program as necessary, to ensure that employees participating in entry operations are protected from permit space hazards.

Date: _____

Instructor: _____

Subject: _____

Employee Name

Employee Signature

PRE-ENTRY CHECKLIST FOR CONFINED SPACES

Date: _____

Time: _____

Expires: _____

Issued By: _____

Job Site: _____

Job Supervisor: _____

Equipment to Be Worked on: _____

Work to Be Performed: _____

1. Atmospheric Checks:

Carbon Monoxide _____ ppm

Oxygen % _____

Explosive _____ % L.F.L.
(lower flammability limit)

Toxic _____ PPM
(parts per million)

2. Source Isolation (NO ENTRY):

N/A YES NO

Pumps and Lines Blinded

Disconnected or Blocked

3. Ventilation Modification:

N/A YES NO

Mechanical

Natural Ventilation Only

4. Atmospheric Check After Isolation and Ventilation:

Carbon Monoxide	_____	0 - +35 PPM
Oxygen	_____ %	>19.5% OR <23.5%
Explosive	_____ % L.F.L.	<10%
Toxic	_____ PPM	<10 PPM H ₂ S

If conditions are in compliance with the previous requirements and there is no reason to believe conditions may change adversely, then complete the following questions 5 – 7 and post with this permit.

If conditions are not in compliance or if there is reason to believe that conditions may change adversely, stop here and proceed to the Entry Permit.

5. Entry, Standby, and Back-Up Persons: **YES** **NO**

- Successfully completed required training?
- Is training current?

6. Equipment: **N/A** **YES** **NO**

- Direct reading gas monitor tested?
- Safety harnesses and lifelines for entry and standby persons?
- Hoisting equipment?
- Powered communications?
- SCBAs for entry and standby persons?
- Protective clothing?
- Electric equipment listed Class I, Division I, Group D, and non-sparking tools?

7. Rescue Procedure:

The work authorized by this permit and the information contained herein has been reviewed. Written instructions and safety procedures have been received and are understood. This permit is not valid unless all appropriate items are completed.

Permit and Checklist prepared by: _____

Approved by: _____

Reviewed by: _____

This permit must be kept at job site. Return job site copy to Safety Office following job completion.
Copies to Safety Office and unit supervisor.

ENTRY PERMIT

Confined Space: _____

Hazardous Area: _____

All copies of permit will remain at job site until job is completed.

Site Location and Description: _____

Purpose of Entry: _____

Supervisor(s) in Charge of Crews: _____

Phone Number: _____

Type of Crew: _____

Requirements Completed *	Completed	Date
Lock-Out/De-Energize/Tag-Out	<input type="checkbox"/>	_____
Line(s) Broken-Capped-Blanked	<input type="checkbox"/>	_____
Purge-Flush and Vent	<input type="checkbox"/>	_____
Full Body Harness w/ "D" Ring	<input type="checkbox"/>	_____
Emergency Escape Retrieval Equipment	<input type="checkbox"/>	_____
Lifelines	<input type="checkbox"/>	_____
Secure Area (Post and Flag)	<input type="checkbox"/>	_____
Breathing Apparatus	<input type="checkbox"/>	_____
Standby Safety Personnel	<input type="checkbox"/>	_____
Fire Extinguishers	<input type="checkbox"/>	_____
Lighting (Explosive Proof)	<input type="checkbox"/>	_____
Protective Clothing	<input type="checkbox"/>	_____
Respirator(s)	<input type="checkbox"/>	_____
Air Purifying	<input type="checkbox"/>	_____

Bold denotes minimum requirements to be completed and reviewed before entry.
For items that do not apply, enter N/A in the blank.

Continuous Monitoring (every 4 hours)

Test(s) to be Implemented	Entry Level	Monitoring Results					
Percent of Oxygen	19.5% to 23.5%						
Lower Flammable Limit	Under 10%						
Carbon Monoxide	+35 PPM						
Aromatic Hydrocarbon	+ 1 PPM *5 PPM						
Hydrogen Cyanide (skin)	(skin) *4 PPM						
Hydrogen Sulfide	+ 10 PPM *15 PPM						
Sulfur Dioxide	+2 PPM *5 PPM						
Ammonia	*35 PPM						

* Permissible

Short Term Exposure Limit: Employee can work in the area up to 15 minutes.

Time-Weighted Average: Employee can work in area 8 hours (longer with appropriate respiratory protection).

Remarks:

Gas Tester Name: _____

Instrument(s) Used: _____

Model and/or Type: _____

Serial and/or Unit #: _____

Safety standby person is required for all confined space work.

Safety Standby Person(s): _____

Permit #: _____

Supervisor Authorizing Entry: _____

All above conditions satisfied: Y N (circle one)

Ambulance: _____ Gas Coordinator: _____

Fire: _____ Job No.: _____

Safety: _____ Phone: _____

Metro Electric Co., Inc.

Discipline in Support of Safety



1. Role Of Disciplinary System In The Workplace

- 1.1 Metro Electric disciplinary system in support of safety does not exist to punish employees. Its purpose is to help control the work environment so that workers are protected and accidents are prevented. The disciplinary system helps ensure workplace safety and health by letting the company's employees know what is expected of them. It provides workers with opportunities to correct their behavior before an accident happens.
- 1.2 The disciplinary system is one of the keys to successfully implementing the company's safety and health program. It ensures that the company's rules and safe working practices are taken seriously by employees and are actually followed. It lets employees know how the company expects them to operate in relation to the goals of the company's safety and health program. And it lays out the actions the company will take if individuals do not meet the company's expectations. The employees' supervisor and all members of management are responsible for the enforcement of this disciplinary program.
- 1.3 A disciplinary system cannot work in a vacuum. Before the company can hold employees accountable for their actions, the company first has established its safety and health policy and disciplinary rules.

2. Policy Statement For Enforcement Of Safety

- 2.1 Employees need to know the company's position on safety and health and what the company expects of them. They need a clear understanding of the rules and the consequences of breaking those rules. This is true in all areas of work, but it is especially important for worker safety and health.
- 2.2 As part of the policy statement, and in the employee safety handbook, the company has a written statement setting forth the company's disciplinary policy.
- 2.3 The company Safety Coordinator, company managers and supervisors will always be on the lookout for safety violations and will conscientiously and vigorously enforce the company's commitment to safety. On a company job site, the Site Supervisor has specific responsibility for enforcing company safety rules, policies and safe work procedures.

3. Employee Information And Training

- 3.1 It is important that employees understand the system and have a reference to turn to if they have any questions. Therefore, in addition to issuing a written statement of the company's disciplinary policy, the company has drawn up a list of what it considers major violations of company policy and less serious violations. This list specifies the disciplinary actions that will be taken for first, second, or repeated offenses. The company will use the 5 Step Disciplinary System listed in Appendix B to correct minor "General Offenses."
- 3.2 Disciplinary violations that are grounds for immediate suspension and penalties up to and including termination of employment specifically include:

- 3.2.1 Fighting, provoking or engaging in an act of violence against another person on company property;
 - 3.2.2 Failure to follow written or verbal safe work procedures, company safety rules or authorized posted safety instructions;
 - 3.2.3 Willful damage to property;
 - 3.2.4 Failure to wear personal protective equipment (eye protection, hearing protection, safety helmets, etc.);
 - 3.2.5 Not using safety harnesses and lanyards when fall protection is required;
 - 3.2.6 Removing and/or making inoperative safety guards on tools and equipment;
 - 3.2.7 Tampering with machine safeguards or removing machine tags or locks;
 - 3.2.8 Removing barriers and/or guardrails and not replacing them;
 - 3.2.9 Failure to follow recognized industry practices;
 - 3.2.10 Failure to follow rules regarding the use of company equipment or materials;
 - 3.2.11 Major traffic violations while using a company vehicle;
 - 3.2.12 Engaging in dangerous horseplay;
 - 3.2.13 Failure to notify the company of a hazardous situation;
 - 3.2.14 Theft;
 - 3.2.15 Violation of company policies regarding alcohol, non-prescription and illegal drugs;
and
 - 3.2.16 Other major violations of company rules or policies.
- 3.3 Company supervisors, managers and personnel who have specific responsibilities for implementation and management of safety are expected to know, understand, support, implement and enforce the company's policies, procedures, posted instructions and work practices relating to safety.
- 3.4 In the event that the company determines through direct observations, inspections, reviews of documentation and training or by other objective means that a supervisor, manager or authorized person has not performed his or her safety responsibilities, this shall be considered a disciplinary violation, punishable in the same way that misbehaviors explained in 3 b) are punishable.

4. Training

- 4.1 Training can reduce the need for disciplinary action. The company shall instruct employees in the importance of workplace safety and health, the need to develop safety habits, the company's operations, safe work practices, and the hazards they control, and the standards of behavior that the company expects.
- 4.2 The company's employees must understand the disciplinary system and the consequences of any deliberate, unacceptable behavior.

5. Supervision

- 5.1 Supervision includes both training and corrective action.
- 5.2 Ongoing monitoring of the company's employees' work and safety habits gives the company's supervisors the opportunity to correct any problems before serious situations develop. In most cases, effective supervision means correcting a problem before issuing any punishment.
- 5.3 Where the relationship between employees and their supervisors is open and interactive, problems are discussed and solutions are mutually agreed upon. This type of relationship fosters a work environment where the need for disciplinary action is reduced. When such action is needed, the parties are more likely to perceive it as corrective action rather than punitive.

6. Employee Involvement

- 6.1 Employees are encouraged to help informally in the enforcement of rules and practices. The intent here is not to turn employees into spies and informers, but to encourage them to be their "brother's keeper" and to watch out for the safety and health of their colleagues.
- 6.2 Many employers successfully have encouraged an atmosphere -- a company "culture" -- where employees readily speak up when they see an easily corrected problem, for example, a coworker who needs reminding to put on safety goggles.
- 6.3 Unless the safety violation is so serious that it requires immediate suspension and review for termination, the company's employees deserve the opportunity to correct their own behavior problems.
- 6.4 An effective disciplinary system is a 2-way process. Once a problem is spotted, discuss it with the employee, who should be given at least 1 or 2 opportunities to change the behavior or correct the problem.
- 6.5 Only after these discussions (and possibly some retraining) should disciplinary action be taken.

7. Appropriate Control Measures

- 7.1 Disciplinary actions need to be proportionate to the seriousness of the offense and the frequency of its occurrence. It is certainly inappropriate to fire someone for occasional tardiness. It is equally inappropriate to issue only oral warnings to an employee who repeatedly removes a machine guard. Appendix B provides an example of disciplinary actions in a five-step disciplinary system.

- 7.2 Disciplinary procedures should not be instituted without explanation. The company will provide feedback to the employee on what behavior is unacceptable, why the corrective action is necessary, and how the employee can prevent future violations and disciplinary action.
- 7.3 In addition, supervisors should take time to recognize an employee who improves or corrects his/her behavior.

8. Consistent Enforcement

- 8.1 Workers must realize that safe work practices are a requirement of employment and that unsafe practices will not be tolerated. It is necessary, therefore, that the employer has a disciplinary system that is implemented fairly and consistently.
- 8.2 If the company's disciplinary system is to work well and be accepted by the company's workforce, the system applies equally to everyone. This includes subjecting managers and supervisors to similar rules and similar or even more stringent disciplinary procedures.
- 8.3 For minor violations, supervisors shall meet with the employee to discuss the infraction and inform the employee of the rule or procedure that was violated AND describe the corrective action needed to remedy the situation.

9. Documentation

- 9.1 One key to ensuring fairness and consistency in a disciplinary system is keeping good records. It is in the best interest of both the company and the employee to have written rules and disciplinary procedures.
- 9.2 It is just as important to document instances of good or poor safety and health behavior, including discussions with the employee, and to place relevant information in the employee's personnel file.
- 9.3 The Safety Hazard Citation format below shall be used to document infractions.
- 9.4 Documentation serves a variety of purposes. It helps the company to track the development of a problem, corrective actions, and the impact of measures taken. It provides information so the company can keep employees informed of problems that need correction.
- 9.5 When the company is evaluating the managerial and supervisory skills of a supervisor, it provides a useful record of how they handled problems.
- 9.6 If warnings, retraining, and other corrective actions fail to achieve the desired effect, and if the company decides to discharge an employee, then documentation becomes even more critical. Conversely, the company will conduct an annual clearing of the personnel files of employees whose good overall safety records are marred by minor warnings.
- 9.7 Minor safety violations will be documented in a manner comparable to the example below, and a copy of the form will become part of the employee's personnel record. Three citations can be grounds for termination.

10. Positive Reinforcement

- 10.1 Each supervisor should provide frequent reinforcement of work practices training.
- 10.2 Informal observation serves not only to gauge training effectiveness, but also to reinforce the desired behavior.
- 10.3 Supervisors should also provide special recognition for the use of safe work practices. For examples, supervisors may hand out "Thank you for working safely" cards that can be redeemed for a free cup of coffee or soft drink when they observe a positive safety behavior.
- 10.4 When a supervisor periodically observes individual workers at their tasks, he or she should give oral and/or written feedback on what was done safely.
- 10.5 OSHA recommends award systems that recognize positive activities rather than absence of injuries. Supervisors and safety managers should be aware that award programs with prizes for hours worked without injury may have the unintended consequence of putting heavy peer pressure on workers NOT to report injuries.

APPENDIX A

**Tracking of Individual
Safety Disciplinary Actions**

Employee _____

TRACKING	First Offense Date & Response	Second Offense Date & Response	Repeated Violations Date & Response
Unsafe Work Habits			
Refusal to Follow Safety Instructions			

APPENDIX B

Five-Step Discipline System

- First violation: Instruction/discussion concerning violation, proper procedures, and the hazards they control; notation for the supervisor's file.
- Second violation: Re-instruction with notation in the employee's personnel file.
- Third violation: Written warning describing the violation and actions that will be taken if it recurs.
- Fourth violation: Final warning; may include suspension.
- Fifth violation: Discharge.

It is company philosophy that all employees be trained in proper safety procedures and employees are expected to follow and adhere to all aspects of company Safety Program. The close observance of all Federal, local and client rules and regulations will be monitored at all times.

If there is an infraction of these rules and regulations the following disciplinary action will be taken:

Minor Infraction Definition: Any infraction of government, corporate or client rules that does not have the immediate potential of causing serious damage or injury.

1st offense – verbal warning from supervisor or management

2nd offense – written notice with notice placed on file

3rd offense – written notice + time off without pay

4th offense – termination of employment

Major Infraction Definition: Any infraction of government, corporate or client rules that does have the potential to cause immediate serious damage or injury.

1st offense – time off without pay; or termination

2nd offense – termination of employment.

Co-Worker Warning Reprimand Form

Co-Worker's Name:		Co-Worker's Foreman:	
Date:	Time:	(AM)(PM)	Metro Job No.:
Location:			
Violation - Check Appropriate Box(es)			
<input type="checkbox"/> Falsifying company records <input type="checkbox"/> Excessive Tardiness / Absenteeism <input type="checkbox"/> Loafing / Abuse of working time / Sleeping on the job <input type="checkbox"/> Leaving work area without permission <input type="checkbox"/> Unauthorized use of tools, machinery, vehicles <input type="checkbox"/> Insubordination <input type="checkbox"/> Horseplay <input type="checkbox"/> Smoking in restricted areas <input type="checkbox"/> Gambling <input type="checkbox"/> Theft of company or other property		<input type="checkbox"/> Possession of weapons <input type="checkbox"/> Fighting <input type="checkbox"/> Violation of safety rules or other unsafe acts <input type="checkbox"/> Violation of drug policy <input type="checkbox"/> Unsatisfactory work <input type="checkbox"/> Possession of recording equipment/unauthorized taking of notes on the job <input type="checkbox"/> Divulging confidential information <input type="checkbox"/> Violation of solicitation / distribution policy <input type="checkbox"/> Threatening / harassing others on job site	
Violation Description / Explanation (Use separate paper if required)			
Foreman (please print)		Signature	Date
Project Manager / Safety Director		Signature	Date
Co-Worker Comment / Response			
<p><i>The absence of any response indicates your agreement with the above information. This written warning will remain active in your personnel file for a period of one (1) year from this date of issue. Further disciplinary / performance problems in this twelve (12) month period may result in suspension without pay or discharge.</i></p> <p><i>I have read and understand this warning reprimand form.</i></p>			
Co-Worker Signature		Date	

Metro Electric Co., Inc.

Driver Requirements & Safe Driving Procedures



Applicable OSHA Standards: Supplemental and supportive of general safety and compliance

1. Purpose

- 1.1 Driving is among the most hazardous tasks performed by company employees, both on and off the job. Collisions can result in death or disabling injuries to the driver or passengers. This policy includes requirements for the prevention of driving-related incidents, reporting of incidents, and requirements for employees to report citations.

2. Qualifications and Requirements for Authorized Drivers

- 2.1 Only company-authorized employees will drive a motor vehicle in the course and scope of work, or operate a company-owned vehicle.
- 2.2 All employees who are authorized and required to drive in order to perform their job duties must be at least 18 years of age and possess a valid driver's license from their state of residency, or provide an alternate means of transportation which is approved by their supervisor.
- 2.3 Under no circumstances will an employee be granted a grace period to obtain a license from their current state of residency.
- 2.4 When required, the license must have the appropriate commercial endorsement. DMV records checks are conducted as a condition of employment for employees who are required to drive as part of their job.
- 2.5 Employees who are required to drive in order to perform their job duties will have an acceptable driving record. Examples of offenses that may render a driving record unacceptable include but are not limited to:
 - 2.5.1 A major traffic offense in the last 24 months. This can include reckless driving, driving under the influence of intoxicants, failing to perform the duties of a driver, criminal driving while suspended or revoked, fleeing or attempt to elude a police officer;
 - 2.5.2 A felony revocation of driving privileges or felony or misdemeanor driver license suspension within the last 24 months;
 - 2.5.3 Three or more moving traffic violations in the last 12 months;
 - 2.5.4 A careless driving conviction or Class A moving traffic infraction in the last 12 months; and

- 2.5.5 Failure to use a seat belt while driving during work, or at any time while operating a company-owned vehicle; or failure to ensure that all passengers in a company-owned vehicle or while driving during work.
 - 2.5.6 Failure to maintain an acceptable driving record will result in the company revoking an employee's authorization to drive on company business or to drive a company-owned vehicle.
 - 2.5.7 A supervisor will not permit an employee to drive either a rental or privately-owned vehicle on company business, or while traveling on a company work assignment, prior to a review and approval of the DMV record by company management in accordance with established procedures.
 - 2.5.8 Authorized drivers will notify their supervisor in writing within 24 hours of any conviction, on or off the job, for a traffic citation.
 - 2.5.9 Authorized drivers will notify their supervisor in writing within 24 hours of a suspension or revocation of a state-issued driver's license. In the event of license suspension or revocation, an authorized driver will not drive a vehicle in the course and scope of work, nor operate any company-owned vehicle on a public street, road or highway.
 - 2.5.10 Failure to notify their supervisor of a conviction in accordance with 2.9.8, or driving with a suspended or revoked license (see 2.9.9) will be cause for disciplinary action up to and including termination of employment.
- 2.6 On an annual basis supervisors will require employees who are authorized drivers to self-certify that they have a valid driving license.
 - 2.7 Driving convictions received in the course of company business may be considered grounds for disciplinary action up to and including dismissal.
 - 2.8 There will be a review of driving records of any company-authorized employee who will drive in the course and scope of company business:
 - 2.8.1 Upon hire / assignment;
 - 2.8.2 Following a collision;
 - 2.8.3 Upon notification of a citation; and
 - 2.8.4 Upon receipt of a second citizen complaint relating to operation of the motor vehicle.

3. Driver Responsibilities for Safe Condition of Vehicle Prior to Use

- 3.1 An authorized driver shall not operate any vehicle that is unsafe.

- 3.2 Company-owned or rental vehicles will receive a safety check prior to the vehicle's first use on each shift or work period. Authorized drivers will be instructed by their supervisor on the process for reporting defects with company-owned or rental vehicles.
- 3.3 Authorized drivers will report any collision or near-collision; vehicle breakdown, flat tire, call for road service; vandalism or other damage to the vehicle occurring while they are driving a company-owned or rented vehicle, or driving a private vehicle on company business.
- 3.4 Supervisors will promptly investigate and report any incidents as explained in 3.3, citizen complaints, citations, driver's license suspensions or revocations to the corporate Safety Manager.
- 3.5 Authorized drivers will complete the company's Driver Safety Orientation or attend a defensive driving course upon initial assignment.
- 3.6 All loads will be secured. Manufacturer's specifications for the legal limits of the vehicle will be followed.
- 3.7 The vehicle must be of the correct size and must be of intended use for the job.

4. Safe Driving Behaviors & Procedures

- 4.1 Authorized drivers will follow safe driving practices. These include steps to ensure the driver's total concentration and safe operation of vehicles, such as, but not limited to:
 - 4.1.1 Determining clear directions before departing;
 - 4.1.2 Not manipulating radios, personal data assistants or other equipment while the vehicle is moving;
 - 4.1.3 Not talking on a cell phone while the vehicle is moving (see also the company's Cell Phone Use & Distracted Driving Program);
 - 4.1.4 Not reaching for objects if you have to take your eyes off the road; and
 - 4.1.5 Not operating a vehicle when the driver's ability to react is impaired.
- 4.2 Drivers are expected to follow defensive driving principles and laws and regulations to prevent accidents in spite of unsafe driving by others and/or adverse driving conditions.
- 4.3 Drivers and passengers are required to properly use seat belts. The driver will ensure that any passenger is legally restrained.
- 4.4 Headlights will be on at all times while operating a company-owned or rental vehicle which is not equipped with daytime running lights.

5. Defensive Driving Basics

- 5.1 Defensive driving can save lives. Follow these guidelines:

- 5.1.1 Always wear your safety belt when driving and insist that your passengers wear a safety belt, too. Wearing a safety belt is required by law in every state, except New Hampshire. In some states, passengers also are required by law to wear a safety belt.
- 5.1.2 Do not drive while under the influence of alcohol or drugs. Alcohol slows your reaction time, blurs and distorts vision, and impairs your judgment about distance. Never use illegal drugs. Read the labels on all prescription medications for warnings; consult your physician about how your medications or over-the-counter drugs could affect your driving.
- 5.1.3 Never exceed the posted speed limit. Weather conditions permitting, always maintain the legal speed limit.
- 5.1.4 To maintain a safe distance between you and the car ahead, keep a following distance of at least two seconds. Add one second for each adverse driving condition such as bad weather.
- 5.1.5 Expect other drivers to make mistakes at intersections. Four preventative rules to follow are:
 - 5.1.5.1 When approaching a green light, be prepared for it to turn red. It may have been green for a long time.
 - 5.1.5.2 When stopped at a red light and it turns green, proceed slowly. Look left and right before you drive through the intersection.
 - 5.1.5.3 Yellow lights mean proceed with caution, not speed up to get through the intersection before the light turns red.
 - 5.1.5.4 Turning right at a red light is not permitted in every state. Even in states where it is permitted, turning right is not allowed in some intersections. Watch for signs at the intersection.
- 5.1.6 If you are going to pass a car, follow these rules:
 - 5.1.6.1 Make sure you are in a passing zone.
 - 5.1.6.2 Be certain that there is no oncoming traffic.
 - 5.1.6.3 Look at all mirrors carefully before you make a lane change.
 - 5.1.6.4 Look behind you for any vehicles that might be trying to pass you.
 - 5.1.6.5 Be aware of any blind spots. Once the lane is clear, signal your move.
 - 5.1.6.6 Move into the passing lane, and accelerate to pass the car in front of you.
 - 5.1.6.7 Never look directly at an approaching car's headlights. Use the right edge of the pavement as a lane guide until the other car has passed.

- 5.1.7 Be aware of any potential road hazards. Watch for cars that suddenly swerve from their lanes to avoid pot holes, construction barriers, or stalled vehicles.
- 5.1.8 Bad weather such as rain, snow, or fog can make driving difficult. Always watch for difficult conditions and be prepared to take defensive action. Follow these bad weather tips:
 - 5.1.8.1 The tires on your car can lose traction on wet roads. Slow down if the roads are wet.
 - 5.1.8.2 Snow and ice can make roads slippery. If your car goes into a skid, do not push down hard on the brakes. Take your foot off the accelerator and turn the steering wheel in the direction you want to go. Do not turn sharply. Use moderate turns of the wheel until you come out of the skid.
 - 5.1.8.3 Slow down as you approach shaded areas, bridges, and overpasses in winter. These areas freeze first and stay frozen longer.
- 5.1.9 When driving on a highway, always be prepared for drivers to change lanes suddenly in order to exit.
- 5.1.10 Do not let your emotions dominate your driving.
- 5.1.11 Do not drive when you are tired. If you feel tired, pull off the road for some exercise and fresh air or a cup of coffee.
- 5.1.12 Drive a well-maintained vehicle.

Metro Electric Co., Inc.

Electrical Hot Work Policy



It is Metro's intent to work only in an environment where all electrical power sources are de-energized or in a neutral position. However, in some circumstances where it is necessary to test equipment voltages or amperages, some hot work is necessary. In other cases, usually under emergency circumstances where working in a totally de-energized state is impossible, hazardous hot work is necessary. Accordingly, there are two levels of hot work as follows:

Level 1 - Latent Danger

All manipulative operations (such as making connections or alterations to, or near, normally energized components) are to be conducted with the equipment in the positively de-energized state.

Measurements and observations of equipment functions may then be conducted with the equipment energized and with normal protective barriers removed. Level 1 is a MODERATE-TO-SEVERE HAZARD SITUATION depending on operational voltages and energy supplied to the equipment.

Level 2 - Hot Wiring

Level 2 is a SEVERE HAZARD SITUATION that will be permitted only when there is no other option. It must be conducted under close supervision and control.

Level 2 exists when manipulative, measurement and observational operations must be conducted with the equipment fully energized and with the normal barriers removed. One knowledgeable person should be involved in addition to the worker(s). Written permission may be required but oral permission may be granted by a corporate officer. Work on any energized circuitry must only be done when absolutely necessary and only in extreme situations.

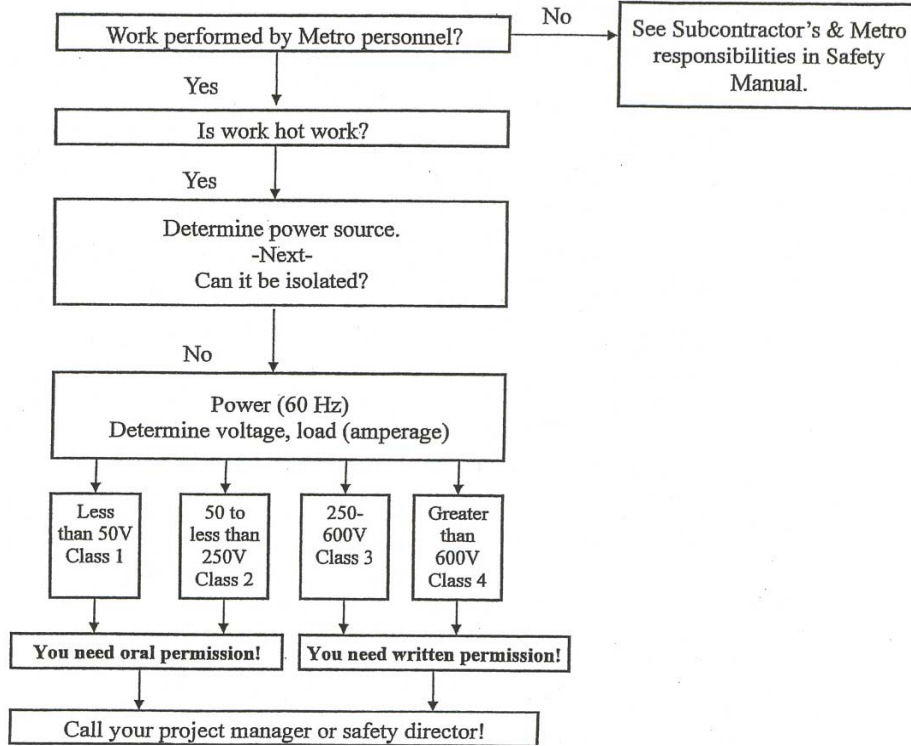
“It is Metro Electric's intent to work only in an environment where all electrical power sources are de-energized!”

If you anticipate the need to “work hot” while at Metro Electric Co., Inc. discuss your activities with your project manager and safety coordinator, or another individual designated by Metro Electric well in advance.

For routine development or testing work on energized electrical circuits, follow Metro Electric's policy on electrical safety.

For tasks that are not routine or testing tasks and that require work on or near electrically energized components at a potential of 50 volts or greater to ground, the additional procedures outlined below must be followed.

METRO ELECTRIC CO., INC.'s
Guide to Hot Work
Electrical Hazard Classification and Analysis



- Obtain an approved Hot Work Permit (Electrical) for the work (see Hot Work Permit in Safety Manual).
- Appoint a qualified person as a Safety Watch class 3 or greater. This person will be responsible for ensuring that all appropriate protective devices and procedures are used and that all safety requirements are met. The Safety Watch must have:
 - Current CPR certification
 - Immediate access to a telephone or radio to call 911 in case of emergency
 - The ability to immediately cut off all sources of electrical power.
- Become thoroughly familiar with the circuitry involved.
- Locate and note all de-energizing points and energizing sources.
- Use only power sources that have adequate fault protection.
- Insulate yourself from contact with ground potential and energized parts by using such devices as insulated tools; linemen's gloves, mats, and sleeves (all inspected and tested); phenolic sheets; dry boards; rubber-soled shoes (no nails); and or insulated mechanical barriers. Keep in mind that the insulation on energized wires may have unseen cracks or other defects.
- Avoid water and dampness.
- Ground all non-current-carrying parts that may become accidentally energized, to prevent shocks to grounded persons.
- To protect yourself against splatter caused by accidental arcing, wear plastic-framed safety glasses, a face shield, long sleeves, and a hard hat on class 3 or greater.
- Cordon off the work area to exclude all nonparticipants.

Utility Sources
Work Normally Performed by Qualified Electricians

CLASS 1	Voltage ^a ▶ and Capacity ◀	Hazard	Remarks
	▶ Less than 50V and less than 500W ◀	▶ Burn ◀	Low-voltage control circuits
Mode 1	• A qualified person may work alone.		
Mode 2	• A qualified person may work alone.		
Mode 3	• A qualified person may work alone.		
^a Voltage is line-to-ground or line-to-line.			

CLASS 2	Voltage ^a ▶ and Capacity ◀	Hazard	Remarks
	▶ More than 50V and less than 250V ◀	▶ Shock, burn & arc blast ◀	Low-voltage utility power
Mode 1	• A qualified person may work alone.		
Mode 2	<ul style="list-style-type: none"> • Insulated gloves and/or insulated tools and/or other insulating personal protective equipment, as appropriate to the task, are required. • Oral approval and general supervision are required. 		
Mode 3	<ul style="list-style-type: none"> • Insulated gloves and/or insulated tools and/or other insulating personal protective equipment, as appropriate to the task, are required. • ▶ Two people are required. ◀ • Oral permission is required for all work. An open permit is allowed for routine maintenance and operations work. • A Safety Watch may be required when the hazard level is elevated by environmental or physical circumstances; it must be noted on the written work approval. • Specific approval from a project manager or safety director is required. Oral approval is acceptable for routine maintenance and operations work. • Access must be restricted by ropes, barriers, or other means to exclude unauthorized personnel. 		
^a Voltage is line-to-ground or line-to-line, whichever is higher.			

Mode 1 = Cold | Mode 2 = Cold to Hot | Mode 3 = Hot

CLASS 3	Voltage ^a ▶ and Capacity ◀	Hazard	Remarks
	▶ More than 250V but less than 600V ◀	▶ Shock, burn & arc blast ◀	Medium-voltage utility (less than 600V)
Mode 1	<ul style="list-style-type: none"> • Two people are required. 		
Mode 2	<ul style="list-style-type: none"> • Implied approval and general supervision are required. • While equipment is energized, ▶ one person may work alone for probing and testing only. ◀ • Insulated gloves and/or insulated tools and/or other insulating personal protective equipment, as appropriate to the task, are required. 		
Mode 3	<ul style="list-style-type: none"> • At least two (2) qualified persons are required. One (1) is a Safety Watch, stationed outside normal protective barriers and in continuous sight and sound communication with the worker(s). • Insulated gloves and/or insulated tools and/or other insulating personal protective equipment, as appropriate to the task, are required. • Written hot work permit is required for all work. Company president or his designated representative in his absence must sign all hot work permits above 250V. Specific approval from a project manager or safety director is also required. Implied approval is acceptable for routine maintenance and operations work. • Access must be restricted by ropes, barriers, or other means to exclude unauthorized personnel. 		
^a Voltage is line-to-ground or line-to-line.			

Mode 1 = Cold | Mode 2 = Cold to Hot | Mode 3 = Hot

CLASS 4	Voltage ^a ▶ and Capacity ◀	Hazard	Remarks
	▶ Greater than 600V ◀	▶ Shock, burn & arc blast ◀	High-voltage utility
Mode 1	<ul style="list-style-type: none"> • ▶ Two people are mandatory ◀ until it has been clearly verified that the equipment has been de-energized. Then, one (1) qualified person may work alone. • Workers must wear eye protection, use insulated tools or insulated gloves, and use an insulating floor mat. All equipment must be rated for use with the expected hazards. 		
Mode 2	<ul style="list-style-type: none"> • At least two (2) qualified persons are required. One (1) is a Safety Watch, stationed outside normal protective barriers and within continuous sight and sound communication with the worker(s). The Safety Watch must not be distracted from this assignment at any time. • Insulated gloves and/or insulated tools and/or other insulating personal protective equipment, as appropriate to the task, are required. • Implied approval and general supervision must exist. 		
Mode 3	<ul style="list-style-type: none"> • Metro personnel must not work on Class 4 equipment in Mode 3, except for certain testing procedures performed under a hot work permit. Special permission must be granted by the company president or his designated representative in his absence on an individual basis to do hot work on this classification. • Insulated gloves and/or insulated tools and/or other insulating personal protective equipment, as appropriate to the task, are required. • Commercial power utility personnel or their subcontractors will work on energized Class 4 equipment, and they will follow their own procedures. • Access must be restricted by ropes, barriers, or other means to exclude unauthorized personnel. • ▶ A Safety Watch is required. ◀ 		
^a Voltage is line-to-ground or line-to-line, whichever is higher.			

Mode 1 = Cold | Mode 2 = Cold to Hot | Mode 3 = Hot

The following OSHA standard is included in this policy as an aid to Metro's employees to better understand this safety manual.

TITLE 29--LABOR
Subpart S--Electrical

Sec. 1910.333 Selection and use of work practices.

(a) General. Safety-related work practices shall be employed to prevent electric shock or other injuries resulting from either direct or indirect electrical contacts, when work is performed near or on equipment or circuits which are or may be energized. The specific safety-related work practices shall be consistent with the nature and extent of the associated electrical hazards.

(1) Deenergized parts. Live parts to which an employee may be exposed shall be deenergized before the employee works on or near them, unless the employer can demonstrate that deenergizing introduces additional or increased hazards or is infeasible due to equipment design or operational limitations. Live parts that operate at less than 50 volts to ground need not be deenergized if there will be no increased exposure to electrical burns or to explosion due to electric arcs.

Note 1: Examples of increased or additional hazards include interruption of life support equipment, deactivation of emergency alarm systems, shutdown of hazardous location ventilation equipment, or removal of illumination for an area.

Note 2: Examples of work that may be performed on or near energized circuit parts because of infeasibility due to equipment design or operational limitations include testing of electric circuits that can only be performed with the circuit energized and work on circuits that form an integral part of a continuous industrial process in a chemical plant that would otherwise need to be completely shut down in order to permit work on one circuit or piece of equipment.

Note 3: Work on or near deenergized parts is covered by paragraph (b) of this section.

(2) Energized parts. If the exposed live parts are not deenergized (i.e., for reasons of increased or additional hazards or infeasibility), other safety-related work practices shall be used to protect employees who may be exposed to the electrical hazards involved. Such work practices shall protect employees against contact with energized circuit parts directly with any part of their body or indirectly through some other conductive object. The work practices that are used shall be suitable for the conditions under which the work is to be performed and for the voltage level of the exposed electric conductors or circuit parts. Specific work practice requirements are detailed in paragraph (c) of this section.

(b) Working on or near exposed deenergized parts--(1) Application. This paragraph applies to work on exposed deenergized parts or near enough to them to expose the employee to any electrical hazard they present. Conductors and parts of electric equipment that have been deenergized but have not been locked out or tagged in accordance with paragraph (b) of this section shall be treated as energized parts, and paragraph (c) of this section applies to work on or near them.

(2) Lockout and tagging. While any employee is exposed to contact with parts of fixed electric equipment or circuits which have been deenergized, the circuits energizing the parts shall be locked out or tagged or both in accordance with the requirements of this paragraph. The requirements shall be followed in the order in which they are

presented (i.e., paragraph (b)(2)(i) first, then paragraph (b)(2)(ii), etc.).

Note 1: As used in this section, fixed equipment refers to equipment fastened in place or connected by permanent wiring methods.

Note 2: Lockout and tagging procedures that comply with paragraphs (c) through (f) of Sec. 1910.147 will also be deemed to comply with paragraph (b)(2) of this section provided that:

(1) The procedures address the electrical safety hazards covered by this Subpart; and

(2) The procedures also incorporate the requirements of paragraphs (b)(2)(iii)(D) and (b)(2)(iv)(B) of this section.

(i) Procedures. The employer shall maintain a written copy of the procedures outlined in paragraph (b)(2) and shall make it available for inspection by employees and by the Assistant Secretary of Labor and his or her authorized representatives.

Note: The written procedures may be in the form of a copy of paragraph (b) of this section.

(ii) Deenergizing equipment. (A) Safe procedures for deenergizing circuits and equipment shall be determined before circuits or equipment are deenergized.

(B) The circuits and equipment to be worked on shall be disconnected from all electric energy sources. Control circuit devices, such as push buttons, selector switches, and interlocks, may not be used as the sole means for deenergizing circuits or equipment. Interlocks for electric equipment may not be used as a substitute for lockout and tagging procedures.

(C) Stored electric energy which might endanger personnel shall be released. Capacitors shall be discharged and high capacitance elements shall be short-circuited and grounded, if the stored electric energy might endanger personnel.

Note: If the capacitors or associated equipment are handled in meeting this requirement, they shall be treated as energized.

(D) Stored non-electrical energy in devices that could reenergize electric circuit parts shall be blocked or relieved to the extent that the circuit parts could not be accidentally energized by the device.

(iii) Application of locks and tags. (A) A lock and a tag shall be placed on each disconnecting means used to deenergize circuits and equipment on which work is to be performed, except as provided in paragraphs (b)(2)(iii)(C) and (b)(2)(iii)(E) of this section. The lock shall be attached so as to prevent persons from operating the disconnecting means unless they resort to undue force or the use of tools.

(B) Each tag shall contain a statement prohibiting unauthorized operation of the disconnecting means and removal of the tag.

(C) If a lock cannot be applied, or if the employer can demonstrate that tagging procedures will provide a level of safety equivalent to that obtained by the use of a lock, a tag may be used without a lock.

(D) A tag used without a lock, as permitted by paragraph (b)(2)(iii)(C) of this section, shall be supplemented by at least one additional safety measure that provides a level of safety equivalent to that obtained by the use of a lock. Examples of additional safety measures include the removal of an isolating circuit element, blocking

of a controlling switch, or opening of an extra disconnecting device.

(E) A lock may be placed without a tag only under the following conditions:

- (1) Only one circuit or piece of equipment is deenergized, and
- (2) The lockout period does not extend beyond the work shift, and
- (3) Employees exposed to the hazards associated with reenergizing the circuit or equipment are familiar with this procedure.

(iv) Verification of deenergized condition. The requirements of this paragraph shall be met before any circuits or equipment can be considered and worked as deenergized.

(A) A qualified person shall operate the equipment operating controls or otherwise verify that the equipment cannot be restarted.

(B) A qualified person shall use test equipment to test the circuit elements and electrical parts of equipment to which employees will be exposed and shall verify that the circuit elements and equipment parts are deenergized. The test shall also determine if any energized condition exists as a result of inadvertently induced voltage or unrelated voltage backfeed even though specific parts of the circuit have been deenergized and presumed to be safe. If the circuit to be tested is over 600 volts, nominal, the test equipment shall be checked for proper operation immediately before and immediately after this test.

(v) Reenergizing equipment. These requirements shall be met, in the order given, before circuits or equipment are reenergized, even temporarily.

(A) A qualified person shall conduct tests and visual inspections, as necessary, to verify that all tools, electrical jumpers, shorts, grounds, and other such devices have been removed, so that the circuits and equipment can be safely energized.

(B) Employees exposed to the hazards associated with reenergizing the circuit or equipment shall be warned to stay clear of circuits and equipment.

(C) Each lock and tag shall be removed by the employee who applied it or under his or her direct supervision. However, if this employee is absent from the workplace, then the lock or tag may be removed by a qualified person designated to perform this task provided that:

- (1) The employer ensures that the employee who applied the lock or tag is not available at the workplace, and
- (2) The employer ensures that the employee is aware that the lock or tag has been removed before he or she resumes work at that workplace.

(D) There shall be a visual determination that all employees are clear of the circuits and equipment.

(c) Working on or near exposed energized parts--(1) Application. This paragraph applies to work performed on exposed live parts (involving either direct contact or contact by means of tools or materials) or near enough to them for employees to be exposed to any hazard they present.

(2) Work on energized equipment. Only qualified persons may work on electric circuit parts or equipment that have not been deenergized under the procedures of paragraph (b) of this section. Such persons shall be capable of working safely on energized circuits and shall be familiar with the proper use of special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools.

(3) Overhead lines. If work is to be performed near overhead lines, the lines shall be deenergized and grounded, or other protective measures shall be provided before work is started. If the lines are to be deenergized, arrangements shall be made with the person or

organization that operates or controls the electric circuits involved to deenergize and ground them. If protective measures, such as guarding, isolating, or insulating are provided, these precautions shall prevent employees from contacting such lines directly with any part of their body or indirectly through conductive materials, tools, or equipment.

Note: The work practices used by qualified persons installing insulating devices on overhead power transmission or distribution lines are covered by Sec. 1910.269 of this Part, not by Sec. Sec. 1910.332 through 1910.335 of this Part. Under paragraph (c)(2) of this section, unqualified persons are prohibited from performing this type of work.

(i) Unqualified persons. (A) When an unqualified person is working in an elevated position near overhead lines, the location shall be such that the person and the longest conductive object he or she may contact cannot come closer to any unguarded, energized overhead line than the following distances:

- (1) For voltages to ground 50kV or below--10 ft. (305 cm);
- (2) For voltages to ground over 50kV--10 ft. (305 cm) plus 4 in. (10 cm) for every 10kV over 50kV.

(B) When an unqualified person is working on the ground in the vicinity of overhead lines, the person may not bring any conductive object closer to unguarded, energized overhead lines than the distances given in paragraph (c)(3)(i)(A) of this section.

Note: For voltages normally encountered with overhead power lines, objects which do not have an insulating rating for the voltage involved are considered to be conductive.

(ii) Qualified persons. When a qualified person is working in the vicinity of overhead lines, whether in an elevated position or on the ground, the person may not approach or take any conductive object without an approved insulating handle closer to exposed energized parts than shown in Table S-5 unless:

- (A) The person is insulated from the energized part (gloves, with sleeves if necessary, rated for the voltage involved are considered to be insulation of the person from the energized part on which work is performed), or
- (B) The energized part is insulated both from all other conductive objects at a different potential and from the person, or
- (C) The person is insulated from all conductive objects at a potential different from that of the energized part.

Table S-5--Approach Distances for Qualified Employees--Alternating Current

Voltage range (phase to phase)	Minimum approach distance
300V and less.....	Avoid contact.
Over 300V, not over 750V.....	1 ft. 0 in. (30.5 cm).
Over 750V, not over 2kV.....	1 ft. 6 in. (46 cm).
Over 2kV, not over 15kV.....	2 ft. 0 in. (61 cm).
Over 15kV, not over 37kV.....	3 ft. 0 in. (91 cm).
Over 37kV, not over 87.5kV.....	3 ft. 6 in. (107 cm).
Over 87.5kV, not over 121kV.....	4 ft. 0 in. (122 cm).
Over 121kV, not over 140kV.....	4 ft. 6 in. (137 cm).

(iii) Vehicular and mechanical equipment. (A) Any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines shall be operated so that a clearance of 10 ft. (305 cm) is maintained. If the voltage is higher than 50kV, the clearance shall be increased 4 in. (10 cm) for every 10kV over that voltage. However, under any of the following conditions, the clearance may be reduced:

(1) If the vehicle is in transit with its structure lowered, the clearance may be reduced to 4 ft. (122 cm). If the voltage is higher than 50kV, the clearance shall be increased 4 in. (10 cm) for every 10kV over that voltage.

(2) If insulating barriers are installed to prevent contact with the lines, and if the barriers are rated for the voltage of the line being guarded and are not a part of or an attachment to the vehicle or its raised structure, the clearance may be reduced to a distance within the designed working dimensions of the insulating barrier.

(3) If the equipment is an aerial lift insulated for the voltage involved, and if the work is performed by a qualified person, the clearance (between the uninsulated portion of the aerial lift and the power line) may be reduced to the distance given in Table S-5.

(B) Employees standing on the ground may not contact the vehicle or mechanical equipment or any of its attachments, unless:

(1) The employee is using protective equipment rated for the voltage; or

(2) The equipment is located so that no uninsulated part of its structure (that portion of the structure that provides a conductive path to employees on the ground) can come closer to the line than permitted in paragraph (c)(3)(iii) of this section.

(C) If any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines is intentionally grounded, employees working on the ground near the point of grounding may not stand at the grounding location whenever there is a possibility of overhead line contact. Additional precautions, such as the use of barricades or insulation, shall be taken to protect employees from hazardous ground potentials, depending on earth resistivity and fault currents, which can develop within the first few feet or more outward from the grounding point.

(4) Illumination. (i) Employees may not enter spaces containing exposed energized parts, unless illumination is provided that enables the employees to perform the work safely.

(ii) Where lack of illumination or an obstruction precludes observation of the work to be performed, employees may not perform tasks near exposed energized parts. Employees may not reach blindly into areas which may contain energized parts.

(5) Confined or enclosed work spaces. When an employee works in a confined or enclosed space (such as a manhole or vault) that contains exposed energized parts, the employer shall provide, and the employee shall use, protective shields, protective barriers, or insulating materials as necessary to avoid inadvertent contact with these parts. Doors, hinged panels, and the like shall be secured to prevent their swinging into an employee and causing the employee to contact exposed energized parts.

(6) Conductive materials and equipment. Conductive materials and equipment that are in contact with any part of an employee's body shall be handled in a manner that will prevent them from contacting exposed energized conductors or circuit parts. If an employee must handle long dimensional conductive objects (such as ducts and pipes) in areas with

exposed live parts, the employer shall institute work practices (such as the use of insulation, guarding, and material handling techniques) which will minimize the hazard.

(7) Portable ladders. Portable ladders shall have nonconductive side rails if they are used where the employee or the ladder could contact exposed energized parts.

(8) Conductive apparel. Conductive articles of jewelry and clothing (such as watch bands, bracelets, rings, key chains, necklaces, metalized aprons, cloth with conductive thread, or metal headgear) may not be worn if they might contact exposed energized parts. However, such articles may be worn if they are rendered nonconductive by covering, wrapping, or other insulating means.

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

(10) Interlocks. Only a qualified person following the requirements of paragraph (c) of this section may defeat an electrical safety interlock, and then only temporarily while he or she is working on the equipment. The interlock system shall be returned to its operable condition when this work is completed.

[55 FR 32016, Aug. 6, 1990; 55 FR 42053, Nov. 1, 1990, as amended at 59 FR 4476, Jan. 31, 1994]

METRO ELECTRIC CO., INC.
Energized Electrical Work Permit

Location: Activity: Job #: Date:

Approvals	Signatures	Date
Project Manager		
Foreman		
Electrician		
Metro Approval		
Customer Approval		
Safety Director		

Describe Work/Activity:
Describe Electrical System:
Energized Work:
Justification:

Anticipated Hazards: Check all that apply (✓)

List electrical hazards: ___ 250V to 480V ___ 600V & up

Actions to Control Hazards

Controls

- ___ Alertness
- ___ Barricades to keep others away
- ___ Control of wearing conductive articles
- ___ Disconnect verification
- ___ Distance
- ___ Lockout/tagout
- ___ Rated test equipment
- ___ Safety signs and tags

- Standard operating procedures
- Project Manager, Safety Director & Foreman walk through

Describe Controls:

Personal Protective Equipment (If PPE is required, instruction in that PPE must be received.)

*These items may be required to be manufacturer rated, tested, periodically retested, and/or maintained in accordance with specific codes, standards and manufacturer's recommendations.

- Eye Protection: face shields safety glasses
- Head Protection: full-face shield or hood nonconductive flame-resistant protection
- Body Protection: clothing resistant to flash flames
- Hand & Arm Protection: insulated rubber gloves with leather protectors*
 insulating rubber sleeves*
- Foot & Leg Protection: insulated footwear (e.g., dielectric overshoes)*
 rubber insulated mats*

Other Protective Equipment:

- isolating/operating sticks*
- insulated tools*
- insulating blankets*
- nonconductive ladders
- personal safety grounding equipment
- voltage-rated plastic guard equipment*

Describe Lock Out System:

Metro Electric Co., Inc.

Electrical Safety



Applicable OSHA Standard: 29 CFR 1910.332-333

1. Purpose

- 1.1 Metro Electric has designed and adopted this electrical safety program to prevent electrically related injuries to personnel resulting from either direct or indirect electrical contacts, or damage to company property and client facilities when work is performed near or on equipment or circuits which are or may be energized.
- 1.2 This program also provides for proper training of site supervisors to ensure they have the required knowledge and understanding of electrical work practices and procedures. Employees shall be trained in and familiar with the safety-related work practices that pertain to their respective job assignments.
- 1.3 Only employees who are qualified to perform electrical work, knowledgeable about this program, and authorized by the company are allowed to repair or replace electrical components or electrically powered tools or equipment.
- 1.4 Electricity has long been recognized as a serious workplace hazard, exposing employees to such dangers as electric shock, electrocution, fires and explosions. References: NFPA 70E, Electrical Safety Requirements for Employee Workplaces, National Electrical Code (NEC) and OSHA Standard (Electrical Safety) 29 CFR 1910 Subpart S - Electrical.
- 1.5 Safe work practices regarding electricity shall be followed by employees as they relate to specific job assignments. Specific safety-related work practices shall be consistent with the nature and extent of the associated electrical hazards.

2. Responsibilities

- 2.1 Management
 - 2.1.1 Provide training for qualified and unqualified employees
 - 2.1.2 Conduct inspections to identify electrical safety deficiencies in facilities and at job sites
 - 2.1.3 Guard and correct all electrical deficiencies promptly
 - 2.1.4 Ensure all new electrical installations meet codes and regulations
- 2.2 Employees
 - 2.2.1 Report electrical deficiencies immediately

- 2.2.2 DO NOT work on electrical equipment unless authorized and trained
- 2.2.3 Properly inspect all electrical equipment prior to use

3. Training

3.1 Unqualified persons

- 3.1.1 Employees who face a risk of electric shock that is not reduced to a safe level by electrical installation requirements and who are not qualified persons shall also be trained in and be familiar with any electrically related safety practices that are necessary for their safety.

3.2 Qualified persons

- 3.2.1 Qualified persons (i.e. those permitted to work on or near exposed energized parts) shall, at a minimum, be trained in and familiar with the following:
 - 3.2.1.1 The skills and techniques necessary to distinguish exposed live parts from other parts of electric equipment.
 - 3.2.1.2 The skills and techniques necessary to determine the nominal voltage of exposed live parts, and
 - 3.2.1.3 The clearance distances specified in 1910.333(c) and the corresponding voltages to which the qualified person will be exposed.
- 3.2.2 An employee must have successfully completed the training required in this program for a qualified person in order to be so considered.
- 3.2.3 Qualified persons whose work on energized equipment involves either direct contact or contact by means of tools or materials shall also have training to make them capable of working safely on energized circuits and shall be familiar with the proper use of special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools.
- 3.2.4 The required training shall be of the classroom or on-the-job type. The degree of training provided shall be determined by the risk to the employee.
- 3.2.5 For purposes of general comparison, typical occupational employee categories that face a higher than normal risk of electrical accident include blue collar supervisors; electrical and electronic engineers; electrical and electronic equipment assemblers; electrical and electronic technicians; electricians; industrial machine operators; material handling equipment operators; mechanics and repairers; painters; riggers and roustabouts; stationary engineers; and welders.

- 3.3 Workers in these groups or with comparable job assignments do not need to be trained if their work or the work of those they supervise does not bring them or the employees they supervise close enough to exposed parts of electric circuits operating at 50 volts or more to ground for a hazard to exist.

4. De-Energized Parts

- 4.1 If an employee is exposed to “live” energized parts or components, these shall be de-energized before the employee begins work on or near them. An exception will be if it can be demonstrated that de-energizing these parts or components will present additional or increased hazards, or if de-energizing is not feasible due to equipment design or operational limitations.
- 4.2 Live parts that operate at less than 50 volts to ground need not be de-energized if there will be no increased exposure to electrical burns or to explosion due to electric arcs.
- 4.3 Examples of increased or additional hazards include tasks such as deactivation of emergency alarm systems, shutdown of hazardous location ventilation equipment, or removal of illumination for an area.
- 4.4 Examples of work that may be performed on or near energized circuit parts because of infeasibility due to equipment design or operational limitations include:
- 4.5 Testing of electric circuits that can only be performed with the circuit energized, and
- 4.6 Work on circuits that form an integral part of a continuous industrial process in a chemical plant that would otherwise need to be completely shut down in order to permit work on one circuit or piece of equipment.

5. Energized Parts

- 5.1 If the exposed “live” parts or components are not de-energized for reasons of increased or additional hazards or infeasibility, other safety-related work practices shall be used to protect employees who may be exposed to the electrical hazards involved.
- 5.2 Such work practices shall protect employees against direct contact with energized circuit parts with any part of their body, or indirectly through some other conductive object.
- 5.3 The work practices that are used shall be suitable for the conditions under which the work is to be performed and for the voltage level of the exposed electric conductors or circuit parts.

6. Working On Or Near Exposed De-Energized Parts

- 6.1 This paragraph applies to work on exposed de-energized parts or near enough to them to expose the employee to any electrical hazard they present.
- 6.2 Conductors and parts of electric equipment that have been de-energized but have not been locked out or tagged in accordance with paragraph (b) of this section shall be treated as energized parts, and paragraph (c) of this section applies to work on or near them.

7. Lockout and Tagout

- 7.1 While any employee is exposed to contact with parts of fixed electric equipment or circuits which have been de-energized, the circuits energizing the parts shall be locked out or tagged

or both in accordance with the company's written safety procedures for the control of hazardous energy.

- 7.2 For the purposes of this safety policy, "fixed equipment" refers to equipment fastened in place or connected by permanent wiring methods.
- 7.3 The company shall maintain a copy of the written procedures for control of hazardous energy (lockout and tagout procedures). These shall be made available for inspection by employees and by the Assistant Secretary of Labor and the Assistant Secretary's authorized representatives.

8. De-Energizing Equipment

- 8.1 Safe procedures for de-energizing circuits and equipment shall be determined before circuits or equipment is de-energized. These procedures shall be machine-specific, system-specific or circuit-specific, in accordance with the company's procedures for control of hazardous energy (lockout and tagout program procedures).
- 8.2 The circuits and equipment to be worked on shall be disconnected from all electric energy sources. Control circuit devices, such as push buttons, selector switches, and interlocks, may not be used as the sole means for de-energizing circuits or equipment. Interlocks for electric equipment may not be used as a substitute for lockout and tagging procedures.
- 8.3 Stored electric energy which might endanger personnel shall be released.
- 8.4 Capacitors shall be discharged and high capacitance elements shall be short-circuited and grounded, if the stored electric energy might endanger personnel. If the capacitors or associated equipment are handled in meeting this requirement, they shall be treated as being energized.
- 8.5 Stored non-electrical energy in devices that could re-energize electric circuit parts shall be blocked or relieved to the extent that the circuit parts could not be accidentally energized by the device.

9. Application of Locks and Tags

- 9.1 A lock and a tag shall be placed on each disconnecting means used to de-energize circuits and equipment on which work is to be performed. For purposes of the company's program, lockout only and tagout only shall not be permitted as a safe work procedure, except in accordance with the company's written program for the control of hazardous energy for when a lock cannot be applied.
- 9.2 Locks shall be attached so as to prevent persons from operating the disconnecting means unless they resort to undue force or the use of tools.
- 9.3 Each tag shall contain a statement prohibiting unauthorized operation of the disconnecting means and removal of the tag.
- 9.4 Selection and use of locks and tags shall be in accordance with the company's written program for the control of hazardous energy.

- 9.5 If a lock cannot be applied, work shall not continue until a specific safe work procedure for the situation at hand is agreed upon between the employee and his or her on-site supervisor with approval prior to continuance of work from the company's Safety Coordinator.
- 9.6 When a lock cannot be applied, the on-site supervisor and company Safety Coordinator may allow use of a tagout only when tagout is supplemented by at least one additional safety measure that provides a level of safety equivalent to that obtained by use of a lock. Examples of additional safety measures include the removal of an isolating circuit element, blocking of a controlling switch, or opening of an extra disconnecting device.

10. Verification Of De-Energized Condition

- 10.1 The requirements of this section shall be met before any circuits or equipment can be considered and worked upon as being de-energized.
- 10.2 A qualified person shall operate the equipment operating controls or otherwise verify that the equipment cannot be restarted.
- 10.3 A qualified person shall use test equipment to test the circuit elements and electrical parts of equipment to which employees will be exposed and shall verify that the circuit elements and equipment parts are de-energized.
- 10.4 The test shall also determine if any energized condition exists as a result of inadvertently induced voltage or unrelated voltage back feed even though specific parts of the circuit have been de-energized and presumed to be safe.
- 10.5 If the circuit to be tested is more than 600 volts, nominal, the test equipment shall be checked for proper operation immediately after this test.

11. Re-Energizing Equipment

- 11.1 These requirements shall be met, in the order given, before circuits or equipment are re-energized, even temporarily.
- 11.2 A qualified person shall conduct tests and visual inspections, as necessary, to verify that all tools, electrical jumpers, shorts, grounds, and other such devices have been removed, so that the circuits and equipment can be safely energized.
- 11.3 Employees exposed to the hazards associated with re-energizing the circuit or equipment shall be warned to stay clear of circuits and equipment.
- 11.4 Each lock and tag shall be removed by the employee who applied it or under his or her direct supervision. However, if this employee is absent from the workplace, then the lock or tag may be removed by a qualified person designated to perform this task provided that:
 - 11.4.1 The on-duty supervisor ensures that the employee who applied the lock or tag is not available at the workplace, and
 - 11.4.2 The employer ensures that the employee is aware that the lock or tag has been removed before he or she resumes work at that workplace.

- 11.5 There shall be a visual determination that all employees are clear of the circuits and equipment.
- 11.6 All of the above procedures for re-energizing shall be done in compliance with the company's written program for the control of hazardous energy.

12. Working On Or Near Exposed Energized Parts

- 12.1 This section applies to work performed on exposed live parts (involving either direct contact or by means of tools or materials), or work performed near enough so that employees are exposed to these hazards and potential exposures.
- 12.2 Regarding work on energized equipment, only qualified persons may work on electric circuit parts or equipment that have not been de-energized under the procedures explained in this program. Such qualified persons shall be capable of working safely on energized circuits and shall be familiar with the proper use of special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools.
- 12.3 If work is to be performed near overhead lines, the lines shall be de-energized and grounded, or other protective measures shall be provided before work is started. If the lines are to be de-energized, arrangements shall be made with the person or organization that operates or controls the electric circuits involved to de-energize and ground them. If protective measures, such as guarding, isolating, or insulating, are provided, these precautions shall prevent employees from contacting such lines directly with any part of their body or indirectly through conductive materials, tools, or equipment.
- 12.4 The work practices used by qualified persons installing insulating devices on overhead power transmission or distribution lines shall be in accordance with 1910.269 and not by 1910.332 through 1910.335.
- 12.5 Unqualified persons are specifically prohibited from performing this type of work.

13. Unqualified Persons

- 13.1 When an unqualified person is working in an elevated position near overhead lines, the location shall be such that the person and the longest conductive object he or she may contact cannot come closer to any unguarded, energized overhead line than the following distances:
 - 13.1.1 For voltages to ground 50kV or below - 10 feet (305 cm);
 - 13.1.2 For voltages to ground over 50kV - 10 feet (305 cm) plus 4 inches (10 cm) for every 10kV over 50kV.
- 13.2 When an unqualified person is working on the ground in the vicinity of overhead lines, the person may not bring any conductive object closer to unguarded, energized overhead lines than the distances given in this section.
- 13.3 For voltages normally encountered with overhead power line, objects which do not have an insulating rating for the voltage involved are considered to be conductive.

14. Qualified Persons

- 14.1 When a qualified person is working in the vicinity of overhead lines, whether in an elevated position or on the ground, the person may not approach or take any conductive object without an approved insulating handle closer to exposed energized parts than shown in the table Approach Distances For Qualified Employees - Alternating Current contained in this section unless:
- 14.1.1 The person is insulated from the energized part (gloves, with sleeves if necessary, rated for the voltage involved are considered to be insulation of the person from the energized part on which work is performed), or
 - 14.1.2 The energized part is insulated both from all other conductive objects at a different potential and from the person, or
 - 14.1.3 The person is insulated from all conductive objects at a potential different from that of the energized part.

Approach distances for qualified employees -- alternating current

Voltage range (phase to phase)	Minimum approach distance
300V and less	Avoid Contact
Over 300V, not over 750V	1 ft. 0 in. (30.5 cm)
Over 750V, not over 2kV	1 ft. 6 in. (46 cm)
Over 2kV, not over 15kV	2 ft. 0 in. (61 cm)
Over 15kV, not over 37kV	3 ft. 0 in. (91 cm)
Over 37kV, not over 87.5kV	3 ft. 6 in. (107 cm)
Over 87.5kV, not over 121kV	4 ft. 0 in. (122 cm)
Over 121kV, not over 140kV	4 ft. 6 in. (137 cm)

15. Vehicular And Mechanical Equipment

- 15.1 Any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines shall be operated so that a clearance of 10 ft. (305 cm) is maintained. If the voltage is higher than 50kV, the clearance shall be increased 4 in. (10 cm) for every 10kV over that voltage. However, under any of the following conditions, the clearance may be reduced:
 - 15.2 If the vehicle is in transit with its structure lowered, the clearance may be reduced to 4 ft. (122 cm). If the voltage is higher than 50kV, the clearance shall be increased 4 in. (10 cm) for every 10 kV over that voltage.
 - 15.3 If insulating barriers are installed to prevent contact with the lines, and if the barriers are rated for the voltage of the line being guarded and are not a part of or an attachment to the vehicle or its raised structure, the clearance may be reduced to a distance within the designed working dimensions of the insulating barrier.

- 15.4 If the equipment is an aerial lift insulated for the voltage involved, and if the work is performed by a qualified person, the clearance (between the un-insulated portion of the aerial lift and the power line) may be reduced to the distance given in table Approach Distances for Qualified Employees - Alternating Current.
- 15.5 Employees standing on the ground may not contact the vehicle or mechanical equipment or any of its attachments, unless:
 - 15.5.1 The employee is using protective equipment rated for the voltage; or
 - 15.5.2 The equipment is located so that no un-insulated part of its structure (that portion of the structure that provides a conductive path to employees on the ground) can come closer to the line than permitted under this section.
- 15.6 If any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines is intentionally grounded, employees working on the ground near the point of grounding may not stand at the grounding location whenever there is a possibility of overhead line contact. Additional precautions, such as the use of barricades or insulation, shall be taken to protect employees from hazardous ground potentials, depending on earth resistance and fault currents, which can develop within the first few feet or more outward from the grounding point.

16. Illumination

- 16.1 Employees may not enter spaces containing exposed energized parts, unless illumination is provided that enables the employees to perform the work safely.
- 16.2 Where lack of illumination or an obstruction precludes observation of the work to be performed, employees may not perform tasks near exposed energized parts.
- 16.3 Employees may not reach blindly into areas that may contain energized parts.

17. Confined Or Enclosed Work Spaces

- 17.1 When an employee works in a confined or enclosed space (such as a manhole or vault) that contains exposed energized parts, the employer shall provide, and the employee shall use, protective shields, protective barriers, or insulating materials as necessary to avoid inadvertent contact with these parts. Doors, hinged panels, and the like shall be secured to prevent their swinging into an employee and causing the employee to contact exposed energized parts.

18. Conductive Materials And Equipment

- 18.1 Conductive materials and equipment that are in contact with any part of an employee's body shall be handled in a manner that will prevent them from contacting exposed energized conductors or circuit parts. If an employee must handle long dimensional conductive objects (such as ducts and pipes) in areas with exposed live parts, the employer shall institute work practices (such as the use of insulation, guarding, and material handling techniques) which will minimize the hazard.

19. Portable Ladders

- 19.1 Portable ladders shall have nonconductive side rails if they are used where the employee or the ladder could contact exposed energized parts. Use of portable ladders shall comply with the company's written safety procedures for working with ladders.

20. Conductive Apparel

- 20.1 Conductive articles of jewelry and clothing (such as watch bands, bracelets, rings, key chains, necklaces, metalized aprons, cloth with conductive thread, or metal headgear) may not be worn if they might contact exposed energized parts. However, such articles may be worn if they are rendered nonconductive by covering, wrapping, or other insulating means.

21. Housekeeping Duties

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

22. Interlocks

- 22.1 Only a qualified person, who is following established safe work procedures in accordance with OSHA requirements, may defeat an electrical safety interlock, and then only temporarily while he or she is working on the equipment. The interlock system shall be returned to its operable condition when this work is completed.

Metro Electric Co., Inc. Emergency Action Plan



Applicable Standard: 1910.38 Emergency Action Plans

1. Overview and Responsibilities

- 1.1 Metro Electric Co., Inc. has established this program for developing emergency action plans that are specific to Company workplaces and project locations.
- 1.2 This program applies to all Company employees, as well as subcontractor personnel performing work under Company supervision at a project location or other workplace.
- 1.3 The Company Safety Coordinator is responsible for development and managing of this program so that it is effective in providing emergency action plans as specified here.

2. Requirement For a Site-Specific Plan

- 2.1 A site-specific written emergency action plan will be developed for each Company workplace and/or project location prior to beginning work.
- 2.2 When the Company is working at a host employer's or general contractor's location, development of the Company's site-specific emergency action plan will be done in coordination with the host's designated safety and emergency response representatives.
- 2.3 A copy of the project's written emergency action plan will be maintained in the Company workplace, available for review by employees.
- 2.4 In addition to having the written plan available to employees, it will be communicated orally through an orientation to Company employees and subcontractor personnel prior to their beginning work at the project location.

3. Components of the Emergency Action Plan

- 3.1 The site-specific emergency action plan will include at least the following:
 - 3.1.1 Phone numbers for local fire and emergency medical services. Numbers to immediately report, chemical release, weather-related or other emergency should be posted for any employee to use;(911)
 - 3.1.2 Emergency evacuation procedures for the type(s) of evacuations anticipated for the specific work location, with identification of primary (main entrance) and secondary exit routes (nearest road way); designated assembly areas; and instructions for evacuated personnel to remain at the location until released in accordance with plan instructions;

- 3.1.3 Special procedures for employees who must remain at their station to perform critical operations prior to evacuation;
 - 3.1.4 When applicable to the emergency or workplace situation, procedures to shelter in place inside of a building, structure, vehicle or facility for a greater level of protection from weather, chemical release or emergency conditions;
 - 3.1.5 Roll call will be conducted at the assembly area (closest safe area) to ensure that all employees are accounted for after evacuation. So the proper authorities can notified responding emergency personnel about anyone who is not accounted for;
 - 3.1.6 Specific procedures for employees who are designated as first responders, or who will perform rescue, emergency medical, fire fighting and/or hazardous materials response duties; and
 - 3.1.7 Contact the supervisor of the project or the safety department if more information about the plan, or an explanation of duties under the plan is required.
- 3.2 The Company Safety Coordinator will review and approve each site-specific emergency response plan prior to its implementation.
- 3.3 Regarding 3.1.3, routine assignments for Company employees do not require that they remain at their stations to perform critical duties during an emergency evacuation. If such a contingency is identified during emergency planning, the procedures for standing by to perform critical duties will be reviewed and authorized by the Company Safety Coordinator prior to implementation.
- 3.4 Regarding 3.1.6, outside emergency services generally will be called and utilized for response in these circumstances.

Routine assignments for Company employees do not require that they serve as designated first responders, rescue, and emergency medical or firefighting personnel. In most routine assignments, Company employees will not serve in hazardous materials response roles that require specific training and certification.

In the event that Company employees are required to perform any of the duties stated in 3.1.6, this will be done only with authorization of the Company Safety Coordinator, and then only after they have successfully completed all required training and received certification(s) as may be required for such assignments.

4. Methods of Alarm and Emergency Notification

- 4.1 An air horn will be used for sounding the emergency alarm. At least one air horn maintained at each Company work location.
- 4.2 The emergency alarm signal will be distinctive in that it is able to communicate the different types of emergencies, as well as an all-clear signal. Selection, installation, use and testing of the alarm will comply with 1910.165 Employee Alarm Systems.

5. Initial Training & Communicating Changes in the Plan

- 5.1 Employees at the project or workplace will be designated and trained about the site- specific emergency action plan, as well as how to help others make a safe, orderly evacuation to a designated assembly area or shelter-in-place location.
- 5.2 The site supervisor, superintendent or manager will communicate and review the emergency action plan with each affected employee before they start work at the location.
- 5.3 When a new emergency action plan is implemented at a work location, the site supervisor, superintendent or manager will communicate and review the emergency action plan with each Company employee and subcontractor at the job site.
- 5.4 When the plan is changed, or employee responsibilities under the plan change, this will be communicated and reviewed with each employee at the job site.
- 5.5 Communication and review of the emergency action plan with individual employees and subcontractors will be documented in writing with the date and time of presentation; printed name and signature of the individual employee or subcontractor worker; and the name and signature of the Company representative who gives the presentation.
- 5.6 Documentations of initial orientation and subsequent training or notification of change in the emergency action plan will be maintained in the project safety file by the project superintendent, supervisor or manager.

Metro Electric Co., Inc. Environmental Policy



Metro Electric Co., Inc. is strongly committed to good environmental practices during the course of our work. Our policy has been developed to meet the needs of our clients in ensuring all environmental legislation is conformed to.

Metro Electric Co., Inc. will:

- Comply with, and strive to exceed, any requirements under local, state and national environmental legislation;
- Organize site/places of work so that work is carried out to the required standards with minimum risk to vegetation and the environment;
- Know the requirements of all relevant Environmental Site Procedures at all sites where work is performed;
- Include environmental risks as part of the Job Safety Analysis for all work undertaken;
- Maintain a clean and tidy work site;
- Endeavor to reduce consumption of materials and where possible, use environmentally sustainable materials;
- Dispose of all rubbish and redundant material/equipment in an environmentally responsible and safe manner;
- Communicate and promote our environmental policy and responsibilities to all Metro Electric employees; and
- Continue to improve all aspects of our environmental policy to meet the future needs of our clients and our social responsibilities.

Metro Electric Co., Inc.

Excavation/Trenching/Shoring Safety Program



Applicable OSHA Standards: 29 CFR 1926.650, 651, 652

1. Purpose & Scope

- 1.1 The purpose of this policy is to comply with the OSHA standard guidelines for the protection of Metro Electric employees working in and around excavations and trenches.
- 1.2 This program applies to all of work locations that are controlled by the Company where an employee or subcontract personnel may be occupationally exposed to excavations and trenches.
- 1.3 Compliance is mandatory to ensure employee protection when working in or around excavations. The programs in this manual on confined space, hazard communication, lockout/tagout, respiratory protection, and any other safety programs or procedures deemed essential for employee protection, are to be used in conjunction with this program.

2. Responsibilities

- 2.1 It is the responsibility of management and each Site Supervisor to implement and maintain the procedures and steps set forth in this program. Each employee involved with excavation and trenching work is responsible to comply with all applicable safety procedures and requirements of this program.

3. Definitions

- 3.1 **BENCHING** - 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.
- 3.2 **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 failing or sliding, in sufficient quantity so that it could entrap, bury, or otherwise injure and immobilize a person.
- 3.3 **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.
- 3.4 **DURATION OF EXPOSURE** - The longer an excavation is open, the longer the other factors have to work on causing it to collapse.
- 3.5 **EXCAVATION** - Any man-made cut, trench, or depression in an earth surface, formed by earth removal.

- 3.6 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.
- 3.7 PROTECTIVE SYSTEM - A method of protecting employees from cave-ins, from material that could fall or roll from 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 necessary protection.
- 3.8 SHIELD - A structure that is capable of withstanding the forces imposed on it by a cave-in and thereby protects employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. Shields can be pre-manufactured or job-built in accordance with 1926.652(c)(3) or (c)(4). Shields are also referred to as "trench boxes" or "trench shields."
- 3.9 SLOPING - A method of protecting workers from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences such as soil type, length of exposure, and application of surcharge loads.
- 3.10 SURCHARGE LOADS - Generated by the weight of anything in proximity to the excavation, push starts for a cave-in (anything up top pushing down). Common surcharge loads:
 - 3.10.1 Weight of spoil pile
 - 3.10.2 Weight of nearby buildings, poles, pavement, or other structural objects.
 - 3.10.3 Weight of material and equipment
- 3.11 TRENCH - A narrow excavation below the surface of the ground, less than 15 feet wide, with a depth no greater than the width.
- 3.12 UNDERMINING - Undermining can be caused by such things as leaking, leaching, caving or over-digging. Undermined walls can be very dangerous.
- 3.13 VIBRATION - A force present on construction sites and must be considered. The vibrations caused by backhoes, dump trucks, compactors and traffic on job sites can be substantial.

4. General Requirements

- 4.1 The program establishes an excavation and trenching safety plan.
- 4.2 All surface encumbrances that are located at the excavation or trenching area so as to create a hazard to employees will be removed or supported, as necessary, to safeguard employees.
- 4.3 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, will be determined prior to opening an excavation.

- 4.4 Utility companies or owners will 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.
- 4.5 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 Company may proceed, provided the Company does so with caution, and provided detection equipment or other acceptable means to locate utility installations are used.
- 4.6 When excavation operations approach the estimated location of underground installations, the exact location of the installations will be determined by safe and acceptable means.
- 4.7 While the excavation is open, underground installations will be protected, supported or removed as necessary to safeguard employees.
- 4.8 Structural ramps that are used solely by employees as a means of access or egress from excavations will be designed by a competent person. Structural ramps used for access or egress of equipment will be designed by a competent person qualified in structural design, and will be constructed in accordance with the design.
- 4.9 Ramps and runways constructed of two or more structural members will have the structural members connected together to prevent displacement.
- 4.10 Structural members used for ramps and runways will be of uniform thickness.
- 4.11 Cleats or other appropriate means used to connect runway structural members will be attached to the bottom of the runway or will be attached in a manner to prevent tripping.
- 4.12 Structural ramps used in lieu of steps will be provided with cleats or other surface treatments on the top surface to prevent slipping.
- 4.13 Means of egress from trench excavations will be provided. A stairway, ladder, ramp or other safe means of egress will 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.
- 4.14 Employees exposed to public vehicular traffic will be provided with and will wear warning vests or other suitable garments marked with or made of reflector or high-visibility material.
- 4.15 No employee will be permitted underneath loads handled by lifting or digging equipment. Employees will 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, in accordance with 1926.601(b)(6), to provide adequate protection for the operator during loading and unloading operations.
- 4.16 Daily inspections of excavations, the adjacent areas, and protective systems will 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.
- 4.17 An inspection will be conducted by the competent person prior to the start of work and as needed throughout the shift. Inspections will also be made after every rainstorm or other

hazard increasing occurrence. These inspections are only required when employee exposure can be reasonably anticipated.

- 4.18 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 will be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.
- 4.19 Walkways will be provided where employees or equipment are required or permitted to cross over excavations. Guardrails which comply with 1926.502(b) will be provided where walkways are 6 feet (1.8 m) or more above lower levels.

5. Safe Work Procedures

- 5.1 Before any work is performed and before any employees enter the excavation, a number of items must be checked and insured:
 - 5.1.1 Before any excavation, underground installations must be determined. This can be accomplished by either contacting the local utility companies or the local "one-call" center for the area. All underground utility locations must be documented on the proper forms. All overhead hazards (surface encumbrances) that create a hazard to employees must be removed or supported to eliminate the hazard.
 - 5.1.2 If the excavation is to be over 20 feet deep, it must be designed by a professional engineer who is registered in the state where work will be performed.
 - 5.1.3 Adequate protective systems will be utilized to protect employees. This can be accomplished through sloping, shoring, or shielding.
 - 5.1.4 The worksite must be analyzed in order to design adequate protection systems and prevent cave-ins. There must also be an excavation safety plan developed to protect employees.
 - 5.1.5 Workers must be supplied with and wear any personal protective equipment deemed necessary to assure their protection.
 - 5.1.6 All spoil piles will be stored a minimum of 2 feet from the sides of the excavation. The spoil pile must not block the safe means of egress.
 - 5.1.7 If a trench or excavation is 4 feet or deeper, stairways, ramps, or ladders will be used as a safe means of access and egress. For trenches, the employee must not have to travel any more than 25 feet of lateral travel to reach the stairway, ramp, or ladder.
 - 5.1.8 No employee will work in an excavation where water is accumulating unless adequate measures are used to protect the employees.
 - 5.1.8.1 A competent person will inspect all excavations and trenches daily, prior to employee exposure or entry, and after any rainfall, soil change, or any other time needed during the shift. The competent person must take prompt measures to eliminate any and all hazards.

5.1.8.2 Excavations and trenches 4 feet or deeper that have the potential for toxic substances or hazardous atmospheres will be tested at least daily. Documentation of test data will be maintained throughout the course of the project. If the atmosphere is inadequate, protective systems will be utilized.

5.1.8.3 If work is in or around traffic, employees must be supplied with and wear orange reflective vests. Signs and barricades must be utilized to ensure the safety of employees, vehicular traffic, and pedestrians.

6. **Competent Person Responsibilities**

6.1 In most work situations, the Site Supervisor will be the competent person for excavation and trenching operations.

6.2 The OSHA Standards require that the competent person must be capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and have authorization to take prompt corrective measures to eliminate them and, if necessary, to stop the work.

6.3 A competent person is required to:

6.3.1 Have a complete understanding of the applicable safety standards and any other data provided.

6.3.2 Identify the proper locations of underground installations or utilities, and ensure that the proper utility companies have been contacted.

6.3.3 Conduct and document soil classification tests and reclassify soil after any condition changes.

6.3.4 Determine adequate protective systems (sloping, shoring, or shielding systems) for employee protection.

6.3.5 Conduct and document all air monitoring for potential hazardous atmospheres.

6.3.6 Conduct and document daily and periodic inspections of excavations and trenches.

6.3.7 Approve design of structural ramps, if used.

7. **Excavation Safety Plan**

7.1 An excavation safety plan is required in written form. This plan is to be developed to the level necessary to ensure complete compliance with the OSHA Excavation Safety Standard and state and local safety standards.

7.2 Excavation safety plan factors:

7.2.1 Utilization of the local one-call system

7.2.2 Determination of locations of all underground utilities

- 7.2.3 Consideration of confined space atmosphere potential
- 7.2.4 Proper soil protection systems and personal protective equipment and clothing
- 7.2.5 Determination of soil composition and classification
- 7.2.6 Determination of surface and subsurface water
- 7.2.7 Depth of excavation and length of time it will remain open
- 7.2.8 Emergency rescue system/procedure
- 7.2.9 Proper adherence to all other applicable OSHA Standards, this Excavation and Trenching Safety Program, and any other coinciding safety programs.

8. Soil Classification and Identification

- 8.1 The OSHA Standards define soil classifications within the Simplified Soil Classification Systems, which consist of four categories: Stable Rock, Type A, Type B, and Type C. Stability is greatest in Stable Rock and decreases through Type A and B to Type C, which is the least stable. Appendix A of the Standard provides soil mechanics terms and types of field tests used to determine soil classifications.
- 8.2 Stable Rock is defined as:
 - 8.2.1 Natural solid mineral matter that can be excavated with vertical sides and remain intact while exposed.
- 8.3 Type A soil is defined as:
 - 8.3.1 Cohesive soils with an unconfined compressive strength of 1.5 tons per square foot (TSF) or greater.
 - 8.3.2 Cemented soils like caliches and hardpan are considered Type A.
 - 8.3.3 Soil is NOT Type A if:
 - 8.3.3.1 It is fissured.
 - 8.3.3.2 The soil is subject to vibration from heavy traffic, pile driving or similar effects.
 - 8.3.3.3 The soil has been previously disturbed.
 - 8.3.3.4 The material is subject to other factors that would require it to be classified as a less stable material.
 - 8.3.3.5 The exclusions for Type A most generally eliminate it from most construction situations.
- 8.4 Type B soil is defined as:

- 8.4.1 Cohesive soil with an unconfined compressive strength greater than .5 TSF, but less than 1.5 TSF.
 - 8.4.2 Granular cohesion less soil including angular gravel, silt, silt loam, and sandy loam.
 - 8.4.3 The soil has been previously disturbed except that soil classified as Type C soil.
 - 8.4.4 Soil that meets the unconfined compressive strength requirements of Type A soil, but is fissured or subject to vibration.
 - 8.4.5 Dry rock that is unstable.
- 8.5 Type C soil is defined as:
- 8.5.1 Cohesive soil with an unconfined compressive strength of .5 TSF or less.
 - 8.5.2 Granular soils including gravel, sand and loamy sand.
 - 8.5.3 Submerged soil or soil from which water is freely seeping.
 - 8.5.4 Submerged rock that is not stable.

9. Soil Test and Identification

- 9.1 The competent person will classify the soil type in accordance with the definitions in Appendix A of the Standard on the basis of at least 1 visual and 1 manual analysis. These tests should be run on freshly excavated samples from the excavation and are designed to determine stability based on a number of criteria: the cohesiveness, the presence of fissures, the presence and amount of water, the unconfined compressive strength, and the duration of exposure, undermining, and the presence of layering, prior excavation and vibration.
- 9.2 The cohesion tests are based on methods to determine the presence of clay. Clay, silt, and sand are size classifications, with clay being the smallest sized particles, silt intermediate and sand the largest. Clay minerals exhibit good cohesion and plasticity (can be molded). Sand exhibits no elasticity and virtually no cohesion unless surface wetting is present. The degree of cohesiveness and plasticity depend on the amounts of all three types and water.
- 9.3 When examining the soil, 3 questions must be asked: Is the sample granular or cohesive? Fissured or non-fissured? What is the unconfined compressive strength measured in TSF?

10. Methods of Testing Soils

- 10.1 Visual test: If the excavated soil is in clumps, it is cohesive. If it breaks up easily, not staying in clumps, it is granular.
- 10.2 Wet manual test: Wet your fingers and work the soil between them. Clay is a slick paste when wet, meaning it is cohesive. If the clump falls apart in grains, it is granular.
- 10.3 Dry strength test: Try to crumble the sample in your hands with your fingers. If it crumbles into grains, it is granular. Clay will not crumble into grains, only into smaller chunks.
- 10.4 Pocket penetrometer test: This instrument is most accurate when soil is nearly saturated. This instrument will give unconfined compressive strength in tons per square foot. The spring-operated device uses a piston that is pushed into a coil up to a calibration groove. An indicator sleeve marks and retains the reading until it is read. The reading is calibrated in tons per square foot (TSF) or kilograms per cubic centimeter.
- 10.5 Thumb penetration test: The competent person attempts to penetrate a fresh sample with thumb pressure. If the sample can be dented, but penetrated only with great effort, it is Type A. If it can be penetrated several inches and molded by light pressure, it is Type C. Type B can be penetrated with effort and molded.
- 10.6 Shear vane: Measures the approximate shear strength of saturated cohesive soils. The blades of the vane are pressed into a flat section of undisturbed soil, and the knob is turned slowly until soil failure. The dial is read directly when using the standard vane. The results will be in tons per square foot or kilograms per cubic centimeter.
- 10.7 The competent person will perform several tests along the depth and length of the excavation to obtain consistent, supporting data. The soil is subject to change several times within the scope of an excavation and the moisture content will vary with weather and job conditions. The competent person must also determine the level of protection based on what conditions exist at the time of the test, and allow for changing conditions.

11. Hazardous Atmospheres

- 11.1 To prevent exposure to harmful levels of atmospheric contaminants and to assure acceptable atmospheric conditions, the following requirements will apply:
 - 11.1.1 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 will be tested before employees enter excavations greater than 4 feet (1.22 m) in depth.
 - 11.1.2 Adequate precautions will 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.
 - 11.1.3 Adequate precaution will 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.

- 11.1.4 When controls are used that is intended to reduce the level of atmospheric contaminants to acceptable levels, testing will be conducted as often as necessary to ensure that the atmosphere remains safe.
- 11.1.5 Emergency rescue equipment, such as breathing apparatus, a safety harness and line, or a basket stretcher, will be readily available where hazardous atmospheric conditions exist or may reasonably be expected to develop during work in an excavation. This equipment will be attended when in use.
- 11.1.6 Employees entering bell-bottom pier holes, or other similar deep and confined footing excavations, will wear a harness with a lifeline securely attached to it. The lifeline will be separate from any line used to handle materials, and will be individually attended at all times while the employee wearing the lifeline is in the excavation.

12. Water Accumulation

- 12.1 Employees will 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.
- 12.2 If water is controlled or prevented from accumulating by the use of water removal equipment, the water removal equipment and operations will be monitored by a competent person to ensure proper operation.
- 12.3 If excavation work interrupts the natural drainage of surface water (such as streams), diversion ditches, dikes, or other suitable means will 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 and compliance with provisions of the two paragraphs above.

13. Excavation Protection Systems

- 13.1 The three basic protective systems for excavations and trenches are sloping and benching systems, shoring, and shields.
- 13.2 The protective systems will have the capacity to resist without failure all loads that are intended or could reasonably be expected to be applied to or transmitted to the system. Every employee in an excavation will be protected from cave-ins by an adequate protective system.
- 13.3 Exceptions to using protective system:
 - 13.3.1 Excavations are made entirely in stable rock
 - 13.3.2 Excavations are less than 5 feet deep and declared safe by a competent person

13.4 Sloping and Benching Systems

13.4.1 There are 4 options for sloping:

13.4.1.1 Slope to the angle required by the Standard for Type C soil, which is the most unstable soil type.

13.4.1.2 The table provided in Appendix B of the Standard may be used to determine the maximum allowable angle (after determining the soil type).

13.4.1.3 Tabulated data prepared by a registered professional engineer can be utilized.

13.4.1.4 A registered professional engineer can design a sloping plan for a specific job.

13.4.2 Sloping and benching systems for excavations 5 to 20 feet in depth must be constructed under the instruction of a designated competent person.

13.4.3 Sloping and benching systems for excavations greater than 20 feet must be designed and stamped by a registered professional engineer.

13.4.4 Sloping and benching specifications can be found in Appendix B of the Standard.

14. Shoring Systems

14.1 Shoring is another protective system or support system. Shoring utilizes a framework of vertical members (uprights), horizontal members (whales), and cross braces to support the sides of the excavation to prevent a cave-in. Metal hydraulic, mechanical or timber shorings are common examples.

14.2 Different examples of shoring are found in the OSHA Standard under these appendices:

14.2.1 Appendix C - Timber Shoring for Trenches

14.2.2 Appendix D - Aluminum Hydraulic Shoring for Trenches

14.2.3 Appendix E - Alternatives to Timber Shoring

15. Shield Systems (Trench Boxes)

15.1 Shielding is the third method of providing a safe workplace. Unlike sloping and shoring, shielding does not prevent a cave-in. Shields are designed to withstand the soil forces caused by a cave-in and protect the employees inside the structure. Most shields consist of 2 flat, parallel metal walls that are held apart by metal cross braces. Shielding design and construction is not covered in the OSHA Standards. Shields must be certified in design by a registered professional engineer and must have either a registration plate on the shield or registration papers from the manufacturer on file at the jobsite office.

15.2 Any repairs or modifications MUST be approved by the manufacturer!

15.2.1 Safety Precautions For Shield Systems

15.2.1.1 Shields must not have any lateral movement when installed.

15.2.1.2 Employees will be protected from cave-ins when entering and exiting the shield (examples - ladder within the shield or a properly sloped ramp at the end).

15.2.1.3 Employees are not allowed in the shield during installation, removal, or during any vertical movement.

15.2.1.4 Shields can be 2 ft. above the bottom of an excavation if they are designed to resist loads at the full depth and if there are no indications of caving under or behind the shield.

15.2.1.5 The shield must extend at least 18 inches above the point where proper sloping begins (the height of the shield must be greater than the depth of the excavation).

15.2.1.6 The open end of the shield must be protected from the exposed excavation wall. The wall must be sloped, shored, or shielded. Engineer designed end plates can be mounted on the ends of the shield to prevent cave-ins.

16. Personal Protective Equipment

16.1 It is Company policy to wear a hard hat, safety glasses, and work boots on the jobsite. Because of the potential hazards involved with excavations, other personal protective equipment may be necessary (examples - goggles, gloves, safety harness and lifeline, and respiratory equipment).

17. Inspections

17.1 Daily inspection of excavations, the adjacent areas and protective systems will be made by the competent person for evidence of a situation that could result in a cave-in, indications of failure of protective systems, hazardous atmospheres or other hazardous conditions.

17.2 All inspections will be conducted by the competent person prior to the start of work and as needed throughout the shift.

17.3 Inspections will be made after every rainstorm or any other increasing hazard.

17.4 All documented inspections will be kept on file in the jobsite safety files

17.5 A copy of the Daily Excavation Checklist is located at the end of this program.

18. Training

- 18.1 When the Company is not initiating the excavation or trenching operation, basic awareness training will be provided by communicating all elements of this program to employees at the work location.
- 18.2 The competent person(s) must be trained in accordance with the OSHA Excavation Standard, and all other programs that may apply (examples Hazard Communication, Confined Space, and Respiratory Protection), and must demonstrate a thorough understanding and knowledge of the programs and the hazards associated.
- 18.3 All other employees working in and around the excavation must be trained in the recognition of hazards associated with trenching and excavating.

Metro Electric Co., Inc.

Eye Protection



Eye hazards are common in construction work. Eye protection is a must if you are involved in the following operations:

- Chipping, sledging and hammering on metal, stone or concrete.
- Using manual, pneumatic and power impact tools.
- Caulking, brushing and grinding.
- Drilling, scaling and scraping.
- Soldering and casting hot metals.
- Handling hot tar, oils, liquids and molten substances.
- Using acids, caustics and creosoted materials.
- Gas welding, cutting and brazing or electric arc welding or any other operation that may expose the eyes to dust, gases, fumes or liquids.
- Drilling, sawing or hammering overhead.
- Working in a dusty environment.

Comfort in eye protection depends upon a good fit. Goggles sometimes may become foggy from condensation, however, this situation can be remedied by wearing a sweat band or the use of anti-fog substances on the goggles. **Don't discard eye protection just because it's inconvenient or uncomfortable! A moment of carelessness can destroy sight!**

Metro Electric Co., Inc.

Fall Protection Equipment



Applicable OSHA Standards: 29 CFR 1926.500

1. Purpose & Scope

- 1.1 This policy sets forth requirements and criteria for fall protection in construction workplaces covered under 29 CFR part 1926. Exception: The provisions of this policy do not apply when employees are making an inspection, investigation, or assessment of workplace conditions prior to the actual start of construction work or after all construction work has been completed.
- 1.2 This policy applies to all employees and subcontractors working within Metro Electric controlled job sites.

2. Definitions

- 2.1 "Anchorage" means a secure point of attachment for lifelines, lanyards or deceleration devices.
- 2.2 "Body belt (safety belt)" means a strap with means both for securing it about the waist and for attaching it to a lanyard, lifeline, or deceleration device.
- 2.3 "Body harness" means straps which may be secured about the employee in a manner that will distribute the fall arrest forces over at least the thighs, pelvis, waist, chest and shoulders with means for attaching it to other components of a personal fall arrest system.
- 2.4 "Buckle" means any device for holding the body belt or body harness closed around the employee's body.
- 2.5 "Connector" means a device which is used to couple (connect) parts of the personal fall arrest system and positioning device systems together. It may be an independent component of the system, such as a carabineer, or it may be an integral component of part of the system (such as a buckle or Dee-ring sewn into a body belt or body harness, or a snap-hook spliced or sewn to a lanyard or self-retracting lanyard).
- 2.6 "Controlled access zone (CAZ)" means an area in which certain work (e.g., overhand bricklaying) may take place without the use of guardrail systems, personal fall arrest systems, or safety net systems and access to the zone is controlled.
- 2.7 "Dangerous equipment" means equipment (such as pickling or galvanizing tanks, degreasing units, machinery, electrical equipment, and other units) which, as a result of form or function, may be hazardous to employees who fall onto or into such equipment.
- 2.8 "Deceleration device" means any mechanism, such as a rope grab, rip-stitch lanyard, specially-woven lanyard, tearing or deforming lanyards, automatic self-retracting

lifelines/lanyards, etc., which serves to dissipate a substantial amount of energy during a fall arrest, or otherwise limit the energy imposed on an employee during fall arrest.

- 2.9 "Deceleration distance" means the additional vertical distance a falling employee travels, excluding lifeline elongation and free fall distance, before stopping, from the point at which the deceleration device begins to operate. It is measured as the distance between the location of an employee's body belt or body harness attachment point at the moment of activation (at the onset of fall arrest forces) of the deceleration device during a fall, and the location of that attachment point after the employee comes to a full stop.
- 2.10 "Equivalent" means alternative designs, materials, or methods to protect against a hazard which the employer can demonstrate will provide an equal or greater degree of safety for employees than the methods, materials or designs specified in the standard.
- 2.11 "Failure" means load refusal, breakage, or separation of component parts. Load refusal is the point where the ultimate strength is exceeded.
- 2.12 "Free fall" means the act of falling before a personal fall arrest system begins to apply force to arrest the fall.
- 2.13 "Free fall distance" means the vertical displacement of the fall arrest attachment point on the employee's body belt or body harness between onset of the fall and just before the system begins to apply force to arrest the fall. This distance excludes deceleration distance, and lifeline/lanyard elongation, but includes any deceleration device slide distance or self-retracting lifeline/lanyard extension before they operate and fall arrest forces occur.
- 2.14 "Guardrail system" means a barrier erected to prevent employees from falling to lower levels.
- 2.15 "Hole" means a gap or void 2 inches (5.1 cm) or more in its least dimension, in a floor, roof, or other walking/working surface.
- 2.16 "Infeasible" means that it is impossible to perform the construction work using a conventional fall protection system (i.e., guardrail system, safety net system, or personal fall arrest system) or that it is technologically impossible to use any one of these systems to provide fall protection.
- 2.17 "Lanyard" means a flexible line of rope, wire rope, or strap which generally has a connector at each end for connecting the body belt or body harness to a deceleration device, lifeline, or anchorage.
- 2.18 "Leading edge" means the edge of a floor, roof, or formwork for a floor or other walking/working surface (such as the deck) which changes location as additional floor, roof, decking, or formwork sections are placed, formed, or constructed. A leading edge is considered to be an "unprotected side and edge" during periods when it is not actively and continuously under construction.
- 2.19 "Lifeline" means a component consisting of a flexible line for connection to an anchorage at one end to hang vertically (vertical lifeline), or for connection to anchorages at both ends to stretch horizontally (horizontal lifeline), and which serves as a means for connecting other components of a personal fall arrest system to the anchorage.

- 2.20 "Low-slope roof" means a roof having a slope less than or equal to 4 in 12 (vertical to horizontal).
- 2.21 "Lower levels" means those areas or surfaces to which an employee can fall. Such areas or surfaces include, but are not limited to, ground levels, floors, platforms, ramps, runways, excavations, pits, tanks, material, water, equipment, structures, or portions thereof.
- 2.22 "Mechanical equipment" means all motor or human propelled wheeled equipment used for roofing work, except wheelbarrows and mop carts.
- 2.23 "Opening" means a gap or voids 30 inches (76 cm) or more high and 18 inches (48 cm) or more wide, in a wall or partition, through which employees can fall to a lower level.
- 2.24 "Personal fall arrest system" means a system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, a body belt or body harness and may include a lanyard, deceleration device, lifeline, or suitable combinations of these. As of January 1, 1998, the use of a body belt for fall arrest is prohibited.
- 2.25 "Positioning device system" means a body belt or body harness system rigged to allow an employee to be supported on an elevated vertical surface, such as a wall, and work with both hands free while leaning.
- 2.26 "Rope grab" means a deceleration device which travels on a lifeline and automatically, by friction, engages the lifeline and locks so as to arrest the fall of an employee. A rope grab usually employs the principle of inertial locking, cam/level locking, or both.
- 2.27 "Roof" means the exterior surface on the top of a building. This does not include floors or formwork which, because a building has not been completed, temporarily becomes the top surface of a building.
- 2.28 "Roofing work" means the hoisting, storage, application, and removal of roofing materials and equipment, including related insulation, sheet metal, and vapor barrier work, but not including the construction of the roof deck.
- 2.29 "Safety-monitoring system" means a safety system in which a competent person is responsible for recognizing and warning employees of fall hazards.
- 2.30 "Self-retracting lifeline/lanyard" means a deceleration device containing a drum-wound line which can be slowly extracted from, or retracted onto, the drum under slight tension during normal employee movement, and which, after onset of a fall, automatically locks the drum and arrests the fall.
- 2.31 "Snap hook" means a connector comprised of a hook-shaped member with a normally closed keeper, or similar arrangement, which may be opened to permit the hook to receive an object and, when released, automatically closes to retain the object. Snap hooks are generally one of two types:
- 2.31.1 The locking type with a self-closing, self-locking keeper which remains closed and locked until unlocked and pressed open for connection or disconnection; or

- 2.31.1.1 The non-locking type with a self-closing keeper which remains closed until pressed open for connection or disconnection. As of January 1, 1998, the use of a non-locking snap hook as part of personal fall arrest systems and positioning device systems is prohibited.
- 2.32 "Steep roof" means a roof having a slope greater than 4 in 12 (vertical to horizontal).
- 2.33 "Toe board" means a low protective barrier that will prevent the fall of materials and equipment to lower levels and provide protection from falls for personnel.
- 2.34 "Unprotected sides and edges" means any side or edge (except at entrances to points of access) of a walking/working surface, e.g., floor, roof, ramp, or runway where there is no wall or guardrail system at least 39 inches (1.0 m) high.
- 2.35 "Walking/working surface" means any surface, whether horizontal or vertical on which an employee walks or works, including, but not limited to, floors, roofs, ramps, bridges, runways, formwork and concrete reinforcing steel but not including ladders, vehicles, or trailers, on which employees must be located in order to perform their job duties.
- 2.36 "Warning line system" means a barrier erected on a roof to warn employees that they are approaching an unprotected roof side or edge, and which designates an area in which roofing work may take place without the use of guardrail, body belt, or safety net systems to protect employees in the area.
- 2.37 "Work area" means that portion of a walking/working surface where job duties are being performed.

3. General

- 3.1 Fall protection is required whenever employees are potentially exposed to falls from heights of 6 feet or greater to lower levels. This includes work near and around excavations.
- 3.2 Use of guard rails, safety net, or personal fall arrest systems will be used as methods of fall protection when standard methods are not feasible or a greater hazard would be created by use of standard methods. Determination of employee exposure to fall hazards will be made without regard for the use of personal protective equipment.
- 3.3 Scaffolds, ladders or vehicle mounted work platforms may be utilized at a work location so long as employees have been sufficiently trained in the safe use of these devices and are authorized by the Site Supervisor for such work. Use of vehicle-mounted work platforms and scaffolding requires specific training for individual in charge of the work and users.
- 3.4 The Site Supervisor, in conjunction with the Company's Safety Representative, will determine if the walking or working surfaces on which employees are to work have the strength and structural integrity to support employees safely. Employees will be allowed to work on those surfaces only when the surfaces have the requisite strength and structural integrity.
- 3.5 Each employee on a walking/working surface (horizontal and vertical surface) with an unprotected side or edge which is 6 feet (1.8 m) or more above a lower level will be protected from falling by the use of guardrail systems, safety net systems, or personal fall arrest systems.

- 3.6 Each employee who is constructing a leading edge 6 feet (1.8 m) or more above lower levels will be protected from falling by guardrail systems, safety net systems, or personal fall arrest systems. Exception: When the Site Supervisor can demonstrate that it is infeasible or creates a greater hazard to use these systems, the Site Supervisor, in conjunction with the Company's Safety Representative, will develop and implement a fall protection plan which meets the requirements of paragraph (k) of 1926.502.
- 3.7 Each employee on a walking/working surface 6 feet (1.8 m) or more above a lower level where leading edges are under construction, but who is not engaged in the leading edge work, will be protected from falling by a guardrail system, safety net system, or personal fall arrest system. If a guardrail system is chosen to provide the fall protection, and a controlled access zone has already been established for leading edge work, the control line may be used in lieu of a guardrail along the edge that parallels the leading edge.
- 3.8 Each employee in a hoist area will be protected from falling 6 feet (1.8 m) or more to lower levels by guardrail systems or personal fall arrest systems. If guardrail systems, [or chain, gate, or guardrail] or portions thereof, are removed to facilitate the hoisting operation (e.g., during landing of materials), and an employee must lean through the access opening or out over the edge of the access opening (to receive or guide equipment and materials, for example), that employee will be protected from fall hazards by a personal fall arrest system.
- 3.9 Each employee on walking/working surfaces will be protected from falling through holes (including skylights) more than 6 feet (1.8 m) above lower levels, by personal fall arrest systems, covers, or guardrail systems erected around such holes.
- 3.10 Each employee on a walking/working surface will be protected from tripping in or stepping into or through holes (including skylights) by covers.
- 3.11 Each employee on a walking/working surface will be protected from objects falling through holes (including skylights) by covers.
- 3.12 Each employee on the face of formwork or reinforcing steel will be protected from falling 6 feet (1.8 m) or more to lower levels by personal fall arrest systems, safety net systems, or positioning device systems.
- 3.13 Each employee on ramps, runways, and other walkways will be protected from falling 6 feet (1.8 m) or more to lower levels by guardrail systems.
- 3.14 Each employee at the edge of an excavation 6 feet (1.8 m) or more in depth will be protected from falling by guardrail systems, fences, or barricades when the excavations are not readily seen because of plant growth or other vision barrier.
- 3.15 Each employee at the edge of a well, pit, shaft, and similar excavation 6 feet (1.8m) or more in depth will be protected from falling by guardrail systems, fences, barricades, or covers.
- 3.16 Each employee less than 6 feet (1.8 m) above dangerous equipment will be protected from falling into or onto the dangerous equipment by guardrail systems or by equipment guards.
- 3.17 Each employee 6 feet (1.8 m) or more above dangerous equipment will be protected from fall hazards by guardrail systems, personal fall arrest systems, or safety net systems.

- 3.18 Each employee reaching more than 10 inches (25 cm) below the level of the walking/working surface on which they are working will be protected from falling by a guardrail system, safety net system, or personal fall arrest system.
- 3.19 Each employee engaged in roofing activities on low-slope roofs, with unprotected sides and edges 6 feet (1.8 m) or more above lower levels will be protected from falling by guardrail systems, safety net systems, personal fall arrest systems, or a combination of warning line system and guardrail system, warning line system and safety net system, or warning line system and personal fall arrest system, or warning line system and safety monitoring system. Or, on roofs 50-feet (15.25 m) or less in width the use of a safety monitoring system alone [i.e. without the warning line system] is permitted.
- 3.20 Each employee on a steep roof with unprotected sides and edges 6 feet (1.8 m) or more above lower levels will be protected from falling by guardrail systems with toe boards, safety net systems, or personal fall arrest systems.
- 3.21 Each employee engaged in the erection of pre-cast concrete members (including, but not limited to the erection of wall panels, columns, beams, and floor and roof "tees") and related operations such as grouting of pre-cast concrete members, who is 6 feet (1.8 m) or more above lower levels will be protected from falling by guardrail systems, safety net systems, or personal fall arrest systems.
- 3.22 Each employee working on, at, above, or near wall openings (including those with chutes attached) where the outside bottom edge of the wall opening is 6 feet (1.8 m) or more above lower levels and the inside bottom edge of the wall opening is less than 39 inches (1.0 m) above the walking/working surface, will be protected from falling by the use of a guardrail system, a safety net system, or a personal fall arrest system.
- 3.23 When an employee is exposed to falling objects, each employee will wear a hard hat and the Site Supervisor will implement one of the following measures:
 - 3.23.1 Erect toe boards, screens, or guardrail systems to prevent objects from falling from higher levels; or,
 - 3.23.2 Erect a canopy structure and keep potential fall objects far enough from the edge of the higher level so that those objects would not go over the edge if they were accidentally displaced; or,
 - 3.23.3 Barricade the area to which objects could fall, prohibit employees from entering the barricaded area, and keep objects that may fall far enough away from the edge of a higher level so that those objects would not go over the edge if they were accidentally displaced.
- 3.24 When fall protection is required for the protection of employees, a fall protection plan will be prepared by a qualified person and developed specifically for the site where the work is being performed. The plan must be maintained up to date.
- 3.25 When fall protection is required, a competent person will be assigned to: recognize fall hazards; warn employees if they are unaware of a fall hazard or are acting in an unsafe manner; be on same working surface and in visual sight; stay close enough for verbal communication;

and not have other assignments that would distract the monitor's attention from the monitoring responsibilities.

- 3.26 When purchasing equipment and raw materials for use in fall protection systems applicable ANSI and ASTM requirements will be met.

4. Guardrail Systems

- 4.1 Top edge height of top rails, or equivalent guardrail system members, will be 42 inches (1.1 m) plus or minus 3 inches (8 cm) above the walking/working level. When conditions warrant, the height of the top edge may exceed the 45-inch height, provided the guardrail system meets all other criteria of this paragraph.
- 4.2 Mid-rails, screens, mesh, intermediate vertical members, or equivalent intermediate structural members will be installed between the top edge of the guardrail system and the walking/working surface when there is no wall or parapet wall at least 21 inches (53 cm) high.
- 4.3 Mid-rails, when used, will be installed at a height midway between the top edge of the guardrail system and the walking/working level.
- 4.4 Screens and mesh, when used, will extend from the top rail to the walking/working level and along the entire opening between top rail supports.
- 4.5 Intermediate members (such as balusters), when used between posts, will be not more than 19 inches (48 cm) apart. Other structural members (such as additional mid-rails and architectural panels) will be installed so that there are no openings in the guardrail system that are more than 19 inches (.5 m) wide.
- 4.6 Guardrail systems will be capable of withstanding, without failure, a force of at least 200 pounds (890 N) applied within 2 inches (5.1 cm) of the top edge, in any outward or downward direction, at any point along the top edge.
- 4.7 Mid-rails, screens, mesh, intermediate vertical members, solid panels, and equivalent structural members will be capable of withstanding, without failure, a force of at least 150 pounds (666 N) applied in any downward or outward direction at any point along the mid-rail or other member.
- 4.8 Guardrail systems will be so surfaced as to prevent injury to an employee from punctures or lacerations, and to prevent snagging of clothing.
- 4.9 The ends of all top rails and mid-rails will not overhang the terminal posts, except where such overhang does not constitute a projection hazard.
- 4.10 Steel banding and plastic banding will not be used as top rails or mid-rails.
- 4.11 Top rails and mid-rails will be at least one-quarter inch (0.6 cm) nominal diameter or thickness to prevent cuts and lacerations. If wire rope is used for top rails, it will be flagged at not more than 6-foot intervals with high-visibility material.

- 4.12 When guardrail systems are used at hoisting areas, a chain, gate or removable guardrail section will be placed across the access opening between guardrail sections when hoisting operations are not taking place.
- 4.13 When guardrail systems are used at holes, they will be erected on all unprotected sides or edges of the hole.
- 4.14 When guardrail systems are used around holes used for the passage of materials, the hole will have not more than two sides provided with removable guardrail sections to allow the passage of materials. When the hole is not in use, it will be closed over with a cover, or a guardrail system will be provided along all unprotected sides or edges.
- 4.15 When guardrail systems are used around holes which are used as points of access (such as ladder ways), they will be provided with a gate, or be so offset that a person cannot walk directly into the hole.
- 4.16 Guardrail systems used on ramps and runways will be erected along each unprotected side or edge.
- 4.17 Manila, plastic or synthetic rope being used for top rails or mid-rails will be inspected as frequently as necessary to ensure that it continues to meet the strength requirements of paragraph 3.6 of this section.
- 4.18 Safety nets may be used only after approval by the Company Safety Representative.

5. Personal Fall Arrest Systems

- 5.1 Connectors will be drop forged, pressed or formed steel, or made of equivalent materials.
- 5.2 Connectors will have a corrosion-resistant finish, and all surfaces and edges will be smooth to prevent damage to interfacing parts of the system.
- 5.3 D-rings and snap hooks will have a minimum tensile strength of 5,000 pounds (22.2 kN).
- 5.4 Snap hooks will be sized to be compatible with the member to which they are connected to prevent unintentional disengagement of the snap hook by depression of the snap hook keeper by the connected member, or will be a locking type snap hook designed and used to prevent disengagement of the snap hook by the contact of the snap hook keeper by the connected member. Effective January 1, 1998, only locking type snap hooks will be used.
- 5.5 Unless the snap hook is a locking type and designed for the following connections, snap hooks will not be engaged:
 - 5.5.1 Directly to webbing, rope or wire rope;
 - 5.5.2 To each other;
 - 5.5.3 To a d-ring to which another snap hook or other connector is attached;
 - 5.5.4 To a horizontal lifeline; or

- 5.5.5 To any object which is incompatibly shaped or dimensioned in relation to the snap hook such that unintentional disengagement could occur by the connected object being able to depress the snap hook keeper and release itself.
- 5.6 On suspended scaffolds or similar work platforms with horizontal lifelines which may become vertical lifelines, the devices used to connect to a horizontal lifeline will be capable of locking in both directions on the lifeline.
- 5.7 Horizontal lifelines will be designed, installed, and used, under the supervision of a qualified person, as part of a complete personal fall arrest system, which maintains a safety factor of at least two.
- 5.8 Lanyards and vertical lifelines will have a minimum breaking strength of 5,000 pounds (22.2 kN).
- 5.9 Lifelines will be protected against being cut or abraded.
- 5.10 Self-retracting lifelines and lanyards which automatically limit free fall distance to 2 feet (0.61 m) or less will be capable of sustaining a minimum tensile load of 3,000 pounds (13.3 kN) applied to the device with the lifeline or lanyard in the fully extended position.
- 5.11 Self-retracting lifelines and lanyards which do not limit free fall distance to 2 feet (0.61 m) or less, rip stitch lanyards, and tearing and deforming lanyards will be capable of sustaining a minimum tensile load of 5,000 pounds (22.2 kN) applied to the device with the lifeline or lanyard in the fully extended position.
- 5.12 Ropes and straps (webbing) used in lanyards, lifelines, and strength components of body belts and body harnesses will be made from synthetic fibers.
- 5.13 Anchorages used for attachment of personal fall arrest equipment will be independent of any anchorage being used to support or suspend platforms and capable of supporting at least 5,000 pounds (22.2 kN) per employee attached, or will be designed, installed, and used as follows:
 - 5.13.1 As part of a complete personal fall arrest system which maintains a safety factor of at least two; and
 - 5.13.2 Under the supervision of a qualified person.
- 5.14 The attachment point of the body belt will be located in the center of the wearer's back. The attachment point of the body harness will be located in the center of the wearer's back near shoulder level, or above the wearer's head.
- 5.15 Harnesses and components will be used only for employee protection (as part of a personal fall arrest system or positioning device system) and not to hoist materials.
- 5.16 Personal fall arrest systems and components subjected to impact loading will be immediately removed from service and will not be used again for employee protection until inspected and determined by the Company's Safety Representative to be undamaged and suitable for reuse.

- 5.17 Personal fall arrest systems will be inspected prior to each use for wear, damage and other deterioration, and defective components will be removed from service.
- 5.18 Personal fall arrest systems will not be attached to guardrail systems, nor will they be attached to hoists.

6. Positioning Device Systems

- 6.1 Positioning devices will be rigged so that an employee cannot free fall more than 2 feet (.9 m).
- 6.2 Positioning devices will be secured to an anchorage capable of supporting at least twice the potential impact load of an employee's fall or 3,000 pounds (13.3 kN), whichever is greater.
- 6.3 Positioning device systems will be inspected prior to each use for wear, damage, and other deterioration and defective components will be removed from service.

7. Warning Line Systems

- 7.1 Warning line systems may be used only after approval by the Company Safety Representative.

8. Controlled Access Zones

- 8.1 The fall protection plan will identify each location where conventional fall protection methods cannot be used. These locations will then be classified as controlled access zones.
- 8.2 When used to control access to areas where leading edge and other operations are taking place the controlled access zone will be defined by a control line or by any other means that restricts access.
- 8.3 When control lines are used, they will be erected not less than 6 feet (1.8 m) nor more than 25 feet (7.7 m) from the unprotected or leading edge.
- 8.4 The control line will extend along the entire length of the unprotected or leading edge and will be approximately parallel to the unprotected or leading edge.
- 8.5 The control line will be connected on each side to a guardrail system or wall.
- 8.6 Each line will be flagged or otherwise clearly marked at not more than 6-foot (1.8 m) intervals with high-visibility material.
- 8.7 Each line will be rigged and supported in such a way that its lowest point (including sag) is not less than 39 inches (1 m) from the walking/working surface and its highest point is not more than 45 inches (1.3 m) [50 inches (1.3 m) when overhand bricklaying operations are being performed] from the walking/working surface.
- 8.8 Each line will have a minimum breaking strength of 200 pounds (.88 kN).
- 8.9 Controlled access zones may be used only after approval by the Company Safety Representative.

9. Safety Monitoring Systems

- 9.1 Where no other alternative measure has been implemented, the employer will implement a safety monitoring system in conformance with 1926.502(h).
- 9.2 Safety monitoring systems and their use will comply with the following provisions:
 - 9.2.1 The Company will designate a competent person to monitor the safety of other employees and the employer will ensure that the safety monitor complies with the following requirements:
 - 9.2.2 The safety monitor will be competent to recognize fall hazards;
 - 9.2.3 The safety monitor will warn the employee when it appears that the employee is unaware of a fall hazard or is acting in an unsafe manner;
 - 9.2.4 The safety monitor will be on the same walking/working surface and within visual sighting distance of the employee being monitored;
 - 9.2.5 The safety monitor will be close enough to communicate orally with the employee; and
 - 9.2.6 The safety monitor will not have other responsibilities which could take the monitor's attention from the monitoring function.
- 9.3 Mechanical equipment will not be used or stored in areas where safety monitoring systems are being used to monitor employees engaged in roofing operations on low-slope roofs.
- 9.4 No employee, other than an employee engaged in roofing work [on low-sloped roofs] or an employee covered by a fall protection plan, will be allowed in an area where an employee is being protected by a safety monitoring system.
- 9.5 Each employee working in a controlled access zone will be directed to comply promptly with fall hazard warnings from safety monitors.
- 9.6 Safety monitoring systems may be used only after approval by the Company Safety Representative.

10. Covers

- 10.1 Covers for holes in floors, roofs, and other walking/working surfaces will meet the following requirements:
- 10.2 Covers located in roadways and vehicular aisles will be capable of supporting, without failure, at least twice the maximum axle load of the largest vehicle expected to cross over the cover.
- 10.3 All other covers will be capable of supporting, without failure, at least twice the weight of employees, equipment, and materials that may be imposed on the cover at any one time.

- 10.4 All covers will be secured when installed so as to prevent accidental displacement by the wind, equipment, or employees.
- 10.5 All covers will be color coded or they will be marked with the word "HOLE" or "COVER" to provide warning of the hazard.

11. Training

- 11.1 The Company provides a training program for each employee who might be exposed to fall hazards. Training will enable each employee to recognize the hazards of falling and will train each employee in the procedures to follow to minimize these hazards.
- 11.2 Training will be documented with written certification records showing the name of the person trained, time and date(s) of training, and the signature of the trainer. Record will also be made of the date on which the Company determined training was adequate.
- 11.3 Re-training will be conducted when deficiencies in training are noted, or procedures in the work change, and / or when fall protection systems or equipment modifications and changes render previous training obsolete.
- 11.4 The Site Supervisor will assure that a training program is in place for each employee who might be exposed to fall hazards. The program will enable each employee to recognize the hazards of falling and will train each employee in the procedures to be followed in order to minimize these hazards.
- 11.5 The Site Supervisor will assure that each employee has been trained, as necessary, by a competent person qualified in the following areas:
 - 11.5.1 The nature of fall hazards in the work area;
 - 11.5.2 The correct procedures for erecting, maintaining, disassembling, and inspecting the fall protection systems to be used;
 - 11.5.3 The use and operation of guardrail systems, personal fall arrest systems, safety net systems, warning line systems, safety monitoring systems, controlled access
 - 11.5.4 The role of each employee in the safety monitoring system when this system is used;
 - 11.5.5 The limitations on the use of mechanical equipment during the performance of roofing work on low-sloped roofs;
 - 11.5.6 The correct procedures for the handling and storage of equipment and materials and the erection of overhead protection;
 - 11.5.7 The role of employees in fall protection plans; and
 - 11.5.8 The standards contained in 29 CFR 1926 Subpart M.

- 11.6 The Site Supervisor will verify compliance by preparing a written certification record. The written certification record will contain the name or other identity of the employee trained, the date(s) of the training, and the signature of the person who conducted the training.
- 11.7 When the Site Supervisor has reason to believe that any affected employee who has already been trained does not have the understanding and skill required by this policy, the Site Supervisor will ensure that each such employee is retrained.

12. Rescue Following A Fall

- 12.1 The Site Supervisor will assess the fall protection methods and equipment to be utilized, workplace situations and access to emergency responders, and develop a plan with site-specific procedures to provide for prompt rescue of employees in the event of a fall.
- 12.2 This process will include provisions to allow employees to rescue themselves when they are able.

13. Accident Investigation

- 13.1 In the event an employee falls, or some other related, serious incident occurs, (e.g., a near miss) the employer will investigate the circumstances of the fall or other incident to determine if the fall protection plan needs to be changed (e.g. new practices, procedures, or training) and will implement those changes to prevent similar types of falls or incidents.

Metro Electric Co., Inc.

Fire Protection Program



Applicable OSHA Standards: 29 CFR 1926.24, .150-.155

1. Purpose & Scope

- 1.1 The purpose of this Metro Electric policy is to outline prevention and protective measures which should be taken to ensure protection of personnel, property, and the environment from a fire incident.
- 1.2 This program applies to all company-controlled worksites where an employee or a subcontract worker may be occupationally exposed to fire hazards.

2. Fire Prevention

- 2.1 Electrical wiring and equipment for light, heat or power purposes must be installed in accordance with the national electric code. The proper type and size of fuses will be used at all times. All equipment and portable tools are to be grounded. Explosion proof fixtures are required in hazardous classified locations.
- 2.2 Housekeeping -- Remove trash daily from the work areas and from the work site. Use trash drums to reduce extra handling. Put rags in closed containers. Rags used for solvent cleaning should be kept in a closed metal container until properly disposed of.
- 2.3 Paper and other combustible materials will not be allowed to accumulate. Weeds or other rank vegetation will be controlled in or around meter stations, pipe yard, buildings, storage tanks and other structures.
- 2.4 Compressed Gas Cylinder -- Separate the full cylinders from "empty" cylinders in storage. Keep oxygen cylinders separate from fuel cylinders by 20 feet, or by a fire resistant barrier. Tie cylinders in a vertical position. Keep oil and grease away from oxygen valves. Turn cylinders off when not in use. Protect cylinders from excess heat (sun, open flame, equipment exhausts, sparks slag, etc.) No cylinder storage inside buildings.
- 2.5 Gasoline and Diesel Pumps -- Service station type pumps require physical barriers to prevent damage to the pumps. "No Smoking or Open Flame" signs are also necessary. Dispensing nozzles will be of an approved type.
- 2.6 Internal Combustion Engines -- Turn off engine before refueling, and allow a minimum of fifteen (15) minutes for engine to cool off. Insulate exhaust stacks near combustible material. Keeps exhaust discharge away from flammable liquids (particularly truck exhausts).
- 2.7 Material Storage -- Storage areas containing combustible material (lumber, etc.), or non-combustible material in combustible containers (metal parts in wooden boxes) need to be separated from other material by at least 20 feet on all sides to help prevent the spread of fire and to allow fire equipment access. A single storage area cannot be larger than 50 by 150

feet. All weeds, dead grass, and combustible trash need to be kept out of the storage areas and out of access ways.

- 2.8 Combustible material such as oil-soaked rags, and waste and shavings will be kept in approved metal containers with metal lids.
- 2.9 No Smoking or Open Flame Areas and Signs -- Areas where flammable liquids are stored or dispensed need to be clearly identified. "NO SMOKING OR OPEN FLAME" signs need to be posted no more than 25 feet away from the hazard. Areas containing large quantities of combustible materials should also be identified and marked with the same signs. Metal cigarette butt cans will be used to help prevent careless disposal of smoking materials.
- 2.10 Open Flames -- Welding torches, matches, heaters, and other open flames have caused many unnecessary fires. Check the area for possible hazards before lighting up.
- 2.11 Sparks and Slag -- To avoid a fire, move flammable or combustible materials before starting to weld or burn. If material cannot be moved, cover it with fire retardant material.
- 2.12 Tarps and Plastic Coverings -- Tarps must be fire retardant. Plastic sheets must be flame resistant if they are to be used with flame or high heat operations. Tie tarps and plastic securely so they cannot blow loose.
- 2.13 Temporary Heating Devices -- When temporary combustion type heating devices are used, adequate fresh air will be available. They will not be set directly on wood floors or other combustible materials, unless designed for that purpose and should be located at least 10 feet from the vicinity of combustible tarpaulins, canvas and other plastic coverings. They will be set horizontally and level, unless otherwise permitted by manufacturer's markings, and will be securely placed to prevent overturning and spillage of fuel. Propane heating units will have automatic fuel shut-off valves. Oil salamanders will be cool before being refilled or moved. All heaters will have good clearance or non-combustible insulation on all sides, top and bottom.
- 2.14 A temporary building will not be erected where it will adversely affect any means of exit.
- 2.15 There will be no open burning of trash allowed at a work location or Company premises.
- 2.16 No combustible material will be stored within 10 feet of a building or structure.
- 2.17 Roadways and access to storage areas must be maintained to accommodate the widest vehicle that may be used for fire fighting purposes.
- 2.18 Material will not be stored within 36 inches of a fire door opening.
- 2.19 Persons working in and around compressor stations, regulator stations, vaults, battery rooms, excavations, and other enclosed areas where there is a possibility of gas or vapor leakage are required to leave matches, lighters and smoking material in the car, truck, or in some remote area in which they are working.
- 2.20 Natural gas or other flammable gases will not be used to operate paint sprayers, impact tools, drills or sandblasting equipment.

- 2.21 A safe atmosphere will be confirmed by monitoring prior to working in restricted or hazardous areas where equipment is capable of creating sufficient heat to cause the ignition of combustible materials or gases.

3. Flammable And Combustible Liquid Storage

- 3.1 Only approved containers and portable tanks will be used for storage and handling.
- 3.2 Flammable Liquids - All - Liquids with a flash point below 140 degrees F are referred to as "flammable liquids." Store in original containers until needed. All tanks, drums, containers, cans and cabinets are to be electrically grounded and labeled with the name of the material. Do not mix contents and labels. Handle small quantities (5 gallon maximum) in "safety cans." Two main features of a safety can are a spring-loaded cap and a flame arrester.
- 3.3 Flammable or Combustible Liquids will not be stored in areas used for exits, stairways, or normally used for the safe passage of personnel.

4. Indoor Storage Of Flammable And Combustible Liquids

- 4.1 Flammable liquids such as gasoline, naphtha, lacquer thinner, etc., will be limited to five gallons in approved properly labeled containers except in buildings approved for their storage, or in an approved flammable liquid storage cabinet that is labeled "Flammable - Keep Fire Away."
- 4.2 No more than 60 gallons of flammable or 120 gallons of combustible liquids may be stored inside of a single storage cabinet inside a building. No more than 3 storage cabinets are allowed in a single building when containing the maximum amount allowed.
- 4.3 Quantities of flammable or combustible liquids stored inside a building which exceed the amount of three storage cabinets must be stored in an approved storage room which meets the applicable requirements of The National Fire Protection Association. An aisle space of three feet wide must be maintained at all times in inside storage rooms.
- 4.4 Materials which react with water will not be stored in the same location as flammable or combustible liquids. A separate storage area should be provided for water reactive materials and they should be conspicuously marked as such.
- 4.5 Electrical wiring and equipment located in inside flammable and combustible liquid storage rooms will be approved for hazardous locations.

5. Storage Of Flammable And Combustible Liquids Outside Of Buildings

- 5.1 No more than 1,100 gallons of flammable or combustible liquids may be stored in any one outside storage area unless separated by a minimum aisle space of 5 feet. Groups of containers will not be nearer than 20 feet to a building. Each container or outside storage area must be accessible by a 12 foot wide access for a maximum distance of 200 feet. At least one portable fire extinguisher having a rating of not less than 20-B units will be located not less than 25 feet, nor more than 75 feet, from any flammable liquid storage area located outside.

6. Handling Flammable And Combustible Liquids

- 6.1 Dispensing of flammable or combustible liquids from one container to another will be separated from other operations by a distance of not less than 25 feet.
- 6.2 When pouring or pumping flammable liquids such as gasoline, methanol, etc., from one container to another, metallic contact will be maintained or an electrical bonding jumper connected between the containers.
- 6.3 Approved self-closing valves will be used for dispensing of flammable or combustible liquids.
- 6.4 Flammable or combustible liquids will be drawn or transferred by either gravity or pump only. Never transfer by means of air pressure on the container or portable tank.
- 6.5 Flammable liquids will be kept in closed containers when not actually in use.
- 6.6 Precautions will be taken to eliminate leakage or spillage of flammable and combustible liquids where necessary such as the use of funnels.
- 6.7 Leakage or spillage from flammable and combustible liquids must be promptly cleaned up and properly disposed of.
- 6.8 Flammable liquids may be used only where there are no open flames or other sources of ignition within 50 feet of the operation, unless conditions warrant greater clearance.

7. Training

- 7.1 Where the company has provided portable fire extinguishers for employees use in the workplace, training will be provided to educate and familiarize employees with the general principles of fire extinguisher use, the hazards involved in incipient stage fire fighting, and general safe use of the extinguisher.
- 7.2 Work environments, classified as hot work, sometimes require the use of a trained fire watch. Whenever personnel are assigned as fire watch they will be properly trained. Fire watches are to be at the site prior to beginning hot work and thirty minutes after hot work is complete.
- 7.3 Fire extinguisher training will be conducted when the employee is initially assigned and at least annually thereafter.

8. Fire Extinguishers -- Mounting And Access

- 8.1 Fire protection equipment will be properly located at all times and not obstructed or obscured from view. In large rooms and in some locations, signs will be conspicuously posted to show the location of such equipment. Also, proper fire extinguishers will be located on company trucks, vans, and on other specific types of equipment if necessary.
- 8.2 Extinguishers are not to be left on the floor, or a scaffold, or on the ground. They are to be mounted on a wall, handrail, barricade, etc.

- 8.3 Extinguishers that have a total weight of more than 40 pounds are to be mounted with the top of the extinguisher no more than 42 inches above the floor. Extinguishers weighing 40 pounds or less may be mounted with the top as high as 5 feet above the floor. (Mounting all extinguishers at the 42 inch height is a good habit.)
- 8.4 Extinguishers should be located where they can be easily seen. In cases where this is not practical, signs or red paint marking, need to be added to identify the location of the extinguisher.
- 8.5 Keep trash and stored material away from extinguishers to prevent blockage of the access to the extinguisher.

9. **Fire Extinguishers -- Inspection And Testing**

- 9.1 The company will ensure that portable fire extinguishers are visually inspected at least monthly and inspected annually as part of a thorough maintenance check of the integrity of the device.
- 9.2 Portable fire extinguishers will be given an annual maintenance check to ensure integrity of the device. Stored pressure extinguishers do not require an internal examination. A written record will be made of the annual maintenance date. This record will be retained for one year after the last entry or the life of the shell, whichever is less. The record will be available to the Assistant Secretary upon request.

9.3 Monthly Inspections

9.3.1 Every fire extinguisher is to be visually inspected at least once a month. The inspection is to include:

9.3.1.1 Proper location

9.3.1.2 Fully charged

9.3.1.3 Seal wire not broken

9.3.1.4 Free of any obvious defects or damage

9.3.1.5 Inspection tag is current

9.3.2 Annual inspections:

9.3.2.1 A through examination of each extinguisher will be conducted annually by an individual trained to examine, repair, and recharge extinguishers. An inspection tag is to be attached to each extinguisher showing the date of the annual examination, the date of the recharge, and the initials of the individual making the examination.

9.4 Hydrostatic Tests:

9.4.1 Hydrostatic testing of fire extinguishers used in the Company workplace will be performed by qualified service personnel in accordance with Table L-1 in 1910.157(f)(2), as shown below.

Soda acid (stainless steel shell)	5
Cartridge operated water and/or antifreeze	5
Stored pressure water and/or antifreeze	5
Wetting agent	5
Foam (stainless steel shell)	5
Aqueous Film Forming foam (AFFF)	5
Loaded stream	5
Dry chemical with stainless steel	5
Carbon Dioxide	5
Dry chemical, stored pressure, with mild steel, brazed brass or aluminum shells	12
Dry chemical, cartridge or cylinder operated, with mild steel shells	12
Halon 1211	12
Halon 1301	12
Dry powder, cartridge or cylinder operated with mild steel shells	12

9.4.2 Stored pressure dry chemical fire extinguishers that require a 12-year hydrostatic test will be emptied and subjected to applicable maintenance procedures every 6 years. Dry chemical extinguishers that have non-refillable disposable containers are exempt from this requirement.

9.4.3 When recharging or hydrostatic testing is performed, the 6-year requirement begins from that date.

10. EMERGENCY ACTION PLAN

10.1 Company locations will have written emergency action plans to cover employees to ensure safety from fire and other emergencies. These plans will include the following:

10.1.1 Emergency escape procedures and emergency route assignments.

10.1.2 Procedures to be followed by employees who remain to operate critical operations before they evacuate.

10.1.3 Procedures to account for all employees after emergency evacuation has been completed.

10.1.4 Rescue and medical duties for those employees who are to perform them.

10.1.5 The preferred means of reporting fires and other emergencies.

10.1.6 Names or regular job titles of persons who can be contacted for further information or explanation of duties.

- 10.2 Employees will be trained initially in the fire prevention and emergency plans.
- 10.3 As required, the plans will be incorporated with the Company's or host employer's DOT Pipeline Emergency Plan and the Annual Review.

Metro Electric Co., Inc.

First Aid, CPR & Emergency Medical Response



Applicable OSHA Standard: 29 CFR 1926.50 Medical Services and First Aid

1. Purpose & Scope

- 1.1 Personal injury is not uncommon in the plant and pipeline services workplace. These injuries are usually minor cuts or burns but can be as severe as acute effects of chemical exposure or incidents such as heart attacks or strokes.
- 1.2 This written plan and policy, along with accompanying materials, will be utilized by Site Supervisors and Company employees to ensure that medical services and first aid are available at each work location.
- 1.3 This policy applies to all employees and subcontractors at work locations that are controlled by Metro Electric.

2. General Requirements

- 2.1 The Company will ensure the availability of medical personnel for advice and consultation on matters of occupational health.
- 2.2 Provisions will be made prior to commencement of the project for prompt medical attention in case of serious injury.
- 2.3 In the absence of medical care that is within 3–4 minutes of the worksite, a person who has a valid certificate in first aid training from the U.S. Bureau of Mines, the American Red Cross, or equivalent training that can be verified by documentary evidence, will be available at the worksite to render first aid.
- 2.4 First aid supplies will be easily accessible when required.
- 2.5 The contents of the first aid kit will be placed in a weatherproof container with individual sealed packages for each type of item, and will be checked by the Company Safety Representative before being sent out on each job, and at least weekly on each job by the Site Supervisor to ensure that the expended items are replaced.
- 2.6 First aid supplies will be readily available.
- 2.7 An example of the minimal contents of a generic first aid kit is described in American National Standard (ANSI) Z308.1-1978 "Minimum Requirements for Industrial Unit-Type First-aid Kits." The contents of the kit listed in the ANSI standard should be adequate for small worksites. When larger operations or multiple operations are being conducted at the same location, employers should determine the need for additional first aid kits at the worksite, additional types of first aid equipment and supplies and additional quantities and types of supplies and

equipment in the first aid kits. For purposes of this program, the Company will provide a first aid kit or station at the workplace that is in accordance with ANSI standards.

- 2.8 Work locations may have unique or changing first aid needs and may need to enhance the first aid kits maintained at these locations.
- 2.9 In areas where 911 is not available, the telephone numbers of the physicians, hospitals, or ambulances will be conspicuously posted by the Site Supervisor. See Emergency Phone List form at Appendix 1 of this section.
- 2.10 Where the eyes or body of any person may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes and body will be provided within the work area for immediate emergency use. Quick drenching may be accomplished by use of portable eyewash and body wash stations, or stations designed for this purpose that are plumbed into an appropriate water supply.

3. First Aid & Emergency Medical Response

- 3.1 Proper equipment for prompt transportation of the injured person to a physician or hospital, or a communication system for contacting necessary ambulance service, will be provided. The Site Supervisor will be responsible for confirming the availability of emergency medical services assistance should they be needed, and confirming that arrangements are in place for transporting injured persons to a physician or hospital.
- 3.2 In most situations communication to obtain emergency medical assistance will be provided by land-line telephone, cellular telephone or two-way radio. The Site Supervisor will ensure that such communications capabilities are available at the jobsite prior to commencing work.
- 3.3 The initial responsibility for first aid rests with the first person(s) at the scene, who should react quickly but in a calm and reassuring manner.
- 3.4 The person assuming responsibility should immediately summon medical help (be explicit in reporting suspected types of injury or illness, location of victim, and type of assistance required).
- 3.5 Send people to meet the emergency medical services (EMS) personnel at highway intersections, entrance roadways or as needed to help direct them to scene. The injured person should not be moved except where necessary to prevent further injury.
- 3.6 The names of persons on the jobsite who are trained in CPR and first aid should be posted by the telephone or other communications method when possible, or posted in a prominent place.
- 3.7 The number to call for medical emergencies (911) will also be posted by your telephone.
- 3.8 All first aid, chemical exposures and medical emergencies will be reported to the Site Supervisor so that immediate response can be made and proper accident reporting procedures followed.

4. General First Aid For Minor Injuries

- 4.1 For purposes of this policy, general first aid is defined as any one-time treatment and any follow up visit for the purpose of observation, treatment of minor scratches, cuts, burns, splinters, and so forth, which do not ordinarily require medical care.
- 4.2 Minor injuries should be initially treated with self-administered first aid unless assistance of another person is required. This limits the exposure of other persons to potential pathogens in the blood, body fluids and tissues of the injured person.
- 4.3 Minor injuries requiring general first aid should always be reported to a supervisor and recorded on the First Aid Report form maintained at each work location at the first aid station. This is important because a minor injury may indicate a hazardous situation that should be corrected to prevent a serious future injury. It is also important to document a minor injury as having been "work related" if the injury later leads to serious complications, such as from an infected cut.

5. Personal Protection During First Aid

- 5.1 OSHA requires adherence to "Universal Precautions" when employees respond to emergencies which provide potential exposure to blood and other potentially infectious materials. "Universal Precautions" stresses that all patients should be assumed to be infectious for HIV and other bloodborne pathogens. NOTE: See the Company's written safety program on *Bloodborne Pathogens*.
- 5.2 Persons responding to a medical emergency should be protected from exposure to blood and other potentially infectious materials. Protection can be achieved through adherence to work practices designed to minimize or eliminate exposure and through the use of personal protective equipment (i.e., gloves, masks, and protective clothing), which provide a barrier between the worker and the exposure source.
- 5.3 For most situations in which first aid is given, the following guidelines should be adequate:
- 5.4 For bleeding control with minimal bleeding and for handling and cleaning instruments with microbial contamination, disposable gloves alone should be sufficient.
- 5.5 For bleeding control with spurting blood, disposable gloves, a gown, a mask, and protective eye wear are recommended.
- 5.6 For measuring temperature or measuring blood pressure, no protection is required.
- 5.7 After emergency care has been administered, hands and other skin surfaces should be washed immediately and thoroughly with warm water and soap if contaminated with blood, other body fluids to which universal precautions apply, or potentially contaminated articles. Hands should always be washed after gloves are removed, even if the gloves appear to be intact.

6. Requirement to Report Work-Related Injuries & Illnesses

- 6.1 All work-related injuries and illnesses will be reported and treated as soon as possible after occurrence.

- 6.2 If a Company employee becomes injured or ill due to a work-related injury or illness and is in need of immediate medical assistance, this will be reported to the Site Supervisor.
- 6.3 Failure to report minor injuries or to receive medical treatment may result in serious infections or complications to the health of the employee.
- 6.4 A First Aid Station is located at each work location and jobsite. Each First Aid Station will be stocked with basic supplies specified in the inventory on the next page. Each First Aid Station will also contain First Aid Report forms.
- 6.5 When first aid is rendered, the supervisor will note treatment on the First Aid Report form. In the event the employee refuses first aid and/or examination by a doctor, this will be noted in the First Aid Report.

IMPORTANT: If an employee declines first aid and/or medical treatment for a reported on-the-job injury after the Site Supervisor recommends it, the employee will NOT be allowed to continue work. Site Supervisors will discuss each such situation with the Company Safety Representative or the Personnel Dept. BEFORE allowing the employee to return to duty.

- 6.6 The Site Supervisor or someone designated by the Site Supervisor will be responsible for checking and maintaining the First Aid Station(s) at the work location.

This person will take a regular inventory of supplies and make sure that the station or kit remains adequately stocked. The following first aid supplies checklist will be used as a guide to ensure proper stocking of the station.

7. First Aid Supplies

- 7.1 Workplaces vary widely in their degree of hazard, location, size, amount of staff training and availability of professional medical service. Because of these significant variables, OSHA standards (1910.151 and 1926.50) do not require specific first aid kit contents.

However, because some employers may find it useful to refer to a list of basic first aid supplies, federal OSHA provided a reference to this type of information by adding non-mandatory Appendix A to the standard. Appendix A references ANSI Z308.1-1 978, "Minimum Requirements for Industrial Unit-Type First-aid Kits." This ANSI standard was revised in 1998 and re-titled: "Minimum Requirements for Workplace First Aid Kits."

First aid kits in compliance with this standard will provide a basic range of products to deal with most types of injuries encountered in the workplace.

The assortment of required items was developed based on treatment for the following potential injuries: major wounds, minor wounds (cuts and abrasions), minor burns and eye injuries.

ANSI Z308.1-1 998 includes the following recommended basic contents of a first aid kit.

ANSI Z308.1 - 1998 - *Minimum Requirements for Workplace First Aid Kits*
Basic Kit - Minimum Contents NOTE: *means recommended but not required

Item	Minimum Quantity
Absorbent compress, 32 sq. in. (81.34 sq. cm.) with no side smaller than 4 in. (10 cm.)	1
Adhesive bandages, 1 in. x 3 in. (2.4 cm. x 7.5 cm.)	16
Adhesive tape, 5 yd. (457.2 cm.) total	1
Antiseptic, 0.5g (0.14 fl. oz.) applications	10
Burn treatment, 0.5g (0.14 fl. oz.) applications	6
Medical exam gloves	2 pair
Sterile pads, 3 in. x 3 in. (7.5 x 7.5 cm.)	4
Triangular bandage, 40 in. x 40 in. x 56 in. (101 cm. x 101 cm. x 142 cm.)	1
Protective Rubber Gloves (Surgical Type) as PPE barrier against bloodborne pathogens*	2 pair*
Protective CPR Mask w/One-Way Valve*	1 each*
Optional Contents	
<p>Optional items and sizes should be added to the basic contents listed above to augment a first aid kit, based on the specific hazards existing in a particular work environment.</p> <p>Optional items addressed in ANSI Z308.1-1 998 (listed below) must meet the minimum requirements of Section 5.3 of that standard. Items not addressed by the ANSI standard must comply with standards or regulations, where applicable, established by the U.S. Food and Drug Administration (FDA), the current edition of the U.S. Pharmacopoeia/ National Formulary (USP/NF) or other standards-writing body.</p>	
Bandage compress - 2 in. x 2 in.	4
Bandage compress - 3 in. x 3 in.	2
Bandage compress - 4 in. x 4 in.	1
Eye covering with means of attachment	1
Eye wash - 1 fl. oz. (30 ml)	1
Cold pack - 4 in. x 5 in.	1
Roller bandage - 2 in. (5 cm)	2
Roller bandage - 4 in. (10 cm)	1

8. Heat-Related Illnesses

- 8.1 Heat is a serious hazard outdoors in hot weather and indoors when the work exposes personnel to unusually hot temperatures and high humidity. A person's body builds up heat when at work, and sweats to get rid of extra heat.
- 8.2 But there are times when this cannot happen as it should – for example outdoors in the summer, on a humid day and without shade in an area where heat radiates from the surroundings. This may be a time when the body simply cannot cool off fast enough.
- 8.3 Too much heat can make a person tired, hurt job performance, and increase the chance of injury. Overheating can cause skin rash on the minor side, and progress into a range of conditions that can be life-threatening. Effects of physical overheating include:
- 8.3.1 Dehydration. When the body loses water, a person cannot cool off fast enough, but will feel thirsty and weak.
 - 8.3.2 Cramps. The heat can cause muscle cramps, even after a person leaves work.
 - 8.3.3 Heat exhaustion. The victim feels tired, nauseous, headachy, and giddy (dizzy and silly). The skin is damp and looks ruddy or flushed. Fainting may occur.
 - 8.3.4 Heat stroke. This is a life-threatening condition. The victim may have hot, dry skin and a high temperature. The skin dryness is because the body's ability to sweat is compromised or has shut down. Victims may feel confused, suffer convulsions or lose consciousness. Heat stroke can kill quickly and emergency medical assistance is urgently needed.
- 8.4 A person's risk of developing heat stress depends on several factors. These include physical condition, the weather (temperature AND humidity), clothing worn, quickness of movement and how much physical demand is being placed on the body (lifting, heavy work), if there is air circulation over the body, whether the person is in direct sunlight, and whether they are taking medication. Evaluation of workplace conditions using the Wet-Bulb Globe Temperature Index is one precise way to estimate the risk of heat stress.
- 8.5 Types Of Heat Sickness (in a progressing order of seriousness)
- 8.5.1 HEAT RASH is recognized by tiny, red, blister-like eruptions on the skin and by a prickly, itchy, burning sensation. First Aid: Bathe skin to prevent infection and put on dry clothes.
 - 8.5.2 SUNBURN is caused by the exposure of unprotected skin to ultraviolet light. Symptoms of first degree sunburn are red, painful skin. Second degree sunburn causes blistering and/or peeling. First Aid: Skin lotions, topical anesthetics and staying in a shaded area.
 - 8.5.3 HEAT CRAMPS bring painful muscle spasms. First Aid: Water and/or electrolyte replacement beverage. Get medical assistance.
 - 8.5.4 HEAT EXHAUSTION results from loss of too much water or salt from the body. It causes cool, moist skin, obvious sweating and rapid pulse (more than 150 beats per

minute). It may or may not cause fever. First Aid: Water and/or electrolyte replacement beverage.

- 8.5.5 HEAT STROKE (thermoregulatory failure) is characterized by hot, dry skin, a flushed face, body temperature of 105 degrees F (40.6° C) or higher, rapid pulse and brain disorders such as headaches, confusion, delirium or unconsciousness. Usually, there is an absence of sweating because the body's "cooling system" has shut down. There may also be difficulty breathing, constricted pupils, high blood pressure, strange behavior, weakness, nausea or vomiting. First Aid: This is a potentially LIFE-THREATENING condition. The victim must be removed from the heat source and the body temperature lowered as quickly as possible. Immerse in water (garden hose, shower, bath tub) or cover and massage the body with wet cool soaked towels or sheets. DO NOT give liquids to an unconscious person. Call for emergency medical assistance immediately.

8.6 Protective Measure To Avoid Heat Stress

8.6.1 Here is advice that employees can be given toward preventing heat-related illness:

- 8.6.1.1 Drink a lot of cool water all day before you feel thirsty. Every 15 minutes, you may need a cup of water (5 to 7 ounces).
- 8.6.1.2 Keep taking rest breaks. Rest in a cool, shady spot. Use fans.
- 8.6.1.3 Wear light-colored clothing, made of cotton.
- 8.6.1.4 Do the heaviest work in the coolest time of the day.
- 8.6.1.5 Work in the shade.
- 8.6.1.6 For heavy work in hot areas, take turns with other workers, so some can rest.
- 8.6.1.7 If you travel to a warm area for a new job, you need time for your body to get used to the heat. Be extra careful the first two weeks on the job.
- 8.6.1.8 If you work in protective clothing, you need more rest breaks. You may also need to check your temperature and heart rate.

8.7 OSHA does not have a special rule for heat. But because heat stress is known as a serious hazard, workers are protected under the General Duty Clause of the Occupational Safety and Health Act.


The clause says employers must provide "employment free from recognized hazards causing or likely to cause physical harm."


9. **Administrative And Work Practice Controls**


9.1 Heat stress often can be reduced by rescheduling work. Sometimes, strenuous tasks can be postponed until a cooler time of day or a cooler season. Heavy jobs will be spread out over longer periods of time, allowing employees to pace themselves appropriately and to take work breaks as needed.


9.2 Employees will be trained in the causes, symptoms, treatment and prevention of heat stress.


Emergency Procedure for a Severed Body Part Call 9-1-1 for Emergency Medical Service immediately. Transport the Patient and the severed part to the health care facility as quickly as possible.

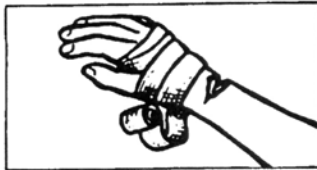
 Keep the Patient from eating and drinking in case he is later placed under anesthesia.

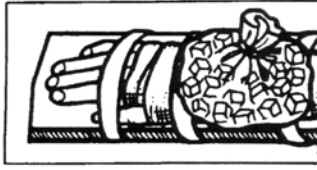
 Do not allow the Patient to drink alcohol to "deaden" the pain.

 **DRESSING THE REMAINING PART OF THE LIMB.** Wrap the end of the limb in a compressive dressing so bleeding is stopped. Do not wrap it so tightly that blood flow is cut off to healthy tissue.

 **CARING FOR THE SEVERED PART.** Wrap the severed part in a terrycloth towel, paper towel or piece of gauze.

 **PLACE THE SEVERED PART** in a clean plastic bag or plastic container and seal it so that it is waterproof. Store plastic bag on ice.

 **WHEN A LIMB OR DIGIT IS PARTIALLY SEVERED.** Wrap the injury with a compressive dressing tightly enough to stop blood flow.

 **SPLINT THE INJURED AREA** by wrapping it securely to a piece of rigid material. Splints should only be used if you need to move a patient.

APPENDIX 1
Emergency Phone List

CALLING FROM
FIRE
POLICE
AMBULANCE
DOCTOR
HOSPITAL
COMPANY SAFETY COORDINATOR
HELICOPTER AMBULANCE

Metro Electric Co., Inc.

Fit for Duty



1. Purpose

- 1.1 This program is to help prevent injuries and accidents due to fatigue, drug use (legal or illegal) or physical limitations for Metro Electric Co., Inc. and contractor personnel in a Company workplace.
- 1.2 This program also stresses that training will be provided initially and then at least annually for all functions of the job. When a job is reassigned to a different environment or there is an accident or near miss, training will be redone at that time.
- 1.3 Each employee will be given training on the specific jobs they will be performing in the workplace. The training will be on such subjects as confined space entry; welding and hot work; scaffolding, operator qualifications, etc.
- 1.4 Pre-employment physicals will be given to new hires to assure physical fitness to be able to perform job duties, as well as a drug and alcohol test to assure a safe working environment for employees.

2. Scope

- 2.1 Drug and alcohol screening shall be done before an employee is hired, as well as post-accident and random testing as outlined by the host facility. The testing shall meet DOT or host facility standards.
- 2.2 Safe work practices and procedures shall be followed by all employees, including permits being obtained for confined space entry and hot works. Process Safety Management, electrical safety and Lockout/Tagout are some examples of overall safety that shall be conducted at jobsites.
- 2.3 Employees must report to their Supervisor of any prescription or over-the-counter medicines that they are taking that could impair their judgment. Cold and flu medicines obtained over-the-counter may also physically or mentally affect the person taking them.
- 2.4 Employees must be monitored to determine if their activities and behaviors are safer or if they should be removed from the worksite.
- 2.5 It is the employee's responsibility to inform a supervisor if they are fatigued. Responsibility for being physically and mentally fit is an employee's duty. They are responsible not only for their own safety, but for the safety of co-workers as well.

Metro Electric Co., Inc.

Forklift Safety



Applicable OSHA Standards: 29 CFR 1910.178

1. Purpose & Scope

- 1.1 This policy contains safety requirements relating to maintenance, and use of fork trucks, tractors, platform lift trucks, motorized hand trucks, and other specialized industrial trucks powered by electric motors or internal combustion engines.
- 1.2 This policy applies to all employees and subcontractors working within Metro Electric controlled job sites.

2. General Procedures

- 2.1 Only trained and authorized operators will be permitted to operate a powered industrial truck. The Company will ensure that each powered industrial truck operator is competent to operate a powered industrial truck safely. This will be demonstrated by the successful completion of the training and evaluation specified in this program.
- 2.2 Prior to permitting an employee to operate a powered industrial truck (except for training purposes), the Company will ensure that each operator has successfully completed the training required by this program.
- 2.3 All operators must be certified through the Company's forklift operator certification program.
- 2.4 Modifications and additions which affect capacity and safe operation will not be performed by the customer or user without manufacturer's prior written approval. Capacity, operation, and maintenance instruction plates, tags, or decals will be changed accordingly.
- 2.5 If the truck is equipped with front-end attachments other than factory installed attachments, the user will request that the truck be marked to identify the attachments and show the approximate weight of the truck and attachment combination at maximum elevation with load laterally centered.
- 2.6 The operator or a designated qualified person will perform a daily or pre-shift inspection of the forklift to confirm that it is safe to use. This will be documented on the Forklift Safety Inspection Form (included as an attachment).
- 2.7 The user will see that all nameplates and markings are in place and are maintained in a legible condition.
- 2.8 Where general lighting is less than 2 lumen per square foot, auxiliary directional lighting will be provided on the truck.

- 2.9 The brakes of highway trucks will be set and wheel chocks placed under the rear wheels to prevent the trucks from rolling while they are boarded with powered industrial trucks.
- 2.10 Fixed jacks may be necessary to support a semi-trailer and prevent upending during the loading or unloading when the trailer is not coupled to a tractor.
- 2.11 Wheel stops or other recognized positive protection will be provided to prevent railroad cars from moving during loading or unloading operations.
- 2.12 Fork trucks will not be driven up to anyone standing in front of a bench or other fixed object.
- 2.13 No person will be allowed to stand or pass under the elevated portion of any truck, whether loaded or empty.
- 2.14 Unauthorized personnel will not be permitted to ride on powered industrial trucks. A safe place to ride will be provided where riding of trucks is authorized.
- 2.15 Do not place arms or legs between the uprights of the mast or outside the running lines of the truck.
- 2.16 When a powered industrial truck is left unattended, load engaging means will be fully lowered, controls will be neutralized, power will be shut off, and brakes set. Wheels will be blocked if the truck is parked on an incline.
- 2.17 A powered industrial truck is unattended when the operator is 25 ft. or more away from the vehicle which remains in his view or whenever the operator leaves the vehicle and it is not in his view.
- 2.18 When the operator of an industrial truck is dismounted and within 25 ft. of the truck still in his view, the load engaging means will be fully lowered, controls neutralized, and the brakes set to prevent movement.
- 2.19 A safe distance will be maintained from the edge of ramps or platforms while on any elevated dock, or platform or freight car. Trucks will not be used for opening or closing freight doors.
- 2.20 Only approved industrial trucks will be used in hazardous locations.

3. **Traveling**

- 3.1 All traffic regulations will be observed, including authorized plant speed limits. A safe distance will be maintained approximately three truck lengths from the truck ahead, and the truck will be kept under control at all times.
- 3.2 The right of way will be yielded to ambulances, fire trucks, or other vehicles in emergency situations.
- 3.3 Other trucks traveling in the same direction at intersections, blind spots, or other dangerous locations will not be passed.

- 3.4 The driver is required to slow down and sound the horn at cross aisles and other locations where vision is obstructed. If the load being carried obstructs forward view, the driver will be required to travel with the load trailing.
- 3.5 Railroad tracks will be crossed diagonally wherever possible. Parking closer than 8 feet from the center of railroad tracks is prohibited.
- 3.6 The driver is required to look in the direction of, and keep a clear view of the path of travel.
- 3.7 Grades will be ascended or descended slowly.
- 3.8 When ascending or descending grades in excess of 10 percent, loaded trucks will be driven with the load upgrade.
- 3.9 On all grades the load and load engaging means will be tilted back if applicable, and raised only as far as necessary to clear the road surface.
- 3.10 Under all travel conditions the truck will be operated at a speed that will permit it to be brought to a stop in a safe manner.
- 3.11 Stunt driving and horseplay will not be permitted.
- 3.12 The driver is required to slow down for wet and slippery floors.
- 3.13 Dock board or bridge plates, will be properly secured before they are driven over. Dock board or bridge plates will be driven over carefully and slowly and their rated capacity never exceeded.
- 3.14 Running over loose objects on the roadway surface will be avoided.
- 3.15 While negotiating turns, speed will be reduced to a safe level by means of turning the hand steering wheel in a smooth, sweeping motion. Except when maneuvering at a very low speed, the hand steering wheel will be turned at a moderate, even rate.

4. Loading

- 4.1 Only stable or safely arranged loads will be handled. Caution will be exercised when handling off-center loads which cannot be centered.
- 4.2 Only loads within the rated capacity of the truck will be handled.
- 4.3 The long or high (including multiple-tiered) loads which may affect capacity will be adjusted.
- 4.4 Trucks equipped with attachments will be operated as partially loaded trucks when not handling a load.
- 4.5 Extreme care will be used when tilting the load forward or backward, particularly when high tiering. Tilting forward with load engaging means elevated will be prohibited except to pick up a load. An elevated load will not be tilted forward except when the load is in a deposit

position over a rack or stack. When stacking or tiering, only enough backward tilt to stabilize the load will be used.

5. Operation of the Truck

- 5.1 If at any time a powered industrial truck is found to be in need of repair, defective, or in any way unsafe, the truck will be taken out of service until it has been restored to safe operating condition.
- 5.2 Fuel tanks will not be filled while the engine is running. Spillage will be avoided.
- 5.3 Spillage of oil or fuel will be carefully washed away or completely evaporated and the fuel tank cap replaced before restarting engine.
- 5.4 No truck will be operated with a leak in the fuel system until the leak has been corrected.
- 5.5 Open flames will not be used for checking electrolyte level in storage batteries or gasoline level in fuel tanks.

6. Maintenance of Industrial Trucks

- 6.1 Any power-operated industrial truck not in safe operating condition will be removed from service. All repairs will be made by authorized personnel.
- 6.2 Those repairs to the fuel and ignition systems of industrial trucks which involve fire hazards will be conducted only in locations designated for such repairs.
- 6.3 Trucks in need of repairs to the electrical system will have the battery disconnected prior to such repairs.
- 6.4 All parts of any such industrial truck requiring replacement will be replaced only by parts equivalent as to safety with those used in the original design.
- 6.5 Industrial trucks will not be altered so that the relative positions of the various parts are different from what they were when originally received from the manufacturer, nor will they be altered either by the addition of extra parts not provided by the manufacturer or by the elimination of any parts. Additional counter-weighting of fork trucks will not be done unless approved by the truck manufacturer.
- 6.6 Industrial trucks will be examined before being placed in service, and will not be placed in service if the examination shows any condition adversely affecting the safety of the vehicle. Such examination will be made at least daily. Where industrial trucks are used on a round-the-clock basis, they will be examined after each shift. Defects when found will be immediately reported and corrected.
- 6.7 When the temperature of any part of any truck is found to be in excess of its normal operating temperature, thus creating a hazardous condition, the vehicle will be removed from service and not returned to service until the cause for such overheating has been eliminated.

- 6.8 Industrial trucks will be kept in a clean condition, free of lint, excess oil, and grease. Noncombustible agents should be used for cleaning trucks. Low flash point (below 100 deg. F.) solvents will not be used. High flash point (at or above 100 deg. F.) solvents may be used. Precautions regarding toxicity, ventilation, and fire hazard will be consonant with the agent or solvent used.

7. Training

- 7.1 All operators will be trained on the contents of this policy:
- 7.1.1 Before initial assignment;
 - 7.1.2 At least annually thereafter, and as required according to circumstances explained below;
 - 7.1.3 When an operator is involved in an incident with a fork truck, or when remedial training is required as explained below.
- 7.2 Training will consist of a combination of formal instruction (e.g., lecture, discussion, interactive computer learning, video tape, written material), practical training (demonstrations performed by the trainer and practical exercises performed by the trainee), and evaluation of the operator's performance in the workplace.
- 7.3 All operator training and evaluation will be conducted by persons who have the knowledge, training, and experience to train powered industrial truck operators and evaluate their competence.
- 7.4 Powered industrial truck operators will receive initial training in the following topics, except in topics that the Company can demonstrate are not applicable to safe operation of the truck in the Company workplace.
- 7.4.1 Truck-related topics:
 - 7.4.1.1 Operating instructions, warnings, and precautions for the types of truck the operator will be authorized to operate;
 - 7.4.1.2 Differences between the truck and the automobile;
 - 7.4.1.3 Truck controls and instrumentation: where they are located, what they do, and how they work;
 - 7.4.1.4 Engine or motor operation;
 - 7.4.1.5 Steering and maneuvering;
 - 7.4.1.6 Visibility (including restrictions due to loading);
 - 7.4.1.7 Fork and attachment adaptation, operation, and use limitations;
 - 7.4.1.8 Vehicle capacity;

- 7.4.1.9 Vehicle stability;
 - 7.4.1.10 Any vehicle inspection and maintenance that the operator will be required to perform;
 - 7.4.1.11 Refueling and/or charging and recharging of batteries;
 - 7.4.1.12 Operating limitations;
 - 7.4.1.13 Any other operating instructions, warnings, or precautions listed in the operator's manual for the types of vehicle that the employee is being trained to operate.
- 7.4.2 Workplace-related topics:
- 7.4.2.1 Surface conditions where the vehicle will be operated;
 - 7.4.2.2 Composition of loads to be carried and load stability;
 - 7.4.2.3 Load manipulation, stacking, and unstacking;
 - 7.4.2.4 Pedestrian traffic in areas where the vehicle will be operated;
 - 7.4.2.5 Narrow aisles and other restricted places where the vehicle will be operated;
 - 7.4.2.6 Hazardous (classified) locations where the vehicle will be operated;
 - 7.4.2.7 Ramps and other sloped surfaces that could affect the vehicle's stability;
 - 7.4.2.8 Closed environments and other areas where insufficient ventilation or poor vehicle maintenance could cause a buildup of carbon monoxide or diesel exhaust;
 - 7.4.2.9 Other unique or potentially hazardous environmental conditions in the workplace that could affect safe operation.
 - 7.4.2.10 The requirements of this program.
- 7.5 Refresher training, including an evaluation of the effectiveness of that training, will be conducted as to ensure that the operator has the knowledge and skills needed to operate the powered industrial truck safely. Refresher training in relevant topics will be provided to the operator when:
- 7.5.1 The operator has been observed to operate the vehicle in an unsafe manner;
 - 7.5.1.1 The operator has been involved in an accident or near-miss incident;
 - 7.5.1.2 The operator has received an evaluation that reveals that the operator is not operating the truck safely;

- 7.5.1.3 The operator is assigned to drive a different type of truck; or
 - 7.5.1.4 A condition in the workplace changes in a manner that could affect safe operation of the truck.
- 7.6 An evaluation and re-certification of each powered industrial truck operator's performance will be conducted at least once every three years.
- 7.7 The Company will certify that each operator has been trained and evaluated as required by this program. The certification will include the name of the operator, the date of the training, the date of the evaluation, and the identity of the person(s) performing the training or evaluation.

Daily / Pre-Shift Forklift Safety Inspection

Date _____ Unit # _____

<input type="checkbox"/>	Overhead Guard - Are there broken welds, missing bolts, or damaged areas?
<input type="checkbox"/>	Hydraulic Cylinders - Is there leakage or damage on the lift, tilt, and attachment functions of the cylinders?
<input type="checkbox"/>	Mast Assembly - Are there broken welds, cracked or bent areas, and worn or missing stops?
<input type="checkbox"/>	Lift Chains and Rollers
<input type="checkbox"/>	Is there wear or damage or kinks, signs of rust, or any sign that lubrication is required?
<input type="checkbox"/>	Is there squeaking?
<input type="checkbox"/>	Forks
<input type="checkbox"/>	Are they cracked or bent, worn, or mismatched?
<input type="checkbox"/>	Is there excessive oil or water on the forks?
<input type="checkbox"/>	Tires - What do the tires look like?
<input type="checkbox"/>	Are there large cuts that go around the circumference of the tire?
<input type="checkbox"/>	Are there large pieces of rubber missing or separated from the rim?
<input type="checkbox"/>	Are there missing lugs?
<input type="checkbox"/>	Is there bond separation that may cause slippage?
<input type="checkbox"/>	Battery Check
<input type="checkbox"/>	Are the cell caps and terminal covers in place?
<input type="checkbox"/>	Are the cables missing insulation?
<input type="checkbox"/>	Hydraulic Fluid - Check level?
<input type="checkbox"/>	Gauges - Are they all properly working?
<input type="checkbox"/>	Steering
<input type="checkbox"/>	Is there excessive free play?
<input type="checkbox"/>	If power steering, is the pump working?
<input type="checkbox"/>	Brakes
<input type="checkbox"/>	If pedal goes all the way to the floor when you apply the service brake, that is the first indicator that the brakes are bad. Brakes should work in reverse also.
<input type="checkbox"/>	Does the parking brake work? The truck should not be capable of movement when the parking brake is engaged.
<input type="checkbox"/>	Lights - If equipped with lights, are they working properly?
<input type="checkbox"/>	Horn - Does the horn work?
<input type="checkbox"/>	Safety Seat - If the truck is equipped with a safety seat, is it working?
<input type="checkbox"/>	Load Handling Attachments
<input type="checkbox"/>	Is there hesitation when hoisting or lowering the forks, when using the forward or backward tilt, or the lateral travel on the side shift?
<input type="checkbox"/>	Is there excessive oil on the cylinders?
<input type="checkbox"/>	Propane Tank - Is the tank guard bracket properly positioned and locked down?
<input type="checkbox"/>	Propane Hose
<input type="checkbox"/>	Is it damaged? It should not be frayed, pinched, kinked, or bound in any way.
<input type="checkbox"/>	Is the connector threaded on squarely and tightly?
<input type="checkbox"/>	Propane Odor - If you detect the presence of propane gas odor, turn off the tank valve and report the problem.
<input type="checkbox"/>	Engine Oil - Check levels.
<input type="checkbox"/>	Engine Coolant - Visually check the level. Note: Never remove the radiator cap to check the coolant level when the engine is running or while the engine is hot. Stand to the side and turn your face away. Always use a glove or rag to protect your hand.
<input type="checkbox"/>	Transmission Fluid - Check levels.
<input type="checkbox"/>	Windshield Wipers - Do they work properly?
<input type="checkbox"/>	Seat Belts - Do they work?

<input type="checkbox"/>	Safety Door - (found on stand up rider models) Is it in place?
<input type="checkbox"/>	Safety Switch - (found on stand up riding tow tractors) Is it working?
<input type="checkbox"/>	Hand Guards - (found on stand up riding tow tractors, walking pallet trucks, walking transtackers) Are they in place?
<input type="checkbox"/>	Tow Hook
<input type="checkbox"/>	Does it engage and release smoothly?
<input type="checkbox"/>	Does the safety catch work properly?
<input type="checkbox"/>	Control Lever - Does the lever operate properly?
Comments:	

Inspection performed by _____

FORKLIFT TRAINING CERTIFICATE

This certifies that _____
employee name

has successfully completed a forklift safety training course and is authorized to operate the equipment listed on this card.

Authorized by: _____
name (print)

signature

title

Company: _____ Date: _____

Equipment authorized to operate:

Retraining Date

Trainer

FORKLIFT SAFETY TRAINING RECORD

Company: _____

Date: _____ Trainer: _____

Employee Name	Social Security No.	Employee Signature

FORKLIFT PERFORMANCE EVALUATION

Company: _____

Operator Name: _____

	GOOD	FAIR	POOR	N/A
1. Inspects equipment at the start of each shift?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Lowers forks when driving without a load?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Keeps forks spaced as widely as possible?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Sounds horn at blind curves and intersections?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Slows down at curves and intersections?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Lifts loads smoothly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Stacks loads properly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Turns key off, lowers forks, and sets parking brake when leaving forklift?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Parks without blocking EXITS and fire lanes?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Places dock plate properly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Negotiates curves and ramps with two-tier load?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Drives between skids without touching?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Slows down when pedestrians are present?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Refuels/recharges equipment safely?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Transports loads at a minimal distance from floor?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The operator listed above has shown the ability to safely operate a forklift at this facility.

Trainer's Name (print) _____ Title

Signature _____

(continued)

FORKLIFT OPERATOR'S DAILY EQUIPMENT CHECKLIST

Company: _____

Operator: _____
 print name signature

Forklift #: _____ Shift: _____ Date: _____

- | | OK | NEEDS SERVICE |
|-------------------------------|--------------------------|--------------------------|
| 1. Engine oil | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Radiator level | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Fuel level | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Battery level | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Damage or leaks | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Tire condition | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Fire extinguisher | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Horn | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Warning lights | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Headlights and taillights | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. Steering | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. Brakes | <input type="checkbox"/> | <input type="checkbox"/> |
| 13. Parking brake | <input type="checkbox"/> | <input type="checkbox"/> |
| 14. Battery load test | <input type="checkbox"/> | <input type="checkbox"/> |
| 15. Battery plug condition | <input type="checkbox"/> | <input type="checkbox"/> |

Remarks: _____

(continued)

OFFICIAL LIST OF AUTHORIZED FORKLIFT OPERATORS

Company: _____

Employee	Clock No.	Dept. No.	Type of Equipment	Date Issued

Metro Electric Co., Inc.

General Waste Management



1. Scope of Program

- 1.1 Metro Electric Co., Inc. has established this General Waste Management program with regard to the following types of operations:
 - 1.1.1 Estimation of the amount and type of waste that will be produced on each job site prior to work;
 - 1.1.2 Coordination with project or site owner on disposal of waste;
 - 1.1.3 Assignment of responsibilities for proper waste disposal;
 - 1.1.4 Safe work practices;
 - 1.1.5 Classification of waste;
 - 1.1.6 Training

2. Estimation of Waste

- 2.1 During the bid process Metro Electric Co., Inc. will estimate the amount of waste that is to be generated so that available containers can be obtained for proper disposal.
- 2.2 Metro Electric Co., Inc. will coordinate with the project or site owner to determine if the waste can be disposed of onsite and containers are available.
- 2.3 Off site waste disposal will be coordinated with project or site management to obtain proper permits for removal.
- 2.4 The responsibility of waste removal will be assigned to an employee of Metro Electric Co., Inc., who will be on the jobsite for the duration of the work.
- 2.5 Containers for the waste will be made of a leak proof material with covers to prevent the accidental runoff from rain water and contamination of the environment.
- 2.6 Waste will be classified and separated by like materials for recycling. Metal, wood, general refuse and oily materials will be separated as according to the project or site management plan that is in place.
- 2.7 Project related waste will be stored and maintained in an orderly fashion. Metal refuse will be stored in a way that sharp edges shall be guarded against accidental contact with employees.

- 2.8 Employees of Metro Electric Co., Inc. will be instructed on the proper disposal method of waste. General instruction on disposal of non-hazardous waste, trash, or scrap metals. If waste is classified as hazardous then additional training is required.
- 2.9 Personal protective equipment such as leather gloves will be worn for protection.

Metro Electric Co., Inc.

Ground Fault Circuit Interrupters (GFCI) & Assured Grounding



Applicable OSHA Standards: 29 CFR 1926.404

1. Purpose & Scope

- 1.1 To establish methods, guidelines and responsibilities to protect Metro Electric employees from electrical exposure while at a work location.
- 1.2 This program applies to all employees and subcontractors working within Company controlled job sites. This assured equipment grounding conductor program covers all cord sets, receptacles which are not a part of the building or structure, and equipment connected by cord and plug which are available for use or used by employees at a work location.

2. Introduction

- 2.1 All 120-volt, single-phase 15- and 20-ampere receptacle outlets on construction sites, which are not a part of the permanent wiring of the building or structure and which are in use by employees, will have approved ground-fault circuit interrupters for personnel protection. Receptacles on a two-wire, single-phase portable or vehicle-mounted generator rated not more than 5kV, where the circuit conductors of the generator are insulated from the generator frame and all other grounded surfaces, need not be protected with ground-fault circuit interrupters.

3. General Requirements

- 3.1 Employees who are exposed to electrical hazards at a work location will use either ground fault circuit interrupters or assured equipment grounding conductor program to protect them from these hazards. These requirements are in addition to any other specific requirements for equipment grounding conductors.
- 3.2 The Company has established and implemented an assured grounding conductor program at all work locations covering all cord sets, receptacles that are not part of the building or structure and equipment connected by cord and plug that are available for use, or are in use by employees.
- 3.3 A written description of the program including the specific procedures adopted by the Company will be available at each work location for inspection and copying by the Assistant Secretary and any affected employee.
- 3.4 The Company will designate one or more competent persons to implement the program at each work location. "Competent person" means 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. At most work locations the competent person will be the Site Supervisor.
- 3.5 Each cord set, attachment cap, plug and receptacle of cord sets, and any equipment connected by cord and plug, except cord sets and receptacles which are fixed and not exposed to damage,

will be visually inspected before each day's use for external defects, such as deformed or missing pins or insulation damage, and for indications of possible internal damage. Equipment found damaged or defective will not be used until repaired.

- 3.6 Damaged items will be tagged "DO NOT USE", removed from service until repaired and tested.
- 3.7 The following tests will be performed on all cord sets, receptacles which are not a part of the permanent wiring of the building or structure, and cord- and plug-connected equipment required to be grounded:
 - 3.8 All equipment grounding conductors will be tested for continuity and will be electrically continuous.
 - 3.9 Each receptacle and attachment cap or plug will be tested for correct attachment of the equipment grounding conductor. The equipment grounding conductor will be connected to its proper terminal.
 - 3.10 The Company will not make available or permit the use by employees of any equipment which has not met the requirements of this program.
 - 3.11 Tests performed as required in this program will be recorded. This test record will identify each receptacle, cord set, and cord- and plug-connected equipment that passed the test and will indicate the last date it was tested or the interval for which it was tested. This record will be kept by means of logs, color coding, or other effective means and will be maintained until replaced by a more current record. The record will be made available on the work location for inspection by the Assistant Secretary and any affected employee. A copy of this program is kept on each work location with the Site Supervisor.
 - 3.12 The Site Supervisor is responsible for implementing and monitoring the GFCI and assured grounding program.
 - 3.13 The GFCI is not a replacement for visually checking all cords, wires, and other electrical devices for defects on a daily basis.
 - 3.14 All 120 volt, single phase, 15 and 20 ampere receptacles will be of the grounding type and their contacts will be grounded by connection to the equipment grounding conductor of the circuit supplying the receptacles in accordance with applicable requirements of the National Electrical Code.
 - 3.15 All 120 volt cord sets (extension cords) will have an equipment grounding conductor which will be connected to the grounding contacts of the connectors on each end of the cord. Extension cord sets used with portable electric tools and appliances will be of the three-wire type and will be designed for heavy or extra heavy-duty usage. Flexible cords used with temporary and portable lights will be designed for heavy or extra heavy-duty usage.
 - 3.16 The exposed noncurrent-carrying metal parts of 120 volt cord and plug connected tools or equipment that are likely to become energized will be grounded in accordance with the applicable requirements of the National Electrical Code.
 - 3.17 Employees will visually inspect receptacles, flexible cord sets (extension cords), electrical equipment and electrical tools before each day's use for external defects such as:

- 3.17.1 Deformed or missing pins;
 - 3.17.2 Insulation damage;
 - 3.17.3 Indication of possible internal damage.
- 3.18 Where there is evidence of damage the item will be taken out of service until tests or any required repairs have been made.

4. Testing

- 4.1 All 120-volt, single-phase 15- and 20-ampere receptacle outlets on construction sites, which are not a part of the permanent wiring of the building or structure, 120 volt flexible cord sets and 120 volt cord and plug connected equipment which are in use by employees, will be tested.
- 4.2 A qualified person will be designated by the Site Supervisor to be responsible for testing, tagging and documentation of testing of all equipment-grounding conductors.
- 4.3 All equipment-grounding conductors will be tested for continuity and they will be electrically continuous. A continuity inspection device will be used or a voltmeter that is specifically designed to test for continuity.
- 4.4 Each receptacle and attachment cap or plug will be tested for correct attachment of the equipment-grounding conductor. The equipment-grounding conductor will be connected to the proper terminal.
- 4.5 All required test will be performed:
 - 4.5.1 Before its first use;
 - 4.5.2 Before the equipment is returned to service following any repairs;
 - 4.5.3 Before the equipment is used after any incident that can be reasonably suspected to have caused damage (for example, when a cord is run over).
 - 4.5.4 At intervals not exceeding 3 months, except that cord sets and receptacles, which are fixed and not exposed to damage, will be tested at intervals not exceeding 6 months.
- 4.6 Test verification will be by means of a color coded marking tape on the receptacle, cord set or equipment to identify that it has passed the test and to indicate the quarter as illustrated in the following table:

Quarter	Month	Color Code	Number
1st	January	Orange	1
1st	February	Orange	2
1st	March	Orange	3
2nd	April	Yellow	1
2nd	May	Yellow	2
2nd	June	Yellow	3
3rd	July	Blue	1
3rd	August	Blue	2
3rd	September	Blue	3
4th	October	Red	1
4th	November	Red	2
4th	December	Red	3
	Repair Color	Brown	

5. Training & Testing

- 5.1 Training about the program will be provided to all affected employees prior to work assignments involving exposure to electrical hazards. Training will primarily involve a thorough review of what the standard covers (29 CFR 1926.404), Company policy and work experiences relating to implementation of this program.
- 5.2 Personnel so trained will be tested as a way to help confirm and document their understanding of information presented. A score of between 80% and 100% will require a review of missed questions, if any, and the score corrected to 100%. A score of below 80% will require complete retraining and testing.
- 5.3 The test format is included as Appendix 1 in this program.

Appendix 1
Ground Fault Circuit Interrupters (GFCI) and Assured Grounding Program

TEST

Employee Name (Print): _____

Employee Signature: _____ Score: _____

Instructor: _____ Date: _____

Circle the answer that is most correct:

1. This policy applies to all employees and subcontractors working within * controlled job sites.
2. Employees may use any equipment that has not met the requirements of this program.
3. The GFCI is not a replacement for visually checking all cords, wires, and other electrical devices for defects.
4. All 120 volt cord sets (extension cords) will have an equipment grounding conductor which will be connected to the grounding contacts of the connectors on each end of the cord.
5. All 120-volt, single-phase 15- and 20-ampere receptacle outlets on construction sites, which are not a part of the permanent wiring of the building or structure, 120 volt flexible cord sets and 120 volt cord and plug connected equipment which are in use by employees, will be tested.
6. A qualified person, designated by the Site Supervisor, is responsible for testing, tagging and documentation of testing of all equipment-grounding conductors.
7. Test verification will be by means of a color-coded marking tape on the receptacle, cord set or equipment to identify that it has passed the test and to indicate the quarter it was tested.
8. All tests will be performed whenever there is time for it.
9. Each receptacle and attachment cap or plug will be tested for correct attachment of the equipment-grounding conductor.
10. The equipment-grounding conductor will be connected to the proper terminal.

Metro Electric Co., Inc.
Ground Fault Circuit Interrupters (GFCI) and Assured Grounding Program

TEST ANSWER KEY

1. T
2. F
3. T
4. T
5. T
6. T
7. T
8. F
9. T
10. T

Metro Electric Co., Inc.

Hand & Power Tool Safety



Applicable OSHA Standards: 29 CFR 1910 Subpart P

1. Purpose

- 1.1 The purpose of this program is to provide direction and to establish the Metro Electric general requirements to be implemented when using hand or power tools.

2. Scope

- 2.1 The scope of this program applies to all Company job sites and work locations where tool operations are or may be conducted. The requirements, as set forth in this program, will be implemented to the fullest extent possible and will be considered as the minimum requirements of this program.

3. Responsibilities

- 3.1 The primary responsibilities for the implementation of requirements of this program will rest with the Site Supervisor.
- 3.2 The Company Safety Representative or designee will be responsible to provide for the monitoring of the work activities to assure compliance to the requirements of this program and to the host employer's safety requirements regarding tools being prohibited if they are not in compliance.
- 3.3 Company management will be responsible for disciplinary action resulting from violation or failure of assigned persons to implement the requirements of this program.

4. Small Tools And Equipment

- 4.1 Many at-work accidents and/or injuries occur because of improper or unsafe use of tools, or the use of tools which are in poor condition. The few extra seconds required examining tools and to use them properly can reduce the number of accident/injuries.

NOTE: Condition of tools; all hand, power, and similar equipment, whether furnished by the employee or employer, will be maintained in a safe working condition.

5. General Precautions

- 5.1 Never remove or interfere with the operation of any tool guard or safety features.
- 5.2 Always use the right tool for the right job.

- 5.3 Keep tools clean and check their condition prior to using. If heads or striking tools become mushroomed or burred, have them dressed. If handles of tools are splintered, broken, or loose, have them replaced.
- 5.4 Tools must always be returned to their proper storage place and not left where they create a hazard.
- 5.5 Do not carry tools in pockets. It is dangerous; especially if tools are sharp or pointed.
- 5.6 Do not use excessive pressure or force on any hand tool or the use of cheaters to apply more force.
- 5.7 Metal measuring tapes having metal strands woven into fabric, brassbound rules, wire or metal bound hose, or rope with wire core will not be used when working on or near energized electrical circuits or equipment.
- 5.8 Tools should neither be dropped nor thrown from place to place or from employee to employee.
- 5.9 Tools that must be raised or lowered from one elevation to another will be placed in an approved tool bucket or firmly attached to hand-line (rope).

NOTE: Handmade or job made tools should not be used. In the event a special tool is needed for a specific task for which no such manufactured tool exists, proper engineering design, specifications, and Company management approval will be obtained prior to construction of such a tool.

6. Hand Tools

- 6.1 Employees will inspect tools prior to use. Damaged or defective tools will be tagged "Do not operate" and removed from service as soon as the defect or damage is discovered.
- 6.2 Wooden handles of tools, such as hammers, picks, etc. will not be taped or covered in such a way as to hide damage or defects.
- 6.3 Cracked or damaged wooden handles of tools, such as hammers, will be replaced immediately upon discovery of the damage.
- 6.4 Hand tools will be used only for the purpose for which they were intended.
- 6.5 Tools will not be altered such as welding extensions on wrench handles or pad eyes on hammer wrenches.
- 6.6 Every tool was designed to do a certain job. Use it only for its intended purpose! Every tool requires care.
- 6.7 Keep your hand tools in peak condition, sharp, clean, oiled, and not abused.
- 6.8 Do not use tools for pry bars.

6.9 Do not use two wrenches to increase leverage capacity.

7. **Screwdrivers**

7.1 Use the right size and type screwdriver for the job.

7.2 Do not hold screwdriver tip in palm of hand. The screwdriver may slip causing injury.

7.3 Screwdrivers should be filed properly to prevent slipping.

7.4 Do not use a screwdriver as a pry bar.

8. **Hammers**

8.1 Hammers will have a clear path for back swing and the target area will be free from obstructions.

8.2 Hammers with mushroomed heads will never be used as they might glance off the target or the damaged head may splinter and send metal fragments flying.

8.3 Never hold, with you hands, any object to be struck with a hammer by another employee. Hold the object with pliers or another tong-type device.

8.4 Wooden handles will be kept free of splinters or cracks and will be kept tight in the tool.

9. **Files**

9.1 Do not use a file for a pry or hammer as it is brittle and breaks easily.

9.2 Files should be fitted with wooden handles to protect employees from the pointed file end.

10. **Pry Bars**

10.1 Be sure bite of bar is secure under load by first applying a slight pressure.

10.2 Check your own balance before exerting full force.

10.3 A cheater bar will not be used on pry bars.

11. **Wrenches**

11.1 Wrenches should be pushed away from the body, if possible, to reduce the chance of the wrench slipping and striking the user in the face or body.

11.2 Adjustable (crescent) and combination wrenches should be snug on bolts and nuts to avoid slipping.

11.3 Never use a wrench as a hammer or a hammer on a wrench that is not to be used as such.

11.4 Never use a cheater on a wrench or "double wrench" a nut. Use a hammer wrench or impact instead.

11.5 Wrenches will not be used when jaws are sprung to the point that slippage occurs.

12. Drill Bits

12.1 Avoid unsafe defects; worn or battered heads, over tempered, and dull cutting edges.

12.2 Do not use drill as a reamer (get a larger bit), use proper bit for drilling steel or brass or copper without removing the lip, or change bits without unplugging cord.

13. Shovels, Pick Axes and Axes

13.1 Be aware of unsafe defects; rough, loose, cracked, or split handles; dull or nicked edges, over tempered surfaces.

13.2 Do not use a wedge, pry bar, or hammer.

14. Power Tools

14.1 All tools will be inspected for defects or damage prior to use. Tools found to be damaged or defective will be immediately tagged "Do Not Use" and removed from service.

14.2 Protective guards on power tools will not be removed. Do not use tools without guards in place.

14.3 Tools will not be dropped or allowed to strike another object in such a fashion that damage may occur.

14.4 The power source on tools will be physically disconnected prior to attempting any repairs or attachment changes. Always double check to make sure no one has come along and plugged the cord back in.

14.5 Employees will avoid loose fitting clothing when operating power tools. Shirttails must be tucked in the trousers/pants while operating power tools.

14.6 Electrical tools will be of the double insulated type with Underwriters Laboratory approval or be of the three wires grounded type.

14.7 All electrical tools and power cords must be inspected per the Assured Grounding program guidelines and display the proper color-codes for the current inspection period.

14.8 All electrical tools and power cords must be used with a Ground Fault Interrupter to protect against faulty ground.

14.9 Electrical tools will not be hoisted or carried by their power cords.

14.10 Employees will not operate electrical tools while standing in water or wet locations.

- 14.11 Extension cords will be of the three wires grounded type and be continuous without splice or repair. Extension cords will reflect the proper color code.
- 14.12 Extension cords will be kept clear of traffic aisles and will not be placed across vehicle traffic paths unless guarded to prevent damage. (Recommend to run cords 7' over head to prevent tripping hazards).
- 14.13 Extension cords will not be placed through doorways unless stops or guards are put in place to prevent pinching of the cord by the door.
- 14.14 Extension cords will not be suspended by wire or nails.
- 14.15 Do not operate power tools without instructions from your supervisor. (Note: Some activities will require permits before work begins).
- 14.16 Torque: The circular or rotating motion in tools such as drills, impact wrenches, saws, etc. which results in a strong twisting force. Be prepared in case of jamming.
- 14.17 Have good footing. Use two hands. Ask for help as necessary and be prepared to release the power switch or trigger.
- 14.18 Flying objects can result from operating almost any power tool, so you must always:
- 14.19 Warn people around you.
- 14.20 Use proper personal protective equipment.
- 14.21 Avoid contact with moving parts.
- 14.22 Keep moving parts directed away from your body.
- 14.23 Do not "swing around" with the tool running. Someone might be behind you.
- 14.24 Be sure replacement parts conform to correct specifications. For example, grinder wheels will be approved for the maximum RPM of the machine, wood cutting bits will be for woodwork only, etc.
- 14.25 Contact with rotating and fast moving parts. Poor housekeeping, broken bits and blades, and lack of concentration can lead to serious cuts or amputations.

15. Electrical Safety With Power Tools

- 15.1 The use of portable power tools can make a job go faster and easier. The misuse of portable power tools can cause electric shocks, burns, and cuts and puncture wounds, severed fingers and limbs, broken bones, loss of eyesight, and even death.
- 15.2 The slightest shock when using electrical equipment is an ominous warning of a potentially serious safety hazard.

- 15.3 A slight shock when using the equipment in one location might result in electrocution if the body makes a little better contact with the earth or a grounded object in another location.
- 15.4 Electrocution is the leading cause of fatal injury in construction related activities. Most such injuries result from the use of portable tools powered by 110-volt electricity.
- 15.5 Electrical shock can occur from improper grounding or from attempting to adjust, clean, or service the tool without disconnecting the power.
- 15.6 Fires can be caused by defective electrical cords, overheated motors, sparking, and working near flammable liquids or gases.

16. Ways to Protect Yourself

- 16.1 Choosing the right tool for the job. This will depend on the work to be done. Most commonly used power tools include drills, saws, sanders, routers, and grinders.
- 16.2 Know how to use the tools safely and properly by reading the owner's manual carefully before use, by getting training from an experienced tool user, and by practicing before actually doing the job.
- 16.3 Repair tools when needed. Worn or defective electrical tools should be taken out of service and repaired immediately. Every time you use an improperly grounded or unguarded power tool, you are playing "Russian Roulette".
- 16.4 Transport and store tools properly. Power tools should be transported with extra care. Always hold the handle (not the cord) with your finger off the trigger. Place each tool in a safe storage area after use, preferably in a locked cabinet or toolbox.
- 16.5 Keep your work area clean, dry, and orderly. Power tools should not be used when working on slippery floors, in poorly lighted work areas, or near flammable liquids or gases.
- 16.6 Electric cords also deserve attention. They may become frayed leading to electrical shock or fire. Light-duty extension cords may become overheated when improperly used. They can also present tripping hazards.

17. Ground Fault Current Interrupters

- 17.1 GFCIs are used to protect people from shock hazards. The 12-volt lighting systems that may be utilized at some work locations do not require GFCIs.
- 17.2 GFCIs will be required whenever a Company employee uses an extension cord or a receptacle that is not part of a permanent building or structure that exceeds 12 volts.
- 17.3 Prior to each use, Company employees will visually inspect all cords, receptacles and attachment caps that have the potential to become damaged. Inspection is to confirm the safety of these components and to ensure that there are no defects such as deformed or missing grounding prongs on plugs, or damaged insulation that exposes interior wires.

- 17.4 GFCIs will be used on all 120 volt, single phase, 15 and 20-ampere receptacle outlets, which are not part of the permanent wiring of the building or structure. Receptacles on a two wire, single phase portable or vehicle mounted generator rated not more than 5kw, where the circuit conductors of the generator are insulated from the generator frame and all other grounded surfaces, need not be protected with GFCIs.
- 17.5 NOTE: A job site that is close to electrical lines will be pre-planned and written procedures developed before attempting to do the work. The Site Supervisor will review and approve any procedures that involve working in an area that has any such electrical exposure.

18. Pneumatic Tools (Air) – General

- 18.1 When gas or diesel compressors furnish the air source, keep them outside or vent them to the outside to prevent carbon monoxide poisoning.
- 18.2 If you are using a permanent source of air, make sure it is not oxygen. Oxygen mixed with the oil in your air hose and tool will or may cause an instant explosion and fire.
- 18.3 All hoses exceeding ½ inch inside diameter will have a safety device at the source of supply or branch line to reduce pressure in case of hose failure.
- 18.4 Air hoses and connections will be checked prior to each use for defects.
- 18.5 Air hoses should be protected from vehicle traffic, pedestrians and sharp objects.
- 18.6 Attachments on air tools will be secured by retainer pins and rings. The retainer rings should be taped to prevent accidental placement.
- 18.7 All crows foot type air connections will be safety wired or pinned.
- 18.8 Disconnect source and "bleed" hose before breaking connection on any air tool. To insure proper bleeding close the valve at the air source and insure all valves and regulators between the source and the tool are in the open position before bleeding air from tool.
- 18.9 Never crimp hoses to stop air.
- 18.10 Do not let your hoses create tripping hazards. Keep out of traffic areas, walkways, stairs, etc.
- 18.11 Never point a pneumatic hammer at anyone. There is always the chance the retainer may fail.
- 18.12 The bit should be in contact with the work surface before pulling the trigger.
- 18.13 Governors require strict maintenance to prevent dangerous over-speeding of grinders, drills, wrenches, etc.
- 18.14 Always wear eye, face and ear protection when using air tools.
- 18.15 Air used for cleaning machines will be regulated to 30 psi or less.

- 18.16 When compressed air is used for cleaning purposes, a nozzle must be provided with a shut off valve at the outlet of the hose.
- 18.17 Metatarsal and shin guards should be worn for complete foot protection when using ground tampers that leave the ground such as "pogo sticks". This is in addition to other PPE requirements.
- 18.18 Metatarsal guards and shin guards should be worn together when using pavement breakers or jackhammers. This is in addition to other PPE requirements.
- 18.19 Extreme care will be taken when working with compressed air. It should never be blown against clothing or any part of the body.
- 18.20 Storage and cleaning are very important with any tool. Keep tools clean and stored properly where they belong.
- 18.21 Air tools will not be hoisted or carried by their air hoses.

19. Powder Activated Tools

- 19.1 Hilti and Ramset are just two common names of powder activated tools. Give these kinds of tools the same respect as a firearm.

SPECIAL NOTE: No employee is permitted to use any powder-activated tool unless he or she has a current operator's license issued by a licensed instructor by the manufacturer.

20. Chainfalls and Comealongs

- 20.1 Employees have to rely on special lifting and hoisting equipment. Most of our work requires moving equipment and materials that can seldom be lifted by hand alone.
- 20.2 These portable hand hoists are very useful. Knowledge of the following portable hoisting tools and their safe use can save you much time in performing work duties and make lifting and pulling bulky items an easier task.
- 20.3 Chainfalls and comealongs are designed to be operated by one employee only. If it takes two to raise or move a load, chances are the load is greater than the capacity of the lifting device or the device is malfunctioned. Never wrap the chain around the load.
- 20.4 Know the weight of the load and capacity of the lifting device. Do Not Exceed!
- 20.5 Periodic inspections, for instance monthly, or chainfalls and come along are required and must be documented.
- 20.6 Lifting chainfalls are low speed, geared for precision lifting, and have built-in, no-slip brakes. There are two lifting hooks; one swivel hook mounted on the housing and the other located at the end of the lifting chain. Chainfalls are available in a variety of weight capacities ranging from ¼ ton to 10 tons with assorted pulling chain lengths for longer reaches to the work area.

- 20.7 Chainfalls is designed primarily for vertical lifting. The lifting hooks on the housing and chain are tempered but can be or partially straightened and will therefore be provided with a safety clip latch to prevent hooks from being dislodged. Before making a lift with the chainfall, be sure the load is rigged properly and the lift area is barricaded and free of personnel. Make all lifts true vertically to prevent a shifting, swaying load and undo wear on the hoist. Never use a chainfall for a horizontal pull. The designed chain sprocket engagement will not be obtained.
- 20.8 Comealongs are compact hoists for use in close areas. Their size permits toolbox size storage and versatility in almost any lifting and pulling situation.
- 20.9 The comealong is most popular because of its heavy-duty construction and greater lifting ability. A ratchet lever moves the lifting chain or cable. The lever has three positions -- forward for lifting or pulling, neutral for free gear travel, and reverse for lowering or releasing tension.
- 20.10 A comealong will have one hook attached to the gear housing and one at the end of the lifting chain or cable. They are available in various lifting chain and cable lengths for longer reaching pulls and lifts. They range in capacities from ¼ ton to 6 tons.
- 20.11 Considered the most versatile of the hand-operated hoists, the comealong can be used in vertical lifting (only in certain situation), pulling, and binding on any plane and in moving heavy objects. A ratchet movement of the hand lever, even under tension accomplishes pulling or releasing. Therefore, if it takes two employees to crank the hand lever, the hoist is overloaded for the job. Avoid using cable-type lever hoists if the cable is frayed or damaged. Never use a cheater bar on the handle of the comealong.

21. Pedestal, Bench, And Portable Grinders – General

- 21.1 Each employee is responsible for inspection of the grinder he/she is using.
- 21.2 Wheel rating must exceed the maximum potential RPM of the grinder on which it is mounted.
- 21.3 No special adapters, arbors, or other improvisation are not permitted, nor may more than one wheel be mounted between a single set of flanges.
- 21.4 All abrasive wheels will be mounted between flanges which are at least 1/3 the diameter of the wheel.
- 21.5 On all portable tools, the control switch will be instant-pressure controlled without a locking pin.
- 21.6 Wheels should be stored in a dry place with constant temperature above freezing and protected from physical damage, which could cause cracking.
- 21.7 Guards will be installed and maintained.
- 21.8 The proper respiratory protection will be used in the event dust hazards exist.
- 21.9 The proper eye/face, hand, and ear protection will be used.

- 21.10 Guards, work rests, eye shields, and other permanent protection devices will not be removed from any grinding or buffing wheels.
- 21.11 The tool room will perform initial inspection and subsequent maintenance of all grinders. Inspections will be made on an established schedule and records maintained by the Tool Room and filed with the Safety Department.
- 21.12 The using department will be responsible for installing all wheels and determining that they are designed for the speed of the grinder. (Any questions, you should contact the Tool Room or Main Office).
- 21.13 The using department will be responsible for maintaining the maximum distance between the work rest and the wheel -- 1/8" and tongue guard 1/4".
- 21.14 Grinding will not be performed on the side of the wheel.

Metro Electric Co., Inc.

Hard Hats



The skull, an anatomically hard bony structure, protects the brain. The brain consists of a mass of soft tissue which is highly vulnerable to injury. The slightest injury to any part of the brain usually causes some serious mental or physical malfunction which may be permanent! Even though the skull protects the brain, additional reinforcement is needed at job sites where there are frequent possibilities of falling or flying objects.

Hard hats not only reduce the chance of serious injury resulting from falling objects but also afford protection from head injury caused by machinery, ductwork or other overhead structures. Non-conductive hard hats have often afforded protection from electrical shocks or burns. Metal hard hats are prohibited around electrical work!

Take care of your hard hat and it will take of you! Here are tips on hard hat care:

- Adjust the suspension for comfort and to maintain clearance between your head and the hard hat shell.
- Don't cut holes for ventilation or attempt to bend the hat by applying heat!
- Don't substitute a "bump cap." It will not do the job!
- Don't paint your hard hat or wear it backwards....please!
- Don't keep cigarettes, notebooks or pencils in the hard hat....only your head!

Hard hats are all too heavy, too hot, cause headaches and they won't stay on. But...they are valuable safety equipment that **often prevent a lifetime disability!**

Don't be a hard head! - Wear your hard hat!

Metro Electric Co., Inc.

Hazard Communication Program



Applicable OSHA Standard: 29 CFR 1910.1200, 1926.59

1. Purpose & Scope

- 1.1 The purpose of this program is to ensure that the hazards of all chemicals produced or imported are evaluated, and that information concerning their hazards is transmitted to Metro Electric and its employees.
- 1.2 This program applies to any chemical which is known to be present in any Metro Electric workplace in such a manner that employees may be exposed under normal conditions of use or in a foreseeable emergency.

2. General Requirements

- 2.1 The following written Hazard Communication Program is to be implemented for employees of Metro Electric. Information about this program, any hazardous chemicals at their work location and training about the program will be provided to employees prior to work assignment.
- 2.2 The Company's Safety Representative will be responsible for ensuring the program is current and enforced. The Site Supervisor is responsible for ensuring that the program is effectively implemented at the supervisor's work location.
- 2.3 A copy of this program will be made available to an employee(s) upon hiring. Copies may also be obtained on written request from an employee or a designated representative. Requested copies will be provided in a timely manner. This program will also be available to the Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor, or designee, and the Director, National Institute for Occupational Safety and Health, U.S. Department of Health and Human Services, or designee.
- 2.4 The program will be updated when new chemicals or hazards are introduced into the working environment; new processes or work assignments require changes or updating; and at least annually.
- 2.5 Material Safety Data Sheets will be required at the time that any chemical product for use in the Company workplace is purchased and obtained upon receipt of the chemical product.
- 2.6 Specific operations in the Company workplace where hazardous chemicals are used include:
 - 2.6.1 Vehicle, tools and equipment operations requiring use of fuels and lubricants
 - 2.6.2 Surface preparation, painting and coating operations requiring the use of abrasive blasting chemical products, paints, solvents and other necessary chemical products

welding and hot work where welding rods, solders and other chemical products are required for welding and hot work processes.

- 2.7 A Right To Know Station will be established at each Company work location. The station will be prominently displayed at a place where all employees in the area will have immediate and ready access to station contents for information and in case of emergency.

A copy of the Company's written Hazard Communication Program, a Chemical Inventory List of all chemicals authorized by the Company for use at the work location, and current copies of the Material Safety Sheet (MSDS) for each chemical product listed in the Chemical Inventory will be maintained at the station.

A master Right To Know Station will also be maintained at the corporate office and shop facility to employees, their designated representatives, the Assistant Secretary & the Director in accordance with the requirements of 29 CFR 1910.1020(e).

- 2.8 When employees are working at a remote job site or must travel between work locations, a copy of this program, written Chemical Inventory List and Material Safety Data Sheets of chemicals authorized for the work location will be sent with employees. Hazard communication information will be readily available to employees at the work location. The Site Supervisor will be contacted when a copy of the program is needed.

- 2.9 Supervisors and other Company employees at a work location will be constantly aware of signs and indications of a potential spill or some other accidental release of chemical product in the workplace.

Generally, chemical spills and release are noticed visually by observation or because an odor suspected to be from a chemical is noticed. Any such suspicion will be reported to the Site Supervisor immediately so that emergency response, containment and proper clean-up can be accomplished.

Industrial hygiene monitoring and monitoring devices operated by qualified personnel will also be used as required to detect the presence of chemicals, fumes and vapors.

- 2.10 Supervisors and employees will be aware of the physical and health hazards of chemicals present in the work location through review of MSDS.

- 2.11 MSDS and container labeling will be the primary reference information about: preventing exposures; safe work practices; proper selection and use of PPE for working with a chemical product; safe storage of chemical products; properties of the chemical product; emergency and containment/clean-up procedures in the event of a spill or release; and other types of information that is contained in an MSDS.

3. **Container Labeling**

- 3.1 The Site Supervisor will be responsible for all containers of hazardous chemicals entering the workplace and will assure that the chemical containers are properly labeled with:

3.1.1 Chemical name, including product name and identity of the chemical;

- 3.1.2 Hazard warnings about the chemical;
- 3.1.3 Name and address of the manufacturer, importer, or responsible party; and
- 3.1.4 HMIS® labels properly marked (see sample tag at right)



- 3.2 Chemical containers other than the original product container will be checked and approved by the Site Supervisor or a competent person and the MSDS reviewed to ensure the safety of the alternate container. The Site Supervisor will ensure that the new container is properly labeled; i.e., that all secondary containers are labeled with an extra copy of the original manufacturer's label or with generic labels which have a block for identity and blocks for the hazard warning. For help with labeling, employees will contact the Site Supervisor and, if additional assistance is required, the Company's Safety Coordinator. The Safety Coordinator will review the labeling system annually as part of the annual review of this Hazard Communication Program and update as required.
- 3.3 The Site Supervisor will ensure that the contents of piping, gas and transmission lines are properly identified. The Site Supervisor will also inform employees of the hazards associated with chemicals contained in piping within the work areas.
- 3.4 Company employees will not remove or deface chemical product labeling.
- 3.5 Chemical product labeling will be in English. At the same time, if employees on the work location do not speak English as their primary language, the information provided in labeling will be provided to these employees in their primary language.

4. Material Safety Data Sheets (MSDS)

- 4.1 The corporate office or Site Supervisor, whichever is in charge of purchasing a chemical product, will be responsible for obtaining an MSDS for each product. The Site Supervisor will maintain the MSDS system at the work location.

The Site Supervisor will review incoming data sheets for new and significant health/safety information and will ensure that the new information is given to the affected employees. Copies of all MSDS will be kept by the Site Supervisor with copies displayed at the Right To Know Station at the location. The Site Supervisor and Safety Representative will review each MSDS annually for accuracy and completeness.

- 4.2 The MSDS system will include:
 - 4.2.1 Current master Chemical Inventory List of all MSDS, indexed alphabetically and by vendor;
 - 4.2.2 The identity used on the MSDS will be the same as used on the container label;
 - 4.2.3 The chemical and common name of all ingredients determined to present a hazard will appear on all MSDS;
 - 4.2.4 The MSDS will list:

- 4.2.4.1 The physical and chemical characteristics of the chemical including vapor pressure, flash point, etc.;
- 4.2.4.2 The fire, explosion, and reactivity hazard(s) of the chemical mixture including the boiling point, flash point and auto ignition temperature;
- 4.2.4.3 Health hazards of the chemical mixture including signs and symptoms of exposure and medical conditions recognized as aggravated by exposure with primary route(s) of entry;
- 4.2.4.4 Permissible exposure limit (PEL) or any other exposure limit used or recommended by the manufacturer, importer, or employer;
- 4.2.4.5 Whether on carcinogen listing (NTP) or has been found to be a potential carcinogen (IARC listing) or by OSHA (see Appendix A immediately following this program);
- 4.2.4.6 Control measures including fire, engineering, personal protective equipment;
- 4.2.4.7 General precautions for safe handling and use including protective measures during repair and maintenance and procedures for clean-up of spills and leaks;
- 4.2.4.8 Emergency and first aid procedures;
- 4.2.4.9 Date prepared or changed;
- 4.2.4.10 Name, address, telephone numbers of manufacturer, importer, or responsible party to call in an emergency.

4.3 The MSDS will be available for use by employees. Each Site Supervisor will keep a current copy of the program on file and in the location's Right To Know Station. New chemicals will not be used until a MSDS has been obtained and reviewed for health hazards by the Site Supervisor.

5. Employee Training & Education

5.1 Before starting work, the respective Site Supervisor will go over with the new employee the hazard communication program and site-specific work plan, as well as each MSDS applicable to their job. This orientation may be supported with handouts, video tapes, etc. Before any new chemical is used, all effected employees will be informed of its use, will be instructed on safe use, and will be trained on hazards associated with the new chemical. All employees will attend additional training, as appropriate, to review the program and MSDS. Appropriate reference material will also be discussed during the training session(s).

5.2 The minimum orientation and training for a new employee is as follows:

- 5.2.1 An overview of the requirements contained in the Hazard Communication standard, 29 CFR 1926.59;

- 5.2.2 Chemicals present in their workplace operations;
 - 5.2.3 Location and availability of the written program;
 - 5.2.4 Location of MSDS file and location of hazardous chemicals inventory list.
 - 5.2.5 Physical and health effects of the hazardous chemicals listed on the inventory list of this program;
 - 5.2.6 Accepted work practices, required PPE, spill and leak procedures, emergency procedures and other protective measures to be used for the chemicals authorized for the workplace;
 - 5.2.7 Methods and observation techniques used to determine the presence or release of hazardous chemicals in the work area;
 - 5.2.8 How to lessen or prevent exposure to these hazardous chemicals through usage of control/work practices and personal protective equipment;
 - 5.2.9 Steps taken by the Company to lessen or prevent exposure to the chemicals listed on the inventory list; and
 - 5.2.10 Emergency procedures to follow if exposed to a chemical.
- 5.3 Prior to a new chemical being introduced into any section of the workplace, each affected employee will be given information and training as outlined above by the Site Supervisor. MSDS will be available prior to use.
- 5.4 After attending the training class, each employee will sign a form to verify that he or she attended the training, that the written plan is made available for review, and that the employee understands the plan.
- 5.5 Before entering a job site, the Site Supervisor will ascertain what chemical hazards employees may be exposed to and then take appropriate action to protect the employees. If an employee has any question about what protection is needed, he or she should contact the Site Supervisor or site Safety Representative immediately.

6. Non-Routine Tasks

- 6.1 Before any non-routine task is performed, employees will contact the Site Supervisor for special precautions to follow as required. Also, the supervisor will inform any other personnel who could be exposed. Non-routine task situations include unlabeled pipes, gas and transmission lines at the work location.
- 6.2 In the event that a non-routine task is expected to present a chemical exposure, the Site Supervisor will provide the following information as it relates to the task and the specific chemicals that may be encountered:
- 6.2.1 Specific chemical name(s) and hazard(s);

- 6.2.2 Protective equipment required and safety measures to be taken;
- 6.2.3 Measures that have been taken to lessen the hazards (i.e. ventilation);
- 6.2.4 Presence of other personnel in the area; and
- 6.2.5 Emergency response procedures.

7. Multi-Employer Workplaces

- 7.1 If Company employees at the work location produce, use or store hazardous chemicals in such a way that the personnel of another employer may be exposed (i.e. other contractors working on-site) the Site Superintendent will ensure that job-site hazard communication compliance includes the following:
 - 7.1.1 Methods for providing personnel of other employers with on-site access to MSDS for each hazardous chemical that they may be exposed to while working;
 - 7.1.2 Methods used to inform personnel of other employers about any precautionary measures that need to be taken to protect themselves during normal workplace operations, as well as in the event of foreseeable emergencies; and,
 - 7.1.3 Methods used to inform personnel of other employers about the labeling system used in the workplace.

8. Obtaining MSDS from Other Contractors

- 8.1 The Site Supervisor or Safety Representative will contact any other contractor working at a job site for information about chemicals they bring to the work location that may affect Company employees. MSDS will be obtained from the other contractor, as required, before Company employees begin work.

APPENDIX A

The following chemicals are regulated by OSHA as carcinogens in substance-specific standards that include labeling requirements.

- Asbestos
- 4-Nitrobyphenyl
- Alpha-Naphthylamine
- Methyl Chloromethyl Ether
- 3,3 Dichlorobenzidine (and its salts)
- Bis-Chloromethyl Ether
- Beta-Naphthylamine
- Benzidine
- 4-Aminodiphenyl
- Ethyleneimine
- Beta-Propiolactone
- 2-Acetylaminofluorene
- 4-Dimethylaminoazobenzene

- N-Nitrosodimethylamine
- Vinyl Chloride (and poly-vinyl Chloride)
- Inorganic Arsenic
- 1,2 Dibromo-3-Chloropropane
- Acrylonitrile
- Ethylene Oxide
- Formaldehyde
- Benzene

Metro Electric Co., Inc.

Hazard Identification & Risk Assessment



Applicable Standard: Owner Requirement

1. Purpose, Applicability and Scope

- 1.1 Metro Electric Co., Inc. has established this written safety policy and implemented procedures to ensure that hazard identification and risk assessment will be part of routine safety procedures in the Company workplace.
- 1.2 This program outlines methods for the identification of hazards and the assessment and control of health and safety risks in the Company workplace.
- 1.3 This policy applies to management, supervisors and employees during the course and scope of Company workplace operations.

2. Definitions

- 2.1 "Hazard" is the potential to cause harm to a person or to the natural environment.
- 2.2 "Risk" means a combination of the severity and likelihood of harm arising from a hazard.
- 2.3 "Risk assessment" is the process of evaluating the severity and likelihood of harm arising from a hazard.
- 2.4 "Risk control" is the process of implementing measures to reduce the risk associated with a hazard. The control process must follow the control hierarchy, in order, as prescribed in Company safety procedures and in accordance with federal and state OSHA requirements. It is important that control measures do not introduce new hazards, and that the ongoing effectiveness of the controls is monitored.
- 2.5 "Risk control hierarchy" ranks risk control measures in decreasing order of effectiveness:
 - 2.5.1 Elimination of hazard;
 - 2.5.2 Substitution of hazardous processes or materials with safer ones;
 - 2.5.3 Engineering controls;
 - 2.5.4 Administrative controls; and
 - 2.5.5 Personal protective equipment.

The risk control measures implemented for the hazards identified should always aim to be as high in the list as practicable.

- 2.6 "Superintendent," "Supervisor" and "Manager" are terms that apply to any employee who plans, organizes or supervises assignments and activities of other employees or contractors in the course and scope of Company work.
- 2.7 "New" is used to describe Company work situations, tasks or assignments that have not previously been undertaken; and chemical products that have not previously been used or located in the Company workplace. The term also may apply to changing work situations, quantities or uses of chemicals that apply to or have been previously used at the work location, but in ways that are different and have the potential to present new hazards or risk.
- 2.8 "Workplace" means the location where employees, machinery, equipment and/or resources are being utilized in the course and scope of a Company project or work assignment.
- 2.9 "Substance" covers all chemicals and materials, in any physical form (liquid, solid, powder, gas, mixtures, etc), used in the course of employees' or contractors' work. The term includes, but is not limited to: chemicals, compressed gases, solvents, radioactive substances, building materials, pesticides, welding materials, fuels, lubricants, cleaning and other products for which a Material Safety Data Sheet (MSDS) is required. It excludes first-aid products and pharmaceuticals.

3. **Actions**

- 3.1 Regarding hazard evaluation and risk assessment in present or upcoming Company locations, superintendent, supervisor or manager in charge will:
- 3.1.1 Consult with the Company Safety Coordinator and ensure that a written Job Hazard Analysis (JHA) is conducted prior to beginning work. This will be done in accordance with procedures as specified in the Company's written Accident Prevention Plan;
- 3.1.2 Complete a Work Location Chemical Product Checklist prior to beginning work. This will be done in accordance with procedures as specified in the Company's written Accident Prevention Plan to ensure that chemical products to be used or stored at the work location are communicated, managed and controlled in accordance with the procedures specified in the Company's written Master Safety & Health Program, and specifically the Company's written Hazard Communication and Chemical Safety Program;
- 3.1.3 Conduct follow-up or additional evaluation whenever change is introduced in a Company workplace or with work activities, situations or environment, where there is a potential to create or increase hazards or risk.
- This generally will be determined through investigation, gathering relevant information, and consultation with affected employees and knowledgeable sources about whether the change may reasonably be expected to affect the health or safety of any person.
- 3.1.4 Conduct Job Safety Analysis (JSA) as an ongoing tool for hazard and risk evaluation. This will be done in accordance with procedures as specified in the Company's written Accident Prevention Plan and Master Safety & Health Programs.

- 3.1.5 JSAs will be utilized on a schedule and in the manner determined in coordination with the Company's management and Safety Coordinator, as well as the host employers or general contractor's designated person(s) for site safety management.
- 3.1.6 Employees and contractor personnel will utilize and be actively involved in processes for identifying workplace hazards and evaluating risk in accordance with this program and the procedures specified herein.
- 3.1.7 JSA and other hazard/risk evaluation processes will be utilized for both routine and non-routine work operations, as well as whenever there is a change or supplement to procedures in place that could impact the safety and health of employees and other persons at the work location.

4. Classification and Prioritizing of Hazards

- 4.1 Hazards identified through processes in this program will be classified and corrective actions will be prioritized based on potential severity and estimated probability.
- 4.2 All identified hazards will be corrected or mitigated in a timely, appropriate manner. Those that are most severe and/or have the highest likelihood of occurrence will be given priority.
- 4.3 These processes will be performed in cooperation with and under review of the Company Safety Coordinator prior to taking any hazard abatement or mitigation action. This prior review may include consultation with persons knowledgeable and experienced with the specific hazard or risk situation to help ensure that proposed actions will not inadvertently create other hazards or risks.
- 4.4 Corrective actions to an identified hazard will be tracked, confirmed and documented by the project superintendent, supervisor or manager in accordance with procedures specified in the Company's written Accident Prevention Plan.
- 4.5 The Company Safety Coordinator will review reports and documentations of corrective actions taken. This will be done to help confirm that the hazard has been effectively eliminated or mitigated.

5. Documentation and Recordkeeping

- 5.1 Written documentation will be made and maintained in accordance with the Company's written Accident Prevention Plan and Master Safety & Health Programs.
- 5.2 The Company Safety Coordinator will be responsible for reviewing and maintaining these documents in a file.

6. Training

- 6.1 The Company Safety Coordinator, with assistance from Superintendents, Supervisors, Managers and other qualified personnel as designated by the Safety Coordinator, will be responsible for developing and delivering site-specific training on how to implement this program effectively.

- 6.2 Training will include instruction in the proper selection and use of personal protective equipment (PPE), regarding both hazards under evaluation, and also as may be required for abatement or mitigation activities.
- 6.3 Individual training will be documented in writing with: date, time and place of training; the names of personnel trained; the name of the person(s) presenting the training; and a copy of the training material.
- 6.4 This training documentation will become part of the project safety file in accordance with Company recordkeeping procedures.

Metro Electric Co., Inc.

Hazardous (HOT) Work Policy



PURPOSE

To establish minimum requirements for performing hot work during maintenance and construction activities.

POLICY

A hot work permit will be required for any activity that requires the use of a flame or generates sufficient heat or sparks that might serve as a source of ignition. This policy applies to indoor or outdoor work in or around hazardous areas or a non-hazardous area that may contain combustible materials.

Persons performing hot work and signing permits must have completed training by the safety director. The person conducting the hot work will complete a permit and meet all of its requirements. Metro Electric employees will coordinate with the owner/customer before issuing the permit. The safety director will allow the use of the customers permit if it meets Metro Electric's standards. A trained supervisor will review completed permits and the affected area before signing the permit.

This hot work policy applies to subcontractors as well as employees. Permits provided to subcontractors are to be issued by the Metro Electric supervisor managing the project.

No hot work can be preformed in a "confined space" without approval of the safety director.

Definitions

Hot Work: Any work that produces open flame, hot slag, or sparks. The fire code defines hot work as cutting, drilling, welding, brazing, soldering, grinding, thermal spraying, thawing pipe, installation of torch applied roof systems, or any other similar situation.

Combustible: A material capable of sustained burning when ignited and in the presence of air.

Flammable: A liquid having a flashpoint below 100 degrees Fahrenheit.

Fire Watch: A trained individual stationed in the hot work area who monitors the work area for the beginnings of potential, unwanted fires both during and after hot work for 30 minutes. A fire watch is required for all welding and cutting. Individuals must be trained and familiar with the operation of portable fire extinguishers and methods to activate building fire alarm systems. Fire watch can have other duties if these do not prevent him from being an effective fire watch.

Confined Space: A space that has the following characteristics:

- Is large enough and so configured that an individual can bodily enter and perform assigned work; and
- Has limited or restricted means for entry or exit; and
- Is not designated for continuous employee occupancy

PROCEDURE

A permit is required when any form of hot work is to be done. The permit is to be completed prior to the start of the work. A permit will be issued by the safety director or a hot work trained supervisor. The safety director and the supervisor will work together to meet the customer's requirements on hot work. The safety director will accept the customer's permit after review. All permits will be turned in to the safety director.

The supervisor is responsible for preparing the hot work area daily according to the permit requirements prior to allowing any hot work. All areas for which a hot work permit is to be issued must be checked for combustible materials, flammable gases, floor/wall penetrations and fire alarm accessibility prior to the start of every hot work project, as well as for compliance with all requirements of the permit.

The supervisor shall monitor the area for fire safe working conditions and see that a minimum of one portable fire extinguisher shall be readily accessible within 30 feet. The discharge of any fire extinguisher shall be reported to the safety director. An additional person to act as a fire watch shall be available if conditions warrant. Factors to consider are the spread of ignition sources such as sparks and slag.

HOT WORK is restricted from occurring as follows:

- Areas where flammable vapors may be present within a minimum 50' radius.
- The immediate vicinity of any pipe line, valve, fitting, vessel, or equipment that contains or has contained a flammable or combustible liquid or gas without approval from the safety director.
- Areas where a gas meter test is done, the Lower Explosive Limit (LEL) reading is above 10 % LEL.
- A confined space without approval of the safety director.

Floor openings or drains must be adequately covered to prevent slag or sparks from falling to the area below or entering drains. In the case of the work being performed in an elevated area, the area below shall be barricaded. In areas where heavy dust may be present, the dust accumulation must be cleaned prior to the start of work.

The signed permit shall be posted on the job site at all times by personnel doing the work. When the work is completed, the area shall be returned to normal condition. The supervisor or the fire watch shall check the area for fire, up to 30 minutes after work has been completed for the day, and return all fire fighting equipment to its proper place.

Any unusual incidents that occur shall be noted on the permit and reported to the supervisor and the safety director for a follow-up investigation. Permits shall be maintained for 48 hours following expiration.

Metro Electric Co., Inc.

Hearing Conservation



Applicable OSHA Standards: 29 CFR 1910.95(c)

1. Purpose & Scope

- 1.1 This hearing conservation program for Metro Electric is developed to comply with CFR 1910.95 and to provide guidelines to protect employees from potential hearing loss.
- 1.2 This program will establish the minimum hearing protection requirements for employees and applies to all employees and subcontractors working at company controlled work locations.
- 1.3 All employees who are exposed to a noise at or above action level or work in high noise area will receive the appropriate training. The training shall be before initial assignment and be repeated annually for each employee.

2. Responsibilities

- 2.1 Contractors will be responsible for the enforcement and disciplinary action resulting from violation or failure of assigned persons to implement the requirements of this program.
- 2.2 The company Safety Coordinator will be responsible to provide for the monitoring of work activities to assure compliance to the requirements of this program.
- 2.3 The primary responsibility for the implementation of the requirements of this program will rest with the Site Supervisors.
- 2.4 Individual employees will also have responsibility to abide by this program.

OSHA Continuous Noise Exposure Limits Equaling 100% Dose – Table G-16

OSHA PEL, dBA	Maximum Duration Minutes (hrs.)
90	480 (8)
92	360 (6)
95	240 (4)
97	180 (3)
100	120 (2)
102	90 (1½)
105	60 (1)
110	30 (½)

3. Requirements

- 3.1 The company will provide protection against the effects of noise exposure in the workplace when the sound levels exceed those shown in Table G-16 above when measured on the A scale of a standard sound level meter at slow response.
- 3.2 When employees are subjected to sound exceeding those listed in Table G-16, feasible administrative or engineering controls will be utilized. If such controls fail to reduce sound levels within the levels of Table G-16, personal protective equipment will be provided and used to reduce sound levels within the levels of the table.
- 3.3 If the variations in noise level involve maxima at intervals of 1 second or less, it is to be considered continuous.
- 3.4 The company will administer a continuing, effective hearing conservation program, as described in this program, whenever employee noise exposures equal or exceed an 8-hour time-weighted average sound level (TWA) of 85 decibels measured on the A scale (slow response) or, equivalently, a dose of 50 percent. For purposes of the hearing conservation program, employee noise exposures will be computed in accordance with appendix A and Table G-16a, and without regard to any attenuation provided by the use of personal protective equipment.
- 3.5 The standard permits an unprotected, 8-hour permissible exposure limit (PEL) of 90 decibel-A scale (dBA) for continuous noise.
- 3.6 Higher unprotected exposure is allowed provided there are sufficient periods of noise exposure low enough to maintain a PEL below 90 dBA.
- 3.7 The maximum allowable exposure level is 110 dBA for 30 minutes.
- 3.8 Unprotected exposure above 110 dBA is not permitted regardless of duration.
- 3.9 The PEL is based on 100% dose of the allowed exposure. Table G-16 shows the noise level and corresponding time limits that result in a dose of 100%. 92 decibels for 8 hours is the same dose as 110 dBA for 2 hours.
- 3.10 The standard defines impact or impulse noise as noise with the duration of one second or less. The PEL for impact noise is 140 dBA, peak sound level.
- 3.11 The OSHA standard requires that employees be included in a hearing conservation program if their full shift exposure exceeds the action level by 50%. Employees working 12 hour shifts exceed the action level with a 12 hour average noise exposure of 82 dBA. Employees working 12 hour shifts exceed the permissible exposure limit of 100% dose at 87 dBA.
- 3.12 When information indicates that any employee's exposure may equal or exceed an 8-hour time-weighted average of 85 decibels, a monitoring program will be developed and implemented.
- 3.13 When a hearing conservation program is required, it will be provided at no cost to employees. Hearing protectors shall be replaced as necessary.

4. Hearing Protection

- 4.1 Hearing protection devices are available to employees who are exposed to noise above the action level. Employees who have shown a standard threshold shift measured on their annual audiogram must wear hearing protection at all times in the workplace. Hearing protection must be worn when an employee is working in an area above 90 dBA.
- 4.2 There are two types of hearing protection devices available. These are the circumoral device, better known as an ear-muff, and the insert device. Each type provides a different degree of protection and the employee must be properly trained in its use to obtain the maximum protection.
 - 4.2.1 Circumoral or "Ear Muffs"
 - 4.2.1.1 Circumoral hearing protection seals the area around the entry to the ear canal by means of a liquid or foam filled cushion and has a band connecting each muff. Some models may also be attached to hard hats.
 - 4.2.1.2 This type of protection is easily donned and requires minimal training. It does not require fitting.
 - 4.2.1.3 They provide noise attenuation in a range of 15-25 dBA.
 - 4.2.1.4 The effectiveness of these devices is dependent on the seal around the ear.
 - 4.2.1.5 Temple bars on safety glasses can reduce the protection factor of ear muffs.
 - 4.2.1.6 One advantage of ear muffs is that they may be used in conjunction with insert type hearing protectors to maximize protection.
 - 4.2.2 Insert or "Ear Plugs"
 - 4.2.2.1 Insert devices or "plugs" are available in pre-formed or user-formed styles and may be disposable or non-disposable.
 - 4.2.2.2 Insert plugs provide noise reductions in the 20-30 decibel range.
 - 4.2.2.3 These devices are inserted into the ear canal by the user and their effectiveness depends on proper insertion.
- 4.3 Providing training to the user and practice by the user are imperative to insuring a good fit to insure maximum protection.
- 4.4 The company will evaluate hearing protector attenuation for the specific noise environments in which the protector will be used. This will be done using one of the evaluation methods described in Appendix B: "Methods for Estimating the Adequacy of Hearing Protection Attenuation."

- 4.5 Hearing protectors must attenuate employee exposure at least to an 8-hour time-weighted average of 90 decibels.
- 4.6 Employees shall be allowed the opportunity to select their hearing protectors from a variety of suitable hearing protectors provided by the employer.
- 4.7 Employees while on an owner client facility and in areas signed where they will be exposed to an 8-hour time-weighted average of 85 decibels or greater shall wear hearing protection.

5. Audiometric Testing

- 5.1 Audiometric testing is a means of determining if an employee's hearing is being adversely affected by noise exposure in the workplace.
- 5.2 Within 6 months of an employee's first exposure at or above the action level, the company will obtain a valid baseline audiogram. This will be used to compare with subsequent audiograms.
- 5.3 If a mobile test van is used for audiometric testing, a valid baseline audiogram will be obtained within 1 year of an employee's first exposure at or above the action level.
- 5.4 If a baseline audiogram is obtained more than 6 months after the employee's first exposure at or above the action level, the employee will utilize hearing protection for any period exceeding six months after first exposure until the baseline audiogram is received.
- 5.5 Testing to establish a baseline audiogram shall be preceded by at least 14 hours without exposure to workplace noise. Hearing protectors may be used as a substitute for the requirement that baseline audiograms be preceded by 14 hours without exposure to workplace noise.
- 5.6 Employees who will take an audiogram will be told to avoid high levels of non-occupational noise exposure during the 14-hour period immediately preceding the examination.
- 5.7 This audiometric testing is to establish a baseline, which must be preceded by at least 14 hours without exposure to high noise levels.
- 5.8 Hearing protection may be used prior to the audiometric test to ensure the employee is not exposed to high noise levels.
- 5.9 At least annually after obtaining the baseline audiogram, the employer will obtain a new audiogram (annual audiogram) for each employee exposed at or above an 8-hour time-weighted average of 85 decibels.
- 5.10 An annual audiogram may be substituted for the baseline audiogram when in the judgment of the audiologist or physician making the evaluation:
 - 5.10.1 The standard threshold shift revealed by the audiogram is persistent; or
 - 5.10.2 The hearing threshold shown in the annual audiogram indicates significant improvement over the baseline audiogram.

- 5.11 Annual audiometric testing (when applicable) provides results that should be compared to the baseline to identify any changes in an individual's hearing threshold.
- 5.12 If the audiogram shows a 10 decibel reduction of hearing capability at 2000, 3000, or 4000 Hertz, a repeat audiometric test should be done within 30 days.
- 5.13 This 10 dBA reduction at these frequencies is referred to as a "Standard Threshold Shift" (STS).
- 5.14 A repeat audiogram that shows a permanent threshold shift requires that a full assessment of the hearing loss be completed. Unless a physician has determined that the STS is not work related or aggravated by occupation noise exposure, the company will ensure that:
 - 5.14.1 The employee is notified in writing within 21 days of the determination that the STS is permanent.
 - 5.14.2 The adequacy of hearing protector attenuation will be re-evaluated and/or refitted as required. The company will provide more effective hearing protectors as necessary.
 - 5.14.3 Employees will be re-trained in the requirements for and proper use of hearing protection.
 - 5.14.4 In the event that employee noise exposures increase to where hearing protectors provided no longer give adequate attenuation, a medical evaluation may be required.
 - 5.14.5 The employee will be referred for a clinical audiological or ontological examination if additional testing is needed or if there is suspicion that a medical condition is caused or aggravated by wearing hearing protection.

6. Employee Training

- 6.1 The company will institute a training program for all employees who are exposed to noise at or above an 8-hour time-weighted average of 85 decibels, and will ensure employee participation in such program.
- 6.2 The training program will be repeated annually for each employee included in the hearing conservation program. Information provided in the training program will be updated to be consistent with changes in protective equipment and work processes.
- 6.3 The employer will ensure that each employee is informed of the following:
 - 6.3.1 The effects of noise on hearing;
 - 6.3.2 The purpose of hearing protectors, the advantages, disadvantages, and attenuation of various types, and instructions on selection, fitting, use, and care; and
 - 6.3.3 The purpose of audiometric testing, and an explanation of the test procedures.

- 6.4 Training should include information on the physical nature of sounds, the effects of noise on the ear and the proper use of hearing protection.
- 6.5 Employees that work in high noise areas (>85 dBA) should also be trained for a basic understanding of noise monitoring, work areas with high noise levels, and the purpose of audiometric testing.
- 6.6 Each employee that works in an area above the action level must complete and obtain an acceptable score on the hearing conservation exam.
- 6.7 This exam must be maintained in the employee training files at the corporate office.
- 6.8 Noise exposure monitoring records should be retained for at least 2 years. Audiometric test results should be retained for the duration of the employee(s) employment plus 30 years.
- 6.9 Employees may have access to the noise exposure monitoring records and audiometric test results under the OSHA standard "Access to Employee Exposure and Medical Records", 29 CFR 1910.20. For access to these records, a written request for the records must be made to the company Safety Coordinator. Written request form will be distributed upon request.

7. Recordkeeping

- 7.1 The company will maintain an accurate record of all employee exposure measurements required by OSHA and this program.
- 7.2 The company will retain all employee audiometric test records obtained pursuant to this Program:
- 7.3 This record will include:
 - 7.3.1 Name and job classification of the employee;
 - 7.3.2 Date of the audiogram;
 - 7.3.3 The examiner's name;
 - 7.3.4 Date of the last acoustic or exhaustive calibration of the audiometer; and
 - 7.3.5 Employee's most recent noise exposure assessment.
- 7.4 The company will maintain accurate records of the measurements of the background sound pressure levels in audiometric test rooms.
- 7.5 The company will retain records required in this program for at least the following periods.
 - 7.5.1 Noise exposure measurement records will be retained for 2 years.
 - 7.5.2 Audiometric test records will be retained for the duration of the affected employee's employment.

- 7.6 All records required by this section will be provided upon request to employees, former employees, representatives designated by the individual employee, and the Assistant Secretary.
- 7.7 If the company ceases to do business, the company will transfer to the successor employer all records required to be maintained by this section, and the successor employer will retain them for the remainder of the period prescribed in this program.

Metro Electric Co., Inc. Horseplay



On construction sites, there is no such thing as a practical joke. Playing tricks on your co-workers can cause a serious injury or death!

While a worker is performing a job, don't cause a distraction!.

DON'T startle your fellow worker.

DON'T play tricks on the younger or new worker. Innocent tricks have often caused confusion resulting in injury.

DON'T wrestle or show off feats of strength. Wrestling or weight lifting matches can be held after hours but not on the job site.

Be a smart worker! Don't be a smart aleck.

Metro Electric Co., Inc.

Hydrogen Sulfide Safety



1. Purpose

- 1.1 Metro Electric performs services for clients/customers in workplaces where there is a potential for exposure to hydrogen sulfide (H_2S). Consequently, the Company has designed and adopted this *Hydrogen Sulfide (H_2S) Safety Program* to prevent injuries and death due to exposure to H_2S at work locations.
- 1.2 Exposure potentials occur when Company operations are near places and situations where there can be releases and accumulations of H_2S . Such operations include pipeline maintenance or repair, and any work performed near wells, tanks and production facilities. Other H_2S exposure situations include: work near drilling operations or with drilling mud; water from sour crude wells; wells blowouts; tank gauging at production, pipeline or refining points; and during field maintenance or battery work at wells.
- 1.3 This program provides for training site supervisors and employees who have a potential for H_2S exposure at work, giving them the required knowledge about and qualification for H_2S hazard recognition, safety practices, work procedures, and response to a H_2S emergency.

2. Physical Characteristics

- 2.1 Hydrogen sulfide (H_2S) refers to either the gaseous or liquid form of the compound. Under atmospheric conditions, it is a toxic, highly flammable and colorless gas.
- 2.2 Typically called "sour gas", hydrogen sulfide is soluble in water, crude oil or petroleum fractions, and is extremely corrosive. At low concentrations it has the odor of rotten eggs.
- 2.3 The gas can cause severe stress cracking of steel and other metals.
- 2.4 Hydrogen sulfide burns with a blue flame to form sulfur dioxide which is also a toxic gas.
- 2.5 Hydrogen sulfide has a density 1.2 times greater than that of air and tends to settle in low lying areas.
- 2.6 The gas can be dispersed by wind movement or air currents. Additional characteristics are provided in Appendix I in this program.
- 2.7 It is important to understand that the concentration of hydrogen sulfide can be measured or expressed in two ways:
 - 2.7.1 Parts per million (ppm) of H_2S in liquid, by weight ratio, and
 - 2.7.2 ppm of H_2S in the air, by volume ratio.

- 2.8 While both methods of measurement are utilized, there is a significant difference between a hydrogen sulfide concentration in air and that in liquid. The actual concentration measured in air (by volume ratio) is usually much higher, and can be 10 to 100 times higher than the same value measured in liquid by weight ratio.

For example, crude oil being discharged into a storage tank may contain only 70 ppm hydrogen sulfide in the liquid by weight. However, the concentration of hydrogen sulfide in the tank vapor space above the crude oil could exceed 7000 ppm hydrogen sulfide by volume. Unless otherwise specified, all following discussions refer to hydrogen sulfide concentrations based on ppm in air, by volume ratio.

3. Exposure Standards

- 3.1 The exposure standards provided are intended primarily for domestic operations. Where foreign operations are concerned, practices will be in accordance with the respective foreign government's regulations.
- 3.2 OSHA General Industry standards (29 CFR 1910.1000 Z-2 Table) establish a Permissible Exposure Limit (PEL) of 20 ppm (ceiling), with one exception. If no other measurable exposure occurs during the 8-hour work shift, exposures may exceed 20 ppm, but not more than 50 ppm (peak), for a single time period up to 10 minutes.
- 3.3 OSHA Construction Industry standards (29 CFR 1926.55 Appendix A) establish a PEL of 10 ppm, 15 mg/m³ TWA.
- 3.4 In addition to federal regulations and guidelines such as the Threshold Limit Values, some state governments such as California have enacted occupational health and safety legislation. In many cases, state regulations are a merging of the OSHA and ACGIH exposure limits.

For example, Cal OSHA notes an 8 hour hydrogen sulfide exposure limit of 10 ppm. An excursion limit of 20 ppm may be experienced over one 20 minute period per 8 hours, and a ceiling limit of 50 ppm is not to be exceeded at any time.

Operations located in states having their own occupational health and safety regulations should reference the respective exposure limits with regard to exposure control and compliance.

- 3.5 The exposure limits for hydrogen sulfide are primarily based upon the irritant effects of the gas and resulting worker discomfort. The more significant concerns regarding the potential disabling or lethal capabilities of the gas at concentrations greater than 100 ppm are not primarily considered.

4. Health Effects from Exposure

- 4.1 The effects associated with hydrogen sulfide exposure are primarily determined by the concentration of the gas in the individual's breathing zone, the length of the exposure period(s) and individual susceptibility to the contaminant.
- 4.2 Exposure effects at various hydrogen sulfide concentrations are provided in summary as Table I.

- 4.3 The health effects associated with hydrogen sulfide exposure are most often the result of sudden, excessive exposures experienced over a short time period. For example, a short term exposure to hydrogen sulfide at a concentration of 600 ppm can result in death within minutes.
- 4.4 A most important characteristic of hydrogen sulfide gas is its ability to cause olfactory fatigue or a failure in the sense of smell. At concentrations approaching 100 ppm, exposure to hydrogen sulfide causes a loss of the sense of smell. This effect can result in an individual developing a false sense of security relative to the exposure conditions.

HIGH CONCENTRATIONS OF HYDROGEN SULFIDE, ESPECIALLY THOSE CAPABLE OF CAUSING PHYSIOLOGICAL DAMAGE, CANNOT BE DETECTED BY THE SENSE OF SMELL.

Table I – Potential Health Effects Of Hydrogen Sulfide At Various Concentrations

<u>H₂S Concentration (ppm)*</u>	<u>Potential Effect</u>
10 to 20	eye irritation, especially in hyper-susceptible workers
20 to 100	inflammation, corneal blistering and the capacity of the eye, loss of the sense of smell, headache, cough, nausea
100 to 300	respiratory difficulty, pulmonary edema, respiratory depression and irritation (30 min - 8 hrs)
300 to 600	central and peripheral nervous system effects, e.g., tremors, weakness, numbness of extremities, unconsciousness and convulsions (several minutes - hrs)
600 to 1000	rapid breaths, unconsciousness resulting in death if emergency aid is not promptly administered
1000 and greater	cessation of breathing (instantaneous) and death

Note: Effects described at a specific concentration usually occur with increasing severity at higher concentrations.

* parts per million parts of air in breathing zone.

5. Work Practices

5.1 The incorporation of the specific work practices discussed below into routine operation and maintenance activities can help prevent overexposure to hydrogen sulfide. These work practices have proven effective in controlling hydrogen sulfide exposure in various Company operations.

5.1.1 Ventilation

5.1.1.1 When the potential for hydrogen sulfide exposure occurs during routine operation and maintenance activities, ventilation of the worker's breathing zone is extremely important. Hydrogen sulfide gas is 1.2 times

heavier than air and does not readily dissipate. The gas accumulates in low lying and confined spaces and may remain for an extended time. Adequate ventilation, whether provided by natural winds, powered air or local exhaust, can prevent hazardous concentrations of hydrogen sulfide from accumulating.

5.1.1.2 Outdoor tasks involving potential exposure to hydrogen sulfide should not be conducted on calm days, when it is not practical to do so. Wind direction should be verified by a wind sock, streamer, or vane, prior to initiating work. If possible, workers should always remain upwind from the source of the gas during tasks. Wind conditions cannot be relied upon as a single means of controlling exposure.

5.1.1.3 Inside work, where hydrogen sulfide exposure may occur, should be conducted under a properly functioning laboratory hood or with local exhaust ventilation placed at the source of emission. Laboratory hoods should provide a minimum average face velocity of 125 linear feet per minute (fpm). Ventilation requirements for confined spaces are discussed separately.

5.1.2 Monitoring

5.1.2.1 Fixed or portable monitors will be used to detect the presence of H₂S. Alarms will be preset to signal at the appropriate permissible exposure limit of 20 ppm when work being performed is regulated under OSHA General Industry 1910 standards; or 10 ppm when work being performed is regulated under OSHA 1926 Construction Safety standards.

5.1.2.2 Upon the sounding of an area or personal H₂S monitor, evacuation of the area will begin immediately to a safe area upwind from the location. The evacuated area will not be re-entered except by trained and authorized personnel utilizing appropriate respiratory protection; or until the “all clear” is sounded by personnel in charge of the work site and it is safe to re-enter the area.

5.1.2.3 Representative employees should be selected to wear personal monitors when such group tasks are to be performed. Portable monitors can be substituted for the personal type as long as it adequately samples the work area used by all employees with a potential for exposure.

5.1.2.4 Monitors should be utilized for the complete duration of work activity. If the alarm sounds, indicating a concentration at/or above this level, workers should immediately leave the area.

5.1.2.5 Workers should withdraw upwind to a position that is considered to be a safe distance from the source of the gas. The alarm will continue to sound until the detector sensor is cleared of hydrogen sulfide.

5.1.2.6 Allowing workers to re enter, and work in the area should be permitted only if they are wearing a full face pressure demand airline respirator

with escape bottle, or an approved self contained breathing apparatus (SCBA).

- 5.1.2.7 This procedure should be followed until it has been established that the area is safe from hydrogen sulfide. Depending on the type of monitor and the concentration of the gas, this can take several minutes, even though the monitor is removed to a hydrogen sulfide free atmosphere.
- 5.1.2.8 Continuous fixed area monitors can be permanently installed in locations where the sudden release of hydrogen sulfide is possible. The monitor sensors should be placed in proximity to potential sources of a hydrogen sulfide release. Several sensors may be necessary at points of possible gas emission, and should be connected to a central monitor. The monitor's warning device, audible and visual, should be located so that the alarm can be easily recognized throughout the facility. Employees should be instructed to follow established response procedures in the event an alarm is activated.
- 5.1.2.9 Both personal and area monitors must be routinely calibrated and properly maintained. Procedures should be established to carry out these functions. The individual or group responsible for this activity should be identified and should keep a log book for recording calibration and maintenance.

6. Respiratory Protection

- 6.1 Supplied air (airline or SCBA) respiratory protection against hydrogen sulfide exposure is required in the following situations:
 - 6.1.1 When routine or maintenance work tasks involves exposure to H₂S concentrations of 20 ppm or greater.
 - 6.1.2 When a fixed monitor alarms, and re entry to the work area is required to complete a job.
 - 6.1.3 When confined spaces are to be entered without knowledge of H₂S levels present, or if initial measurements are to be taken of H₂S levels.
 - 6.1.4 During rescue of employees suspected of H₂S overexposure.
 - 6.1.5 For specific tasks identified with significant exposure potential and outlined in local program guidelines.
- 6.2 All respiratory equipment for hydrogen sulfide must be of the supplied air type, equipped with pressure demand regulators and operated in the pressure demand mode only. This is the only type of respiratory protection recommended for hydrogen sulfide application. Equipment should be approved by NIOSH/MSHA or other recognized national authority as required. If airline units are used, a five minute egress bottle should also be carried.
- 6.3 Gas masks or other air purifying respirators *MUST NEVER BE USED FOR HYDROGEN SULFIDE* due to the poor warning properties of the gas.

- 6.4 Use of respiratory protection should be accompanied by a written respiratory protection program.

7. Confined Space

- 7.1 Work conducted in low lying areas and confined spaces where hydrogen sulfide may be present require specific precautions beyond those described above. These conditions may be encountered during excavation and line repair or tank (vessel) maintenance and inspection.
- 7.2 Prior to beginning work, these tasks require that the excavated area or vessel be thoroughly tested with a direct reading hydrogen sulfide instrument, as well as tested for sufficient oxygen and the absence of flammable atmospheres. These measurements should be included as an integral part of an entry procedure. Furthermore, where entry permits are required these measured levels should be noted on the permit.
- 7.3 Combination hydrogen sulfide detectors which also measure combustible gas and oxygen are available. CARE SHOULD BE TAKEN TO DETERMINE THE HYDROGEN SULFIDE CONCENTRATION THROUGHOUT THE COMPLETE AREA. Particular attention should be given to measuring hydrogen sulfide in the bottom of tanks, vessels, or open pits, and on the top of floating roof tanks, where the gas is likely to concentrate. IF ENTRY IS REQUIRED ON THE TOP OF FLOATING ROOF TANKS TO PERFORM THIS INITIAL TEST, THEN RESPIRATORY PROTECTION, AS DESCRIBED PREVIOUSLY, SHOULD BE WORN BY THE TESTER.
- 7.4 If hydrogen sulfide levels are determined to be above 20 ppm, entry into a confined space should require respiratory protection. Efforts should be made to ventilate the confined space prior to scheduled entry. When concentrations of hydrogen sulfide remain above 20 ppm, additional forced air venting is recommended before entry, when time permits.
- 7.5 If entry is necessary under the above condition, respiratory protection should consist of a pressure demand airline respirator with an egress bottle or an SCBA. A standby person, also equipped with proper respiratory protection, should be outside the vessel and in constant audio or visual contact with the worker inside. This precaution is necessary to ensure that rapid rescue of the worker inside can be accomplished.

8. Location Controls and Warning Signs

8.1 Wind Indicators

- 8.1.1 Wind direction should be determined prior to performing outdoor tasks where hydrogen sulfide may be encountered.
- 8.1.2 Work tasks which can be performed upwind from a hydrogen sulfide source can greatly reduce the potential for gas in the worker's breathing zone.
- 8.1.3 Wind socks, streamers, or vanes provide an indication of wind direction.
- 8.1.4 These wind indicators should be placed at a location and height to enable free movement and should accurately indicate wind direction.
- 8.1.5 The wind indicator should be easily visible from normal entrances to the work area and from all work locations.

8.2 Warning Signs

- 8.2.1 Consistent with Hazard Communication requirements, warning signs for hydrogen sulfide should be posted to remind employees of the potential hazard at each specific location.
- 8.2.2 Additionally, signs should indicate the need for monitors or respiratory protection in areas where such equipment is required.
- 8.2.3 Where applicable, warning signs should be posted at producing well sites, tank batteries, refinery units, and chemical facilities, etc.
- 8.2.4 In effect, signs should be posted on all units where the potential for a dangerous release of hydrogen sulfide exists.
- 8.2.5 Signs should be large enough to be easily visible.
- 8.2.6 Warning signs such as the following are recommended although variations in the wording may be used:

**WARNING HAZARDOUS AREA
HYDROGEN SULFIDE
HEALTH HAZARD
POTENTIALLY FATAL OR HARMFUL IF INHALED**

9. Automatic Tank Gauges

- 9.1 Automatic Tank Gauging instruments have been used successfully in some operations to control potential hydrogen sulfide exposures. These devices can be installed on crude, produced (RECOVERED) water, and chemical product storage tanks to reduce the need for conventional manual tank gauging and the subsequent potential for gauge exposure. They enable measurement of storage tank volume and require only occasional manual gauging to check for proper operation.
- 9.2 When tanks equipped with automatic gauges require manual gauging and contain hazardous concentrations of hydrogen sulfide, the tank gauge should use pressure demand supplied air respiratory protection.
- 9.3 Respiratory protection should be utilized until the hydrogen sulfide concentration is determined to be within acceptable levels as measured by appropriate monitoring equipment.

10. Emergency Procedures

- 10.1 The prompt performance of specific rescue and emergency first aid procedures can very often result in the full recovery of victims overcome by hydrogen sulfide. These victims should be immediately removed from the contaminated atmosphere by a rescuer wearing full face pressure demand supplied air respiratory protection, e.g., SCBA or supplied air with egress unit.
- 10.2 RESCUE SHOULD NEVER BE ATTEMPTED WITHOUT APPROPRIATE RESPIRATORY PROTECTION! Many such attempts have resulted in the rescuer also becoming a victim.
- 10.3 Respiratory protection equipment should be located on site for rescue purposes and/or carried on Company vehicles, depending on practicality and need. Full face, pressure demand self-contained breathing apparatus (SCBA) is most appropriate for rescue.
- 10.4 Respiratory protection designed specifically for safe egress may be appropriate for some limited locations. Egress equipment differs significantly in design and application from standard SCBA and airline respiratory equipment. This equipment can be placed at visible and easily reached points or carried by employees in areas where the sudden release of hydrogen sulfide is possible.
- 10.5 Egress equipment is primarily suited for areas where exit is restricted and either personal or area monitors are in use. Egress equipment should provide full face protection and 5 to 15 minutes of air supply. The number of such devices should be determined according to the number of workers commonly in the area. EGRESS EQUIPMENT IS DESIGNED FOR ESCAPE ONLY AND IS NOT INTENDED FOR RESCUE OR ROUTINE RESPIRATORY PROTECTION PURPOSES!

11. Emergency Aid

- 11.1 Once the victim is safely removed from the contaminated atmosphere, the rescuer should begin artificial respiration or administer oxygen if breathing has ceased. FRESH AIR SUPPLIED TO THE VICTIM'S LUNGS THROUGH ONE OF THESE METHODS IS THE MOST IMMEDIATE NEED. Back pressure artificial respiration may be applied initially to clear the victim's lungs of the toxic gas before mouth to mouth artificial respiration is administered. NOTE: Follow the Company's first aid procedures.
- 11.2 Caution should be taken during the application of artificial respiration not to inhale air directly from the victim's lungs. This could also result in the rescuer being overcome. Depending on the length of exposure and concentration of hydrogen sulfide, heart failure may occur within 4 to 6 minutes should the exposure be major. If the victim's heart has stopped, cardiopulmonary resuscitation (CPR) must be started immediately. RECOVERY FROM OVEREXPOSURE TO HYDROGEN SULFIDE IS USUALLY COMPLETE IF THIS AID IS ADMINISTERED PROMPTLY.
- 11.3 If the victim does not respond to emergency aid, emergency medical aid should be summoned to the scene, and the individual should be taken, as soon as possible, to a hospital for further treatment. REGARDLESS OF APPARENT CONDITION, OVEREXPOSURE VICTIMS SHOULD RECEIVE APPROPRIATE MEDICAL ATTENTION AS SOON AS POSSIBLE.

- 11.4 Plans for obtaining emergency medical care and transportation of victims should be prearranged such as with contingency plans. Notification lists or contingency plans should be prominently posted or available to individual employees. This list should include the names and phone numbers of local medical facilities, ambulance services, and Company supervisory personnel to be contacted. Local medical facilities should be prepared to handle victims of hydrogen sulfide exposure. Therefore, they must be notified so they can make necessary arrangements to be able to handle such incidents.

12. Contingency Plans

- 12.1 Another part of the contingency plans should be developed for evacuation of employees and local residents where the potential exists for a significant and hazardous hydrogen sulfide release. Employees should be familiar with these plans and with their specific responsibilities in the event that the plan is activated. The plans should be developed in accordance with local, state, and federal environmental and public safety agency requirements.

13. Training

- 13.1 All employees who may encounter H₂S as part of routine or maintenance work should receive thorough training on the hazards associated with hydrogen sulfide. Refresher training should be conducted annually.
- 13.2 The training should include:
- 13.2.1 The hazards of hydrogen sulfide;
 - 13.2.2 Proper work practices to reduce the potential for exposure;
 - 13.2.3 The hydrogen sulfide exposure conditions in the employees' work areas;
 - 13.2.4 The proper use and limitations of hydrogen sulfide monitors and respiratory protective equipment; and
 - 13.2.5 Rescue and emergency aid procedures in assisting hydrogen sulfide overexposure victims.
 - 13.2.6 Site-specific operational, contingency and emergency plans, including host employer and general contractor requirements.
- 13.3 Employees performing jobs that require respiratory protection should receive training specific to the use and limitations of the equipment. Also, employees designated to perform maintenance and inspection of respiratory protective equipment should receive adequate training in these aspects as well.
- 13.4 New or transferred employees should receive instruction regarding hydrogen sulfide and respiratory protection prior to their full release to the new work location.

14. Required Written Programs

- 14.1 Standard Operating Procedures (SOPs) should be written by each job site supervisor if the potential for significant hydrogen sulfide exposure exists during routine tasks, maintenance activities, and confined space entry. These SOPs should be brief, and stated in such a manner that they can be easily understood.
- 14.2 A written respiratory protection program is required by OSHA when respiratory protection is utilized. Such a program is also recommended for Company operations outside OSHA jurisdiction. Written respiratory protection programs should include instruction on proper maintenance, inspection, use, and cleaning of respiratory protection equipment.
- 14.3 The program should also indicate the individual responsible for these activities, and the time at which these various functions are to be carried out. Requirements for training and subsequent refresher training should also be specified.
- 14.4 Routine work operations for Company employees DO NOT include entering confined spaces to perform work. This includes confined spaces that may contain an accumulation of H₂S. In the event that a work assignment should require entering what is identified as a confined space, entry will be performed in accordance with the Company's written Confined Space Entry program; and only by personnel who have been trained and authorized to perform this type of hazardous duty. All such work assignments will be specifically authorized in advance by the Site Supervisor and the Company Safety Representative.

15. Medical Surveillance

- 15.1 Employees subject to potential exposure to hydrogen sulfide can be included in a medical surveillance program.
- 15.2 Pre-placement physical examinations should review work histories to determine the significance of any previous exposure to hydrogen sulfide.
- 15.3 The employee ability to use pressure demand respiratory protection and/or aid in emergency rescue should be determined.
- 15.4 The physical examination should place particular attention on symptoms related to the eyes, central nervous, cardiovascular and respiratory systems.

APPENDIX I

Physical and Chemical Properties of Hydrogen Sulfide

<u>Molecular Formula</u>	<u>H₂S</u>
Density compared to air (air 1.0)	1.2 (gas @ 15NC, 1 atm)
Auto ignition temperature	260NC (500NF)
Flammable range in air	4.3-45% (by volume in air)
Appearance of gas	Colorless
Solubility in Water (Fresh or Salt)	Highly soluble
Solubility in Oil	Highly soluble
Odor	"Rotten eggs"
Odor threshold	0.02 ppm*
Olfactory fatigue level	100 ppm* (may vary)

* parts of H₂S per million parts air

Metro Electric Co., Inc.

Incident Investigation & Reporting



1. Purpose & Scope

- 1.1 Metro Electric has established protocols, policies and procedures for the investigation of all reported at-work injuries, illnesses, non-injury and near-miss incidents.
- 1.2 Based on the nature, circumstances, actual and/or potential severity, investigation will be conducted to obtain information about the incident as needed to ascertain root causes.
- 1.3 Based upon severity and other situation-specific considerations, one or more methods of *Root Cause Analysis* (RCA) then will be utilized to help identify and determine circumstances, events, behaviors and other contributing factors to the incident.
- 1.4 Investigation, information gathering, RCA and related activities will be utilized to identify specific causal factors that will be addressed as required to prevent a reoccurrence.
- 1.5 By its nature, a “near miss” is an event that did not result in an injury or damage to property, assets or the environment only because of good fortune. Consequently, under this program, near-miss incidents will be investigated in the manner and with the same priority as an actual injury, damage and/or environmental occurrence.

2. Incident Reporting Sequence & Timetable

- 2.1 An incident reporting sequence will be followed in accordance with site-specific procedures at the work location.
- 2.2 When the site-specific incident reporting sequence is established, it will be included in written incidence response procedures for the work location and posted along with emergency phone numbers and any other incident reporting information.
- 2.3 Unless otherwise established by host employer emergency response procedures and protocols, here is the reporting sequence for an incident (injury or non-injury):
 - 2.3.1 Call 9-1-1 or the facility’s Emergency Response Team immediately, in accordance with host employer procedures to obtain the quickest emergency assistance.
 - 2.3.2 Call the host employer supervisor or designated contact without delay and no later than 24 hours after the incident.
 - 2.3.3 Call the Company main office without delay during business hours and the Company’s Safety Coordinator after hours and on weekends.
 - 2.3.4 Call the local OSHA office within eight hours if three or more employees are hospitalized, or if there is a fatality.

3. Incident Investigation Responsibilities & Training

- 3.1 For purposes of this program, incidents will be defined as including work-related injuries, illnesses, property and vehicle damage, fires, explosions, chemical spills or releases.
- 3.2 The Company on-site supervisor will conduct and direct the initial on-site incident investigation, when possible in coordination with the Company Safety Coordinator.
- 3.3 The Company Safety Coordinator will direct the ongoing and follow-up investigation. At the discretion of the Company Safety Coordinator, additional qualified personnel may be enlisted to perform specific functions during the investigation (i.e. safety professionals, consultants, industrial hygiene professionals and technicians).
- 3.4 Employees and other personnel involved in conduct of the investigation will be trained and qualified in the methods, techniques and responsibilities of the assignment.
 - 3.4.1 All employees will be trained to be aware of incident investigation requirements and procedures;
 - 3.4.2 First Responders will be trained in first aid, CPR, protection from bloodborne pathogens, use of AED, and other specialized qualifications and skills as may be part of the Company's work assignment to help control further loss.
 - 3.4.3 Company supervisors will be trained on the methods, techniques and requirements for conduct of an initial incident investigation and reporting.
- 3.5 Employee incident investigation and reporting training will be conducted initially prior to assignment with refresher training annually thereafter.

4. Incident Investigation Procedures

- 4.1 Procedures as established by this program will be followed during investigation of all reported incidents.
- 4.2 Equipment necessary for the proper conduct of an incident investigation will be provided and available. Such equipment will include:
 - 4.2.1 Necessary personal protective equipment (i.e. hard hat, high visibility vest, other PPE as required by the incident location);
 - 4.2.2 Pens and paper;
 - 4.2.3 Camera(s);
 - 4.2.4 Audio recorder;
 - 4.2.5 Ruler and measuring tape;
 - 4.2.6 Marking devices such as flags;

- 4.2.7 Warning tape for barricading around the scene;
 - 4.2.8 Flashlights and temporary lighting as required;
 - 4.2.9 Equipment manuals, local work procedures and other documentations that will be reviewed or referenced during the investigation; and
 - 4.2.10 Other materials as may be required.
- 4.3 After rescue, triage and treatment of the injured, additional actions will be taken as possible, within the scope of individual training and as authorized by the host employer, to prevent further loss. For example, host employer maintenance and engineering personnel should be called to confirm the integrity and safety of buildings, structures, units or facilities possibly affected by the incident. If the incident involves a chemical spill or release, or explosive materials, the host employer's Hazardous Materials Team should be called to respond.
 - 4.4 Initial investigation will include the preliminary assessment and collection of evidence. This includes making an initial list of persons, equipment and materials involved; listing the names of witnesses and potential witnesses; noting environmental factors such as weather, wind direction, temperature, noise, illumination, ventilation and other factors observed relating to the incident.
 - 4.5 Following initial rescue, medical response and evacuation of injured persons, evidence at the incident scene will be preserved. The positions of persons, wreckage, equipment, parts, papers and materials involved in the incident will be preserved, secured and collected through notes, photographs, witness statements, flagging and impoundment of physical evidence.
 - 4.6 Unauthorized persons will not be allowed access to the incident location.
 - 4.7 Beginning with the initial investigation, witnesses will be located, their statements taken and interviews conducted in a manner that ensures unbiased testimony.
 - 4.8 Interviewing of witnesses, initially and for follow-up, will be conducted at appropriate times and locations by individuals designated by the Company. Interviewers will be trained in the techniques, methods and skills of interviewing witnesses as part of their incident investigation qualification.
 - 4.9 Necessary tools, equipment and supplies will be available to employees assigned to incident response and investigation.
 - 4.10 Types of equipment provided for emergency first response will be based on the level of response and training of the responder(s).
 - 4.11 First responders will be hold current certification(s) in first aid, CPR, AED, preventing exposures to bloodborne pathogens, and other skills as required by the first responder assignment and selection.
 - 4.12 First response equipment includes first aid and trauma supplies; personal protective equipment for bloodborne pathogens; CPR devices (i.e. one-way face masks, bag masks, latex medical gloves, eye protection; backboards, scoop and basket stretchers; extrication and rescue equipment).

- 4.13 After initial rescue, triage, treatment and safety of personnel at the scene, response will include actions to prevent further damage and loss to property and the environment.
- 4.14 As appropriate to the Company's work assignment and as allowed by the host employer, the site supervisor and designated employees will take steps to avoid or minimize further damage and loss.
- 4.15 This may include contacting host employer maintenance, engineering and security personnel to evaluate the integrity and safety of buildings, structures, facilities, pipeline and process units.
- 4.16 If loss control involves the spill or release of hazardous chemicals, host employer Hazmat responders will be contacted immediately.
- 4.17 Company employees who have initial Hazwoper responsibilities will attempt containment and control of the release in accordance with pre-planning, individual qualifications and host employer procedures.
- 4.18 Preliminary identification, collection, preservation and security of evidence
- 4.19 The Company's site supervisor will conduct and direct the initial investigation.
- 4.20 The incident scene will be secured in accordance with Company and host employer procedures. Scene security will include keeping unauthorized persons out of the area so that scene situations are not disturbed.
- 4.21 This includes impounding and keeping machines, vehicles, equipment, tools, parts, wreckage and other aftermath intact, undisturbed and protected in anticipation of investigation.
- 4.22 Notes, photos, drawings, measurements, video and other recordings, witness identifications and statements, incident time, location, weather, environmental and other factors -- all such information, materials, records and documentations will be taken, protected and secured following an incident.
- 4.23 Witness statements and interviews, initial and follow-up, will be conducted in a timely manner. The interviewer will be trained in the methods, procedures and techniques for obtaining unbiased witness information.
- 4.24 Location of interviews and follow-up questioning will be similarly performed as needed.

5. Determination and Implementation of Corrective Actions

- 5.1 Investigation results will be considered using Root Cause Analysis (RCA) to determine specific corrections as required to prevent a reoccurrence.
- 5.2 Specific individuals will be assigned to take each corrective action. Each action will be tracked to completion with documentation.
- 5.3 A written report will be made based on the incident investigation. The report will include a completed Incident Investigation Form and Root Cause Analysis in the format as established by the Company.

- 5.4 The written report will include a detailed narrative that explains when, where, how and why the incident occurred; the names, statements and other information from or about persons involved; findings and recommendations.
- 5.5 The report will include the name and role of each investigating participant.
- 5.6 Witness statements, photos, videos, drawings, diagrams, reference and other support materials will be included as part of the report.
- 5.7 The report will be used to document and help communicate lessons learned from the incident, as well as corrections, changes and measures taken to prevent reoccurrence of a similar event.

Metro Electric Co., Inc.

Industrial Hygiene Program



Applicable OSHA Standards: Various standards relating to occupational chemical exposures

1. Role of Industrial Hygiene at Metro Electric Co., Inc.

- 1.1 For purposes of this program, the term industrial hygiene or occupational hygiene will mean the discipline of anticipating, recognizing, evaluating and controlling health hazards in the working environment, with the objective of protecting worker health and well-being and safeguarding the community at large.
- 1.2 The Occupational Safety and Health Administration (OSHA) has published and enforces a number of safety and health programs that establish requirements for employee exposures to specific chemicals in the workplace. Generally, compliance with OSHA requirements is determined by the on-site, scientific measurement of chemical exposures in a specific workplace or work location.
- 1.3 When it is necessary to establish occupational exposure levels of chemicals, dusts, fumes and vapors, the Company will utilize accepted industrial hygiene procedures, techniques and laboratory analysis methods. When such procedures, techniques and analysis methods are established or specified by OSHA, American Conference of Governmental Industrial Hygienists (ACGIH), American Industrial Hygiene Association (AIHA), these will be the standards utilized for industrial hygiene initiatives in the Company workplace.
- 1.4 When it is necessary to conduct industrial hygiene operations in the Company workplace, trained and qualified individuals will perform this work. Qualifications include certifications as a Certified Safety Professional (CSP) or Certified Industrial Hygienist (CIH), or a technician who is experienced and working under the direction of a CSP or CIH.
- 1.5 The CSP, CIH or technician may be involved with the assessment and control of chemical, physical or biological hazards in the workplace that could cause disease or discomfort. Physical hazards may include noise, temperature extremes, illumination extremes, ionizing or non-ionizing radiation, and ergonomics. Each of these specific hazards may require additional specialized experience and/or training for the individual performing this work. As part of this activity, the CSP, CIH or technician may be called upon to communicate effectively regarding hazard, risk, and appropriate protective procedures; to evaluate and occasionally to design or make recommendations regarding ventilation systems; and to manage people and programs for the preservation of health and well-being of those who enter the workplace.
- 1.6 This program will be followed whenever industrial hygiene operations are performed in the Company workplace, and whenever safety issues that have industrial hygiene components are addressed. This includes the determination of OSHA Action Levels and Permissible Exposure Limits (PEL) to chemicals, dusts and sound levels in a workplace or environment; and during considerations of Personal Protective Equipment (PPE) when PPE is designed and manufactured to protect employees within specific ranges of exposure.

2. Chemical Hygiene Plan

- 2.1 Where hazardous chemicals are used in the workplace or environment, the Company will develop and carry out the provisions of a chemical hygiene plan which is capable of:
 - 2.1.1 Protecting employees from health hazards associated with hazardous chemicals in that workplace or environment; and
 - 2.1.2 Keeping the exposures below the Action Level or PEL.
- 2.2 The Chemical Hygiene Plan must be readily accessible to employees.
- 2.3 The Chemical Hygiene Plan will include each of the following elements and will indicate specific measures that employees will take to ensure employee protection.
 - 2.3.1 Standard operating procedures relevant to safety and health;
 - 2.3.2 Criteria to be used to implement control measures to reduce employee exposure to hazardous chemicals;
 - 2.3.3 A requirement that ventilation systems, fume hoods and other protective equipment are functioning properly and methods to be taken to ensure proper and adequate performance (i.e. filter changes, preventive maintenance, periodic inspection and evaluation as required by Company, OSHA or manufacturer's instructions);
 - 2.3.4 Provisions for employee training and information;
 - 2.3.5 Circumstances requiring prior approval from the Company Safety Coordinator or designee before implementation;
 - 2.3.6 Provisions for medical consultation and examination as required;
 - 2.3.7 Designation of personnel responsible for implementation of the Chemical Hygiene Plan;
 - 2.3.8 Provisions for additional protection for employees working with particularly hazardous substances including:
 - 2.3.8.1 Chemicals identified by MSDS as being carcinogens
 - 2.3.8.2 Reproductive toxins
 - 2.3.8.3 Substances with a high degree of acute toxicity
 - 2.3.9 Specific consideration shall be given to the following provisions which shall be included where appropriate:
 - 2.3.9.1 Use of containment devices such as abrasive blasting enclosures, ventilation systems, fume hoods or glove boxes;

2.3.9.2 Procedures for safe removal of contaminated waste; and

2.3.9.3 Decontamination procedures.

2.3.10 The Company Safety Coordinator will ensure that the Chemical Hygiene Plan is reviewed and updated at least yearly, or when changes in the workplace require re-evaluation.

3. Employee Information and Training

3.1 The Company will provide employees with information and training to ensure that they are apprised of the hazards of chemicals in their work area.

3.2 Such information will be provided at the time of an employee's initial assignment to a work area where hazardous chemicals are present and prior to assignments involving new exposure situations.

3.3 This information will include:

3.3.1 The contents of this Industrial Hygiene Program and the Chemical Hygiene Plan

3.3.2 The location and availability of the Chemical Hygiene Plan

3.3.3 The PELs for OSHA regulated substances or recommended exposure limits for other hazardous chemicals where PELs do not exist

3.3.4 Signs and symptoms associated with exposures to the hazardous chemicals used in the workplace

3.3.5 The location and availability of known reference materials including MSDSs, but not limited to them

3.4 Training for employees shall include:

3.4.1 Methods and observations that may be used to detect the presence or release of a hazardous chemical;

3.4.2 The physical and health hazards of chemicals in the work area; and

3.4.3 Measures employees can use to protect themselves from these hazards, including specific procedures such as appropriate work practices, emergency procedures, and personal protective equipment to be used.

4. Medical Consultation and Medical Examinations

4.1 The Company will provide all employees who work with hazardous chemicals an opportunity to receive medical attention under the following circumstances:

4.1.1 When the employee develops signs and/or symptoms associated with a hazardous chemical to which the employee may have been exposed in the workplace;

- 4.1.2 When routine monitoring reveals an exposure above the PEL or Action Level;
 - 4.1.3 When an event takes place in the work area such as a spill or leak, explosion, or other occurrence resulting in the likelihood of a hazardous exposure; and
 - 4.1.4 When Company safety and health programs and/or OSHA or other regulatory requirements specify medical consultation and examinations relating to chemical or high noise exposures.
- 4.2 All medical examinations and consultations shall be performed by a licensed physician or under his/her direct supervision.

5. Hazard Recognition and Identification

- 5.1 With respect to labels and Material Safety Data Sheets, the Company's written Hazard Communication Program and OSHA requirements will be followed.
- 5.2 Spills and accidental releases of chemicals in the workplace will be addressed in accordance with the written Hazard Communication Program, other pertinent programs relating to the specific chemical or situation, OSHA and other pertinent regulatory requirements.

6. Use of Respirators

7. Where the use of respirators is required to maintain exposure below the PEL, the Company will provide the proper respirator equipment. Respirators will be selected and used in accordance with the Company's written Respiratory Protection Program and requirements of 29 CFR 1910.135.

8. Recordkeeping

- 8.1 The Company has established and maintains for each affected employee an accurate record of any measurements taken to monitor employee exposures and any medical consultation and examinations including tests or written opinions as required by Company safety and health programs and OSHA.

Metro Electric Co., Inc.

Injury & Illness Prevention Program



Applicable OSHA Standards: 29 CFR 1901.4(a); 1904.29(b)(3); 1904.32(b)(3); 1904.32(b)(5); 1904.32(b)(6); 1904.33(a); Cal-OSHA - TB CCR 3203.

1. Purpose

- 1.1 The Company has established, implemented and maintains this written Injury and Illness Prevention Program (IIPP).
- 1.2 A copy will be maintained at each work location or at a central work location if the work assignment does not involve multiple separate worksites.

2. Scope

- 2.1 This IIPP, supported by the Company's written safety and health programs, contains the following eight elements:
 - 2.1.1 Responsibility
 - 2.1.2 Compliance
 - 2.1.3 Communication
 - 2.1.4 Hazard Assessment
 - 2.1.5 Accident/Exposure Investigation
 - 2.1.6 Hazard Correction
 - 2.1.7 Training and Instruction
 - 2.1.8 Recordkeeping

3. Responsibilities

- 3.1 The Injury and Illness Prevention (IIPP) Program Administrator is the Company Safety Coordinator, or the Site Supervisor if this delegation has been made by the Safety Coordinator.
- 3.2 The designated Program Administrator has the authority and the responsibility for implementing and maintaining this IIP Program for the Company.
- 3.3 Managers and supervisors are responsible for implementing and maintaining the IIP Program in their work areas and for answering worker questions about the IIP Program. A copy of this IIP Program is available from each manager and supervisor.

4. Compliance

4.1 All workers, including managers and supervisors, are responsible for complying with safe and healthful work practices. The Company's system of ensuring that all workers comply with these practices includes one or more of the following checked practices:

4.1.1 Informing workers of the provisions of our IIP Program.

4.1.2 Evaluating the safety performance of all workers.

4.1.3 Recognizing employees who perform safe and healthful work practices.

4.1.4 Providing training to workers whose safety performance is deficient.

4.1.5 Disciplining workers for failure to comply with safe and healthful work practices.

4.2 All workers, including managers and supervisors, are responsible for complying with safe and healthful work practices. The Company's system of ensuring that all workers comply with these practices includes one or more of the following checked practices:

4.2.1 Informing workers of the provisions of our IIPP Program.

4.2.2 Evaluating the safety performance of all workers.

4.2.3 Recognizing employees who perform safe and healthful work practices.

4.2.4 Providing training to workers whose safety performance is deficient.

4.2.5 Disciplining workers for failure to comply with safe and healthful work practices.

5. Communication

5.1 All managers and supervisors are responsible for communicating with all workers about occupational safety and health in a form readily understandable by all workers.

5.2 The Company's communication system encourages all workers to inform their managers and supervisors about workplace hazards without fear of reprisal.

5.3 The communication system includes one or more of the following checked items:

5.3.1 New worker orientation including a discussion of safety and health policies and procedures.

5.3.2 Review of the Company's IIP Program.

5.3.3 Training programs.

5.3.4 Regularly scheduled safety meetings.

- 5.3.5 Posted or distributed safety information.
- 5.3.6 A system for workers to anonymously inform management about workplace hazards.
- 5.3.7 Methods for implementation include communicating with and instructing employees orally about general safe work practices and hazards unique to each employee's job assignment.

6. Hazard Assessment

- 6.1 Periodic inspections to identify and evaluate workplace hazards will be performed in accordance with the Company written Accident Prevention Plan. Inspections will be made by a competent observer in all areas of the workplace. This includes shop, warehouse, staging and office facilities; work locations at a host employer's facility; and separate work locations that are remote from Company facilities.
- 6.2 Periodic inspections are performed according to the following schedule:
 - 6.2.1 When the IIP Program was initially established;
 - 6.2.2 When new substances, processes, procedures or equipment which present potential new hazards are introduced into the Company workplace;
 - 6.2.3 When new, previously unidentified hazards are recognized;
 - 6.2.4 When occupational injuries and illnesses occur; and
 - 6.2.5 Whenever workplace conditions warrant an inspection.

7. Accident/Exposure Investigations

- 7.1 Procedures for investigating workplace accidents and hazardous substance exposures are explained in the Company's written Accident Prevention Plan. They include:
 - 7.1.1 Interviewing injured workers and witnesses;
 - 7.1.2 Examining the workplace for factors associated with the accident/exposure;
 - 7.1.3 Determining the cause of the accident/exposure;
 - 7.1.4 Taking corrective action to prevent the accident/exposure from reoccurring; and
 - 7.1.5 Recording the findings and actions taken.

8. Hazard Correction

- 8.1 Unsafe or unhealthy work conditions, practices or procedures will be corrected in a timely manner based on the severity of the hazards.

8.2 Hazards shall be corrected according to the following procedures:

8.2.1 When observed or discovered; and

8.2.2 When an imminent hazard exists which cannot be immediately abated without endangering employee(s) and/or property, we will remove all exposed workers from the area except those necessary to correct the existing condition. Workers who are required to correct the hazardous condition shall be provided with the necessary protection.

9. **Training and Instruction**

9.1 All workers, including managers and supervisors, shall have training and instruction on general and job-specific safety and health practices. Training and instruction is provided:

9.1.1 When the IIP Program is first established;

9.1.2 To all new workers, except for construction workers who are provided training through a construction industry occupational safety and health training program.

9.1.3 To all workers given new job assignments for which training has not previously provided;

9.1.4 Whenever new substances, processes, procedures or equipment are introduced to the workplace and represent a new hazard;

9.1.5 Whenever the employer is made aware of a new or previously unrecognized hazard;

9.1.6 To supervisors to familiarize them with the safety and health hazards to which workers under their immediate direction and control may be exposed; and

9.1.7 To all workers with respect to hazards specific to each employee's job assignment.

9.2 General workplace safety and health practices include, but are not limited to, the following:

9.2.1 Implementation and maintenance of the IIP Program.

9.2.2 Emergency action and fire prevention plan.

9.2.3 Provisions for medical services and first aid including emergency procedures.

9.2.4 Prevention of musculoskeletal disorders, including proper lifting techniques.

9.2.5 Proper housekeeping, such as keeping stairways and aisles clear, work areas neat and orderly, and promptly cleaning up spills.

9.2.6 Prohibiting horseplay, scuffling, or other acts that tends to adversely influence safety.

- 9.2.7 Proper storage to prevent stacking goods in an unstable manner and storing goods against doors, exits, fire extinguishing equipment and electrical panels.
- 9.2.8 Proper reporting of hazards and accidents to supervisors.
- 9.2.9 Hazard communication, including worker awareness of potential chemical hazards, and proper labeling of containers.
- 9.2.10 Proper storage and handling of toxic and hazardous substances including prohibiting eating or storing food and beverages in areas where they can become contaminated.

10. Recordkeeping

- 10.1 Recordkeeping relating to safety policies, procedures, compliance, results, hazard assessments, inspections and other accident and injury prevention activities will be maintained in accordance with the Company's written Accident Prevention Plan.
 - 10.1.1 Records of hazard assessment inspections, including the person(s) conducting the inspection, any unsafe conditions and work practices that have been identified and the action taken to correct the identified unsafe conditions and work practices, are recorded on a hazard assessment and correction form in accordance with Company procedures; and
 - 10.1.2 Documentation of safety and health training for each worker (including the worker's name or other identifier, training dates, type(s) of training, and training providers) are recorded on a worker training and instruction form in accordance with Company procedures.
- 10.2 Inspection records and training documentation will be maintained in accordance with the Company's written Accident Prevention Plan and Company Human Resources policies and procedures.
- 10.3 You must enter each recordable injury or illness on the OSHA 300 Log and 301 Incident Report within seven (7) calendar days of receiving information that a recordable injury or illness has occurred.
- 10.4 A company executive must certify that he or she has examined the OSHA 300 Log and that he or she reasonably believes, based on his or her knowledge of the process by which the information was recorded, that the annual summary is correct and complete. The company executive who certifies the log must be one of the following persons: An owner of the company (only if the company is a sole proprietorship or partnership); An officer of the corporation; The highest ranking company official working at the establishment; or The immediate supervisor of the highest ranking company official working at the establishment.
- 10.5 How do I post the annual summary? You must post a copy of the annual summary in each establishment in a conspicuous place or places where notices to employees are customarily posted. You must ensure that the posted annual summary is not altered, defaced or covered by other material.

- 10.6 When do I have to post the annual summary? You must post the summary no later than February 1 of the year following the year covered by the records and keep the posting in place until April 30.
- 10.7 You must save the OSHA 300 Log, the privacy case list (if one exists), the annual summary, and the OSHA 301 Incident Report forms for five (5) years following the end of the calendar year that these records cover.

11. General Safety and Safe Work Procedures

- 11.1 Site-specific and Company-wide safe work procedures are explained in detail in the Company's written safety and health programs.
- 11.2 These programs are the basis for the Company's accident and injury prevention activities; compliance with in-house and regulatory occupational safety and health requirements; and as the primary plan and reference, for management and employees, to accomplish the goals stated in the Company's Master Safety Plan.

Metro Electric Co., Inc.

Job Competency



Applicable Standards: Owner Requirement

1. Purpose

- 1.1 This program establishes a system for Metro Electric Co., Inc. to evaluate, document, track and maintain current statuses of individual employee job competency.
- 1.2 This program also establishes responsibilities for management, supervisors and employees for development, implementation and maintenance of Job Competency program components.

2. Scope

- 2.1 Each new, promoted, reassigned or transfer-affected employee whose employment assignments require job competency evaluation, including operator qualification, competent person and other areas of individual capability assessment, will comply with requirements of this program.

3. Components, Methods & Responsibilities

- 3.1 The Company has created job titles and job descriptions for individual work assignments of employees.
- 3.2 Job titles and job descriptions will be used ensure that individual employees have documented qualifications, competencies, certifications and experience as required to perform specific types of work.
- 3.3 Records of designations of job titles and job descriptions to individual employees will be maintained in a spreadsheet, database, organizational chart or list.
- 3.4 Minimum requirements for qualification, competency, certification and/or experience will be specified for each job title and job description.
- 3.5 The information described above will be entered only after the individual employee's qualifications, competencies, certifications and experience as required to perform specific types of work have been confirmed and documented in Company files.
- 3.6 Obtaining required job competency information from employees and other sources will be coordinated by the Human Resources Department in cooperation with affected Supervisors, the Safety Coordinator, project planning personnel and whoever else may be involved in making individual work assignments.

Other sources of job competency information may include third-party database agencies as specified and accepted by the host employer, as well as qualified training providers and authorized operator qualification evaluators.

- 3.7 Individual job competency will be evaluated and approved by one or more competent persons designated by the Company prior to a work assignment and allowing the employee to perform this work.
- 3.8 Competency training for specific job titles, job descriptions and work assignments will be provided by the Company as part of new hire, task-specific, project-specific and other orientations, and in addition to other standards established by this program.
- 3.9 Job competency files will be maintained by the Human Resources Department at the Company's main office.
- 3.10 Employees authorized by the Company will have access to job competency information as needed to pre-plan and make appropriate work assignments for individual employees.

Metro Electric Co., Inc. Ladder Safety Program



Applicable OSHA Standards: 29 CFR 1926.1053 Ladders.

1. Purpose

- 1.1 The purpose of this policy is to outline prevention and protective measures which should be taken by Metro Electric Co., Inc. site management and subcontractor personnel on a project location to ensure the safe use of ladders. This safety policy addresses self-supporting portable ladders, extension ladders and job-built ladders.

2. Scope

- 2.1 This program applies to all Company-controlled project locations and subcontractor job sites where workers utilize ladders in the course and scope of their work. Subcontractors have primary responsibility for compliance with these safety standards and project workplace requirements.

3. Required Training For Use Of Ladders

- 3.1 Metro Electric Co., Inc. will provide training about the safe use of ladders to Employees who will use ladders while working at the project location. Such training will be given before an Employee is assigned to work that involves use of a ladder.
- 3.2 Subcontractors performing work on a Metro Electric Co., Inc. project location will provide training about the safe use of ladders to subcontractor personnel who will use ladders in the course and scope of their work. Such training will be given before subcontractor personnel are assigned to work that involves use of a ladder.
- 3.3 Ladder safety training will enable each worker to recognize hazards related to ladders and explain mandatory safe work procedures that will minimize these hazards.
- 3.4 Ladder safety training will be presented by a competent person and include the following specific components:
 - 3.4.1 The nature of ladder fall hazards in the work area.
 - 3.4.2 The proper construction, use, placement and care in handling ladders.
 - 3.4.3 The maximum intended load-carrying capacities of ladders.

4. Safe Work Procedures For Using Ladders

- 4.1 Do not load any ladder beyond the maximum intended load for which it was built, nor beyond the manufacturer's rated capacity. All ladders, including job made ladders, will be capable of supporting at least four times the maximum intended load.

- 4.2 Use ladders only for the purpose for which they were designed.
- 4.3 A competent person must inspect all ladders for visible defects regularly and after any occurrence that could affect safe use.
- 4.4 Ladders on the project location will be maintained in good and safe condition.
- 4.5 Rungs, cleats and steps on ladders will be level and parallel. They also should be spaced apart uniformly to prevent a potential trip hazard.
- 4.6 Keep ladders clean and free of oil, grease and other slipping hazards.
- 4.7 Workers will inspect the ladder for safety before using it. If it is found to have a safety defect, the ladder will not be used. Additionally, it will be removed from service immediately and prominently marked "Do Not Use."
- 4.8 Never tie or fasten ladders together to provide longer sections unless the ladder is specifically designed for such use.
- 4.9 Each step ladder will have a metal spreader or locking device to hold the front and back sections in an open position during use.
- 4.10 The surface of ladders will be coated or maintained to prevent injury from punctures or lacerations, and to prevent snagging of clothing.
- 4.11 Do not paint or coat wood ladders with any opaque covering that could hide damage or defects.
- 4.12 Identification or warning labels will be placed only on the face of a side rail.
- 4.13 Use portable extension ladders at an angle where the horizontal distance from the top support to the foot of the ladder is $\frac{1}{4}$ of the working length of the ladder. As an example, the base of a 20-ft. ladder should be 5 ft from the structure.
- 4.14 Wood, job-made ladders with spliced side rails will be used at an angle where the horizontal distance is $\frac{1}{4}$ the working length of the ladder.
- 4.15 Portable ladder side rails must extend at least 3 feet above the surface when used to access to an upper landing.
- 4.16 When such an extension is not possible, because of ladder length, secure the ladder at the top.
- 4.17 Only use ladders on stable, level surfaces and secured to prevent traffic away from the ladder.
- 4.18 Never use ladders on slippery surfaces unless secured at the top and bottom.
- 4.19 When a ladder is used in a place where it could be struck by traffic or workplace activities, the ladder will be secured to prevent accidental displacement, or a barricade will be used to keep activities or traffic away from the ladder.

- 4.20 Keep the area around the top and bottom of ladders clear.
- 4.21 Place the top of a portable extension ladder so that the two rails are supported equally.
- 4.22 Never move, shift or extend a ladder while someone is on it.
- 4.23 When the worker or the ladder could have contact with exposed energized electrical equipment, use only a ladder that has non-conductive side rails.
- 4.24 Never use, stand or sit on the top step of a ladder.
- 4.25 Never use single-rail ladders.
- 4.26 Always face the ladder when ascending or descending and keep your belt buckle between both side rails as an easy way to ensure a safe center of gravity.
- 4.27 Maintain three-point contact while using a ladder. This requires the use of at least one hand when moving up or down.
- 4.28 Workers will not carry tools, objects or loads that could cause them to lose balance and fall.
- 4.29 When it is necessary to raise or lower tools, objects or loads from one level to the next, workers will use a rope or some other safe lifting method that does not involve carrying the load while going up or down the ladder.

Metro Electric Co., Inc.

Lead Safety



Applicable OSHA Standards: 29 CFR 1910.1025 and 1926.62

1. Purpose and Scope

- 1.1 The purpose of this program is to minimize the lead and respirable dust exposure potentials of personnel performing abrasive blasting, welding, cutting, brazing or other work on painted or primed material.
- 1.2 This program applies to all of work locations under the control of Metro Electric where an employee or subcontract personnel may be occupationally exposed to lead. Work activities covered include but are not limited to the following:
 - 1.2.1 Demolition or salvage of structures where lead or materials containing lead is present;
 - 1.2.2 Removal or encapsulation of materials containing lead;
 - 1.2.3 New construction, alteration, repair, or renovation of structures, substrates, or portions thereof, that contain lead, or materials containing lead;
 - 1.2.4 Installation of products containing lead;
 - 1.2.5 Lead contamination emergency cleanup;
 - 1.2.6 Transportation, disposal, storage, or containment of lead or materials containing lead on the site or location at which construction activities are performed, and
 - 1.2.7 Maintenance operations associated with removal or work involving lead-containing materials.

2. Definitions

- 2.1 *Action level* means employee exposure, without regard to the use of respirators, to an airborne concentration of lead of 30 micrograms per cubic meter of air (30 ug/m^3 calculated as an 8-hour time-weighted average (TWA)).
- 2.2 *Competent person* means one who is capable of identifying existing and predictable lead hazards in the surroundings or working conditions and who has authorization to take prompt corrective measures to eliminate them.
- 2.3 *Lead* means metallic lead, all inorganic lead compounds, and organic lead soaps. Excluded from this definition are all other organic lead compounds.

3. Responsibilities

- 3.1 The site supervisor will ensure that these procedures are followed by employees performing the work. This individual will ensure that personal protective equipment (PPE) requirements outlined in this plan are followed pertinent to the job at hand.
- 3.2 The site supervisor will be trained regarding lead safety, and will be responsible for assuring that employees have been trained in accordance with this program and are capable of properly implementing lead safety work procedures.

4. Permissible Exposure Limit

- 4.1 No Company employee will be exposed to lead at concentrations greater than 50 micrograms per cubic meter of air (50 ug/m^3) averaged over an 8-hour work period.
- 4.2 In the event that an employee is exposed to lead for longer than 8 hours in any shift or work period, the permissible exposure limit (PEL), as a time weighted average (TWA) for the shift or work period, will be reduced using the following formula: $\text{Maximum PEL (in ug/m}^3\text{)} = 400$ divided by hours worked in the day.
- 4.3 A respirator will be used during installation or implementation of engineering or work practice controls and where engineering and work practice controls are inadequate.
- 4.4 A respirator also will be used in emergency situations.
- 4.5 If respirators are used, employee exposure will be considered to be at the level provided by the respirator's rated protection factor for periods when the respirator is worn. Periods may be averaged with exposure levels during periods when respirators are not worn to determine the employee's daily TWA exposure.

5. Monitoring

- 5.1 Initial monitoring and exposure determination will be made for any work location or operation where there is indication of employee exposure to lead. Monitoring will determine if any employee may be exposed to lead at or above the action level.
- 5.2 Method(s) of monitoring and laboratory analysis will have an accuracy (to a confidence level of 95%) of not less than plus or minus 20 percent for airborne concentrations of lead equal to or greater than 30 ug/m^3 .
- 5.3 Initial determinations will be based on any of the following considerations:
 - 5.3.1 Any information, observations, or calculations that indicate employee exposure to lead;
 - 5.3.2 Any previous measurements of airborne lead; and
 - 5.3.3 Any employee complaints of symptoms associated with exposure to lead.

- 5.4 Monitoring to make an initial determination may be limited to a representative sample of exposed employees who can be reasonably expected to have the greatest exposure to airborne lead in the work area.
- 5.5 Monitoring results obtained in the previous 12 months may be used to satisfy the monitoring requirement so long as sampling and analytical methods meet OSHA accuracy and confidence requirements.
- 5.6 When making determinations based on monitoring, employee use of a respirator will not be considered.
- 5.7 If initial determination shows that no employee is exposed to airborne concentrations of lead at or above the action level, this will be documented in writing, reporting date of determination; location within the work area; and the name and social security number of each employee monitored.
- 5.8 Except when making an initial determination, monitoring performed will involve collecting personal samples during a full shift (for at least 7 continuous hours), with at least one sample collected for each shift, for each job classification in each work area.
- 5.9 Full shift personal samples will be representative of employee's regular, daily exposure to lead.
- 5.10 When monitoring indicates the possibility that any employee is exposed to lead at or above the action level, additional monitoring will be performed to determine the lead exposure for each employee in the work area.
- 5.11 If initial monitoring reveals employee exposure to be below the action level, additional sampling will not be required unless there is a change in the work or production process, exposure controls being utilized, personnel or other change that could introduce new or additional lead exposure.
- 5.12 If initial determination or subsequent monitoring shows employee exposure to be at or above the action level, but below the PEL, monitoring will be repeated at least every 6 months. This schedule will continue until at least two consecutive measurements, taken at least 7 days apart, are below the action level.
- 5.13 If initial monitoring shows employee exposure that is above the PEL, monitoring will be repeated each quarter thereafter. Quarterly monitoring will continue until at least two consecutive measurements, taken at least 7 days apart, are below the PEL. However, if monitoring results show exposure above the action level, monitoring will be repeated every 6 months.
- 5.14 Affected employees will be notified about monitoring results within 15 working days after the receipt of the results. This may be done either by written notice to each individual, or by posting results in a prominent location accessible to affected employees.
- 5.15 When results show representative employee exposure that exceeds the PEL (without regard to use of respirators), this information will be included in the written notice or posting, as well as a description of corrective action(s) that have been or will be taken to reduce exposure to or below the PEL.

6. Compliance Methods

- 6.1 Engineering, work practice and administrative controls will be utilized to reduce and maintain employee exposure to lead that is at or below the PEL when the PEL is exceeded for more than 30 days per year.
- 6.2 In the event that engineering and work practice controls are demonstrated to be either unfeasible or ineffective in reducing employee exposure to or below the PEL, they will be utilized anyway to lower exposures to the lowest feasible level, and will be supplemented by the use of respiratory protection.
- 6.3 Where employee exposure is above the PEL but for 30 days or less each year, engineering controls will be utilized to reduce exposures to 200 ug/m³, but thereafter may use a combination of engineering, work practice, administrative controls and respiratory protection lower and maintain employee lead exposure to or below 50 ug/m³.
- 6.4 In the event that engineering and work practice controls do not reduce employee lead exposure to or below the PEL, these controls will be supplemented by use of respirators.
- 6.5 Any use of respirators will be in compliance with the Company's written *Respiratory Protection Program*.

7. General Requirements

- 7.1 When lead exposure at a work location exceeds the OSHA PEL, the site supervisor will establish and implement a written compliance program to reduce exposures to or below the PEL. This will be done by means of engineering, work practice and administrative controls, with respiratory protection utilized only when the other controls are either not feasible or ineffective.
- 7.2 Written compliance plans will include at least the following:
 - 7.2.1 Description of each operation that presents a lead exposure -- machinery used, material processed, controls in place, size or work crew, individual job responsibilities, operating procedures and maintenance practices;
 - 7.2.2 Description of specific methods used for compliance, including any engineering plans and studies used to determine exposure control methods;
 - 7.2.3 Explanation of the technology being considered to meet the PEL;
 - 7.2.4 Monitoring data to document lead sources;
 - 7.2.5 Schedule for program implementation, including items such as copies of purchase orders for equipment, construction contracts, etc.;
 - 7.2.6 Safe work practices for use of PPE and protective clothing, housekeeping and hygiene facilities;

- 7.2.7 Explanation of any administrative control schedule if such is utilized as a control; and
- 7.2.8 Other pertinent information.
- 7.3 When air from exhaust ventilation is re-circulated into the work area, the following requirements apply:
 - 7.3.1 The ventilation system will have a high efficiency filter with reliable back-up filter; and
 - 7.3.2 Controls will be installed, used and maintained to monitor the concentration of lead in the return air and to bypass the recirculation system automatically if it fails.
- 7.4 If administrative controls are used as a way to reduce employee TWA lead exposure, a job rotation schedule will be used that includes:
 - 7.4.1 Name or identification method of each affected employee;
 - 7.4.2 Duration and levels of exposure at each affected employee's work area; and
 - 7.4.3 Other relevant information that will help to evaluate the effectiveness of administrative controls.

8. Respiratory Protection

- 8.1 The Company will provide respirators to affected employees for the following work situations. Employees will use respirators:
 - 8.1.1 When installing or implementing engineering or work-practice controls;
 - 8.1.2 For work when engineering and work-practice controls are not sufficient to reduce employee lead exposures to or below the PEL; and
 - 8.1.3 Whenever an employee requests a respirator.
- 8.2 All use of respiratory protection will be in accordance with the Company's written *Respiratory Protection Program*.
- 8.3 Respiratory protection, associated medical examinations, fit testing and training will be provided without cost to affected employees.
- 8.4 Employees will be provided to with full face piece respirators instead of half mask respirators for protection against lead aerosols that cause eye or skin irritations.
- 8.5 HEPA filters will be utilized for powered and non-powered air-purifying respirators.
- 8.6 Employees who choose to use a powered air-purifying respirator (PAPR) instead of a negative pressure respirator will be provided with a PAPR so long as it gives adequate protection.

9. Protective Clothing and PPE

- 9.1 If an employee is exposed to lead above the PEL and there is the possibility of skin or eye irritation, he or she will be provided with appropriate personal protective equipment (PPE) and protective clothing. This is without regard to use of a respirator.
- 9.2 PPE will be provided at no cost to affected employees.
- 9.3 Employees will use appropriate PPE and protective work clothing, which may include but is not limited to:
 - 9.3.1 Coveralls or similar full-body work clothing;
 - 9.3.2 Gloves, hats, and shoes or disposable shoe coverlets; and
 - 9.3.3 Face shields, vented goggles or other appropriate protective equipment.
- 9.4 Required protective clothing will be provided to affected employees at least weekly in a clean and dry condition, and daily to employees whose lead exposure levels (without regard to use of a respirator) are over 200 ug/m³ during an 8-hour TWA.
- 9.5 Affected employees issued protective clothing and equipment also will be provided with cleaning, laundering or disposal of such as required.
- 9.6 The site supervisor will ensure that protective clothing and equipment is repaired or replaced as needed to maintain effectiveness.
- 9.7 Protective clothing will be removed at the end of a work shift only in change rooms provided for this purpose.
- 9.8 Contaminated protective clothing to be cleaned, laundered or disposed of will be placed in a closed container in the change-room to prevent dispersion of lead outside the container.
- 9.9 Any person or service provider that cleans or launders protective clothing or equipment will be notified in writing by the Company about the potentially harmful effects of lead exposure.
- 9.10 Containers of contaminated protective clothing and equipment will be labeled with the warning: *CAUTION: CLOTHING CONTAMINATED WITH LEAD. DO NOT REMOVE DUST BY BLOWING OR SHAKING. DISPOSE OF LEAD CONTAMINATED WASH WATER IN ACCORDANCE WITH APPLICABLE LOCAL, STATE, OR FEDERAL REGULATIONS.*
- 9.11 Removal of lead from protective clothing or equipment by blowing, shaking or any other method that could disperse lead into the air is prohibited.

10. Housekeeping in Lead Exposure Work Areas

- 10.1 Surfaces in the work area will be maintained as free as practicable of lead accumulations.
- 10.2 Do not use compressed air to clean floors and other surfaces where lead accumulates.

- 10.3 Shoveling, brushing, dry or wet sweeping will be used for cleaning only where vacuuming or other equally effective methods have been tried and found not to be effective.
- 10.4 When vacuuming is used for cleaning, this equipment will be used and emptied in a way that minimizes the reentry of lead into the work area.

11. Hygiene Facilities and Work Practices

- 11.1 In work areas where employees are exposed to lead above the PEL (whether or not respirators are used), the presence or consumption of food, beverages and tobacco products are prohibited. Additionally, application of cosmetics is prohibited unless this is done in a change rooms, lunch rooms or shower facility.
- 11.2 Employees who are exposed to lead above the PEL will be provided with clean change rooms (without regard to the use of respirators).
- 11.3 To prevent cross contamination, change rooms will be equipped with separate storage facilities for street clothing and protective work clothing/equipment.
- 11.4 Employees who are exposed to lead above the PEL (without regard to the use of respirators) will shower at the end of their work shift. Proper shower facilities will be provided by the Company.
- 11.5 Employees who are required to shower because of lead exposure will not leave the workplace wearing any work clothing or equipment worn during work.
- 11.6 Sanitary lunchroom facilities will be provided for employees who work in areas where exposure to airborne lead is above the PEL. These facilities will be readily available to affected employees and provided without regard to use of respirators.
- 11.7 Lunchrooms will have a temperature controlled, positive pressure, filtered air supply.
- 11.8 Employees who work in areas where their airborne exposure to lead is above the PEL will wash their hands and face prior to eating, drinking, smoking, using tobacco products or applying cosmetics. This is required regardless to the use of respirators.
- 11.9 Employees will not enter lunchroom facilities while wearing protective work clothing or equipment unless surface lead dust has been removed by vacuuming or use of a down draft booth or other cleaning method that does not disperse lead into the air.
- 11.10 The Company will provide an adequate number of lavatory facilities for hand and face washing.

12. Medical Surveillance

- 12.1 The Company will establish a medical surveillance program for employees who are or may be exposed to lead above the action level for more than 30 days per year.
- 12.2 All medical examinations and procedures will be performed by, or under the supervision of, a licensed physician.

- 12.3 The Company will provide required medical surveillance procedures, including multiple physician review, without cost to employees and at a reasonable time and place.
- 12.4 The Company will make available to each affected employee biological monitoring (blood lead and ZPP level sampling and analysis) by providing blood sampling and analysis for lead and zinc protoporphyrin levels in accordance with Company safety and health procedures and OSHA requirements.
- 12.5 Biological monitoring will be performed on the following schedule:
 - 12.5.1 At least every 6 months for each covered employee;
 - 12.5.2 At least every two months for each employee whose last blood sampling and analysis indicated a blood lead level at or above 40 ug/100 g of whole blood. (This frequency will continue until two consecutive blood samples and analyses indicate a blood lead level below 40 ug/100 g of whole blood); and
 - 12.5.3 At least monthly during the removal period of each employee removed from exposure to lead due to an elevated blood lead level.
- 12.6 Follow-up blood sampling tests will be conducted whenever the results of a blood lead level test indicate that an employee's blood lead level exceeds the numerical criterion for medical removal. The Company will provide a second (follow-up) blood sampling test within two weeks after receiving results of the first blood sampling test.
- 12.7 Blood lead level sampling and analysis will have accuracy (to a confidence level of 95 percent) within plus or minus 15 percent or 6 ug/100 ml, whichever is greater. Analysis will be performed by a laboratory licensed by the Center for Disease Control, United States Department of Health, Education and Welfare (CDC) or which has received a satisfactory grade in blood lead proficiency testing from CDC in the prior 12 months.
- 12.8 Employees will be notified in writing within five working days after the receipt of biological monitoring results that report blood lead level exceeds 40 ug/100 g:
 - 12.8.1 About the employee's blood lead level; and
 - 12.8.2 About requirements of the standard for temporary medical removal with Medical Removal Protection benefits when an employee's blood lead level exceeds the numerical criterion for medical removal.

13. Medical Examinations and Consultations

- 13.1 The Company will make available medical examinations and consultations to each affected employee on the following schedule:
 - 13.1.1 At least annually for each employee whose blood sampling conducted at any time during the preceding 12 months indicated a blood lead level at or above 40 ug/100 g;
 - 13.1.2 Prior to first-time assignment to an area in which airborne concentrations of lead are at or above the action level;

- 13.1.3 As soon as possible when an employee reports signs or symptoms commonly associated with lead intoxication; when the employee requests medical advice concerning the effects of current or past exposure to lead regarding his or her ability to procreate a healthy child; or when the employee has difficulty breathing during a respirator fit test or during use of a respirator; and
 - 13.1.4 When it is medically appropriate for each employee to be either removed from exposure to lead due to a risk of sustaining material impairment to health, or to be placed under work restrictions pending a final medical determination.
- 13.2 Medical examinations relating to lead safety compliance will include the following components:
- 13.2.1 Detailed work history and medical history, with particular attention to past lead exposure (occupational and non-occupational), personal habits (smoking, hygiene), and past gastrointestinal, hematologic, renal, cardiovascular, reproductive and neurological problems;
 - 13.2.2 A thorough physical examination, with particular attention to teeth, gums, hematologic, gastrointestinal, renal, cardiovascular, and neurological systems. Pulmonary status should be evaluated if respiratory protection will be used;
 - 13.2.3 Measurement of blood pressure;
 - 13.2.4 Obtaining a blood sample and analysis which determines:
 - 13.2.4.1 Blood lead level;
 - 13.2.4.2 Hemoglobin and hematocrit determinations, red cell indices, and examination of peripheral smear morphology;
 - 13.2.4.3 Zinc protoporphyrin;
 - 13.2.4.4 Blood urea nitrogen and serum creatinine;
 - 13.2.4.5 Routine urinalysis with microscopic examination; and
 - 13.2.4.6 Any laboratory or other test which the examining physician deems necessary.
- 13.3 Content of medical examinations relating to this program will be determined by an examining physician and, if requested by an employee, will include pregnancy testing or laboratory evaluation of male fertility.
- 13.4 If the Company selects the initial physician who conducts any medical examination or consultation provided to an employee under this section, the employee may designate a second physician:
- 13.4.1 To review any findings, determinations or recommendations of the initial physician; and

- 13.4.2 To conduct such examinations, consultations, and laboratory tests as the second physician deems necessary.
- 13.5 The Company will promptly notify an employee of the right to seek a second medical opinion after each occasion when an initial physician conducts a medical examination or consultation.
- 13.6 The Company may condition its participation in, and payment for, the multiple physician review mechanism upon the employee doing the following within fifteen (15) days after receipt of notification, or receipt of the initial physician's written opinion, whichever is later:
 - 13.6.1 The employee informing the Company that he or she intends to seek a second medical opinion, and
 - 13.6.2 The employee making an appointment with a second physician.
- 13.7 If findings, determinations or recommendations of the second physician differ from those of the initial physician, then the Company and the employee will assure that efforts are made for the two physicians to resolve any disagreement.
- 13.8 If the two physicians have been unable to quickly resolve their disagreement, then the Company and the employee -- through their respective physicians -- will designate a third physician to:
 - 13.8.1 To review any findings, determinations or recommendations of the prior physicians; and
 - 13.8.2 To conduct such examinations, consultations, laboratory tests and discussions with the prior physicians as the third physician deems necessary to resolve the disagreement of the prior physicians.
 - 13.8.3 The Company will take action based on findings, determinations and recommendations of the third physician, unless the Company and the employee reach agreement that is otherwise consistent with recommendations of at least one of the three physicians.
 - 13.8.4 The Company will provide an the following information to the initial physician conducting a medical examination or consultation:
 - 13.8.4.1 A copy of the OSHA regulation for lead, including all Appendices;
 - 13.8.4.2 A description of the affected employee's duties as they relate to the employee's exposure;
 - 13.8.4.3 The employee's exposure level or anticipated exposure level to lead and to any other toxic substance (if applicable);
 - 13.8.4.4 A description of any personal protective equipment used or to be used;
 - 13.8.4.5 Prior blood lead determinations; and

- 13.8.4.6 All prior written medical opinions concerning the employee in the Company's possession or control.
- 13.8.5 The Company will provide the information specified above to a second or third physician conducting a medical examination or consultation under this program upon request either by the second or third physician, or by the employee.
- 13.8.6 The Company will obtain and furnish the employee with a copy of a written medical opinion from each examining or consulting physician which contains the following information:
 - 13.8.6.1 The physician's opinion as to whether the employee has any detected medical condition which would place the employee at increased risk of material impairment of the employee's health from exposure to lead;
 - 13.8.6.2 Any recommended special protective measures to be provided to the employee, or limitations to be placed upon the employee's exposure to lead;
 - 13.8.6.3 Any recommended limitation upon the employee's use of respirators, including a determination of whether the employee can wear a powered air purifying respirator if a physician determines that the employee cannot wear a negative pressure respirator; and
 - 13.8.6.4 The results of the blood lead determinations.
- 13.8.7 The Company will instruct each examining and consulting physician to:
 - 13.8.7.1 Not reveal either in the written opinion, or in any other means of communication with the Company, findings, including laboratory results, or diagnoses unrelated to an employee's occupational exposure to lead; and
 - 13.8.7.2 Advise the employee of any medical condition, occupational or non-occupational, which dictates further medical examination or treatment.
- 13.8.8 The Company and an employee or authorized employee representative may agree upon the use of any expeditious alternate physician determination mechanism instead of the multiple physician review mechanism so long as the alternate mechanism otherwise satisfies program and OSHA requirements.
- 13.8.9 Affected employees will not engage in prophylactic chelation as a way to show reduced levels of lead in the blood. Chelation is a therapeutic practice whereby chelating agents such as EDTA (ethylenediamine tetracetate) are administered to reduce blood lead levels in an exposed individual.
- 13.8.10 If therapeutic or diagnostic chelation is to be performed on an affected employee, the Company will assure that it be done under the supervision of a licensed physician in a clinical setting with thorough and appropriate medical monitoring, and that the employee is notified in writing prior to its occurrence.

14. Medical Removal Protection

- 14.1 The Company will remove an employee from work having an exposure to lead at or above the action level on each occasion that a periodic and a follow-up blood sampling test conducted pursuant to this section indicate that the employee's blood lead level is at or above 60 ug/100 g of whole blood; and
- 14.2 The Company will remove an employee from work having an exposure to lead at or above the action level on each occasion that the average of the last three blood sampling tests conducted pursuant to this section (or the average of all blood sampling tests conducted over the previous six (6) months, whichever is longer) indicates that the employee's blood lead level is at or above 50 ug/100 g of whole blood; provided, however, that an employee need not be removed if the last blood sampling test indicates a blood lead level at or below 40 ug/100 g of whole blood.
- 14.3 The Company will remove an employee from work having an exposure to lead at or above the action level on each occasion that a final medical determination results in a medical finding, determination, or opinion that the employee has a detected medical condition which places the employee at increased risk of material impairment to health from exposure to lead.
- 14.4 For purposes of this program, "final medical determination" will mean the outcome of the multiple physician review mechanism or alternate medical determination mechanism used pursuant to the medical surveillance provisions of this section.
- 14.5 Where a final medical determination results in any recommended special protective measures for an employee, or limitations on an employee's exposure to lead, the Company will implement and act in accordance with the recommendation.
- 14.6 The Company will return an employee to his or her former job status:
 - 14.6.1 For an employee removed due to a blood lead level at or above 60 ug/100 g, or due to an average blood lead level at or above 50 ug/100 g, when two consecutive blood sampling tests indicate that the employee's blood lead level is at or below 40 ug/100 g of whole blood;
 - 14.6.2 For an employee removed due to a final medical determination, when a subsequent final medical determination results in a medical finding, determination, or opinion that the employee no longer has a detected medical condition which places the employee at increased risk of material impairment to health from exposure to lead.
- 14.7 For the purposes of this program, the Company's requirement to return an employee to his or her former job status is not intended to expand upon or restrict any rights an employee has or would have had, absent temporary medical removal, to a specific job classification or position under the terms of a collective bargaining agreement.
- 14.8 The Company will remove any limitations placed on an employee or end any special protective measures provided to an employee pursuant to a final medical determination when a subsequent final medical determination indicates that the limitations or special protective measures are no longer necessary.

14.9 Where the multiple physician review mechanism, or alternate medical determination mechanism used pursuant to the medical surveillance provisions of this section, has not yet resulted in a final medical determination with respect to an employee, the Company will act as follows:

14.9.1 The Company may remove the employee from exposure to lead, provide special protective measures to the employee, or place limitations upon the employee, consistent with the medical findings, determinations, or recommendations of any of the physicians who have reviewed the employee's health status.

14.9.2 The Company may return the employee to his or her former job status, end any special protective measures provided to the employee, and remove any limitations placed upon the employee, consistent with the medical findings, determinations, or recommendations of any of the physicians who have reviewed the employee's health status, with two exceptions:

14.9.2.1 If the initial removal, special protection, or limitation of the employee resulted from a final medical determination which differed from the findings, determinations, or recommendations of the initial physician or

14.9.2.2 If the employee has been on removal status for the preceding eighteen months due to an elevated blood lead level, then the Company will await a final medical determination.

15. Medical Removal Protection Benefits

15.1 The Company will provide to an employee up to 18 months of medical removal protection benefits on each occasion that an employee is removed from exposure to lead or otherwise limited in duties in accordance with this program.

15.2 For the purposes of this program, the requirement that the Company provide medical removal protection benefits means that the Company will maintain the earnings, seniority and other employment rights and benefits of an employee as though the employee had not been removed from normal exposure to lead or otherwise limited.

15.3 During the period of time that an employee is removed from normal exposure to lead or otherwise limited, the Company may condition the provision of medical removal protection benefits upon the employee's participation in follow-up medical surveillance made available under this program.

15.4 If a removed employee files a claim for workers' compensation payments for a lead-related disability, then the Company will continue to provide medical removal protection benefits pending disposition of the claim. To the extent that an award is made to the employee for earnings lost during the period of removal, the Company's medical removal protection obligation will be reduced by such amount. The Company will receive no credit for workers' compensation payments received by the employee for treatment related expenses.

15.5 The Company's obligation to provide medical removal protection benefits to a removed employee will be reduced to the extent that the employee receives compensation for earnings lost during the period of removal either from a publicly or employer-funded compensation

program, or receives income from employment with another employer made possible by virtue of the employee's removal.

- 15.6 The Company will take the following measures with respect to any employee removed from exposure to lead due to an elevated blood lead level whose blood lead level has not declined within the past eighteen (18) months of removal so that the employee has been returned to his or her former job status:
 - 15.6.1 The Company will make available to the employee a medical examination pursuant to this section to obtain a final medical determination with respect to the employee;
 - 15.6.2 The Company will assure that the final medical determination obtained indicates whether or not the employee may be returned to his or her former job status, and if not, what steps should be taken to protect the employee's health;
 - 15.6.3 Where the final medical determination has not yet been obtained, or once obtained indicates that the employee may not yet be returned to his or her former job status, the Company will continue to provide medical removal protection benefits to the employee until either the employee is returned to former job status, or a final medical determination is made that the employee is incapable of ever safely returning to his or her former job status.
- 15.7 Where the Company acts pursuant to a final medical determination that permits the return of the employee to his or her former job status despite what would otherwise be an unacceptable blood lead level, later questions concerning removing the employee again will be decided by a final medical determination. The Company need not automatically remove such an employee pursuant to the blood lead level removal criteria provided by this section.
- 15.8 When the Company voluntarily removes an employee from exposure to lead, or otherwise places limitations on an employee due to the effects of lead exposure on the employee's medical condition, the Company will provide the required medical removal protection benefits to the employee.

16. Employee Information and Training

- 16.1 When Company employees work at a location that has a potential exposure to airborne lead at any level, the site supervisor will inform employees of the content of 29 CFR 1910.1025 Appendix A (*Substance data sheet for occupational exposure to lead*) and Appendix B (*Employee standard summary 1910.1025*).
- 16.2 The Company has established and implemented a training program for all employees who are subject to exposure to lead at or above the action level, or for whom the possibility of skin or eye irritation exists as a result of lead exposure. Affected employees will participate in this training in accordance with Company requirements.
- 16.3 Initial training will be conducted prior to initial job assignment for affected employees.
- 16.4 Training will be repeated at least annually for each affected employee.
- 16.5 Training will inform affected employees about:
 - 16.5.1 Content of *29 CFR 1910.1025 Lead* and its appendices;

- 16.5.2 Specific nature of work operations that could result in lead exposure above the action level;
 - 16.5.3 Purpose, proper selection, fitting, use and limitations of respirators;
 - 16.5.4 Purpose and description of the Company's medical surveillance and medical removal protection programs;
 - 16.5.5 Adverse health effects associated with excessive exposure to lead (with particular attention to the adverse reproductive effects on both males and females);
 - 16.5.6 Engineering controls and work practices at the work location associated with the employee's job assignment;
 - 16.5.7 Contents of any compliance plan in effect; and
 - 16.5.8 Instructions to employees that chelating agents should not routinely be used to remove lead from their bodies, and should not be used at all except under the direction of a licensed physician.
- 16.6 Access to information and training materials
- 16.6.1 The Company will make readily available to all affected employees a copy of *29 CFR 1910.1025* Lead and its appendices.
 - 16.6.2 On request, the Company will provide all materials relating to the employee information and training program to authorized OSHA representatives.
 - 16.6.3 The Company will provide to employees any materials pertaining to the Occupational Safety and Health Act, regulations issued pursuant to the Act and the lead standard that are made available to the Company by OSHA.

17. Signs

- 17.1 Signs and posted warnings required by laws, statutes, regulations or ordinances may be used in addition to, or in combination with, signs required by this program.
- 17.2 No statement will appear on or near any sign required by this program that contradicts or detracts from the sign's meaning.
- 17.3 The following warning sign will be posted in each work area where the lead PEL is exceeded:

**WARNING
LEAD WORK AREA
POISON
NO SMOKING OR EATING**

- 17.4 Signs required by this program will be illuminated and cleaned as necessary so that the legend is readily visible.

18. Recordkeeping

- 18.1 The Company will establish and maintain an accurate record of all required monitoring. This record will include:
 - 18.1.1 Date(s), number, duration, location and results of each of the samples taken, including a description of the sampling procedure used to determine representative employee exposure where applicable;
 - 18.1.2 A description of the sampling and analytical methods used and evidence of their accuracy;
 - 18.1.3 The type of respiratory protective devices worn, if any;
 - 18.1.4 Name, social security number and job classification of the employee monitored and of all other employees whose exposure the measurement is intended to represent; and
 - 18.1.5 Environmental variables that could affect the measurement of employee exposure.
- 18.2 Monitoring records will be maintained by the Company for at least 40 years or for the duration of employment plus 20 years, whichever is longer.
- 18.3 The Company will establish and maintain an accurate record for each employee subject to medical surveillance. This record will include:
 - 18.3.1 Name, social security number and description of the duties of the employee;
 - 18.3.2 A copy of the physician's written opinions;
 - 18.3.3 Results of any airborne exposure monitoring done for that employee and the representative exposure levels supplied to the physician; and
 - 18.3.4 Any employee medical complaints related to exposure to lead.
- 18.4 The Company will keep, or assure that the examining physician keeps, the following medical records:
 - 18.4.1 A copy of the medical examination results including required medical and work history;
 - 18.4.2 A description of the laboratory procedures and a copy of any standards or guidelines used to interpret the test results or references to that information;
 - 18.4.3 A copy of the results of biological monitoring.
- 18.5 The Company will maintain or assure that the physician maintains those medical records for at least 40 years, or for the duration of employment plus 20 years, whichever is longer.

- 18.6 The Company will establish and maintain an accurate record for each employee removed under this program from current exposure to lead. Each record will include:
- 18.6.1 Name and social security number of the employee;
 - 18.6.2 Date on each occasion when the employee was removed from current exposure to lead, as well as the corresponding date on which the employee was returned to his or her former job status;
 - 18.6.3 A brief explanation of how each removal was or is being accomplished; and
 - 18.6.4 A statement with respect to each removal indicating whether or not the reason for the removal was an elevated level of lead in the blood.
- 18.7 The Company will maintain each medical removal record for at least the duration of an employee's employment.
- 18.8 All records required to be maintained under this program will be made available to authorized OSHA representatives on request.
- 18.9 Environmental monitoring, medical removal, and medical records required under this program will be provided on request to employees, designated representatives and authorized OSHA representatives. Medical removal records will be provided in the same manner as environmental monitoring records.
- 18.10 In the event that the Company should cease to do business, any successor employer will receive and retain all records required to be maintained under this program. Should the Company cease to do business and there is no successor employer to receive and retain these records for the prescribed period, these records will be transmitted to the Director (hereafter referred to as "the Director"), National Institute for Occupational Safety and Health (NIOSH), U.S. Department of Health, Education and Welfare, or a designee.
- 18.11 On expiration of the required records retention period, the Company will notify the Director at least three months prior to disposal of such records and will transmit those records to the Director if requested within the period.
- 18.12 The Company also will comply with any additional requirements involving transfer of records in accordance with 29 CFR 1910.1020(h).

19. Observation of Monitoring

- 19.1 The Company will provide affected employees or their designated representatives an opportunity to observe any monitoring of employee exposure to lead conducted in accordance with this program.
- 19.2 Whenever such monitoring observations require entry into an area where the use of respirators, protective clothing or equipment is required, the Company will provide the observer(s) with and assure the use of respirators, clothing and other required protective equipment. Observers will be required to comply with all other applicable Company safety and health procedures. This includes providing the Company with written documentation of

safety training, medical evaluation and respirator fit testing to be in compliance with both Company and OSHA requirements.

19.3 Without interfering with the monitoring, observers will be allowed to:

19.3.1 Receive an explanation of measurement procedures;

19.3.2 Observe all steps related to the monitoring of lead performed at the place of exposure; and

19.3.3 Record results obtained, or receive copies of results when returned by the laboratory.

Metro Electric Co., Inc.

Lockout & Tagout/Control of Hazardous Energy



Applicable OSHA Standards: 29 CFR 1910.147

1. Purpose & Scope

- 1.1 This policy and program for Metro Electric covers the servicing and maintenance of pipelines and pipeline components, machines, powered tools and equipment used in the workplace where the unexpected energizing or release of product, start up of the machines, equipment or system, or release of stored energy, could cause injury to employees. This policy establishes minimum performance requirements for the control of such hazardous energy.
- 1.2 This policy and program apply to the control of energy during installation, servicing, repair and/or maintenance operations. Normal production operations are not covered by this policy.
- 1.3 Servicing and/or maintenance which takes place during normal production operations is covered by this standard only if:
 - 1.3.1 An employee is required to remove or bypass a guard or other safety device; or
 - 1.3.2 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 (point of operation) or where an associated danger zone exists during a machine operating cycle.
- 1.4 Minor tool changes and adjustments, and other minor servicing activities, which take place during normal production operations, are not covered by this standard if they are routine, repetitive, and integral to the use of the equipment for production, provided that the work is performed using alternative measures which provide effective protection.
- 1.5 This policy and program does not apply to work on cord and plug connected electric equipment for which exposure to the hazards of unexpected energizing or start up of the equipment is controlled by the unplugging of the equipment from the energy source and by the plug being under the exclusive control of the employee performing the servicing or maintenance.
- 1.6 This policy and program does not apply to hot tap operations involving transmission and distribution systems for substances such as gas, steam, water or petroleum products when they are performed on pressurized pipelines, provided that the employer demonstrates that:
 - 1.6.1 Continuity of service is essential;
 - 1.6.2 Shutdown of the system is impractical; and
 - 1.6.3 Documented safe work procedures are followed, and special equipment is used which will provide proven effective protection for employees.

- 1.7 Under this policy and program, the company shall establish and utilize procedures for affixing appropriate lockout devices or tagout devices to energy isolating devices, and to otherwise disable machines or equipment to prevent unexpected energization, start up or release of stored energy in order to prevent injury to employees.
- 1.8 When other operations and specific safe work procedures require the use of lockout or tagout, they shall be used and supplemented by the procedural and training requirements of this policy and the procedures set forth herein.
- 1.9 Written company Lockout and Tagout (LOTO) Procedures shall be referenced when following machine-specific, circuit specific and system-specific methods for isolating and controlling hazardous energy.

2. Definitions

- 2.1 *Affected employee.* An employee 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.
- 2.2 *Authorized employee.* A person who 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 program. Company requirements for an authorized employee include training in the company's system and specific procedures for performing and removing a lockout and tagout; participation in a group lockout and tagout; and additional training as may be required to be equivalent to the host employer's LOTO and work permit procedures (when applicable).
- 2.3 *Capable of being locked out.* An energy isolating device is capable of being locked out if it has a hasp or other means of attachment to which, or through which, a lock can be affixed, or it has a locking mechanism built into it. Other energy isolating devices are capable of being locked out, if lockout can be achieved without the need to dismantle, rebuild, or replace the energy isolating device or permanently alter its energy control capability.
- 2.4 *Energized.* Connected to an energy source or containing residual or stored energy.
- 2.5 *Energy isolating device.* A mechanical device that physically prevents the transmission or release of energy, including but not limited to the following:
 - 2.5.1 A manually operated electrical circuit breaker; a disconnect switch;
 - 2.5.2 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;
 - 2.5.3 A line valve;
 - 2.5.4 A block;

- 2.5.5 And any similar device used to block or isolate energy. IMPORTANT NOTE: Push buttons, selector switches and other control circuit type devices are not energy isolating devices.
- 2.6 *Energy source.* Any source of electrical (direct or stored), mechanical, hydraulic, pneumatic, chemical, thermal, kinetic, springs or devices under tension, gravity or other energy.
- 2.7 *Hot tap.* A procedure used in the repair, maintenance and services activities which involves welding on a piece of equipment (pipelines, vessels or tanks) under pressure, in order to install connections or appurtenances. Hot tapping is commonly used to replace or add sections of pipeline without the interruption of service for air, gas, water, steam, and petrochemical distribution systems.
- 2.8 *Lockout.* The placement of a lockout device on an energy isolating device, in accordance with an established procedure, ensuring that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.
- 2.9 *Lockout device.* A device that utilizes a positive means such as a lock, either key or combination type, to hold an energy isolating device in the safe position and prevent the energizing of a machine or equipment. Included are blank flanges and bolted slip blinds.
- 2.10 *Normal production operations.* The utilization of a machine or equipment to perform its intended production function.
- 2.11 *Servicing and/or maintenance.* Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines or equipment. These activities include lubrication, cleaning or unjamming of machines or equipment and making adjustments or tool changes, where the employee may be exposed to the unexpected energizing or startup of the equipment or release of hazardous energy.
- 2.12 *Setting up.* Any work performed to prepare a machine or equipment to perform its normal production operation.
- 2.13 *Tagout.* The placement of a tagout device on an energy isolating device, in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.
- 2.14 *Tagout device.* A prominent warning device, such as a tag and a means of attachment, which can be securely fastened to an energy isolating device in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.

3. Energy Control Program

- 3.1 The energy control program established here consists of energy control procedures, employee training and periodic inspections to ensure that before any employee performs any servicing or maintenance on a machine or equipment where the unexpected energizing, startup or release of stored energy could occur and cause injury, the machine or equipment shall be isolated from the energy source and rendered inoperative.

4. Lockout/Tagout

- 4.1 Lockout and tagout shall only be performed by authorized persons as defined in this policy and program. Persons who are exposed to accidents and injury in their work by the accidental energizing of the machine, circuit or system on which they are working shall be trained and authorized to perform lockout and tagout. This includes supervisors, welders and each individual who is exposed to the hazard.
- 4.2 Affected employees shall be notified by the company on-site or department supervisor or authorized employee of the application and removal of lockout devices or tagout devices. Notification shall be given before the controls are applied, and after they are removed from the machine or equipment.
- 4.3 If an energy isolating device is not capable of being locked out, the employee authorized to perform lockout and tagout shall utilize a tagout system, but only with specific permission of the on-site supervisor and the company Safety Coordinator. In all other circumstances lockout and tagout shall be utilized to control and isolate hazardous energy sources.
- 4.4 Whenever replacement or major repair, renovation or modification of a machine or equipment is performed, and whenever new machines or equipment are installed, company management shall confirm that energy isolating devices for such machines or equipment are designed to accept a lockout device.
- 4.5 Special permissions and full employee protection required for “tagout only”.
- 4.6 Specific permissions of the on-site supervisor and the company Safety Representative are required when a lock cannot be placed and “tagout only” is considered. When such permissions have been obtained and a tagout device is used on an energy isolating device that is capable of being locked out, the tagout device shall be attached at the same location that the lockout device would have been attached. The standard that shall be met in all authorized “tagout only” situations is that the company shall demonstrate that the tagout program alone will provide a level of safety equivalent to that obtained by using a lockout program.
- 4.7 In demonstrating that a level of safety is achieved in the tagout program which is equivalent to the level of safety obtained by using a lockout program, the safety standard that shall be met is full compliance with all tagout-related provisions together with such additional elements as are necessary to provide the equivalent safety available from the use of a lockout device. Additional means to be considered as part of the demonstration of full employee protection shall include the implementation of additional safety measures such as:
 - 4.7.1 The removal of an isolating circuit element;
 - 4.7.2 Blocking of a controlling switch;
 - 4.7.3 Opening of an extra disconnecting device; or
 - 4.7.4 The removal of a valve handle to reduce the likelihood of inadvertent energizing.

5. Energy Control Procedure

- 5.1 Procedures shall be developed, documented and utilized for the control of potentially hazardous energy when employees are engaged in the activities covered by this policy and program based on job-specific and site-specific work situations.
- 5.2 The company need not document the required procedure for a particular machine or equipment, when all of the following elements exist:
 - 5.2.1 The machine or equipment has no potential for stored or residual energy or re-accumulation of stored energy after shut down which could endanger employees;
 - 5.2.2 The machine or equipment has a single energy source which can be readily identified and isolated;
 - 5.2.3 The isolation and locking out of that energy source will completely de-energize and deactivate the machine or equipment;
 - 5.2.4 The machine or equipment is isolated from that energy source and locked out during servicing or maintenance;
 - 5.2.5 A single lockout device will achieve a locked-out condition;
 - 5.2.6 The lockout device is under the exclusive control of the authorized employee performing the servicing or maintenance;
 - 5.2.7 The servicing or maintenance does not create hazards for other employees; and
 - 5.2.8 In utilizing this exception, the company has had no accidents involving the unexpected activation or re-energizing of the machine or equipment during servicing or maintenance.
- 5.3 The machine-specific or system-specific procedures shall clearly and specifically outline the scope, purpose, authorization, rules, and techniques to be utilized for the control of hazardous energy, and the means to enforce compliance including, but not limited to, the following:
 - 5.3.1 A specific statement of the intended use of the procedure;
 - 5.3.2 Specific procedural steps for shutting down, isolating, blocking and securing machines or equipment to control hazardous energy;
 - 5.3.3 Specific procedural steps for the placement, removal and transfer of lockout devices or tagout devices and the responsibility for them; and
 - 5.3.4 Specific requirements for testing a machine or equipment to determine and verify the effectiveness of lockout devices, tagout devices, and other energy control measures.

6. Protective Materials and Hardware

- 6.1 Locks, tags, chains, wedges, key blocks, adapter pins, self-locking fasteners, or other hardware shall be provided by the company for isolating, securing or blocking of machines or equipment from energy sources.
- 6.2 Lockout devices and tagout devices shall be singularly identified; shall be the only device(s) used for controlling energy; shall not be used for other purposes; and shall meet the following requirements:
 - 6.2.1 Durability
 - 6.2.1.1 Lockout and tagout devices shall be capable of withstanding the environment to which they are exposed for the maximum period of time that exposure is expected.
 - 6.2.1.2 Tagout devices shall be constructed and printed so that exposure to weather conditions or wet and damp locations will not cause the tag to deteriorate or the message on the tag to become illegible.
 - 6.2.1.3 Tags shall not deteriorate when used in corrosive environments such as areas where acid and alkali chemicals are handled and stored.
 - 6.2.2 Standardized devices
 - 6.2.2.1 Lockout and tagout devices shall be standardized within the facility or workplace in at least one of the following criteria: Color; shape; or size; and additionally, in the case of tagout devices, print and format shall be standardized.
 - 6.2.3 Substantial design and construction
 - 6.2.3.1 Lockout devices shall be substantial enough to prevent removal without the use of excessive force or unusual techniques, such as with the use of bolt cutters or other metal cutting tools.
 - 6.2.3.2 Tagout devices, including their means of attachment, shall be substantial enough to prevent inadvertent or accidental removal. Tagout device attachment means shall be of a non-reusable type, attachable by hand, self-locking, and non-releasable with a minimum unlocking strength of no less than 50 pounds and having the general design and basic characteristics of being at least equivalent to a 1-piece, all environment-tolerant nylon cable tie.
 - 6.2.4 Identifiable
 - 6.2.4.1 Lockout devices and tagout devices shall indicate the identity of the employee applying the device(s).
 - 6.2.4.2 Tagout devices shall warn against hazardous conditions if the machine or equipment is energized and shall include a legend such as the

following: Do Not Start. Do Not Open. Do Not Close. Do Not Energize.
Do Not Operate.

7. Periodic Inspection

- 7.1 The Safety Representative shall conduct a periodic inspection of the energy control procedure at least annually to ensure that the procedure and OSHA requirements are being followed.
- 7.2 The periodic inspection shall be performed by an authorized employee other than the ones(s) utilizing the energy control procedure being inspected.
- 7.3 The periodic inspection shall be conducted to correct any deviations or inadequacies identified.
- 7.4 Where lockout is used for energy control, the periodic inspection shall include a review, between the inspector and each authorized employee, of that employee's responsibilities under the energy control procedure being inspected.
- 7.5 Where tagout is used for energy control, the periodic inspection shall include a review, between the inspector and each authorized and affected employee, of that employee's responsibilities under the energy control procedure being inspected, and the elements set forth in paragraph (c)(7)(ii) of this section.
- 7.6 The company shall certify in writing that the periodic inspections have been performed. The certification shall identify the machine or equipment on which the energy control procedure was being utilized, the date of the inspection, the employees included in the inspection, and the person performing the inspection.

8. Training and Communication

- 8.1 The company shall provide training to ensure that the purpose and function of the energy control program are understood by employees and that the knowledge and skills required for the safe application, usage, and removal of the energy controls are acquired by employees. The training shall include the following:
 - 8.1.1 Each authorized employee shall receive training in the recognition of applicable hazardous energy sources, the type and magnitude of the energy available in the workplace, and the methods and means necessary for energy isolation and control.
 - 8.1.2 Each affected employee shall be instructed in the purpose and use of the energy control procedure.
 - 8.1.3 All other employees whose work operations are or may be in an area where energy control procedures may be utilized, shall be instructed about the procedure, and about the prohibition relating to attempts to restart or re-energize machines or equipment which are locked out or tagged out.
- 8.2 When tagout systems are used, employees shall also be trained in the following limitations of tags:

- 8.2.1 Tags are essentially warning devices affixed to energy isolating devices, and do not provide the physical restraint on those devices that is provided by a lock.
- 8.2.2 When a tag is attached to an energy isolating means, it is not to be removed without authorization of the authorized person responsible for it, and it is never to be bypassed, ignored, or otherwise defeated.
- 8.2.3 Tags must be legible and understandable by all authorized employees, affected employees, and all other employees whose work operations are or may be in the area, in order to be effective.
- 8.2.4 Tags and their means of attachment must be made of materials which will withstand the environmental conditions encountered in the workplace.
- 8.2.5 Tags may evoke a false sense of security, and their meaning needs to be understood as part of the overall energy control program.
- 8.2.6 Tags must be securely attached to energy isolating devices so that they cannot be inadvertently or accidentally detached during use.

8.3 Employee retraining

- 8.3.1 Retraining shall be provided for all authorized and affected employees whenever there is a change in their job assignments, a change in machines, equipment or processes that present a new hazard, or when there is a change in the energy control procedures.
- 8.3.2 Additional retraining shall also be conducted whenever a periodic inspection reveals, or whenever the company has reason to believe that there are deviations from or inadequacies in the employee's knowledge or use of the energy control procedures.
- 8.3.3 The retraining shall re-establish employee proficiency and introduce new or revised control methods and procedures, as necessary.

8.4 The company shall certify that employee training has been accomplished and is being kept up to date. The certification shall contain each employee's name and dates of training.

9. Application of Control

9.1 The established procedures for the application of energy control (the lockout or tagout procedures) shall cover the following elements and actions and shall be done in the following sequence:

- 9.1.1 Preparation for shutdown. Before an authorized or affected employee turns off a machine or equipment, the authorized employee shall have knowledge of the type and magnitude of the energy, the hazards of the energy to be controlled, and the method or means to control the energy.

- 9.1.2 Machine or equipment shutdown. The machine or equipment shall be turned off or shut down using the procedures established for the machine or equipment. An orderly shutdown must be utilized to avoid any additional or increased hazard(s) to employees as a result of the equipment stoppage.
- 9.1.3 Machine or equipment isolation. All energy isolating devices that are needed to control the energy to the machine or equipment shall be physically located and operated in such a manner as to isolate the machine or equipment from the energy source(s).
- 9.1.4 Lockout or tagout device application.
 - 9.1.4.1 Lockout or tagout devices shall be affixed on each energy isolating device by authorized employees.
 - 9.1.4.2 Lockout devices, where used, shall be affixed in a manner to that will hold the energy isolating devices in a "safe" or "off" position.
 - 9.1.4.3 Tagout devices, where used, shall be affixed in such a manner as will clearly indicate that the operation or movement of energy isolating devices from the "safe" or "off" position is prohibited.
 - 9.1.4.4 Where tagout devices are used with energy isolating devices designed with the capability of being locked, the tag attachment shall be fastened at the same point at which the lock would have been attached.
 - 9.1.4.5 Where a tag cannot be affixed directly to the energy isolating device, the tag shall be located as close as safely possible to the device, in a position that will be immediately obvious to anyone attempting to operate the device.
- 9.1.5 Stored energy
 - 9.1.5.1 Following the application of lockout or tagout devices to energy isolating devices, all potentially hazardous stored or residual energy shall be relieved, disconnected, restrained, and otherwise rendered safe.
 - 9.1.5.2 If there is a possibility of re-accumulation of stored energy to a hazardous level, verification of isolation shall be continued until the servicing or maintenance is completed, or until the possibility of such accumulation no longer exists.
- 9.1.6 Verification of isolation. 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-energizing of the machine or equipment have been accomplished.
- 9.1.7 Preparing for release from lockout or tagout. Before lockout or tagout devices are removed and energy is restored to the machine or equipment, procedures shall be followed and actions taken by the authorized employee(s) to ensure the following:

- 9.1.7.1 The machine or equipment. The work area shall be inspected to ensure that nonessential items have been removed and to ensure that machine or equipment components are operationally intact.
 - 9.1.7.2 The work area shall be checked to ensure that all employees have been safely positioned or removed.
 - 9.1.7.3 After lockout or tagout devices have been removed and before a machine or equipment is started, affected employees shall be notified that the lockout or tagout device(s) have been removed.
- 9.1.8 Lockout or tagout devices removal.
- 9.1.8.1 Each lockout or tagout device shall be removed from the energy isolating device by the employee who applied the device.
 - 9.1.8.2 When the authorized employee who applied the lockout or tagout device is not available to remove it, that device may be removed under the direction of the On-site Supervisor or Department Supervisor in accordance with the company's specific written procedures, and when the supervisor has been trained for such removal in accordance with the company's written lockout and tagout procedures. The safety standard to be met is that the specific procedure provides equivalent safety to the removal of the device by the authorized employee who applied it. The specific procedure shall include at least the following elements:
 - 9.1.8.2.1 Verification by the company that the authorized employee who applied the device is not at the facility;
 - 9.1.8.2.2 Making all reasonable efforts to contact the authorized employee to inform him/her that his/her lockout or tagout device has been removed; and
 - 9.1.8.2.3 Ensuring that the authorized employee has this knowledge before he/she resumes work at that facility.
- 9.2 Additional requirements.
- 9.2.1 Testing or positioning of machines, equipment or components thereof. In situations in which lockout or tagout devices must be temporarily removed from the energy isolating device and the machine or equipment energized to test or position the machine, equipment or component thereof, the following sequence of actions shall be followed:
 - 9.2.1.1 Clear the machine or equipment of tools and materials in accordance with procedures specified in this policy and program;
 - 9.2.1.2 Remove employees from the machine or equipment area in accordance with procedures specified in this policy and program;

- 9.2.1.3 Remove the lockout or tagout devices in accordance with procedures specified in this policy and program;
- 9.2.1.4 Energize and proceed with testing or positioning;
- 9.2.1.5 De-energize all systems and reapply energy control measures in accordance with procedures specified in this policy and program to continue the servicing and/or maintenance.

9.3 Outside personnel (contractors, etc.)

- 9.3.1 Whenever outside servicing personnel are to be engaged in activities covered by the scope and application of this standard, the company and the outside contractor shall inform each other of their respective lockout or tagout procedures.
- 9.3.2 The company on-site supervisor shall ensure that his/her employees understand and comply with the restrictions and prohibitions of the outside contractor's energy control program.

9.4 Group lockout or tagout

- 9.4.1 When servicing and/or maintenance is performed by a crew, craft, department or other group, they shall utilize a procedure which affords the employees a level of protection equivalent to that provided by the implementation of a personal lockout or tagout device.
- 9.4.2 Group lockout or tagout devices shall be used in accordance with the procedures required by machine, circuit or system specific lockout and tagout procedures, but not necessarily limited to, the following specific requirements:
 - 9.4.2.1 Primary responsibility is vested in an authorized employee for a set number of employees working under the protection of a group lockout or tagout device (such as an operations lock);
 - 9.4.2.2 Provision for the authorized employee to ascertain the exposure status of individual group members with regard to the lockout or tagout of the machine or equipment and
 - 9.4.2.3 When more than 1 crew, craft, department, etc. is involved, assignment of overall job-associated lockout or tagout control responsibility to an authorized employee designated to coordinate affected work forces and ensure continuity of protection; and

9.4.2.4 Each authorized employee shall affix a personal lockout or tagout device to the group lockout device, group lockbox, or comparable mechanism when he or she begins work, and shall remove those devices when he or she stops working on the machine or equipment being serviced or maintained.

9.5 Shift or personnel changes. Specific procedures shall be utilized during shift or personnel changes to ensure the continuity of lockout or tagout protection, including provision for the orderly transfer of lockout or tagout device protection between off-going and oncoming employees, to minimize exposure to hazards from the unexpected energizing or start-up of the machine or equipment, or the release of stored energy.

10. Specific Procedures

10.1 Individual LOTO. Compare company LOTO procedures with host employer LOTO procedures in place or being utilized at the job site. Proper LOTO procedures require the following steps:

10.1.1 Complete the company's or host employer's work permit or Job Safety Analysis (JSA), as applicable to the work and situation and in accordance with company procedures.

10.1.2 Notify all affected personnel and host employer personnel in the immediate or affected area that LOTO will be utilized and why.

10.1.3 Identify all energy sources and isolation devices.

10.1.4 As allowed and authorized by the host employer, shut down the equipment by following normal shutdown procedures in accordance with host employer requirements. The host employer may require shutdown by host employer personnel only.

10.1.5 Isolate the equipment from all potential energy sources.

10.1.6 Lockout and tagout energy isolation devices in accordance with company safety procedures, or confirm any such LOTO by host employer personnel. Complete the required LOTO information on the work permit form or JSA in accordance with form completion procedures.

10.1.7 Stored energy (such as that in springs, elevated machine members, rotating flywheels, hydraulic systems, air, gas, capacitors, steam, or water pressure) must be dissipated or restrained by appropriate methods (such as repositioning, blocking, bleeding down).

10.1.8 Visually inspect equipment isolation and de-energizing by attempting to start or otherwise operate the device. This is done to ensure that the LOTO was effective.

10.1.9 Perform the repair or maintenance.

10.1.10 Inspect the area around the machines or equipment to ensure that no one is exposed; then remove any tools or rags, and replace any guards or covers.

- 10.1.11 Notify all affected personnel in the area that energy will be restored.
 - 10.1.12 Remove all LOTO devices.
 - 10.1.13 Operate the energy-isolating devices to restore energy to the machine or equipment.
 - 10.1.14 Return the equipment to normal service.
 - 10.1.15 Advise all affected personnel that operations are back to normal.
 - 10.1.16 Complete and terminate the work permit or JSA form.
- 10.2 Extended-Time Energy Isolation Work. When equipment or machines have been locked out for longer than 24 hours, the individual performing the work shall confirm the following:
- 10.2.1 Appropriate locks and tags remain in place
 - 10.2.2 The tag is still serviceable, effective in its communication, and appropriate to the situation
- 10.3 Shift Changes and Call-Out Situations.
- 10.3.1 During changes of shifts and when there is a call-out, any LOTO in place must carry over and be maintained as effective protection. The procedures explained below shall be followed regarding shift changes and call-outs:
 - 10.3.1.1 Employees coming to work on a shift or called out to a work assignment shall identify any equipment, machines or systems pertinent to the work that is locked out.
 - 10.3.1.2 Employees shall inspect and become thoroughly familiar with the LOTO procedures in place and how they are protecting personnel at the time of the shift change or call-out.
 - 10.3.1.3 When the authorized person who installed the LOTO will not be the same person who completes and removes the LOTO, the personnel coming onto the shift or responding to the call-out shall place their own lock(s) and tag(s) either before or during the process of removal of the lock(s) and tag(s) of the authorized person being relieved.
- 10.4 Procedure Involving More Than One Person
- 10.4.1 When more than one person is performing work on equipment, machines or systems that require LOTO, each individual performing this work must place his or her own lock(s) or tag(s) in a manner that effectively isolates energy sources.
 - 10.4.2 If an energy-isolating device accepts only a single lock or tag, a LOTO hasp device that accepts multiple locks and tags shall be used to secure the single-lock energy isolating device.

- 10.4.3 If locked box or locked cabinet procedures is chosen for performing LOTO, confirm that a single lock is placed on the energy-isolating device and the key to that single lock is secured in the locked box or locked cabinet. In turn, the locked box or cabinet is then secured by a lock placed by each employee performing the work. In this way each member of the group is protected by his or her own lock and key because it secures the key to the lock on the energy-isolating device.
 - 10.4.4 As each member of the group completes his or her work and no longer need LOTO protection, that individual shall remove his or her lock from the box or cabinet containing the key to the lock on the energy-isolating device.
- 10.5 Testing or Positioning.
- 10.5.1 A supervisor in charge of work must authorize any removal of a LOTO device prior to any testing or positioning of machines, equipment or components, this must be approved by supervision.
 - 10.5.2 The authorized person who placed the LOTO must clear the machine or equipment and make sure that potentially exposed personnel are at a safe location before any LOTO device is removed.
 - 10.5.3 LOTO device(s) shall be removed only for the time necessary to conduct the test or positioning.
 - 10.5.4 As soon as testing or positioning is completed, the equipment, machine or system shall be de-energized in accordance with LOTO procedures and LOTO shall be re-applied. At that point attempt shall be made to start the equipment, machine or system as a test to confirm that the replaced LOTO is effective.
- 10.6 When Work and Required LOTO Carry Over to Another Shift. Sometimes specific work or maintenance will carry over to the next shift. In this situation the locked box procedure for LOTO may be used to protect personnel. This procedure involves:
- 10.6.1 The authorized person(s) place one lock and tag on an energy isolation device. Note that more than one energy-isolating device may be involved.
 - 10.6.2 All keys to locks placed on energy-isolating devices are then secured inside of a locked box.
 - 10.6.3 The locked box is secured with a hasp that accepts multiple locks.
 - 10.6.4 Once an authorized person involved in the work confirms that all potentially hazardous energy sources are effectively isolated, locked out and tagged out, the authorized person places his or her own lock and tag on the locked box. This is an acceptable alternative to having each authorized person place a lock and tag on each locked-out energy-isolating device.
- 10.7 Removal of Another Authorized Person's LOTO

- 10.7.1 In the event that an authorized person leaves the work location without removing a LOTO he or she has placed there, the company has established specific safety procedures that shall be followed prior to and when removing the lock or tag. Note that the host employer may have its own procedures regarding removal of another person's LOTO. These should be reviewed and coordinated with company procedures. Company procedures are explained below:
 - 10.7.2 Make a determined effort to notify the authorized person who placed the LOTO so that they can return to the work location and personally remove the lock and tag.
 - 10.7.3 In the event that the authorized person who placed the LOTO cannot be contacted or is not able to come to the work location, the company Site Supervisor or other authorized personnel shall confirm that it is safe to remove the lock and that the lock is removed, and all energy-isolating devices are returned to normal operating position.
 - 10.7.4 The Site Supervisor shall notify the authorized person who initially placed the LOTO about the removal immediately upon that individual's returning to work.
- 10.8 Group LOTO -- Responsibilities and Requirements
- 10.8.1 The following safe work procedures for performing a Group Lockout and Tagout have been established by the company. These procedures shall be followed in coordination with group LOTO procedures of the host employer.
 - 10.8.2 Procedures are designed to make sure all employees and personnel involved are identified, and that the level of LOTO protection provided to the group is equivalent to that provided by an individually placed LOTO.
 - 10.8.3 When a LOTO involves more than one energy-isolating device, or when multiple personnel are involved, it may be appropriate to use separate group lockouts and tagouts.
 - 10.8.4 For example, it may not be practical to require each authorized person to LOTO at multiple energy-isolating devices if not practical. At the same time, each employee shall comply with LOTO procedures and achieve effective protection from potentially hazardous energy sources.
 - 10.8.5 The group LOTO procedure provides an option for compliance with safe work requirements while not requiring an authorized person to place more than a single LOTO.
 - 10.8.6 The company's Site Supervisor and the host employer's field supervisor shall make the decision when to perform a group LOTO rather than LOTOs placed by individual authorized persons.
 - 10.8.7 Group LOTO requires that a single authorized person be designated as the individual with overall and primary responsibility for coordinating the group LOTO. This designated authorized person shall be in charge of the LOTO and be responsible for ensuring that LOTO sequences are effectively completed. This

includes performing the basic procedures and confirming that all procedures for group LOTO are followed.

10.8.8 Procedures for group LOTO are:

- 10.8.8.1 Complete the appropriate company and/or host employer work permit.
- 10.8.8.2 Designate the authorized person who will be in charge of and responsible for the group LOTO.
- 10.8.8.3 Complete a thorough assessment of the machines, equipment, systems and processes involved to determine all potential sources of hazardous energy. This includes identification and understanding all potential sources of residual or stored energy. This step may include discussions with other work groups, workers who have previously performed similar work, and host employer representatives who are familiar with this type of work operation and the effective control of hazardous energy.
- 10.8.8.4 Confirm that the host employer has been notified in accordance with established procedures.
- 10.8.8.5 Shutdown, or confirm shutdown, of equipment, machines, systems or processes involved with the work assignment. This may involve having the host employer designate the components involved are ready for servicing, repair or maintenance.
- 10.8.8.6 Safe-for-work designation by the host employer may involve cleaning, flushing or otherwise making sure that work assignment components are in fact safe and ready for work to begin. In situations when the host employer does not make this designation, host employer personnel should specify how the equipment, machine, system or process should be rendered safe.
- 10.8.8.7 The authorized person in charge of the group LOTO must identify, locate, and isolate all energy sources associated with the job. If needed, they must also identify, locate, and prepare relief devices for ensuring that residual or accumulated energy creates no employee hazard.
- 10.8.8.8 The authorized person in charge of the group LOTO places the appropriate LOTO devices and tags on energy-isolating devices and then tests the devices to confirm that energy has been effectively isolated and cannot re-accumulate, re-charge or build up pressure. In certain situations the host employer's personnel may also apply LOTO devices in addition to those places by the authorized person in charge.
- 10.8.8.9 The authorized person in charge of the group LOTO shall record LOTO information on the work permit in accordance with form procedures.
- 10.8.8.10 All keys to lockout devices must be placed in a group lockout box (or a similar securing device). This box then shall be locked by the authorized

person in charge of the group LOTO. The group LOTO box shall be located in a secure place known to all authorized persons involved with the work.

10.8.8.11 Each authorized person and host employer personnel involved in the group LOTO shall place his or her individual locks and tags to the group LOTO box prior to beginning the work at hand.

10.8.9 Company employees involved in the group LOTO should:

10.8.9.1 Follow and respect the LOTO process.

10.8.9.2 Check and, as applicable, test specific LOTO device locations to confirm that proper and effective LOTO is in place.

10.8.9.3 The authorized person in charge of the group LOTO, or someone this person may designate, shall direct and accompany the other authorized persons to the specific locations where energy isolation is in place.

10.8.9.4 During shift changes and the arrival of new crews, the group LOTO box shall remain locked until the authorized person in charge of the group LOTO determines that it is safe to remove the keys. This means that the lock placed by the authorized person in charge of the group LOTO usually stays on the group LOTO box until the job is completed. Other control procedures approved by the authorized person in charge of the group LOTO may be used as required as long as personnel are properly protected.

10.8.9.5 When work is finished, the authorized person in charge of the group LOTO and, if applicable, a host employer representative inspects and reviews the completed work to confirm that it is safe to remove LOTO devices. Special precautions shall be taken to ensure that all personnel are relocated away from danger if removal of a LOTO device might present a hazard.

10.8.9.6 The authorized person in charge of the group LOTO shall review all forms and permits filled out during the work to ensure that the assignment is properly and safely completed. When this is accomplished, the authorized person in charge of the group LOTO is ready to remove LOTO devices from the lockout box and all other energy isolation devices.

10.8.9.7 All applicable work permits and forms shall be completed, signed and submitted in accordance with company and host employer requirements.

10.8.10 Personnel and supervisors shall acknowledge that each group LOTO is different and requires individual site-specific consideration and special procedures / precautions as appropriate to situations at hand. This may include procedures and precautions that are not included in the procedures explained above. Consequently, the authorized person in charge of a group LOTO has the authority to do whatever is

necessary to achieve safety for all company employees and personnel in the work area.

11. Periodic Assessment and Challenge of LOTO Procedures

- 11.1 The company shall inspect, evaluate and challenge LOTO procedures for energy control at least once each year.
- 11.2 This process is intended and shall be carried out to ensure that LOTO procedures are correct, effective and in accordance with OSHA standards and requirements. Additionally, the process shall identify and address any inadequacies or needs for updating that may be discovered.

Metro Electric Co., Inc.

Manual Material Handling Policy



Metro Electric Co., Inc. has developed this program to protect employees from the hazards of improper lifting techniques and overexertion during lifting.

SCOPE

This program applies to all employees that may conduct manual handling tasks as part of their job responsibility. This program is intended to minimize the potential for a back injury caused by lifting heavy objects. Employees should not lift any object 50 pounds or greater without assistance. All employees whose work requires heavy lifting shall be properly trained, physically qualified.

POLICY

This program has the following objectives:

1. Ensuring employees are not required to manually lift materials or objects greater than 50 pounds as part of their job functions
2. Assist in identifying, assessing, and controlling risks associated with manual handling tasks
3. Reducing the incidence of manual handling injuries
4. Establishing an effective system for manual handling.

AUTHORITY AND RESPONSIBILITY

The safety director has overall responsibility for the establishment and implementation of this program. Specific responsibility of all employees is as follows.

The Safety Director shall be responsible for:

1. Evaluating material handling tasks as requested
2. Providing force measurements for material handling tasks as requested
3. Providing training as requested
4. Assisting in the selection of appropriate assist devices as requested.

Each Project Manager shall be responsible for:

1. Identifying operations which involve lifting or material handling tasks that may place individuals at risk for back injuries
2. Instituting engineering controls to reduce manual lifting injury potential
3. Ensuring that all affected employees are trained in the appropriate requirements of this program
4. Providing training in proper material handling as needed
5. Providing employees with personnel assistance or lift assisting devices as necessary.

The Supervisors shall be responsible for:

1. Ensuring affected employees are trained
2. Ensuring that employees use proper lifting techniques
3. Making assistance available to employees who manually handle or lift 50 pounds or greater
4. Contact Safety for assistance in equipment selection, evaluations and training
5. Ensuring all employees who experience work-related injuries following the appropriate procedures.

The Employee shall be responsible for:

1. Attending the required training
2. Using proper lifting and material handling techniques
3. Warming up the back muscles before lifting is conducted
4. Limiting manual lifting or handling tasks to objects less than 50 pounds
5. Getting assistance whenever manual handling or lifting materials or objects that are 50 pounds or greater
6. Reporting injuries within 24 hours of their occurrence.

GENERAL LIFTING TECHNIQUES

Whether it is during leisure activities or as a part of paid work; everyone lifts, holds, carries, pushes and pulls on a daily basis. Manual material handling involves lifting light, heavy and awkward objects. Safe lifting is a critical aspect of daily activities and should be the focus of any manual material handling. Before you lift, remember the following:

- Wear supportive shoes
- Use lift assist devices (hand dollies, carts, lift tables, forklifts)
- Carry all movements out horizontally (e.g., push and pull rather than lift and lower)
- Always use your body weight and not your feet when pushing
- Try to have most workplace deliveries placed at hip height
- Always keep objects in the comfort zone (between hip and shoulder height)
- Keep all loads close to and in front of the body
- Keep the back aligned while lifting
- Maintain the center of balance
- Let the legs do the actual lifting
- Reduce the size of the material to keep it light, compact and safe to grasp.

Plan the Lift prior to lifting as follows:

- Size up the load, its weight, shape and position
- Determine if the load is too large, too heavy or too awkward to move alone
- Get help from a coworker or use a mechanical aid device to help with the lift when necessary
- Decide on the route to take
- Check for any problems or obstacles such as slippery or cluttered floors
- Investigate the location where the load is going to be placed in order to anticipate any difficulties
- Always exercise or warm-up the back prior to lifting.

Squat Lifting should be done for a majority of all lifts. Squat lifting should be performed as follows:

- Stand as close to the load as possible
- Move your feet shoulder width apart
- Tighten your stomach muscles so you can tuck your pelvis
- Bend at the knees, keeping your back straight and stomach tucked
- Get a good firm grip on the load
- Hug the load close to the center of your body
- Lift smoothly with your legs gradually straightening the knees and hips into a standing position
- Avoid twisting your body as you lift.

Carrying Loads should be done as follows:

- Keep the load close to the center of your body to take full advantage of the mechanical leverage of your body
- Do not change your grip on the load unless it is weight supported
- Avoid twisting your body without pivoting your feet at the same time
- If you must change direction, move your feet in that direction instead of twisting your trunk in that direction
- Make sure you can see over the load
- Move carefully toward your destination
- If a heavier load is carried for some distance, consider storing it closer.

Unloading Objects should be done the same way as lifting objects, but in the reverse order as follows:

- Slowly bend your knees to lower the load
- Keep your back straight and the weight close to the center of your body
- Allow enough room for fingers and toes when the load is set down
- Place the load on a bench or table by resting it on the edge and pushing it forward with your arms and body
- Secure the load to ensure that it will not fall, tip over, roll or block someone's way.

One-Arm Loads are used when carrying items such as pails or buckets. Lifting and carrying one-arm loads should be performed as follows:

- Bend the knees and at the waist keeping your back straight
- Reach for the load
- Grasp the handle of the load firmly
- Lift with your legs not your shoulders and upper back
- Keep your shoulders level while switching hands regularly to reduce overexertion on one side of the body while carrying the load.

Team Lifts are used when objects are too heavy, too large or too awkward for one person to lift. Team lifts should be performed as follows:

- Work with someone of similar build and height, if possible
- Choose one person to direct the lift (e.g., lift on the count of three)
- Lift with your legs and raise the load to the desired level at the same time
- Always keep the load at the same level while carrying

- Move smoothly and in unison
- Set the load down together.

Overhead Lifts should be conducted as follows:

- When lifting or lowering objects from above the shoulders, lighten the load whenever possible
- Stand on something sturdy such as a step stool or platform to decrease the vertical distance
- When you are lowering object from above the shoulders, slide the load close to your body, grasp the object firmly, slide it down your body and proceed with your move.

MECHANICAL AIDS

Alternative material-handling techniques for carrying or moving loads are to be used whenever possible to minimize lifting and bending requirements. These alternate techniques include the use of: hand trucks, carts, dollies, forklifts, hoists and wheelbarrows. Although mechanical aids are used, safe lifting procedures should still be followed by maintaining the natural curvature of the back, using the legs for any lifting that is encountered and avoids twisting the back.

LIFTING RESTRICTIONS

When employees are not able to conduct their task fully due to an injury, they could be placed on work restrictions that may contain weight or lifting restrictions. If an employee is placed on any weight restrictions, they may not handle or lift any object heavier than what they have been restricted to until they are cleared to return to normal duties. If a re-evaluation has been conducted and the weight restriction has been modified or lifted the employee must follow the new restrictions.

WORK RESTRICTIONS - RETURN TO WORK

If employees have experienced a work-related injury, they will receive care at Metro Electric's company doctor. One aspect of the medical management of an injury is determination of appropriate activity. When an employee is seen at the company doctor, they may be given certain restrictions regarding physical activity. Employees are to follow those restrictions. The restrictions will be re-addressed each time they are seen by the company doctor. Please note that in most cases, continuing usual activity with some restrictions leads to a better outcome than severely limiting activity. When conditions have improved enough, the restrictions will be lifted.

If employees have experienced a non-work injury, they will receive care from their primary care provider, or another health care professional. Employees should follow the treatment regimen of their providers. Supervisors should be promptly notified of any work restrictions given by the primary care physician.

Metro Electric Co., Inc.

Mobile Cranes, Hoists & Rigging Safety



Applicable References: OSHA 29 CFR 1910.180, 1926.251, 1926.550; ASME B30.5-2004

1. Purpose & Scope

- 1.1 This program is intended to provide Metro Electric personnel with a guideline for the safe operation, use and inspection of mobile cranes and hoists.
- 1.2 This policy applies to wheel mounted cranes of both truck and self-propelled wheel type, and any variations thereof that retain the same fundamental characteristics used at company-controlled work locations where company employees are performing work.

2. Definitions

- 2.1 *Accessory*-- A secondary part or assembly of parts which contributes to the overall function and usefulness of a machine.
- 2.2 *Axis of Rotation* -- The vertical axis around which the crane superstructure rotates.
- 2.3 *Base* -- The traveling base or carrier on which the rotating superstructure is mounted such as a car, truck, crawlers, or wheel platform.
- 2.4 *Boom Angle* -- The angle between the horizontal and longitudinal centerline of the boom. The boom longitudinal centerline is a straight line between the boom foot pin (heel pin) centerline and boom point sheave pin centerline.
- 2.5 *Boom Hoist* -- A hoist drum and rope reeving system used to raise and lower the boom. The rope system may be all live reeving or a combination of live reeving and pendants.
- 2.6 *Boom* -- Member hinged to the front of the rotating superstructure with the outer end supported by ropes leading to a gantry or A-frame and used for supporting the hoisting tackle.
- 2.7 *Boom Stop* -- A device used to limit the angle of the boom at the highest position.
- 2.8 *Brake* -- A device used for retarding or stopping motion by friction or power means.
- 2.9 *Cab*-- A housing which covers the rotating superstructure machinery and/or operator's station. On truck-crane trucks a separate cab covers the driver's station.
- 2.10 *Clutch* -- A friction, electromagnetic, hydraulic, pneumatic, or positive mechanical device for engagement or disengagement of power.
- 2.11 *Counterweight*-- A weight used to supplement the weight of the machine in providing stability for lifting working loads.

- 2.12 *Crane Safe Work Permit* -- The permit issued by the Site Supervisor or Crane Competent Person at the job site to the crane operator before any mobile hoisting work is performed.
- 2.13 *Critical Lift* -- A lift where:
- 2.13.1 The load exceeds 80% of the crane's capacity.
 - 2.13.2 Weight of the lift exceeds 50% of the load chart rating of the equipment being used and the lift is over power lines, process equipment, piping, or personnel are being lifted.
 - 2.13.3 Two booms are required.
 - 2.13.4 Poles or derricks have been erected.
 - 2.13.5 Personnel are being lifted.
 - 2.13.6 Crane is traveling with load.
 - 2.13.7 Any lift in a Critical Lift Area.
- 2.14 *Designated* -- Means selected or assigned by the Company or a representative of the Company as being qualified to perform specific duties.
- 2.15 *Drum* -- Cylindrical members around which ropes are wound for raising and lowering the load or boom.
- 2.16 *Dynamic* -- Means loads introduced into the machine or its components by forces in motion for hoisting and lowering loads.
- 2.17 *Gantry* -- Structural frame, extending above the superstructure, to which the boom support ropes are reeved.
- 2.18 *Jib* -- An extension attached to the boom point to provide added boom length for lifting specified loads. The jib may be in line with the boom or offset to various angles.
- 2.19 *Load (working)* -- Means the external load, in pounds, applied to the crane, including the weight of load-attaching equipment such as load blocks, shackles, and slings.
- 2.20 *Load block [lower]* -- Means the assembly of hook or shackle, swivel, sheaves, pins, and frame suspended by the hoisting ropes.
- 2.21 *Load block [upper]* -- Means the assembly of hook or shackle, swivel, sheaves, pins, and frame suspended from the boom point.
- 2.22 *Load Hoist* -- A hoist drum and rope reeving system.
- 2.23 *Load Ratings* -- Crane ratings in pounds established by the manufacturer.

- 2.24 *Locomotive Crane* -- Consists of a rotating superstructure with power-plant, operating machinery and boom, mounted on a base or car equipped for travel on railroad track. It may be self-propelled or propelled by an outside source. Its function is to hoist and swing loads at various radii.
- 2.25 *Mobile Hoisting Equipment*-- Conventional rigid boom cranes, hydraulic cranes, and flex-lifts.
- 2.26 *Outriggers* -- Extendable or fixed metal arms, attached to the mounting base, which rest on supports at the outer ends.
- 2.27 *Reeving* -- A rope system in which the rope travels around drums and sheaves.
- 2.28 *Rigging* -- Any cables, chokes, slings, hooks, beams, spreaders, or other device used to attach or lift the load.
- 2.29 *Rope* -- Refers to a wire rope unless otherwise specified.
- 2.30 *Side Loading* -- A load applied at an angle to the vertical plane of the boom.
- 2.31 *Superstructure* -- The rotating upper frame structure of the machine and the operating machinery mounted thereon.
- 2.32 *Swing* -- Means the rotation of the superstructure for movement of loads in a horizontal direction about the axis of rotation.
- 2.33 *Swing Mechanism* -- The machinery involved in providing rotation of the superstructure.
- 2.34 *Tackle* -- Assembly of ropes and sheaves arranged for hoisting and pulling.
- 2.35 *Truck Crane* -- Consists of a rotating superstructure with power plant, operating machinery and boom, mounted on an automotive truck equipped with a power plant for travel. Its function is to hoist and swing loads at various radii.
- 2.36 *Wheel Mounted Crane* -- Consists of a rotating superstructure with power plant, operating machinery and boom, mounted on a base or platform equipped with axles and rubber-tired wheels for travel. The base is usually propelled by the engine in the superstructure, but it may be equipped with a separate engine controlled from the superstructure. Its function is to hoist and swing loads at various radii.
- 2.37 *Whipline* -- A separate hoist rope system of lighter load capacity and higher speed than provided by the main hoist.
- 2.38 *Winch Head* -- A power driven spool for handling of loads by means of friction between fiber or wire rope and spool.

3. Safety & Operational Requirements

3.1 Operator Qualification & Training

- 3.1.1 Only qualified operators and trainees, and specific persons who are authorized by a supervisor, will enter the cab of a crane. All persons will enter a crane cab only when their work-related duties require them to do so, and then only with the knowledge of the operator or other appointed individuals.
- 3.1.2 Only personnel who are trained and qualified in accordance with this program will operate a crane in the course and scope of work for the Company. The Company has adopted crane operator requirements specified in ASME B30.5-2004. Provisions explained in this program are intended to coordinate with this ASME standard.
- 3.1.3 The crane operator will operate only the specific type of crane(s) for which he or she is qualified under this program. The operator will be qualified through the successful completion of classroom and hands-on training and a written examination.
- 3.1.4 Experienced crane operators beginning employment with the Company will provide written documentation of successful completion of such training and examination, as well as any prior certification(s) and crane operations experience, before operating a crane at work.
- 3.1.5 The equipment may only be used for the manner in which it was designed.
- 3.1.6 Each crane operator will:
 - 3.1.6.1 Demonstrate his or her ability to read, write, comprehend, and use arithmetic and a load/capacity chart, in the language of the crane manufacturer's operation and maintenance instruction materials;
 - 3.1.6.2 Successfully pass a written examination that covers operational characteristics; routine control skills; emergency control skills (such as response to fire, power line contact, loss of stability, or control malfunction); and characteristic and performance questions appropriate to the crane type for which qualification is being sought;
 - 3.1.6.3 Successfully complete a combination written and verbal test on load/capacity chart usage that covers a selection of the configurations for the crane type for which qualification is being sought;
 - 3.1.6.4 Complete with a satisfactory grade an operation test demonstrating proficiency in handling the specific crane type, including both prestart and poststart inspection, maneuvering skills, shutdown, and securing procedures; and
 - 3.1.6.5 Demonstrate understanding of the applicable sections of the B30 Standard and federal, state, and local requirements.

- 3.2 Qualified operators for a specific crane type will be required to re-qualify if supervision deems it necessary. Re-qualification shall include, but not be limited to:
 - 3.2.1 Showing evidence of successfully passing a current physical examination in accordance with this program's medical qualification requirements;
 - 3.2.2 Successful completion of written, verbal and operational testing as specified for initial qualification of crane operators.
- 3.3 Crane operator trainees will operate cranes only in accordance with training procedures established by the Company and under the direct observation of a designated, qualified operator.
- 3.4 Qualification requirements for each trainee will include, but not be limited to:
 - 3.4.1 Successfully passing a physical examination by a qualified medical provider in accordance with this program;
 - 3.4.2 Satisfactory completion of a written examination that covers safety, operational characteristics and limitations, and controls of the crane type for which qualification is being sought;
 - 3.4.3 Demonstrated ability to read, write, comprehend, and use arithmetic and a load/capacity chart, in the language of the crane manufacturer's operations and maintenance instruction materials;
 - 3.4.4 Satisfactory completion of a combination written and verbal test on the use of a load/capacity chart covering various crane configurations.
- 3.5 Qualification of operators and trainees, as well as the re-qualification of operators, will be performed by an individual designated by the Company who is qualified by experience and training to perform this function.

4. Medical Qualifications

- 4.1 As part of the required physical examination by a qualified medical provider, crane operators and operator trainees will meet physical qualifications as specified below.
 - 4.1.1 Vision of at least 20/30 Snellen in one eye and 20/50 in the other, with or without corrective lenses;
 - 4.1.2 Ability to distinguish colors, regardless of position, if color differentiation is required;
 - 4.1.3 Hearing that is adequate to meet operational demands, with or without use of a hearing aid;
 - 4.1.4 Strength, endurance, agility, coordination and reaction speed that are sufficient to meet the operational demands of the work;

- 4.1.5 Normal depth perception, field of vision, reaction time, manual dexterity, coordination, and no tendencies to dizziness or similar undesirable characteristics;
 - 4.1.6 A negative result for a substance abuse test, with the type and level of testing as specified by the Company based on standard practices for the industry where the crane is employed (with testing and collection of the sample(s) done in accordance with the Company's written substance abuse program, and analysis performed by a NIDA-certified laboratory);
 - 4.1.7 No evidence of having physical defects or emotional instability that could render a hazard to the operator or others, or that in the opinion of the examiner could interfere with the operator's performance; and
 - 4.1.8 No evidence of being subject to seizures or loss of physical control.
- 4.2 Exception to the above qualifications will be considered by the Company if it can be demonstrated that failure to meet a specific qualification will not affect the operation of the crane. Such demonstration may require specialized clinical or medical judgments and tests.
- 4.3 Physical examination of each crane operator by a qualified medical provider will be required every three years, or more frequently if Company supervision deems it necessary.

5. Responsibilities

- 5.1 Site Supervisor -- The Site Supervisor or his or her designate is responsible for assuring that:
- 5.1.1 Employees know, understand, and comply with the requirements of this policy.
 - 5.1.2 Employees are trained in the procedures and use of equipment they are to use to complete the job.
 - 5.1.3 Audit and inspect for compliance of this policy.
 - 5.1.4 Each crane is on a regular (daily, monthly, annual) inspection schedule.
 - 5.1.5 Proofs of regular inspections using the checklist in this policy are available.
 - 5.1.6 Rental or leased cranes have a valid annual certification sticker or other documents prior to the use of the cranes.
 - 5.1.7 Competent, qualified operators are used when lifting.
 - 5.1.8 A Crane Safe Work Permit is issued for the following:
 - 5.1.8.1 All lifts with cranes having a capacity greater than 10 tons.
 - 5.1.8.2 All critical lifts.
 - 5.1.9 Joint responsibility with the crane operator for the safe operation of the crane(s) and the safety of the lift is maintained.

5.1.10 Failure to comply with this policy will result in disciplinary action, up to and including discharge.

5.2 Crane Operators -- The crane operator is responsible for:

5.2.1 Knowing, understanding, and complying with this policy.

5.2.2 Inspecting cranes on a daily basis and reporting defects noted during these inspections.

5.2.3 Reporting any unsafe conditions to supervision.

5.2.4 Knowing the weight of loads PRIOR to lifting.

5.2.5 Knowing the wind speed PRIOR to lifting.

5.2.6 Performing a daily inspection using the Daily Operators Inspection Report at the beginning of each days work PRIOR to the crane use. Any deficiencies that affect the safe operations of the crane shall be repaired PRIOR to use. Each daily inspection report shall remain with the operator during the operation of the crane and turned in at the end of the work day.

5.2.7 Perform a lifting job specific pre-task assessment using Operators Lift Pre-Task Safety Assessment for each lift.

5.2.8 Ensure the load, rigging, procedures, and lifts are safe to use. The operator is responsible for the load and lift when the crane is connected to the load. Do not load rigging equipment beyond its recommended safe load rating. Attach load identification to the rigging.

5.2.9 When the rigging equipment is not in use, it should be removed from the work area to ensure the safety of workers at the site.

5.2.10 Assume joint responsibility with the Site Supervisor for the safe operation of the crane(s) and the safety of the lift.

5.2.11 Understand that failure to comply with this policy will result in disciplinary action, up to and including discharge.

6. General Requirements

6.1 Pre-Lift

6.1.1 Manufacturer's lifting procedures and methods shall be observed at all times.

6.1.2 No modifications or additions which affect the capacity or safe operation of the equipment shall be made by Metro Electric without the manufacturer's written approval. If such modifications or changes are made, the capacity, operation, and maintenance instruction plates, tags, or decals, shall be changed accordingly. In no case shall the original safety factor of the equipment be reduced.

- 6.1.3 All cranes shall have a qualified competent operator. Unauthorized personnel may not ride on the equipment unless it is equipped to accommodate riders safely.
- 6.1.4 Inspect cranes when they arrive on site for mechanical integrity, load chart, operating manual and annual certification decal/sticker. The load rating chart will be substantial and durable, with clearly legible letters and figures. A copy of the manufacturer's load rating chart will be maintained in each crane, securely fixed to the crane cab in a location that is easily visible to the operator while seated at the control station. The load rating chart will not be removed from the crane cab.
- 6.1.5 The crane operator must complete an Operator's Lift Pre-Task Assessment and Mobile Hoisting Safe Work Procedure PRIOR to lifting.
- 6.1.6 Rated load capacities, recommended operating speeds, special hazard warnings, or instructions shall be in a conspicuous place on all equipment, as required, and shall be visible to the operator while at the control station.
- 6.1.7 Inspect all rigging devices before use. Follow manufacturer's capacities and recommendations. Remove any defective rigging material from service immediately.
- 6.1.8 Rigging will be done only by qualified personnel who have successfully completed rigger training as approved by the Company, and who have the experience necessary to perform this work safely. Crane operators and inspectors will not perform rigging unless they are similarly trained and qualified.
- 6.1.9 Obtain a Crane Safe Work Permit for all cranes with capacities of 10 tons or more and critical lifts.
- 6.1.10 Work with lifts, cranes, or any hoisting equipment must be supervised at all times.
- 6.1.11 A qualified Signal Person must be provided.
- 6.1.12 The operator must use access provided for entering and exiting the equipment. Never jump off the equipment.
- 6.1.13 Wooden pads on outriggers will be used on all non-concrete surfaces. Mats will be used as needed.
- 6.1.14 The rear of the rotating superstructure of a crane will be barricaded to warn of the pinch point hazard.
- 6.1.15 The area where an overhead lift is made will be barricaded if personnel can have access and walk under the load.
- 6.1.16 Load block, headache ball, hooks, boom tip, and anti-2 block devices shall be marked with highly visible fluorescent orange paint.
- 6.1.17 Hooks on overhaul ball assemblies, lower load blocks or other attachment assemblies will be of a type that can be closed and locked, eliminating the hook throat opening. Alternatively, an alloy anchor type shackle with a bolt, nut and retaining pin may be used.

6.1.18 All jibs shall have positive stops to prevent their movement of more than 5 degrees above the straight line of the jib and boom on conventional type crane booms. The use of cable type belly slings does not constitute compliance with this rule.

6.2 Lifting

6.2.1 Lifting multiple loads, "Christmas treeing", is prohibited.

6.2.2 Hand signals to crane operators shall be those prescribed by the applicable ANSI standard for the type of crane in use. An illustration of the signals shall be posted at the job site.

6.2.3 All employees shall be kept clear of loads about to be lifted and of suspended loads.

6.2.4 There shall be no sudden acceleration or deceleration of the moving load.

6.2.5 Side loading of booms shall be limited to freely suspended loads. Cranes shall not be used for dragging loads sideways.

6.2.6 No hoisting, lowering, swinging, or traveling shall be done while anyone is on the load or hook.

6.2.7 On truck-mounted cranes, no loads shall be lifted over the front area except as approved by the crane manufacturer.

6.2.8 The operator shall test the brakes each time a load approaching the rated load is handled by raising it a few inches and applying the brakes.

6.2.9 Outriggers shall be used when the load to be handled at that particular radius exceeds the rated load without outriggers as given by the manufacturer for that crane. Where floats are used they shall be securely attached to the outriggers.

6.2.10 Wood blocks used to support outriggers shall:

6.2.10.1 Be strong enough to prevent crushing.

6.2.10.2 Be free from defects.

6.2.10.3 Be of sufficient width and length to prevent shifting or toppling under load.

6.2.11 Neither the load nor the boom shall be lowered below the point where less than 2 full wraps of rope remain on their respective drums.

6.2.12 When two or more cranes are used to lift one load, one designated person shall be responsible for the operation. He/she shall be required to analyze the operation and instruct all personnel involved in the proper positioning, rigging of the load, and the movements to be made.

6.2.13 In transit the following additional precautions shall be exercised:

- 6.2.14 The boom shall be carried in line with the direction of motion.
- 6.2.15 The superstructure shall be secured against rotation, except when negotiating turns when there is an operator in the cab or the boom is supported on a dolly.
- 6.2.16 The empty hook shall be lashed or otherwise restrained so that it cannot swing freely.
- 6.2.17 Before traveling a crane with load, a designated person shall be responsible for determining and controlling safety. Decisions such as position of load, boom location, ground support, travel route, and speed of movement shall be in accord with his determinations. Length, height or width shall be centered and secured without going above the established load limit for the vehicle.
- 6.2.18 A crane with or without load shall not be traveled with the boom so high that it may bounce back over the cab.
- 6.2.19 When rotating the crane, sudden starts and stops shall be avoided. Rotational speed shall be such that the load does not swing out beyond the radii at which it can be controlled. A tagline or restraint line shall be used when rotation of the load is hazardous, unless use of the tagline or restraint line would in itself create a hazard or unsafe situation.
- 6.2.20 When a crane is to be operated at a fixed radius, the boom-hoist pawl or other positive locking device shall be engaged.
- 6.2.21 Ropes shall not be handled on a winch head without the knowledge of the operator.
- 6.2.22 While a winch head is being used, the operator shall be within convenient reach of the power unit control lever.
- 6.2.23 The operator shall not be permitted to leave his position at the controls while the load is suspended.
- 6.2.24 No person should be permitted to stand or pass under a load on the hook.
- 6.2.25 If the load must remain suspended for any considerable length of time, the operator shall hold the drum from rotating in the lowering direction by activating the positive controllable means of the operator's station.

6.3 Other Requirements

- 6.3.1 Cranes shall not be operated without the full amount of any ballast or counterweight in place as specified by the maker, but truck cranes that have dropped the ballast or counterweight may be operated temporarily with special care and only for light loads without full ballast or counterweight in place. The ballast or counterweight in place specified by the manufacturer shall not be exceeded.
- 6.3.2 Necessary clothing and personal belongings shall be stored in such a manner as to not interfere with access or operation.

- 6.3.3 Tools, oil cans, waste, extra fuses, and other necessary articles shall be stored in the tool box, and shall not be permitted to lie loose in or about the cab.
- 6.3.4 Refueling with small portable containers shall be done with an approved safety type can equipped with an automatic closing cap and flame arrester.
- 6.3.5 Machines shall not be refueled with the engine running.
- 6.3.6 No one shall be on the vehicle during fuel operations except as specifically required by design.
- 6.3.7 There will be no smoking or open flames in the area while fueling is taking place.
- 6.3.8 When working in an enclosed area with a combustible engine, tests must be conducted and recorded to assure that the employees are not exposed to harmful gasses or oxygen deficient atmospheres.
- 6.3.9 A carbon dioxide, dry chemical or equivalent fire extinguisher shall be kept in the cab or vicinity of the crane.
- 6.3.10 Operating and maintenance personnel shall be made familiar with the use and care of the fire extinguishers provided.
- 6.3.11 Belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, chains, or other reciprocating, rotating, or other moving parts or equipment shall be guarded if such parts are exposed to contact by employees, or otherwise create a hazard. Guarding shall meet the requirements of the American National Standards Institute B 15.1-1958 Rev., Safety Code for Mechanical Power Transmission Apparatus.
- 6.3.12 All equipment shall have a working backup signal alarm.
- 6.3.13 Eye protection must be used if the equipment has no enclosed cab. If seatbelts are provided with the equipment, they must be used.
- 6.3.14 Accessible areas within the swing radius of the rear of the rotating superstructure of the crane, either permanently or temporarily mounted, shall be barricaded in such a manner as to prevent an employee from being struck or crushed by the crane.
- 6.3.15 All exhaust pipes shall be guarded or insulated in areas where contact by employees is possible in the performance of normal duties.
- 6.3.16 If rigging equipment is not being used, remove it from the area to avoid a potential trip and fall hazard.
- 6.3.17 Crane maintenance, repairs and “out of service” procedures
- 6.3.18 Prior to making repairs or adjustments to a crane, specific procedures shall be followed and precautions taken:

- 6.3.18.1 Move the crane to be repaired to a place where it will cause the least interference with other cranes and operations in the area.
- 6.3.18.2 Set all controllers to the off position.
- 6.3.18.3 Open the main or emergency switch and lock it in the open position.
- 6.3.18.4 Place prominent warning or "out of order" signs on the crane so that they are in plain sight of workers in the area.
- 6.3.18.5 After repairs and adjustments are completed, replace all guards, reactivate all safety devices and remove maintenance equipment before operating the crane.

6.3.19 Operations Near Overhead Electrical Lines

- 6.3.19.1 Except where electrical distribution and transmission lines have been de-energized and visibly grounded at point of work or where insulating barriers, not a part of or an attachment to the equipment or machinery, have been erected to prevent physical contact with the lines, equipment or machines shall be operated proximate to power lines only in accordance with the following:
 - 6.3.19.2 For lines rated 50 kV. or below, minimum clearance between the lines and any part of the crane or load shall be 10 feet.
 - 6.3.19.3 For lines rated over 50 kV., minimum clearance between the lines and any part of the crane or load shall be 10 feet plus 0.4 inch for each 1 kV. over 50 kV., or twice the length of the line insulator, but never less than 10 feet.
 - 6.3.19.4 In transit with no load and boom lowered, the equipment clearance shall be a minimum of 4 feet for voltages less than 50 kV. and 10 feet for voltages over 50 kV. up to and including 345 kV. and 16 feet for voltages up to and including 750 kV.
 - 6.3.19.5 A person shall be designated to observe clearance of the equipment and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means.
 - 6.3.19.6 Cage-type boom guards, insulating links, or proximity warning devices may be used on cranes, but the use of such devices shall not alter the requirements of any other regulation of this part even if such device is required by law or regulation.
 - 6.3.19.7 Any overhead wire shall be considered to be an energized line unless and until the person owning such line or the electrical utility authorities indicate that it is not an energized line and it has been visibly grounded.
 - 6.3.19.8 Prior to work near transmitter towers where an electrical charge can be induced in the equipment or materials being handled, the transmitter

shall be de-energized or tests shall be made to determine if electrical charge is induced on the crane.

6.3.19.9 The following precautions shall be taken when necessary to dissipate induced voltages:

6.3.19.9.1 The equipment shall be provided with an electrical ground directly to the upper rotating structure supporting the boom; and

6.3.19.9.2 Ground jumper cables shall be attached to materials being handled by boom equipment when electrical charge is induced while working near energized transmitters. Crews shall be provided with nonconductive poles having large alligator clips or other similar protection to attach the ground cable to the load.

6.3.19.10 Combustible and flammable materials shall be removed from the immediate area prior to operations.

6.3.19.11 The rated load of the crane shall be plainly marked on each side of the crane, and if the crane has more than one hoisting unit, each hoist shall have its rated load marked on it or its load block, and this marking shall be clearly legible from the ground or floor.

6.3.19.12 Bridge trucks shall be equipped with sweeps which extend below the top of the rail and project in front of the truck wheels.

6.3.19.13 Except for floor-operated cranes, a gong or other effective audible warning signal shall be provided for each crane equipped with a power traveling mechanism.

6.3.19.14 All overhead and gantry cranes in use shall meet the applicable requirements for design, construction, installation, testing, maintenance, inspection, and operation as prescribed in the ANSI B30.2.0-1967, Safety Code for Overhead and Gantry Cranes.

7. Inspection Requirements

7.1 The Crane Operator and the Crane Competent Person are responsible for performing inspections using Daily Operators Inspection Report -- Mobile Crane Operation, Monthly Hydraulic Crane Inspection Report and Monthly Inspection of Truck Cranes.

7.2 Inspection of critical components of the crane shall be performed at least monthly. Components inspected shall include crane hooks and safety latches; brakes and braking components; slings and ropes.

7.3 Inspection records shall be filed and maintained by the Safety Coordinator at the Company main office. Crane certification records shall include the inspection date, signature of the inspector, and identification of the component by serial number or other identifier. This

certification record shall be maintained so that it is readily available for inspection and confirmation.

- 7.4 A written record also shall be maintained of reports showing rated load test procedures and confirming the adequacy of repairs or alterations.
- 7.5 Test loads shall not exceed 110 percent of the rated load at any selected working radius.
- 7.6 If re-rating is required, crawler, truck, and wheel-mounted cranes shall be tested in accordance with SAE Recommended Practice, Crane Load Stability Test Code J765 (April 1961). Re-rating test report shall be readily available.
- 7.7 No re-rating in excess of a crane's original load rating shall be performed unless the manufacturer or designated technician who is in charge of final assembly gives their approval in writing. Such written approval shall be maintained in a file by the Safety Coordinator.
- 7.8 A thorough annual inspection of the hoisting machinery shall be made by a competent person, or by a government or private agency recognized by the U.S. Department of Labor. Metro Electric shall maintain a record of the dates and results of inspections and rated load tests for each hoisting machine and piece of equipment.
- 7.9 Any defects found will be repaired by a qualified person before the crane is used.
- 7.10 Before a crane is placed in service for use, rope components shall be inspected by a qualified person for defects, damage and deformities and at least monthly thereafter. Certification of this inspection shall be in writing and document the date of inspection; inspector's name and signature; and identification number of the rope component inspected.

8. Inspection of Wire Rope

- 8.1 Wire rope shall be taken out of service when any of the following conditions exist:
 - 8.1.1 In running ropes, 6 randomly distributed broken wires in 1 lay or 3 broken wires in one strand in one lay;
 - 8.1.2 Wear of $\frac{1}{3}$ the original diameter of outside individual wires.
 - 8.1.3 Kinking, crushing, bird caging, or any other damage resulting in distortion of the rope structure;
 - 8.1.4 Evidence of any heat damage from any cause;
 - 8.1.5 Reductions from nominal diameter of more than $\frac{1}{64}$ inch for diameters up to and including $\frac{5}{16}$ inch, $\frac{1}{32}$ inch for diameters $\frac{3}{8}$ inch to and including $\frac{1}{2}$ inch, $\frac{3}{64}$ inch for diameters $\frac{9}{16}$ inch to and including $\frac{3}{4}$ inch, $\frac{1}{16}$ inch for diameters $\frac{7}{8}$ inch to $1 \frac{1}{8}$ inches inclusive, $\frac{3}{32}$ inch for diameters $1 \frac{1}{4}$ to $1 \frac{1}{2}$ inches inclusive;
 - 8.1.6 In standing ropes, more than 2 broken wires in 1 lay in sections beyond end connections or more than 1 broken wire at an end connection.

- 8.2 Wire rope safety factors shall be in accordance with American National Standards Institute B 30.5-1968 or SAE J959-1966.
- 8.3 Heavy wear and/or broken wires may occur in sections that have contact with equalizer sheaves or other sheaves (where rope travel is limited) or with saddles. Particular care shall be taken to inspect ropes at these locations.
- 8.4 If rope has not been used for a month or longer (i.e. due to shutdown or storage of a crane on which it is installed) this rope shall be given a thorough inspection before it is used.
- 8.5 This inspection shall be made by a designated person who is authorized by the Company. This inspector shall examine rope for any kind of damage, deterioration or defect that might compromise the safety and specifications of the rope. Specific attention and care shall be given to the inspection of non-rotating rope.
- 8.6 Only this designated and authorized inspector shall give approval for use of this rope following satisfactory safety inspection as described above.
- 8.7 A written record of the inspector's certification shall be maintained by the Safety Coordinator in a file and be readily available for review and confirmation. This certification shall include the inspection date, name and signature of the inspector, and the identification number of the rope component that was inspected.

9. Inspection of Hoist Chains

- 9.1 Hoist chains and end connections shall be inspected daily for damage, deterioration, excessive wear, twist, distorted links interfering with proper function, or stretch beyond manufacturer's recommendations.
- 9.2 Chains shall be inspected visually by the operator each day or before first use.
- 9.3 Chains also shall be inspected monthly for safety certification. The written certification shall include the date of inspection, name and signature of the inspector, and the identification number of the chain that was inspected. Written certification records shall be maintained by the Safety Coordinator in a file.

10. Inspection of Hooks and Hook Components

- 10.1 Crane hooks and safety latches shall be visually inspected each day or at the beginning of a shift prior to use for damage, cracks or deformation.
- 10.2 Hooks and safety latches also shall be inspected monthly for safety certification. The written certification shall include the date of inspection, name and signature of the inspector, and the identification number of the hook that was inspected. Written certification records shall be maintained by the Safety Coordinator in a file.
- 10.3 Hooks that have cracks or a throat opening that is greater than 15 percent in excess of normal, or more than 10 degree twist from the plane of the unbent hook shall be discarded.

11. Preventive Maintenance

- 11.1 The Company has implemented a preventive maintenance program to help ensure the safety of cranes, hoists, rigging and related equipment. Preventive maintenance shall be performed in accordance with manufacturer's recommendations. Each crane shall have a written record of preventive maintenance that is maintained by the Safety Coordinator.

12. Inspection and Safe Use of Slings

- 12.1 Slings will be inspected prior to each use to ensure that they are not damaged, defective or otherwise unsafe.
- 12.2 Synthetic web slings shall not be used with loads in excess of the rated load capacities.
- 12.3 Slings should be used only in accordance with sling manufacturer's recommendations.
- 12.4 Each sling shall be marked to show rated capacities for each type of hitch and type of synthetic material.
- 12.5 Each sling shall be marked for inspection identification.
- 12.6 Webbing shall be of uniform thickness and width and selvage edges shall not be split from the webbing's width.
- 12.7 Inspect fittings to ensure that they have no sharp edges or projections that could damage the sling.
- 12.8 Stitching shall be the only method of attachment of fittings to webbing and to form eyes.
- 12.9 The following restrictions apply:
 - 12.9.1 Nylon web slings are not to be used where fumes, vapors, sprays, mists, or liquids of acids or phenolics are present.
 - 12.9.2 Polyester and polypropylene web slings are not to be used where fumes, vapors, sprays, mists, or liquids of caustics are present.
 - 12.9.3 Web slings with aluminum fittings shall not be used.
- 12.10 Synthetic web slings of polyester or nylon shall not be used at temperatures in excess of 180°F. Polypropylene web slings shall not be used at temperatures in excess of 200°F.
- 12.11 Repaired synthetic web slings are not to be used unless the repair is done by the sling manufacturer or an equivalent entity.
- 12.12 Each repaired sling shall be proof tested to twice the rated capacity by the sling manufacturer or an equivalent entity prior to returning to service.
- 12.13 The certificate of the proof test shall be maintained for the life of the sling.
- 12.14 Synthetic web slings shall be immediately removed from service if any of the following conditions exist:

- 12.14.1 Snags, punctures, cuts or tears,
- 12.14.2 Broken or worn stitches,
- 12.14.3 Distorted fittings.

13. Training Requirements

- 13.1 Employees who perform crane, hoist and rigging operations will be qualified through both experience and training as specified by the Company.
- 13.2 Training will include classroom instruction, hands-on experience and familiarization with components including rigging systems and parts; cables; chokes; slings; hooks; beams; spreaders or other device used to attach or lift the load.
- 13.3 Classroom training will include instruction on:
 - 13.3.1 Concepts and practices of pre-planning a lift;
 - 13.3.2 Identifying both specific and potential hazards;
 - 13.3.3 Safe rigging, balance and lift procedures;
 - 13.3.4 Standard signaling procedures;
 - 13.3.5 Use of fire extinguishers;
 - 13.3.6 Equipment and inspection procedures; and
 - 13.3.7 Other subject matter that pertains to the actual type or types of rigging and lifting operations to be performed in the Company workplace.
- 13.4 Hands-on training and observations will address the pre-use inspection of all components; proper selection and use of rigging components; familiarization with and proper use of lift equipment.
- 13.5 Additionally, training will be conducted annually on the requirements of this policy, and also whenever this policy is revised.
- 13.6 All new crane operators and rigging crew members will review this policy as part of their training prior to starting work.
- 13.7 Crane operators and the rigging crew will review this policy prior to lifts.
- 13.8 If the job involves multiple types of lifts, this policy will be reviewed prior to starting each such lift. This will help ensure that safety situations specific to the type of lift are considered.

Metro Electric Co., Inc.

Personal Protective Equipment



Applicable OSHA Standard: 29 CFR 1910 Subpart I

1. Purpose & Scope

- 1.1 Personal Protective Equipment (PPE), including protection for eyes, face, head, and extremities, by use of protective clothing, respiratory devices, protective shields and barriers, will be provided, used, and maintained in a sanitary and reliable condition wherever it is necessary by reason of hazards of processes or environment, chemical hazards, radiological hazards, or mechanical irritants encountered in a manner capable of causing injury or impairment in the function of any part of the body through absorption, inhalation or physical contact.
- 1.2 This policy applies to all employees and subcontractors at work locations that are controlled by Metro Electric.

2. Application

- 2.1 PPE devices alone should not be relied on to provide protection against hazards, but should be used in conjunction with guards, engineering controls and responsible manufacturing practices.
- 2.2 The Company will provide employees with the proper PPE for use in their specific tasks.
- 2.3 This PPE includes, but is not limited to, protection for eyes, face, head, respiratory system, hearing, body and extremities.
- 2.4 The PPE will be maintained and stored in accordance with the manufacturer's recommendations.

3. Employee-Owned Equipment

- 3.1 Where employees provide their own protective equipment, the Site Supervisor will be responsible to assure its adequacy, including proper maintenance, and sanitation of such equipment.

4. Design

- 4.1 All PPE will meet OSHA/NIOSH standards and approval.
- 4.2 Where a standard may not apply, a competent person will analyze the equipment and give approval or disapproval for its use. The Company's Certificate of Hazard Assessment will be completed and utilized to make a determination if hazards are present, or likely to be present, at the jobsite which will require the use of PPE. The certifier's name, signature, dates and identification of assessment documents will be included.

5. Hazard Assessment and Selection

- 5.1 Selection of PPE will be based on Company supervision's written and signed assessment of the hazards associated with the job site and the recommendations included on the safe work permit provided by the host employer or general contractor.
- 5.2 Prior to the beginning of any job task, Company supervision will determine the PPE necessary to safeguard the employees assigned to do the work. When the job task is complicated in nature the Site Supervisor and the host employer or general contractor safety representative will be consulted for their expertise in determining the proper PPE for the task.
- 5.3 Company supervision will ensure that the PPE is available and is included on the work permit. The information on the permit will be discussed with the crew assigned to do the work.
- 5.4 When reviewing the scope of work prior to the commencement of the job, Company supervision will assess the hazards associated with the work and its environment. This assessment will be distributed to the Site Safety Supervisor/Representative to determine the needs of the job.
- 5.5 PPE determined for the job will be verbally communicated to the employees during a tool box safety meeting prior to the commencement of the job.
- 5.6 PPE selected will be of the types that will protect the affected employee from the hazards identified in the hazard assessment, fitted to the employee as needed to be effective, and with PPE ordered in various sizes and types to accommodate a variety of individuals who may be assigned work.

6. Defective and Damaged Equipment

- 6.1 Defective or damaged equipment will not be used.
- 6.2 When PPE is removed for disposal it will be tagged as such, if not disposed of immediately.

7. Training

- 7.1 The Company will provide training to each employee who is required to use PPE. Each such employee will be trained to know at least the following:
 - 7.1.1 When PPE is necessary;
 - 7.1.2 What PPE is necessary;
 - 7.1.3 How to properly don, doff, adjust, and wear PPE;
 - 7.1.4 The limitations of the PPE; and
 - 7.1.5 The proper care, maintenance, useful life and disposal of the PPE.
- 7.2 Each affected employee will demonstrate an understanding of the training specified in 6.1, and the ability to use PPE properly, before being allowed to perform work requiring the use of PPE.

- 7.3 When Company supervision has reason to believe that any affected employee who has already been trained does not have the understanding and skill required, the employee will be retrained. Circumstances where retraining is required include, but are not limited to, situations where:
- 7.3.1 Changes in the workplace render previous training obsolete; or
 - 7.3.2 Changes in the types of PPE to be used render previous training obsolete; or inadequacies in an affected employee's knowledge or use of assigned PPE indicate that the employee has not retained the requisite understanding or skill.
 - 7.3.3 Company supervision will verify that each affected employee has received and understood the required training through a written certification that contains the name of each employee trained, the date(s) of training, and that identifies the subject of the certification.

8. Eye and Face Protection

- 8.1 The minimum eye protection allowed outside of an office area is ANSI (Z.87.1-1989) approved side shield safety glasses.
- 8.2 Employees WILL wear their eye protection to adequately protect themselves from hazards in the work area.
- 8.3 Contact lenses are not allowed at work areas unless approved in writing by management.
- 8.4 Supervisors and the host employer or general contractor will determine what tasks require other eye protection, such as chemical goggles and face shields.
- 8.5 Eye and face PPE will be distinctly marked to facilitate identification of the manufacturer.
- 8.6 Goggles that can be worn over corrective spectacles without disturbing the adjustment are acceptable.
- 8.7 Questions about eye protection should be brought to your supervisor and resolved before the job is started. Special protection concerns should also be discussed with your supervisor.
- 8.8 All face and eye protection equipment will be kept clean and in good repair.
- 8.9 Full-face shields are required to be worn over side shield safety glasses or chemical goggles for grinding, chipping and any other designated assignment.

9. Head Protection

- 9.1 Approved hard hats (ANSI-Z89.1-1986) in good condition are required when working in the yard and process areas. Protective helmets designed to reduce electrical shock hazard will be worn by each affected employee when near exposed electrical conductors which could contact the head (ANSI -Z89.2-1971). Metal hard hats will not be worn.

- 9.2 Hard hats will be worn in work areas where there is a potential for injury to the head from falling or flying objects.

10. Hand Protection

- 10.1 Metro Electric will select and require employees to use appropriate hand protection when employee's hands are exposed to hazards such as those from skin absorption of harmful substances, severe cuts or lacerations, severe abrasions, punctures, chemical burns, thermal burns, and harmful temperature extremes.
- 10.2 The selection of the appropriate hand protection will be based on an evaluation of the performance characteristics of the hand protection relative to the task(s) to be performed, conditions present, duration of use and the hazards and potential hazards identified.
- 10.3 All employees should obtain protective gloves suitable for the work they will perform. Gloves will be worn when required.

11. Foot Protection

- 11.1 Each affected employee will wear protective footwear when working in areas where there is a danger of foot injuries due to falling and rolling objects, or objects piercing the sole and where such employee's feet are exposed to electrical hazards.
- 11.2 Protective footwear need comply with (ANSI Z41-1991). Steel-toed shoes are required on most job sites. The Company requires the wearing of steel-toed shoes for anyone in the field with the exception of office personnel who are restricted to operations off of job sites.

12. Assessment Guidelines

- 12.1 The on-site Supervisor or Safety Representative will conduct a walk-through survey of the areas in question. The purpose of the survey is to identify sources of hazards to workers and co-workers. Consideration should be given to the following basic hazard categories: Impact, Penetration, Compression (roll-over), Chemical Exposure, Heat and Cold; Harmful dust; and Light (optical radiation).
- 12.2 During the walk-through survey the Site Supervisor should observe:
- 12.2.1 Sources of motion (i.e., machinery or processes where movement of tools, machine elements or particles could exist), or movement of personnel that could result in collision with stationary objects;
 - 12.2.2 Sources of high temperatures that could result in burns, eye injury or ignition of protective equipment, etc.;
 - 12.2.3 Types of chemical exposures;
 - 12.2.4 Sources of harmful dust;
 - 12.2.5 Sources of light radiation (i.e., welding, brazing, cutting, furnaces, heat treating, high intensity lights, etc.);

- 12.2.6 Sources of falling objects or potential for dropping objects;
 - 12.2.7 Sources of sharp objects which might pierce the feet or cut the hands;
 - 12.2.8 Sources of rolling or pinching objects which could crush the feet;
 - 12.2.9 Layout of workplace and location of co-workers; and
 - 12.2.10 Any electrical hazards.
- 12.3 In addition, injury/accident data should be reviewed to help identify problem areas.
- 12.4 Following the walk-through survey, it is necessary to organize the data and information for use in the assessment of hazards. The objective is to prepare for an analysis of the hazards in the environment to enable proper selection of protective equipment.
- 12.5 Having gathered and organized data on a workplace, an estimate of the potential for injuries should be made. Each of the basic hazards should be reviewed and a determination made as to the type, level of risk, and seriousness of potential injury from each of the hazards found in the area. The possibility of exposure to several hazards simultaneously should be considered.

13. Selection Guidelines

- 13.1 After completion of the hazard assessment (see 11 above), the general procedure for selection of protective equipment is to:
- 13.1.1 Become familiar with the potential hazards and the type of protective equipment that is available, and what it can do; i.e., splash protection, impact protection, etc.
 - 13.1.2 Compare the hazards associated with the environment; i.e., impact velocities, masses, projectile shape, radiation intensities, with the capabilities of the available protective equipment.
 - 13.1.3 Select the protective equipment which ensures a level of protection greater than the minimum required to protect employees from the hazards.
 - 13.1.4 Fit the user with the protective device and give instructions on care and use of the PPE. It is very important that end users be made aware of all warning labels for and limitations of their PPE.

14. Selection Chart Guidelines For Eye and Face Protection

- 14.1 Work inside of the plant, including process areas and the yard, require eye protection. The following chart provides general guidance for the proper selection of eye and face protection to protect against hazards associated with the listed hazard "source" operations.

Eye and Face Protection Selection Chart

Source	Assessment of Hazard	Protection
--------	----------------------	------------

IMPACT - Chipping, grinding, machining, masonry work, woodworking, sawing, drilling, chiseling, powered fastening, riveting, and sanding.	Flying fragments, objects, large chips, particles sand, dirt, etc.	Spectacles with side protection goggles, face shields. For severe exposure, use face shield.
HEAT - Furnace operations, pouring, casting, hot dipping, and welding.	Hot sparks. Splash from molten metals. High temperature exposure.	Face shields, goggles, spectacles with side protection. For severe exposure use face shield. Face shields worn over goggles. Screen face shields, reflective face shields.
CHEMICALS - Acid and chemicals handling, degreasing plating.	Splash Irritating mists	Goggles, eyecup and cover types. For severe exposure, use face shield. Special-purpose goggles.
DUST - Woodworking, buffing, general dusty conditions.	Nuisance dust	Goggles, eyecup and cover types.
LIGHT and/or RADIATION - Welding: Electric arc	Optical radiation	Welding helmets or welding shields. Typical shades: 10-14
Welding: Gas	Optical radiation	Welding goggles or welding face shield. Typical shades: gas welding 4-8, cutting 3-6, brazing 3-4
Cutting, Torch brazing, Torch soldering	Optical radiation	Welding goggles or welding face shield. Typical shades: gas welding 4-8, cutting 3-6, brazing 3-4
Glare	Poor vision	Spectacles with shaded or special-purpose lenses, as suitable.

15. Selection Guideline for Head Protection

- 15.1 All head protection (helmets) is designed to provide protection from impact and penetration hazards caused by falling objects. Head protection is also available which provides protection from electric shock and burn. When selecting head protection, knowledge of potential electrical hazards is important.
- 15.2 Class A helmets, in addition to impact and penetration resistance, provide electrical protection from low-voltage conductors (they are proof tested to 2,200 volts).
- 15.3 Class B helmets, in addition to impact and penetration resistance, provide electrical protection from high-voltage conductors (they are proof tested to 20,000 volts).
- 15.4 Class C helmets provide impact and penetration resistance (they are usually made of aluminum which conducts electricity), and should not be used around electrical hazards.

- 15.5 Where falling object hazards are present, helmets must be worn. Some examples include: working below other workers who are using tools and materials which could fall; working around or under conveyor belts which are carrying parts or materials; working below machinery or processes which might cause material or objects to fall; and working on exposed energized conductors.

16. Selection Guidelines for Foot Protection

- 16.1 Safety shoes and boots which meet the ANSI Z41-1991 Standard provide both impact and compression protection. Where necessary, safety shoes can be obtained which provide puncture protection. In some work situations, metatarsal protection should be provided, and in other special situations electrical conductive or insulating safety shoes would be appropriate.
- 16.2 Safety shoes or boots with impact protection would be required for carrying or handling materials such as lumber, metal construction components and parts, or heavy tools -- any of which could be dropped; and for other activities in which objects might fall onto the feet.
- 16.3 Safety shoes or boots with compression protection would be required for work activities involving skid trucks (manual material handling carts) around bulk rolls (such as felt rolls) and around heavy pipes on a job site, all of which could potentially roll over an employee's feet.
- 16.4 Safety shoes or boots with puncture protection would be required where sharp objects such as nails, wire, tacks, screws, large staples, scrap metal, etc., could be stepped on by employees causing a foot injury.

17. Selection Guidelines for Hand Protection

- 17.1 Gloves are often relied upon to prevent cuts, abrasions, burns, and skin contact with chemicals that are capable of causing local or systemic effects following dermal exposure. OSHA is unaware of any gloves that provide protection against all potential hand hazards, and commonly available glove materials provide only limited protection against many chemicals. Therefore, it is important to select the most appropriate glove for a particular application and to determine how long it can be worn, and whether it can be reused.
- 17.2 It also is important to know the performance characteristics of gloves relative to the specific hazard anticipated; e.g., chemical hazards, cut hazards, flame hazards, etc. These performance characteristics should be assessed by using standard test procedures.
- 17.3 Before purchasing gloves, the Supervisor or person ordering should request documentation from the manufacturer that the gloves meet the appropriate test standard(s) for the hazard(s) anticipated. Other factors to be considered for glove selection in general include:
- 17.3.1 As long as the performance characteristics are acceptable, in certain circumstances, it may be more cost effective to regularly change cheaper gloves than to reuse more expensive types; and,
- 17.3.2 The work activities of the employee should be studied to determine the degree of dexterity required, the duration, frequency, and degree of exposure of the hazard, and the physical stresses that will be applied.

- 17.3.3 With respect to selection of gloves for protection against chemical hazards:
- 17.3.3.1 The toxic properties of the chemical(s) must be determined; in particular, the ability of the chemical to cause local effects on the skin and/or to pass through the skin and cause systemic effects;
 - 17.3.3.2 Generally, any "chemical resistant" glove can be used for dry powders;
 - 17.3.3.3 For mixtures and formulated products (unless specific test data are available), a glove should be selected on the basis of the chemical component with the shortest breakthrough time, since it is possible for solvents to carry active ingredients through polymeric materials; and,
 - 17.3.3.4 Employees must be able to remove the gloves in such a manner as to prevent skin contamination.

Metro Electric Co., Inc.

Powder Activated Tools



Only properly trained employees may operate a "powder activated" tool. You may receive training from the Safety Director or the supplier of the equipment.

The following procedures should be followed when using powder activated tools:

- Test the tool before each use to determine that the safety devices are in proper working condition.
- Do not leave a loaded tool unattended. Load the tool just prior to its use.
- Do not point the tool at anyone. Treat it with the same respect you would a loaded gun.
- Only use the tool with proper, personal protective equipment.
- Never attempt to drive fasteners into hard or brittle materials such as: cast iron, glazed tile, hollow tile, face brick or hardened steel.
- Make sure the area is clear on the other side of the material you're fastening. Flying nails, fragments, concrete chips, etc. may cause injury to persons on the opposite side.
- Follow the manufacturer's instructions regarding the correct use of their tool and attachments.

Safety Reminder

DON'T TAKE CHANCES - IF YOU DON'T KNOW, ASK QUESTIONS!

Metro Electric Co., Inc.

Preventive Inspection & Maintenance



Applicable Standards: Owner Requirement

1. Purpose

- 1.1 Metro Electric Co., Inc has established a Preventive Inspection & Maintenance Program to ensure that Company-owned equipment, machines, tools and vehicles are maintained to be safe and serviceable when used in the workplace.
- 1.2 This program also establishes responsibilities for management, supervisors and employees to implement preventive maintenance procedures, responsibilities and documentations.

2. Scope

- 2.1 All affected Company employees will comply with requirements of this program.

3. Components, Methods & Responsibilities

- 3.1 The Company has created an Inventory and Status List for tracking each machine, equipment, tool or vehicle acquisition that is entered in a Company capital investment account.
- 3.2 Entry on the Inventory and Status List will be made on acquisition of an applicable asset and prior to placing the asset into service. An asset will be removed from the list when it is taken out of service and is no longer used in the workplace.
- 3.3 A schedule of preventive maintenance will be established for each applicable asset in accordance with Company procedures; manufacturer's recommendations, service and warranty requirements; and in accordance with industry service and quality standards applicable to use of the equipment, machine, tool or vehicle in Company operations.
- 3.4 Preventive maintenance activities will include a schedule for regular, periodic and pre-use inspections in accordance with a protocol established by the Company to address each specific asset covered by this program.
- 3.5 Any deficiency noted during an inspection will be reported to the on-duty or on-site supervisor so that determination can be made as to whether the asset should be removed from service.
- 3.6 Any equipment, machine, tool or vehicle found during in-house inspection to be damaged, defective, needing service or repair, or requiring certification, regulatory inspection, licensing or renewal, or having any condition that affects its safe use, will be removed from service immediately. It will not be returned to service until the deficiency is corrected.

- 3.7 Warranty and manufacturer's documentation and manuals, as well as records inspections, preventive maintenance, service and repairs will be maintained for each asset covered by this program. These records will include receipts for service, repairs, parts and other documentations relating to work performed by third parties.
- 3.8 Preventive maintenance records will be maintained by the Company's designated Maintenance Coordinator at the main office.
- 3.9 Records will be maintained for as long as the asset is in service, and thereafter for as long as the asset is owned by the Company.

Metro Electric Co., Inc.

Process Safety Management



Applicable OSHA Standards: 29 CFR 1910.119

1. Purpose & Scope

- 1.1 This example Process Safety Management (PSM) Program complies with OSHA standard 29 CFR 1910.119, Process Safety Management of Highly Hazardous Chemicals; Explosives and Blasting Agents.
- 1.2 Because Metro Electric may be a contractor working inside of a PSM facility, it will abide with all such PSM contractor requirements. Under this program, Company employees will be trained in the concepts and requirements of PSM.
- 1.3 This program is included here for informational purposes only, and as a typical example of PSM development and implementation in client facilities.
- 1.4 Actual client PSM Program requirements apply to all employees and contractors working within the client controlled work locations.

2. Contractor Safety Responsibilities Under a PSM Program

- 2.1 The contract employer will assure that each contract employee is trained in the work practices necessary to safely perform his/her job.
- 2.2 The contract employer will assure that each contract employee is instructed in the known potential fire, explosion, or toxic release hazards related to his/her job and the process, and the applicable provisions of the host employer's emergency action plan.
- 2.3 The contract employer will document that each contract employee has received and understood the training required by this paragraph. The contract employer will prepare a record which contains the identity of the contract employee, the date of training, and the means used to verify that the employee understood the training.
- 2.4 The contract employer will assure that each contract employee follows the safety rules of the host facility, including safe work practices required by the contractor's company safety and health programs, and in accordance with OSHA requirements. This includes procedures for lockout/tagout, confined space entry, opening process equipment or piping and controls over entrance to facility.
- 2.5 The contract employer will advise the employer of any unique hazards presented by the contract employer's work, or of any hazards found by the contract employer's work.
- 2.6 Contractor supervisors and personnel will immediately report all incidents, injuries and near misses in accordance with the host employer's PSM program requirements and procedures.

2.7 Contractor employees will immediately report any incident, injury or near miss to his or her employer's on-site supervisor.

2.8 The example program follows.

3. Preface of Example PSM Program

3.1 Safety, health, and environmental responsibilities must be managed by line management as they manage their other responsibilities including production, quality, cost, and personnel relations. The same basic management techniques are used to manage safety, health, and environmental requirements as for production and quality management.

3.2 These include planning, organizing, leading and controlling assigned responsibilities.

3.3 Responsibility for protecting people, property, and the environment begins with the ranking facility manager and extends through all levels of the line management organization including employees. Each person in the line organization from the ranking manager to the employees has specific safety, health, and environmental responsibilities that they cannot delegate to others. They must effectively discharge their personal responsibility for protecting people, property, and the environment to achieve a safe and healthful working environment.

3.4 One important part of the overall safety and health program involves the prevention of unwanted releases of hazardous chemicals into locations which could expose employees and others to serious hazards as well as the environment and people in the surrounding community.

3.5 This Process Safety Management (PSM) Program describes the management system for protecting people, property, and the environment from catastrophic releases of highly hazardous chemicals in the workplace. This is accomplished by systematically evaluating the process(es) using approaches to assess the effectiveness of the process design, technology, operations, maintenance, non-routine activities, procedures, emergency preparedness, training, and other process elements. These are described in more detail throughout this PSM program.

3.6 This PSM Program complies with OSHA standard 29 CFR 1910.119, Process Safety Management of Highly Hazardous Chemicals; Explosives and Blasting Agents issued on

3.7 February 24, 1992, and which became effective on May 26, 1992.

4. Introduction

4.1 The major objective of this Process Safety Management (PSM) program is to prevent unwanted releases of hazardous chemicals into locations which could expose employees and others to serious hazards including those in the surrounding community.

4.2 The PSM program involves a systematic approach to evaluating the entire process, including the design, technology, operation, maintenance, procedures; emergency plans, training programs, and other pertinent process elements. A proactive identification, evaluation and mitigation or prevention of chemical releases is utilized.

- 4.3 The necessary expertise, experience, judgment, and proactive initiative is provided within the line organization or obtained from outside resources as needed to assure an effective PSM program. There are continuing efforts to strengthen and improve the process safety knowledge and expertise within the line organization.
- 4.4 Alternative avenues of decreasing the risks associated with highly hazardous chemicals in the workplace are considered, including the reduction in the inventory of the highly hazardous chemicals and dispersing hazardous chemical storage locations where one location will not cause a release in another location.
- 4.5 The PSM program describes how employees are involved in the programs, how process hazard analyses are conducted, and preparation of operating procedures and practices, training, contractors, pre-startup safety, mechanical integrity, managing change, incident investigation, emergency preparedness, and compliance audits.

5. **Process Safety Management System**

5.1 The facility's process safety management system is a part of the facility's safety, health, and environmental program. The Central Safety and Health Committee (CSHC), chaired by the ranking manager, serve as the decision-making and policy-setting body. All department heads reporting to the ranking manager serve on the CSHC as members and chair safety and health task groups. There are usually eight task groups including:

- 5.1.1 Safety Activities
- 5.1.2 Rules and Procedures
- 5.1.3 Education and Training
- 5.1.4 Health and Environment Inspections and Audits
- 5.1.5 Fire and Emergency
- 5.1.6 Accident Investigation
- 5.1.7 Housekeeping

5.2 A brief description of the CSHC and each task group and how they are involved in the PSM program follows.

6. **Central Safety and Health Committee**

- 6.1 The CSHC meets monthly for about an hour to manage the overall safety, health, and environmental program. Group chairmen will report on his or her task group reviews, audits, findings, conclusions, and recommendations at each meeting.
- 6.2 CSHC task group meeting minutes are maintained. When recommendations are accepted, they are assigned to specific individuals for follow-up, for completion, and for resolving by specified time periods.

6.2.1 Task Groups

6.2.1.1 Each task group is composed of supervisory and employee members who represent their assigned departments. Usually there are an equal number of supervisors and employees on each task group. In some cases, task group members chair safety and health teams, such as one Inspections and Audits task group member chairing a Process Hazards Analysis (PHA) team. This team conducts and/or manages the PHAs.

6.2.2 Safety Activities

6.2.2.1 Task groups promote the overall safety, health, and environmental program to ensure that it effectively protects people, property, and the environment. Task groups help communicate the importance of the PSM program to employees and the surrounding community and solicit employee participation.

6.2.3 Rules and Procedures

6.2.3.1 The Rules and Procedures task group coordinates all facility safety rules and procedures to ensure that the rules and procedures are known, understood, and followed. They manage the preparation and maintenance of the rules and procedures including the PSM procedures and program information. Also, one member of the group serves on the process safety management compliance audit team.

6.2.4 Education and Training

6.2.4.1 This task group coordinates all facility safety, health, and environmental training programs to ensure high quality training and good comprehension. The PSM training programs are coordinated by this group, including management, supervisors, employees, and contractors.

6.2.5 Health and Environment

6.2.5.1 All facility health and environmental program activities are coordinated by this task group, including the hazard communication program, respiratory protection program, hearing conservation program, and bloodborne pathogens program. One member chairs an ergonomics team and another, an environmental team. The task group cooperates with the process hazards analysis team in conducting process analyses.

6.2.6 Inspections and Audits

6.2.6.1 This task group manages all facility safety, health, and environmental inspections, including OSHA required inspections and audits. They determine what should be inspected, when the inspections should be conducted, who should inspect, and how the inspections should be performed. One member of the task group chairs the Process Hazards Analysis (PHA) team. Details concerning the PHA team are provided following this section.

- 6.2.7 Fire and Emergency
 - 6.2.7.1 The fire and emergency task group coordinates all facility emergency plans, including the Employee Emergency Action Plan, the Fire Prevention Plan, and emergency response. This group also manages the Emergency Preparedness requirements of the process safety management program.
- 6.2.8 Accident Investigation
 - 6.2.8.1 All facility accident and incident investigations are managed by this task group. This group appoints a process incident investigative team. They also review all accident and incident reports, including process incident investigations.
- 6.2.9 Housekeeping
 - 6.2.9.1 This task group coordinates all facility housekeeping activities, including routine audits. Recommendations for improving housekeeping and orderliness are made as needed.
- 6.2.10 Process Hazards Analysis (PHA) Team
 - 6.2.10.1 The PHA team of the facility's Inspection and Audits task group conducts the required process hazard analyses per the OSHA Process Safety Management standard. The PHA team leader is a member of the Inspections and Audits task group and meets each month with the task group. When PHA team reports are completed, the team leader accompanies the Inspections and Audits task group.
- 6.3 Chairman to the CSHC meeting and presents a verbal report of the PHA findings, conclusions, and recommendations.
- 6.4 The PHA team leader is fully knowledgeable in the proper implementation of the PHA methodology used and is impartial in the evaluation. Other full and part-time team members provide the team with expertise in areas such as process technology, process design, operating procedures and practices, including how the work is performed, alarms, emergency procedures, instrumentation, maintenance procedures, both routine and non-routine tasks, including how tasks are authorized, procurement of parts and supplies, safety and health, and other relevant subjects as needed. One team member must be familiar with the process being analyzed.
- 6.5 The PHA team has an intimate knowledge of the standards, codes, specifications and regulations applicable to the process being analyzed.
- 6.6 See the Process Hazards Analysis section of the Process Safety Management program for more details concerning PHA methodology.
- 6.7 Employee Participation

- 6.7.1 Employees participate in process safety management by serving on task groups and teams. Also, employees are consulted concerning the various aspects of the process safety management program.

7. Process Safety Information

- 7.1 A compilation of written process safety information is provided for each facility process to enable managers, supervisors, and employees to identify and understand the process hazards. This pertinent process safety information is also provided the process hazards analysis (PHA) Team. This information includes, but is not limited to:

- 7.1.1 Hazards of highly hazardous chemicals used and processed,

- 7.1.2 Process technology, and

- 7.1.3 Process equipment

- 7.2 Highly Hazardous Chemicals Information

- 7.2.1 Information pertaining to highly hazardous chemicals provided managers, supervisors, employees, and the PHA team includes, but not limited to:

- 7.2.1.1 Toxicity,

- 7.2.1.2 Permissible exposure limits,

- 7.2.1.3 Physical data,

- 7.2.1.4 Reactivity,

- 7.2.1.5 Thermal and chemical stability, and

- 7.2.1.6 Hazardous effects of inadvertent mixing of different materials.

- 7.2.2 Most of the above information is provided by Material Safety Data Sheets.

- 7.3 Process Technology Information

- 7.3.1 The process technology information provided to enable managers, supervisors, employees, and the PHA team to identify and understand the process hazards includes, but is not limited to:

- 7.3.1.1 Block flow diagrams or process flow diagrams,

- 7.3.1.2 Process chemistry, maximum intended inventory, safe upper and lower limits of temperature, pressure, flows, compositions, and

- 7.3.1.3 Evaluations of consequences of deviations, including those affecting employee safety and health.

7.3.2 In those cases where the original process technical data no longer exists, the data is developed during the initial PHA.

7.4 Process Equipment Information

7.4.1 Some of the process equipment information available to managers, supervision, employees, and the PHA team include, but is not limited to:

7.4.1.1 Materials of construction,

7.4.1.2 Piping and instrument diagrams,

7.4.1.3 Electrical classification,

7.4.1.4 Relief system design and design basis,

7.4.1.5 Ventilation system design, design codes and standards employed, material and energy balances for processes built after may 26, 1992, and

7.4.1.6 Safety systems (i.e., interlocks, detection or suppression systems).

7.4.2 Documents are maintained showing that the process equipment complies with recognized and generally accepted good engineering practices. Also, documents are provided that show existing equipment designed and constructed in accordance with codes, standards, or practices that are no longer in general use, is designed, maintained, inspected, tested, and is operating in a safe manner.

7.4.3 Where process technology requires a design which departs from applicable codes and standards, documents are provided which show that the design and construction is suitable for the intended purpose.

8. Process Hazards Analysis (PHA)

8.1 Process Hazards Analysis (PHA) is one of the most important elements of the Process Safety Management (PSM) program. It is an organized and systematic effort to identify and analyze the significance of potential hazards associated with the processing or handling of highly hazardous chemicals.

8.2 The PHA provides information to assist management and employees in making decisions for improving safety and reducing the consequences of unwanted and unplanned releases of hazardous chemicals. A PHA analyzes potential causes and consequences of fires, explosions, releases of toxic or flammable chemicals and major spills of hazardous chemicals.

8.3 Each PHA focuses attention on equipment, instrumentation, utilities, human actions (routine and non-routine), external factors that might impact the process. These considerations assist in determining the hazards and potential failure points or failure modes in processes.

8.4 PHAs are conducted initially and updated at least every 5 years. Each PHA is conducted appropriately for the complexity of the process being evaluated, and to properly identify, evaluate, and control the hazards involved.

- 8.5 The priority for conducting PHAs is determined and documented based on the:
 - 8.5.1 Extent of process hazards,
 - 8.5.2 Numbers of potentially affected employees,
 - 8.5.3 Age of the process, and
 - 8.5.4 Operating history of the process.
- 8.6 PHAs completed after May 26, 1987, which meet the requirements of OSHA standard 29 CFR 1910.119, will be updated and revalidated 5 years after the last analysis.
- 8.7 The PHA methodology utilized depends on many factors, including the existing process knowledge, operating experience, process changes, process size and complexity. One or more of the following methodologies may be used.
 - 8.7.1 “What-if?” Method,
 - 8.7.2 Checklist method,
 - 8.7.3 A combination of “what-if?” And checklist methods,
 - 8.7.4 Hazard and operability study (hazop),
 - 8.7.5 Failure mode and effects analysis (fmea),
 - 8.7.6 Fault tree analysis (fta), or
 - 8.7.7 An appropriate equivalent methodology.
- 8.8 The application of a PHA to a particular process may involve the use of different methodologies for various parts of the process. For example, a process involving a series of unit operations of varying sizes, complexities, and ages may use different methodologies and PHA team members for each operation. When this is done, the PHA findings and conclusions are integrated into one final study and evaluation.
- 8.9 In some cases, a PHA checklist is used to perform PHA, such as for standard boiler or heat exchanger evaluations.
- 8.10 Generic PHAs are also used for batch type processes where there are only small changes of monomer or other ingredient ratios and the chemistry is documented for the full range and ration of batch ingredients. Also, for large continuous processes having several different operations, some PHAs are conducted on each segment of the process and then integrated into one final report.
- 8.11 Each PHA addresses the following items:
 - 8.11.1 Hazards of the process,

- 8.11.2 Previous incident(s) with catastrophic consequences,
 - 8.11.3 Engineering and administrative controls including detection methodologies for early warning of releases such as process monitoring and control instrumentation with alarms, detection hardware, etc.
 - 8.11.4 Consequences of failure of engineering and administrative controls,
 - 8.11.5 Facility siting,
 - 8.11.6 Human factors, and
 - 8.11.7 Qualitative evaluation of a range of possible safety and health effects of failure of controls on employees' safety and health.
- 8.12 PHAs are performed by a PHA team with expertise in engineering and process operations, including at least one employee having experience and knowledge specific to the process being evaluated. Also, one team member must be knowledgeable in the specific process hazard analysis methodology used.
- 8.13 As previously addressed, the PHA team leader is a member of the Central Safety and Health Committee's Inspections and Audits task group. The team leader meets monthly with the Inspections and Audits task group and reports on the team's plans and progress.
- 8.14 The PHA team has the major responsibility for coordinating the overall facility Process Safety Management Program.
- 8.15 PHA Report Follow-up
- 8.15.1 All PHA reports are prepared by the PHA team, the ranking line manager of the process analyzed, the Inspections and Audits task group, and the Central Safety and Health Committee. The Central Safety and Health Committee (CSHC) chairman (ranking manager of the facility) assigns specific individuals to be responsible for completing and/or resolving all PHA report recommendations. The PHA team leader maintains a log of all recommendations and reports to the CSHC chairman monthly concerning the status of all unresolved recommendations.
 - 8.15.2 The actions to be taken as the result of PHA report recommendations, including a schedule for completion, are communicated by the PHA team leader to the process managers involved, maintenance, and other employees whose work assignments are in the process and who may be affected by the recommendations or actions.
- 8.16 The PHAs are updated and revalidated by the PHA team at least every 5 years after completion of the initial PHA to assure that the PHA is consistent with the current process.
- 8.17 All PHAs and updates or re-validations are retained for the life of the process.

9. Operating Procedures

- 9.1 Operating procedures have been developed and implemented which describe tasks to be performed, dates to be recorded, operating conditions to be maintained, samples to be collected, and safety and health precautions to be taken.
- 9.2 The procedures are thoroughly reviewed and approved to ensure they are technically accurate. Employees assist in the preparation of the procedures and verify that they are understandable to employees. All operating procedures are routinely reviewed and revised as necessary to ensure they reflect current operations.
- 9.3 Process safety information compiled to assist in conducting process hazards analyses is also used as a resource for assuring the process operating procedures and practices are consistent with the known hazards and operating parameters are accurate.
- 9.4 The operating procedures are reviewed by the engineering staff and operating personnel to ensure they are accurate and provide practical instructions on how to perform jobs safely. Specific instructions and details are included in the operating procedures describing what steps are to be taken or followed, including applicable safety precautions and implications, pressure limits, temperature ranges, flow rates and what to do when the operating limits, ranges and rates are abnormal. Also, the actions needed to correct and/or control upset conditions are included in the procedures.
- 9.5 The training program ensures that operating personnel have a full understanding of the operating procedures including verification that workers not fluent in English understand the procedures.
- 9.6 All process and equipment changes are included as necessary in operating procedures and personnel trained to ensure they are properly informed of all pertinent changes. The operating procedures also include controls for maintenance personnel and contractors to enter the process area and to verify they have completed their authorized jobs.

10. Employee Training

- 10.1 All employees, including maintenance and contractor employees, involved with highly hazardous chemicals are trained to ensure they fully understand the safety and health hazards of the chemicals and processes they work with to protect themselves, and citizens living near the facility.
- 10.2 The training employees receive in compliance with OSHA's hazard communication standard 29 CFR 1910.1200 helps them become more knowledgeable about the chemicals they work with as well as familiarize them with reading and understanding MSDSs. However, additional training is provided concerning operating procedures; safe work practices; emergency procedures including alarms, special assignments, evacuation, and emergency response; safety rules and procedures; routine and non-routine work authorization; and other pertinent process safety information.
- 10.3 The employees to be trained and the subjects to be covered have been defined and documented. Also, the training goals and objectives have been established and written in clear measurable terms. These training goals and objectives are tailored to each specific training module or segment. The important actions and conditions under which employees

demonstrate competence and knowledge as well as acceptable performance have been described and documented.

- 10.4 Hands-on training is provided employees to enhance their senses beyond listening, including dry runs and simulated operations to help employees feel the full reality of the situation under controlled conditions.
- 10.5 Along with the hands-on training, employees receive traditional classroom instruction including lectures, videos, programmed instruction, and on-the-job instruction. Employees are encouraged to actively participate in all training activities and practice their skills and knowledge.
- 10.6 The training programs are periodically evaluated to see if the necessary skills, knowledge, and routines are being properly understood and implemented by the trained employees. The means/methods for evaluating the training programs has been developed and implemented including assigned responsibility and reports.
- 10.7 Any training program deficiencies detected during the evaluation are documented and recommendations made to correct them. Retraining or more frequent refresher training is provided as needed to ensure an effective training program. Each employee trained is requested to complete a training critique to obtain information on how to improve the training process. Also, trainees are consulted as to how to improve the training programs.
- 10.8 Maintenance and contract employees receive current and updated process safety training, including training about process changes which may affect their jobs. Responsibility is assigned for maintenance and contractor employee training and records maintained. They are also consulted about the effectiveness of their training programs.

11. Contractors

- 11.1 A screening process has been established for hiring contractors to perform work in and around processes that involve highly hazardous chemicals. The screening process is designed to ensure that the contractors hired or used can accomplish their assigned tasks without compromising the safety and health of employees at the facility. The screening program involves obtaining information on the contractor's safety performance, including injury and illness rates and experience. Also, contractor references are contracted concerning the contractor's safety performance.
- 11.2 In addition to reviewing the contractor's safety performance, the contractor's job skills, knowledge, and certifications (such as pressure vessel welders) are also reviewed.
- 11.3 A site injury and illness log is maintained for contractors working on or adjacent to processes to provide full knowledge of process injury and illness experience. This information is used by those auditing the process safety management program compliance and those investigating process incidents.
- 11.4 Workplace controls have been established to ensure that contractors perform their work safely. These controls specify that work permits are required for all contractor work on or adjacent to a process. The permit keeps all operating personnel and affected personnel informed concerning contractor work activities.

- 11.5 Contract employees will not perform hot work until a hot work permit is obtained from the host employer.

12. Pre-Startup Safety

- 12.1 Process hazard analyses (PHAs) are used for new processes to improve the design and construction of the process from a reliability and quality standpoint. The PHA recommendations are implemented before final installations are complete. Other items completed prior to initial process startup include piping and instrument diagrams, operating procedures, and operating personnel trained.
- 12.2 The initial startup and normal operating procedures are fully evaluated as part of the pre-startup review to assure a safe transfer into the normal operating mode for meeting the process parameters.
- 12.3 Management of change procedures are required for changes to existing processes that have been shut down for turnaround or modifications. Also, all changes other than "replacement in kind" made to the process during shutdown go through the management of change procedures. Piping and instrument diagrams and operating procedures are updated as necessary following changes. Significant changes impacting the process result in refresher and/or additional employee training.
- 12.4 Incident investigations, compliance, audits, and PHA reports are evaluated to determine their impacts they may have prior to startup of new processes.

13. Mechanical Integrity

- 13.1 An on-going mechanical integrity program is used to ensure safe process operation. Reviews of maintenance programs and schedules are periodically conducted to see if only "breakdown" maintenance is being used. Where such is the case, corrections will be made. Equipment used to process, store, or handle highly hazardous chemicals are designed, constructed, installed, and maintained to minimize releases. To accomplish this, an effective mechanical integrity program has been established to ensure the continued integrity of process equipment.
- 13.2 The elements of the mechanical integrity program include the identification and categorization of equipment and instrumentation, inspections and tests, testing and inspection frequencies, development of maintenance procedures, training of maintenance personnel, criteria for acceptable test results, documentation of test and inspection results, and documentation of manufacturer's recommendations as to the meantime for failure of equipment and instrumentation.
- 13.3 The priority for safe process equipment operation is:
 - 13.3.1 Primary Lines of Defense
 - 13.3.1.1 Operate and maintain the process as designed and keep chemicals contained.
 - 13.3.1.2 Controlled release of chemicals through venting to scrubbers or flares, or to surge or overflow tanks which are designed to receive such chemicals, etc.

- 13.3.2 Secondary Lines of Defense
 - 13.3.2.1 Fixed fire protection systems like sprinklers, water spray, or deluge systems, monitor guns, etc.; dikes, designed drainage systems, and other systems which would control or mitigate hazardous chemicals once an unwanted release occurs.
 - 13.3.2.2 The mechanical integrity program protects the above lines of defense and ensures effective highly hazardous chemical control.
 - 13.3.2.3 The mechanical integrity program includes the following stages:
 - 13.3.2.3.1 A list of all process equipment and instrumentation has been compiled and categorized including:
 - 13.3.2.3.1.1 Pressure vessels,
 - 13.3.2.3.1.2 Storage tanks,
 - 13.3.2.3.1.3 Process piping,
 - 13.3.2.3.1.4 Relief and vent systems,
 - 13.3.2.3.1.5 Fire protection systems components,
 - 13.3.2.3.1.6 Emergency shutdown systems and alarms and interlocks, and
 - 13.3.2.3.1.7 Pumps.
- 13.4 The equipment and instrumentation is categorized on a priority basis for items requiring closer scrutiny than other items. This priority and the manufacturer's data or operating experience determines the inspection and testing frequency and associated procedures.
- 13.5 Applicable codes and standards which provide information for the inspection and testing frequency and appropriate methodologies include:
 - 13.5.1 National Boiler Inspection Code, or
 - 13.5.2 American Society for Testing and Material,
 - 13.5.3 American Petroleum Institute,
 - 13.5.4 National Fire Protection Association,
 - 13.5.5 American National Standards Institute,
 - 13.5.6 American Society of Mechanical Engineers, and
 - 13.5.7 Other groups.

13.6 Inspections

- 13.6.1 The applicable codes and standards are used to provide criteria for external inspections for such items as foundation supports, anchor bolts, concrete or steel supports, guy wires, nozzles and sprinklers, pipe hangers, grounding connections, protective coatings and insulation, and external metal surfaces of piping and vessels, etc.
- 13.6.2 These codes and standards also provide information on methodologies for internal inspection, and a frequency formula based on the corrosion rate of the materials of construction. The erosion of internal and external surfaces is considered along with corrosion effects of pipes and valves. When the corrosion rate is not known, a maximum inspection frequency is followed until the specific corrosion rate has been determined.
- 13.6.3 The internal inspection covers items such as vessel shell, bottom and head; metallic linings; nonmetallic linings; thickness measurements for vessels piping; inspection for erosion; corrosion, cracking and bulges; internal equipment like trays, baffles, sensors and screens for erosion, corrosion or cracking and other deficiencies.
- 13.6.4 Although some inspections may be performed by state and local government inspectors under state and local statutes, procedures have been established to ensure that tests and inspections are conducted properly and consistency is maintained even when different employees may be involved.
- 13.7 Appropriate training is provided maintenance personnel to ensure they understand the preventative maintenance program procedures, safe practices, and the proper use and application of special equipment or unique tools that may be required.
- 13.8 A quality assurance system is provided to help ensure that the proper materials of construction are used, that fabrication and inspection procedures are proper, and that installation procedures recognize field installation concerns.
- 13.9 The quality assurance program is an essential part of the overall mechanical integrity program and helps maintain the primary and secondary lines of defense for preventing unwanted chemical releases or those which control or mitigate a release.
- 13.10 "As built" drawings, together with certifications of coded vessels and other equipment, and materials of construction are verified and retained in quality assurance documentation. Equipment installation jobs are inspected in the field for use of proper materials and procedures and to assure that qualified craftsmen are used. Also, the use of proper gaskets, packing, bolts, valves, lubricants, and welding rods are verified in field inspections. The procedures for installation of safety devices are verified in the field, such as the torque on the bolts for rupture discs, uniform torque on flange bolts, proper installation of pump seals, etc.
- 13.11 Where the quality of parts is a problem, audits of equipment supplier's facilities are conducted to ensure the equipment is suitable for its intended service.
- 13.12 All necessary changes in process equipment go through the management of change procedures.

14. Non-Routine Work Authorizations

- 14.1 Non-routine work performed in process areas is controlled in a consistent manner. The hazards identified involving the work to be accomplished is communicated to those performing the work and to operating personnel whose work could affect the safety of the process.
- 14.2 A work permit procedure describes the steps the maintenance supervisor, contractor representative or other person needs to follow to obtain the necessary clearance to get the job started.
- 14.3 The procedure references and coordinates applicable are:
 - 14.3.1 Lockout/tagout procedures,
 - 14.3.2 Line breaking procedures,
 - 14.3.3 Confined space entry procedures, and
 - 14.3.4 Hot work authorizations.

15. Managing Change

- 15.1 Temporary and permanent changes to process chemicals, technology, equipment and facilities are managed to ensure effective process safety management. This process safety management program describes the overall management system used to assure a safe and healthful workplace from process hazards. Management of change is part of the process safety management system. Both technical and mechanical changes must be authorized.
- 15.2 Process changes include all modifications to equipment, procedures, raw materials and processing conditions other than "replacement in kind." The changes are identified, reviewed, and authorized prior to implementing the change. A Process Change Authorization is required for all changes to ensure the operating procedures contain the
- 15.3 Operating parameters (pressure limits, temperature ranges, flow rates, etc.) and the importance of operating within the limits. See the following process change authorization form.
- 15.4 Management of change covers changes such as process technology changes, and changes to equipment and instrumentation. Changes in process technology requiring authorization include, but are not limited to, changes in production rates, raw materials, experimentation, equipment unavailability, new equipment, new product development, and change in catalyst and changes in operating conditions to improve yield or quality.
- 15.5 Equipment changes requiring authorization include, but are not limited to, changes in materials of construction, equipment specifications, piping pre-arrangements, experimental equipment, computer program revisions, and changes in alarms and interlocks.
- 15.6 The process change authorization is not only used to assure that temporary and permanent changes can be accomplished safely, but to ensure that following the change that processes are returned to the normal operating state and original designed state. Also, the process change

authorization assures that the pertinent safety and health considerations are incorporated into the operating procedures and the process.

- 15.7 All process change authorizations are filed for reference by PHA teams and others reviewing, evaluating, and/or inspecting processes.

16. Incident Investigations

- 16.1 Employees and contractor personnel will immediately report all incidents, injuries and near misses in accordance with the host employer's PSM program requirements and procedures.
- 16.2 Process incidents which result in, or could reasonably have resulted in, a catastrophic release of highly hazardous chemicals are investigated immediately, or no later than within 48 hours of the incident. This includes "near miss" incidents.
- 16.3 The purpose of these incident investigations is to identify the underlying causes of the incident and to implement corrective action to prevent similar incidents and avoid repeating past mistakes.
- 16.4 Following the investigation, a written report will be made. The report will contain at least the following components:
 - 16.4.1 Incident date, time and specific location;
 - 16.4.2 The date when the investigation is initiated;
 - 16.4.3 A description of the incident;
 - 16.4.4 A list and description of factors that caused or contributed to the incident; and
 - 16.4.5 Findings and recommendations for corrective and other actions identified by the investigation.
- 16.5 The Company will assist the host employer as required to promptly address incident report findings and recommendations. This includes resolving needs and recommendations. Resolutions, corrective and any other actions will be documented.
- 16.6 All Company personnel whose work tasks are affected by investigation findings will review the written incident investigation report.
- 16.7 The Company will maintain its copy of the incident investigation report for a minimum of five years.
- 16.8 Investigation Team
 - 16.8.1 An incident investigation team will be established and consist of at least one person knowledgeable in the process involved, including a contract employee if the incident involved work of the contractor, and other persons with appropriate knowledge and experience to thoroughly investigate and analyze the incident.

- 16.8.2 Process incidents are investigated by a process incident investigation team under the Accident Investigation task group. One task group member chairs the team and reports through the task group chairman to the ranking facility manager who chairs the Central Safety and Health Committee.
- 16.8.3 The process incident investigation team has received special training in process incident investigation, including how to conduct interviews and report preparation. Both management and employees are included as team members and is multidisciplinary.
- 16.8.4 One supervisor and one employee knowledgeable of the process is added to process incident investigation teams to ensure effective investigations. The team gathers the facts of the incident, analyzes them and develops plausible scenarios as to what happened, and why.
- 16.8.5 Employees and supervisors in the process area where the incident occurred are consulted and interviewed to obtain incident facts. The focus of the investigation is to obtain facts and not to place blame. The team and the investigation process deals with all involved individuals in a fair, open and consistent manner. An incident report is prepared following the investigation which includes the findings, conclusions, and recommendations. The written report which is to the ranking manager of the process involved is verbally reviewed with him or her prior to distribution.
- 16.8.6 Copies of the report are distributed to the ranking manager of the entire facility, the accident investigation task group, and other affected groups and individuals.
- 16.8.7 The process incident investigation team is responsible for assuring that all report recommendations are completed or resolved by those responsible for the follow-up. Monthly status reports are presented on incident recommendations at each Central Safety and Health Committee meeting by the chairman of the Accident Investigations task group.

17. Emergency Preparedness

- 17.1 The Fire and Emergency Task Group is responsible for assuring proper emergency preparedness and response, including what actions employees are to take when there is an unwanted release of highly hazardous chemicals.
- 17.2 Emergency Action and Fire Prevention Plans have been established that comply with OSHA standard 29 CFR 1910.38. These plans describe the actions employees must take in the event of an emergency. These actions may involve special emergency duties or evacuation. Refer to the Emergency Action and Fire Prevention plans for specific details.
- 17.3 The emergency action plan includes the prompt evacuation of employees due to an unwanted release of highly hazardous chemicals. This plan involves emergency alarms to alert employees when to evacuate. Prompt evacuation is essential, including physically impaired employees who are provided the necessary support and assistance. Also, the use of process control centers in process areas as safe areas is prohibited since they may have not been designed for safe refuge.

- 17.4 When unwanted releases of highly hazardous chemicals may occur outdoors, wind direction indicators have been placed at the highest point that can be seen throughout the process area. These indicators allow employees to move cross wind to upwind to gain safe access to refuge areas.
- 17.5 Minor emergency or incidental releases of unwanted highly hazardous chemicals in the process area are handled by highly trained, designated employees wearing appropriate personal protective equipment and following specific procedures. Preplanning for handling incidental releases for minor emergencies in the process area has been accomplished, including hazard communication training per OSHA standard 29 CFR 1910.1200, emergency action and fire prevention plans per OSHA standard 29 CFR 1910.38, and emergency response per OSHA standard 29 CFR 1910.120.
- 17.6 The specific employee actions which must taken for incidental and major unwanted releases of highly hazardous chemicals have been designated in the emergency action plan. Also, the required actions to obtain outside assistance from mutual aid groups or local government emergency response organizations have been defined in the emergency action plan.
- 17.7 The emergency action plan and fire prevention plan describes the emergency organization and command system, including an on-scene incident commander and staff. This fully trained organization has been properly equipped to carry out their assigned duties.
- 17.8 Drills, training exercises, and simulations with local community emergency response planners and responsible organizations have been conducted and are conducted on a periodic basis. This cooperation with local emergency agencies also assists in complying with EPA's Risk Management Plan Criteria.
- 17.9 An emergency control center has been established at the facility in a safe area away from the process area. This center serves as the major communication link between the on-scene incident commander and plant or corporate management as well as with local emergency organizations and officials. Communication equipment in the center includes a network for receiving and transmitting information by telephone, radio or other means. A back-up communications network is provided in case of power failure or one communication system fails.
- 17.10 The emergency control center is equipped with plant layout and community maps, utility drawings including firefighting water sources, emergency lighting, appropriate reference materials such as government agency notification lists, Company telephone lists, SARA Title III reports, material safety data sheets, emergency plans and procedures manual, listing of local emergency response equipment, mutual aid information, and access to meteorological or weather condition data and dispersion modeling data.

18. Compliance Audits

- 18.1 The PHA team is responsible for assembling a compliance audit team to audit compliance with OSHA's process safety management standard 29 CFR 1910.119 at least every three years. Normally, the entire process hazards team plus a member of the rules and procedures task group not on the PHA team and the facility safety/health manager are assigned to the team. The chairman of the PHA team is the compliance audit team chairman unless he or she is responsible for the process(es) being audited to ensure compliance.

- 18.2 In that case, a person knowledgeable in audit techniques and who is impartial towards the facility area being audited is appointed chairman of the Inspection and Audits task group.
- 18.3 The audit includes an evaluation of the design and effectiveness of the process safety management system and a field inspection of the safety and health conditions and practices to ensure compliance. The essential elements of the audit program include:
 - 18.3.1 Planning,
 - 18.3.2 Staffing,
 - 18.3.3 Conducting the audit,
 - 18.3.4 Evaluation,
 - 18.3.5 Recommendations,
 - 18.3.6 Corrective action,
 - 18.3.7 Follow-up, and
 - 18.3.8 Documentation.
- 18.4 An OSHA standard 29 CFR 1910.119 process safety management checksheet is used by the audit team to conduct the audit. Also, a standardized form is used to document each audit step and ensure an effective audit is conducted and proper follow-up is accomplished. All team members and their expertise are listed. If the needed expertise is not available, it is obtained prior to conducting the audit. The standardized audit form includes:
 - 18.4.1 Process description and documentation,
 - 18.4.2 Process safety information,
 - 18.4.3 Training,
 - 18.4.4 Procedures,
 - 18.4.5 Physical inspection of the facility,
 - 18.4.6 Work authorizations,
 - 18.4.7 Interviews with all levels of facility personnel,
 - 18.4.8 Findings,
 - 18.4.9 Conclusions,
 - 18.4.10 Recommendations, and
 - 18.4.11 Follow-up.

- 18.5 The compliance audit team issues the final audit report to the chairman of the PHA team with copies to the Inspections and Audits task group chairman and the chairman of the Central Safety and Health Committee who is the ranking facility manager. The audit team is responsible for ensuring that all report recommendations are completed or resolved. Written monthly progress reports are issued to the Inspections and Audits task group chairman who gives monthly status reports to the Central Safety and Health Committee until all items are resolved.
- 18.6 All affected persons and groups are informed of the audit findings, conclusions, and recommendations. The Central Safety and Health Committee chairman assigns specific responsibility for follow-up including revision of the process safety management program, revised operating procedures, improved training, etc. The PHA team has the overall responsibility to ensure that the necessary actions are taken to maintain an effective process safety management program.

19. Safety and Health Hazard Control Team

- 19.1 Effective safety and health programs prevent accidents, injuries and illnesses through proper recognition, evaluation and control of safety and health hazards. Emphasis is placed on prevention, not after-the-fact accident investigation. Thus, products, processes, workplaces and environments must be made safe through design. To ensure proper safety and health engineering controls, each organization and facility should establish and maintain effective safety and health hazard control teams.
- 19.2 Accidents are costly for organizations and individuals. Correcting safety and health problems after an accident occurs is expensive. A proactive approach must be taken to eliminate and/or control safety and health hazards before accidents, injuries and/or illnesses occur. The Safety and Health Hazard Control Team can help accomplish this objective.
- 19.3 The purpose of the team is to recognize, evaluate and control safety and health hazards before they cause accidents, damage, injuries and/or illnesses.
- 19.3.1 The following priority is utilized to control recognized safety and health hazards.
- 19.3.1.1 Eliminate hazards by substitution or engineering controls
 - 19.3.1.2 Reduce the risks when hazards cannot be eliminated by substitution, employee rotation, or limited exposure
 - 19.3.1.3 Provide safety devices (guards, interlocks, etc.)
 - 19.3.1.4 Provide warning signs, placards or tags
 - 19.3.1.5 Provide procedures, education and training, and protective equipment
 - 19.3.1.6 Assure that procedures are feasible, that they can be followed and the job can still be done
 - 19.3.1.7 Enforce safety rules and procedures

- 19.4 The Safety and Health Hazard Control (SHHC) Team is chaired by a facility manager or supervisor with strong engineering knowledge and experience. He or she is a member of the Inspections and Audits Task Group of the Central Safety and Health Committee.
- 19.5 Members of the SHHC Team include at least one representative from each major department within the facility including staff, supervisors and employees.
- 19.6 The SHHC Team meets monthly for about 45 minutes to plan their activities and report on their findings, conclusions and recommendations. Minutes are kept and provided to the Inspections and Audits Task Group Chairman.
- 19.7 The following activities are some of the many things the team considers:
 - 19.7.1 New Facilities, Processes and Equipment -- The team develops implements and maintains effective procedures for performing safety and health evaluations of new facilities, processes and equipment.
 - 19.7.2 Modified Facilities, Processes and Equipment -- The team develops implements and maintains effective procedures for reviewing potential safety and health hazards associated with modified or revised facilities, processes and equipment.
 - 19.7.3 Accident/Incident Analysis -- The team develops implements and maintains effective procedures for analyzing accidents and/or incidents which involve basic design (engineering) defects. These procedures are developed in cooperation with the Accident Investigation Task Group.
 - 19.7.4 Process Hazard Analyses -- The team develops implements and maintains effective procedures and systems for performing periodic (usually annual) process hazard analyses of all major facility processes. Written process hazard analysis reports are presented to the Inspections and Audits Task Group Chairman and to the Central Safety and Health Committee.
- 19.8 Responsibilities
 - 19.8.1 Each SHHC Team member is given a specific assignment (activity) to coordinate. He or she obtains assistance from other facility supervisors and employees in effectively coordinating the assignment.
- 19.9 Staff Assistance
 - 19.9.1 The facility staff safety and health manager, supervisor and/or coordinator meets with the Team and provides assistance as needed to ensure the Team has the necessary resources.
- 19.10 Trade Secrets
 - 19.10.1 From the applicable OSHA regulations on Process Safety management, FYI:
 - 19.10.1.1 “Employers will make all information necessary to comply with the section available to those persons responsible for compiling the process safety information (required by paragraph (d) of this section), those assisting in the development of the process hazard analysis (required by

paragraph (e) of this section), those responsible for developing the operating procedures (required by paragraph (f) of this section), and those involved in incident investigations (required by paragraph (m) of this section), emergency planning and response (paragraph (n) of this section) and compliance audits (paragraph (o) of this section) without regard to possible trade secret status of such information.”

19.10.1.2 Nothing in this paragraph will preclude the employer from requiring the persons to whom the information is made available under paragraph (p)(1) of this section to enter into confidentiality agreements not to disclose the information as set forth in 29 CFR 1910.1200.

19.10.1.3 Subject to the rules and procedures set forth in 29 CFR 1910.1200(i)(1) through 1910.1200(i)(12), employees and their designated representatives will have access to trade secret information contained within the process hazard analysis and other documents required to be developed by this standard.

Metro Electric Co., Inc.

Respiratory Protection Program



Applicable OSHA Standards: 29 CFR 1910.134

1. Purpose

1.2 The purpose of this policy is to comply with the OSHA standards on Respiratory Protection.

2. Scope

2.2 This program applies to all Metro Electric controlled work locations where an employee or a subcontract employee may be occupationally exposed to respiratory hazards.

3. Responsibilities

3.1 MANAGEMENT - It is management's responsibility to determine what specific applications require use of respiratory equipment. Management must also provide proper respiratory equipment to meet the needs of each specific application. Employees must be provided with adequate training and instructions on all equipment.

3.2 MANAGEMENT/SUPERVISORY - Superintendents, supervisors, foremen, or group leaders of each area are responsible for insuring that all personnel under their control are knowledgeable of the respiratory protection requirements for the areas in which they work. They are also responsible for ensuring that their subordinates comply with requirements of this respiratory program, including proper respirator inspection, use, cleanliness, sanitation, storage and maintenance.

3.3 EMPLOYEES - It is the responsibility of the employee to have an awareness of the respiratory protection requirements for their work areas (as explained by management), according to proper instruction, and for maintaining equipment in a clean, sanitary and operable condition.

4. Requirements & Guidelines

4.1 The Company Safety Coordinator is designated as the program administrator and will be qualified by appropriate training or experience that is commensurate with the complexity of the program to administer or oversee the respiratory protection program and conduct the required evaluations of program effectiveness.

4.2 In the control of those occupational diseases caused by breathing air contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, sprays, or vapors, the primary objective of this program will be to prevent atmospheric contamination.

4.3 This will be accomplished as far as feasible by accepted engineering control measures (for example, enclosure or confinement of the operation, general and local ventilation, and substitution of less toxic materials).

- 4.4 Respirators, medical evaluation, fit testing and training will be provided by the Company at no cost to employees when such equipment is necessary to protect the health of the employee. The Company will provide the respirators which are applicable and suitable for the purpose intended. The Safety Coordinator will be responsible for the establishment and maintenance of a respiratory protection program.
- 4.5 The guidelines in this program are designed to help reduce employee exposures against occupational dusts, fumes, mists, radio nuclide, gases and vapors.
- 4.6 The primary objective is to prevent atmospheric exposure to these contaminants.
- 4.7 Where feasible, exposure to contaminants will be eliminated by engineering controls (for example, general and local ventilation, enclosure or isolation, and substitution of a less hazardous process or material).
- 4.8 When effective engineering controls are not feasible, use of personal respiratory protective equipment may be required to achieve this goal and will include the following components, as applicable:
 - 4.9.1 Selection of respirators
 - 4.9.2 Medical evaluation
 - 4.9.3 Fit testing
 - 4.9.4 Types of respiratory equipment and their use
 - 4.9.5 Maintenance and care of respirators
 - 4.9.6 Breathing air quality and use
 - 4.9.7 Identification of filters, cartridges, and canisters
 - 4.9.8 Employee training and information
 - 4.9.9 Program evaluation
- 4.10 In any workplace where respirators are necessary to protect the health of the employee or whenever respirators are required, the Company will establish and implement a written respiratory protection program with worksite-specific procedures. The program will be updated as necessary to reflect those changes in workplace conditions that affect respirator use. The employer will include in the program the following provisions of this section, as applicable:
 - 4.10.1 Procedures for selecting respirators for use in the workplace;
 - 4.10.2 Medical evaluations of employees required to use respirators;
 - 4.10.3 Fit testing procedures for tight-fitting respirators;

- 4.10.4 Procedures for proper use of respirators in routine and reasonably foreseeable emergency situations;
- 4.10.5 Procedures and schedules for cleaning, disinfecting, storing, inspecting, repairing, discarding, and otherwise maintaining respirators;
- 4.10.6 Procedures to ensure adequate air quality, quantity, and flow of breathing air for atmosphere-supplying respirators;
- 4.10.7 Training of employees in the respiratory hazards to which they are potentially exposed during routine and emergency situations;
- 4.10.8 Training of employees in the proper use of respirators, including putting on and removing them, any limitations on their use, and their maintenance; and
- 4.10.9 Procedures for regularly evaluating the effectiveness of the program.
- 4.11 The Company will select and provide an appropriate respirator based on the respiratory hazard(s) to which the worker is exposed and workplace and user factors that affect respirator performance and reliability.
- 4.12 The Company will select a NIOSH-certified respirator. The respirator will be used in compliance with the conditions of its certification.
- 4.13 The Company will identify and evaluate the respiratory hazard(s) in the workplace. This evaluation will include a reasonable estimate of employee exposures to respiratory hazard(s) and an identification of the contaminant's chemical state and physical form. Where the Company cannot identify or reasonably estimate the employee exposure, the employer will consider the atmosphere to be IDLH.
- 4.14 The Company will select respirators from a sufficient number of respirator models and sizes so that the respirator is acceptable to, and correctly fits, the user.
- 4.15 The employer will provide the following respirators for employee use in IDLH atmospheres:
 - 4.15.1 A full facepiece pressure demand SCBA certified by NIOSH for a minimum service life of thirty minutes, or
 - 4.15.2 A combination full facepiece pressure demand supplied-air respirator (SAR) with auxiliary self-contained air supply.
 - 4.15.3 Respirators provided only for escape from IDLH atmospheres will be NIOSH-certified for escape from the atmosphere in which they will be used.

4.16 All oxygen-deficient atmospheres will be considered IDLH, except if the Company can demonstrate that, under all foreseeable conditions, the oxygen concentration can be maintained within the ranges specified in the table at right (for the altitudes set out in the table at right), then any atmosphere-supplying respirator may be used.

Altitude (ft.)	Oxygen deficient Atmospheres (% O ₂) for which the employer may rely on atmosphere-supplying respirators
Less than 3,001	16.0–19.5
3,001–4,000	16.4–19.5
4,001–5,000	17.1–19.5
5,001–6,000	17.8–19.5
6,001–7,000	18.5–19.5
7,001–8,000 ¹	19.3–19.5

¹ Above 8,000 feet the exception does not apply. Oxygen-enriched breathing air must be supplied above 14,000 feet.

4.17 The Company will provide a respirator that is adequate to protect the health of the employee and ensure compliance with all other OSHA statutory and regulatory requirements, under routine and reasonably foreseeable emergency situations.

4.18 The Company will not permit respirators with tight-fitting face pieces to be worn by employees who have:

4.18.1 Facial hair that comes between the sealing surface of the facepiece and the face or that interferes with valve function; or

4.18.2 Any condition that interferes with the face-to-facepiece seal or valve function.

4.19 If an employee wears corrective glasses or goggles or other personal protective equipment, the Company will ensure that such equipment is worn in a manner that does not interfere with the seal of the facepiece to the face of the user.

4.20 For all tight-fitting respirators, the Company will ensure that employees perform a user seal check each time they put on the respirator using safety procedures in 29 CFR 1910.146 Appendix B-1 or procedures recommended by the respirator manufacturer that the employer demonstrates are as effective as those in Appendix B-1.

4.21 Appropriate surveillance will be maintained of work area conditions and degree of employee exposure or stress.

4.22 When there is a change in work area conditions or degree of employee exposure or stress that may affect respirator effectiveness, the Company will reevaluate the continued effectiveness of the respirator.

4.23 The Company will ensure that employees leave the respirator use area:

4.23.1 To wash their faces and respirator face pieces as necessary to prevent eye or skin irritation associated with respirator use; or

4.23.2 If they detect vapor or gas breakthrough, changes in breathing resistance, or leakage of the face piece; or

4.23.3 To replace the respirator or the filter, cartridge, or canister elements.

4.24 If the employee detects vapor or gas breakthrough, changes in breathing resistance, or leakage of the face piece, the Company must replace or repair the respirator before allowing the employee to return to the work area.

4.25 For all IDLH atmospheres, the Company will ensure that:

- 4.25.1 One employee or, when needed, more than one employee is located outside the IDLH atmosphere;
 - 4.25.2 Visual, voice, or signal line communication is maintained between the employee(s) in the IDLH atmosphere and the employee(s) located outside the IDLH atmosphere;
 - 4.25.3 The employee(s) located outside the IDLH atmosphere are trained and equipped to provide effective emergency rescue;
 - 4.25.4 The Company representative or designated supervisor is notified before the employee(s) located outside the IDLH atmosphere enter the IDLH atmosphere to provide emergency rescue; and
 - 4.25.5 The representative or designated supervisor authorized to do so by the Company, once notified, provides necessary assistance appropriate to the situation.
- 4.26 Employee(s) located outside IDLH atmospheres are equipped with:
- 4.26.1 Pressure demand or other positive pressure SCBAs, or a pressure demand or other positive pressure supplied-air respirator with auxiliary SCBA; and either
 - 4.26.2 Appropriate retrieval equipment for removing the employee(s) who enter(s) these hazardous atmospheres where retrieval equipment would contribute to the rescue of the employee(s) and would not increase the overall risk resulting from entry; or
 - 4.26.3 Equivalent means for rescue where retrieval equipment is not required.
- 4.27 Appropriate surveillance will be maintained of work area conditions and degree of employee exposure or stress. When there is a change in work area conditions or degree of employee exposure or stress that may affect respirator effectiveness, the Company will reevaluate the continued effectiveness of the respirator.

5. Maintenance & Care of Respirators

- 5.1 The Company will provide for the cleaning and disinfecting, storage, inspection, and repair of respirators used by employees.
- 5.2 The Company will provide each respirator user with a respirator that is clean, sanitary, and in good working order. The Company will ensure that respirators are cleaned and disinfected using procedures required by OSHA, or procedures recommended by the respirator manufacturer, provided that such procedures are of equivalent effectiveness.
- 5.3 The respirators will be cleaned and disinfected at the following intervals:
 - 5.3.1 Respirators issued for the exclusive use of an employee will be cleaned and disinfected as often as necessary to be maintained in a sanitary condition;
 - 5.3.2 Respirators issued to more than one employee will be cleaned and disinfected before being worn by different individuals;

- 5.3.3 Respirators maintained for emergency use will be cleaned and disinfected after each use; and
- 5.3.4 Respirators used in fit testing and training will be cleaned and disinfected after each use.
- 5.4 The Company will ensure that all respirators will be stored to protect them from damage, contamination, dust, sunlight, extreme temperatures, excessive moisture, and damaging chemicals, and they will be packed or stored to prevent deformation of the face piece and exhalation valve.
- 5.5 Additionally, emergency respirators will be:
 - 5.5.1 Kept accessible to the work area;
 - 5.5.2 Stored in compartments or in covers that are clearly marked as containing emergency respirators; and
 - 5.5.3 Stored in accordance with any applicable manufacturer instructions.
- 5.6 The Company will ensure that respirators are inspected as follows:
 - 5.6.1 All respirators used in routine situations will be inspected before each use and during cleaning;
 - 5.6.2 All respirators maintained for use in emergency situations will be inspected at least monthly and in accordance with the manufacturer's recommendations, and will be checked for proper function before and after each use; and
 - 5.6.3 Emergency escape-only respirators will be inspected before being carried into the workplace for use.
- 5.7 The Company will ensure that respirator inspections include the following:
 - 5.7.1 A check of respirator function, tightness of connections, and the condition of the various parts including, but not limited to, the facepiece, head straps, valves, connecting tube, and cartridges, canisters or filters; and
 - 5.7.2 A check of elastomeric parts for pliability and signs of deterioration.
- 5.8 In addition to other requirements of this program, self-contained breathing apparatus will be inspected monthly. Grade D air cylinders will be maintained in a fully charged state and will be recharged when the pressure falls to 90% of the manufacturer's recommended pressure level. The Company will determine that the regulator and warning devices function properly.

- 5.9 For respirators maintained for emergency use, the Company will:
- 5.9.1 Certify the respirator by documenting the date the inspection was performed, the name (or signature) of the person who made the inspection, the findings, required remedial action, and a serial number or other means of identifying the inspected respirator; and
 - 5.9.2 Provide this information on a tag or label that is attached to the storage compartment for the respirator, is kept with the respirator, or is included in inspection reports stored as paper or electronic files. This information will be maintained until replaced following a subsequent certification.

6. Selection of Respirators

- 6.1 Respirators are selected and approved by management. The selection is based upon the physical and chemical properties of the air contaminants and the concentration level likely to be encountered by the employee.
- 6.2 The respirator program administrator will make a respirator available immediately to each employee who is placed as a new hire or as a transferee in a job that requires respiratory protection. Replacement respirators/pre-filters will be made available as required. The Respirator Program Administrator for Metro Electric is the Company Safety Director.
- 6.3 Standard respirators currently approved by this Company are:
 - 6.3.1 3M "EASI-AIR" 7200S -- Dual Cartridge Respirator
 - 6.3.2 3M 8210 -- N95 Particulate Respirator
 - 6.3.3 MSA "COMFO II ELITE" 7-201 -- Dual Cartridge Respirator
 - 6.3.4 Gerson 1730 -- N95 Particulate Respirator
- 6.4 More than one hazard may exist for a given operation and more than one respirator could be used to protect against a number of different air contaminants. Correct respirator selection for each situation however, is a complex job.
- 6.5 Before proper respiratory protection can be assigned, we must consider the nature of the hazard, extent and limitations of respirators. It is important to select the right equipment for the job.
- 6.6 Evaluation of exposure to a toxic air-borne material necessitates:
 - 6.6.1 Identifying the type of contaminant (mist, dust, vapor, gas, and fume).
 - 6.6.2 Logging the name of the contaminant.
 - 6.6.3 Listing pertinent physical and chemical properties (LEL, Flash Point, etc.)

- 6.6.4 Estimating or monitoring the concentration of the contaminant in the breathing zone and immediate work area.
- 6.6.5 Noticing the Threshold Limit Value (TLV) -- both OSHA and ACGIH recommended levels.
- 6.6.6 Comparing the surveyed levels to the recommended exposure limits. (Ceiling, short term, time-weighted average).
- 6.6.7 Noting odor threshold, IDLH level, warning properties and if contaminant is an eye irritant.
- 6.6.8 Evaluating whether the contaminant can be trapped by a given sorbent efficiently; or would react with filter media.
- 6.6.9 Recording if the contaminant may cause systemic poisoning by absorption through the skin.
- 6.7 The toxicology of a given contaminant can be assessed when all information outlined above is evaluated on a respirator selection work sheet.
- 6.8 The overall protection afforded by a given respirator design (and mode of operation) may be defined in terms of its assigned protection factor (APF). The APF is a measure of the degree of protection afforded by a respirator, defined as the ratio of the concentration of contaminant in the ambient atmosphere to that inside the enclosure (usually inside the face piece) under conditions of use.
- 6.9 Respirators should be selected so that the concentration inhaled and the APFs are selection and use guides. These guides should only be used when the employer has established a minimal acceptable respirator program as defined in Section 3 of the ANSI Z88.2-1969 Standard.
- 6.10 In addition to face pieces, this includes any type of enclosure or covering of the wearer's breathing zone, such as supplied-air hoods, helmets or suits.
- 6.11 Review should include dusts, mists, and fumes only. Consideration does not apply when gases or vapors are absorbed on particulates and may be volatilized or for particulates volatile at room temperature. Example: coke oven emissions.
- 6.12 Review also should be given to any single-use dust respirator (with or without valve) not specifically tested against a specified contaminant.
- 6.13 Dust filter refers to a dust respirator and includes all types of media -- that is, both non-degradable mechanical type media and degradable resin- impregnated wool felt or combination wool-synthetic felt media.
- 6.14 Fume filter refers to a fume respirator approved by the lead fume test. All types of media are included.
- 6.15 High-efficiency filter refers to a high-efficiency particulate respirator filter with at least 99.9% efficiency against 0.3 microns in accordance with NIOSH specifications.

- 6.16 For gases and vapors, an APF should only be assigned when published test data indicate the cartridge or canister has adequate sorbent efficiency and service life for a specific gas or vapor. In addition, the APF should not be applied in gas or vapor concentrations that are: (1) immediately dangerous to life, (2) above the lower explosive limit, and (3) cause eye irritation when using a half mask.
- 6.17 A positive pressure supplied-air respirator equipped with a half-mask face piece may not be as stable on the face as a full face piece. Therefore, the APF recommended is half that for a similar device equipped with a full face piece.
- 6.18 A positive pressure supplied-air respirator equipped with a full face piece provides eye protection but is not approved for use in an atmosphere that is immediately dangerous to life.
- 6.19 The design of the supplied-air hood, suit, or helmet (with a minimum of 170 liters/min. of air) may determine its overall efficiency and protection. For example, when working with the arms over the head, some hoods draw the contaminant into the hood-breathing zone. This may be overcome by wearing a short hood under a coat or overalls. Other limitations specified by the approval agency must be considered before using in certain types of atmospheres.
- 6.20 The SCBA operated in the positive pressure mode has been tested and the face piece recorded as < 0.01% penetration. Therefore, a PF of 1,000 + is recommended. At this time, the lower limit of detection 0.01% does not warrant listing a higher number. A positive pressure SCBA for an unknown concentration is recommended. This is consistent with the 1,000 + that is listed. It is essential to have an emergency device for use in unknown concentrations. A combination supplied-air respirator in pressure-demand or other positive pressure mode, with auxiliary self-contained air supply, is also recommended for use in unknown concentrations of contaminants immediately dangerous to life. Other limitations, such as skin absorption of HCN or tritium, must be considered.
- 6.21 The protection a respirator may provide for a worker is dependent upon his type of unit and the fit. A respirator protection factor is an indicator of how much protection a respirator may provide. The factor is the ratio of the contaminant concentrations outside vs. inside the respirator, $P = C/C$. This is determined by quantitative testing. The general rule of thumb, however, says the protection factor is the approximate average effectiveness of a given respirator in qualitative tests with good face seal. Under normal operating conditions, the time-weighted average (TWA) concentration x protection factor = maximum concentration of a contaminant against which a particular type of respirator may be used.
- 6.22 For example: If an employee were spray painting with an enamel paint cut with toluol solvent and the measured TWA concentration was 200 ppm, and the TLV (ACGIH) is 100 ppm, then a half mask air purifying respirator with organic vapor trapping cartridges is satisfactory.

7. Work Area Monitoring

- 7.1 To ensure the adequacy of a respiratory protection program, monitoring will be conducted on exposure hazards as a basis to provide for a continuing healthful environment for employees. Personal sampling equipment may be used in accordance with accepted industrial hygiene standards to sample each work area. Results of these samples will pinpoint areas where respiratory protection is required. A "Job Description -- Respirator Specification" Form will also document what type of equipment should be worn for specific hazards present.

8. Cartridge Change Schedule

8.1 Using the present available air monitoring data, cartridges will be changed as follows:

8.1.1 Organic vapor cartridges -- 1 time per week or when need for change is otherwise indicated.

9. Medical Evaluation

9.1 Using a respirator may place a physiological burden on employees that varies with the type of respirator worn, the job and workplace conditions in which the respirator is used, and the medical status of the employee. Accordingly, this program specifies the minimum requirements for medical evaluation that the Company will implement to determine the employee's ability to use a respirator.

9.2 The Company will provide a medical evaluation to determine the employee's ability to use a respirator, before the employee is fit tested or required to use the respirator in the workplace. The employer may discontinue an employee's medical evaluations when the employee is no longer required to use a respirator.

9.3 The Company will identify a physician or other licensed health care professional (PLHCP) to perform medical evaluations using a medical questionnaire or an initial medical examination that obtains the same information as the medical questionnaire.

9.4 The medical evaluation will obtain the information requested by the questionnaire required in this program.

9.5 The Company will ensure that a follow-up medical examination is provided for an employee who gives a positive response to any question among questions 1 through 8 in Section 2 of the questionnaire, whose initial medical examination demonstrates the need for a follow-up medical examination.

9.6 The follow-up medical examination will include any medical tests, consultations, or diagnostic procedures that the PLHCP deems necessary to make a final determination.

9.7 The medical questionnaire and examinations will be administered confidentially during the employee's normal working hours or at a time and place convenient to the employee. The medical questionnaire will be administered in a manner that ensures that the employee understands its content.

9.8 The Company will provide the employee with an opportunity to discuss the questionnaire and examination results with the PLHCP.

9.9 Each employee required to wear a respirator will fill out a Medical Evaluation Questionnaire.

9.10 The Medical Evaluation Questionnaire will be read by a PLHCP. If the PLHCP determines a follow-up examination is necessary, the employee will make themselves available, during regular business hours, for the follow-up examination. Once the PLHCP has performed all the required duties a written recommendation will be rendered by the PLHCP for the type of respirator which can be worn.

10. Limitations and Surveillance

- 10.1 Employees should be physically fit and able to perform job duties while wearing a respirator. If a physician determines that a worker has a severe cardiovascular or pulmonary dysfunction that would be aggravated by wearing a respirator; then by a written PLHCP opinion, that person would be exempted from a job requiring the use of a respirator.
- 10.2 Conditions that may prevent a person from using an atmosphere supplying respirator may include:
 - 10.2.1 Emphysema
 - 10.2.2 Chronic pulmonary obstructive disease
 - 10.2.3 X-ray evidence of pneumoconiosis
 - 10.2.4 Coronary artery disease
 - 10.2.5 Heart attack
 - 10.2.6 Bronchial asthma
 - 10.2.7 High blood pressure
 - 10.2.8 Epilepsy
 - 10.2.9 Diabetes
 - 10.2.10 Restrictive heart abnormalities
 - 10.2.11 Experiencing anxiety or any problems when wearing a respirator
 - 10.2.12 Open hole in the eardrum
- 10.3 Persons should not be assigned to tasks requiring the use of respirators unless it has been determined that they are physically able to perform the work and use the equipment. A "yes" answer to any of the preceding questions would constitute a warning sign regarding the use of respirators. A medical opinion to confirm any of the above situations (answered "yes") should then be obtained. The respirator user's medical status should be reviewed periodically (for instance, annually).
- 10.4 No beards or facial hair should interfere with the sealing surfaces of any respirator. If respiratory protective equipment is required for a job, no beards or long sideburns will be allowed, as they will not permit a good face seal.
- 10.5 Contact lenses cannot be worn in an atmosphere that necessitates the use of respirators. No glasses may be worn with a full face piece respirator, unless the face piece is fitted with an adapter.
- 10.6 Should a worker have exposure to certain toxic materials, periodic medical examinations such as urinalysis, blood chemistries, or bioassay may be required even though the employee wears the proper respiratory protective equipment.

11. Fit Testing

- 11.1 Before an employee may be required to use any respirator with a negative or positive pressure tight-fitting facepiece, the employee must be fit tested with the same make, model, style, and size of respirator that will be used. This section specifies the kinds of fit tests allowed, the procedures for conducting them, and how the results of the fit tests must be used.
- 11.2 The Company will ensure that employees using a tight-fitting facepiece respirator pass an appropriate qualitative fit test (QLFT) or quantitative fit test (QNFT) as stated in this paragraph.
- 11.3 The Company will ensure that an employee using a tight-fitting facepiece respirator is fit tested prior to initial use of the respirator, whenever a different respirator facepiece (size, style, model or make) is used, and at least annually thereafter.
- 11.4 The Company will conduct an additional fit test whenever the employee reports, or the employer, PLHCP, supervisor, or program administrator makes visual observations of, changes in the employee's physical condition that could affect respirator fit. Such conditions include, but are not limited to, facial scarring, dental changes, cosmetic surgery, or an obvious change in body weight.
- 11.5 If after passing a QLFT or QNFT, the employee subsequently notifies the Company, program administrator, supervisor, or PLHCP that the fit of the respirator is unacceptable, the employee will be given a reasonable opportunity to select a different respirator facepiece and to be retested.
- 11.6 The fit test will be administered using an OSHA-accepted QLFT or QNFT protocol.
- 11.7 QLFT may only be used to fit test negative pressure air-purifying respirators that must achieve a fit factor of 100 or less.
- 11.8 If the fit factor, as determined through an OSHA-accepted QNFT protocol, is equal to or greater than 100 for tight-fitting half facepieces, or equal to or greater than 500 for tight-fitting full facepieces, the QNFT has been passed with that respirator.
- 11.9 Fit testing of tight-fitting atmosphere-supplying respirators and tight-fitting powered air-purifying respirators will be accomplished by performing quantitative or qualitative fit testing in the negative pressure mode, regardless of the mode of operation (negative or positive pressure) that is used for respiratory protection.
- 11.10 Qualitative fit testing of these respirators will be accomplished by temporarily converting the respirator user's actual facepiece into a negative pressure respirator with appropriate filters, or by using an identical negative pressure air-purifying respirator facepiece with the same sealing surfaces as a surrogate for the atmosphere-supplying or powered air-purifying respirator facepiece.
- 11.11 Quantitative fit testing of these respirators will be accomplished by modifying the facepiece to allow sampling inside the facepiece in the breathing zone of the user, midway between the nose and mouth. This requirement will be accomplished by installing a permanent sampling probe onto a surrogate facepiece, or by using a sampling adapter designed to temporarily provide a means of sampling air from inside the facepiece.

- 11.12 Any modifications to the respirator facepiece for fit testing will be completely removed, and the facepiece restored to NIOSH-approved configuration, before that facepiece can be used in the workplace.

12. Implementation

- 12.1 Employees required to wear a respirator must be fitted properly and tested for a face seal prior to use of the respirator in a contaminated area. Manufacturers provide fitting instructions and use limitations on the product packaging.
- 12.2 Qualitative fit testing is acceptable for most hazards in the work place. (Refer to OSHA standards for specific direction.)
- 12.3 Fitting - For a respirator to work effectively, it must fit well and feel comfortable. All the care that went into proper respirator selection will not protect the worker if the face piece does not fit properly. Fitting is most critical for self-contained breathing apparatus and respirators used in IDLH atmospheres.
- 12.4 There are two categories of fitting tests -- qualitative and quantitative.
- 12.4.1 Qualitative tests include:
- 12.4.1.1 Negative Pressure Test - Close off air inlet of canister, cartridge, or filter with palms, inhale gently so that the face piece collapses. Hold breath for 10 seconds, if the face piece remains slightly collapsed and no inward leakage is detected, the respirator probably has an adequate fit.
 - 12.4.1.2 Positive Pressure Test - Close off exhalation valve, exhale gently into the face piece. If a positive pressure can be built up inside the face piece without excess outward leakage, the fit is good. Take care not to disturb placement of the face piece by placing undue pressure on the mask with hand.
 - 12.4.1.3 Banana Oil Testing - A worker is subjected to isoamyl acetate vapor (banana oil) adjacent to sealing surfaces of the respirator face piece. If there is a detectable odor inside the mask, then the face piece should be refitted in clean air; and the test repeated, switching respirators if necessary, until a fit is made.
 - 12.4.1.4 Irritant Smoke Test - Stannic chloride is impregnated on pumice in glass tubes. When the tube ends are broken, irritant smoke is released. The tester puffs smoke towards the wearer from increasingly shorter distances until the tube is within about 6 inches of the respirator, where the smoke is then directed toward potential sources of leakage. At this point, if no leakage has been detected, the wearer may cautiously begin various head movements to simulate use in particular job. This test has an advantage in that the wearer usually reacts involuntarily to leakage by coughing or sneezing. If there is a reaction, stop producing smoke immediately. The irritant smoke test is valid for testing both air-purifying and atmosphere-supplying respirators; but an air-purifying respirator must have high efficiency filters.

- 12.4.2 Quantitative test uses instruments to measure (quantify) the amount of test chemical outside vs. inside of the respirator. This type of test expresses the amount of leakage as a percentage of the challenge atmosphere outside of the mask. This test is excellent when face piece leakage must be minimized for work in IDLH atmospheres. A quantitative test may be required when employees are exposed to chemical agents like acrylonitrile, benzene, coal tar pitch volatiles or vinyl chloride.
- 12.5 When fitting any face piece the head straps must be comfortable. Tightening the straps will sometimes reduce leakage, but the wearer may be unable to tolerate the respirator for any length of time; thus invalidating the fitting test for a normal job routine.

13. Types of Respiratory Protective Equipment and Their Uses

- 13.1 There are three categories of respirators: air purifying, atmosphere supplying and combination respirators.

- 13.1.1 Air purifying

- 13.1.1.1 Single Use Disposal Dust Mask or Filter -- This mask protects against dusts and mists having a TLV not less than .05 mg/m³ or 2.0 mppcf. The respirator has a disposal filter and elastic straps for comfort and tight fit.
- 13.1.1.2 Half Mask Respirator for Dust, Mist Fumes -- The respirator covers the mouth and nose and is provided with flexible straps and is either totally disposal or has replaceable cartridges. Not for use in concentrations greater than 10 x TLV.
- 13.1.1.3 Half Mask Respirator for Gases and Vapors -- The half mask chemical cartridge respirator has a rubber facepiece flexible straps, exhalation port and element holders. Screw in cartridges is available for protection against most gases and vapors.
- 13.1.1.4 Emergency Escape Respirator -- This mouthpiece-type respirator offers protection against low concentrations of gases or vapors or may be used for escape from hazardous atmosphere if the chemical cartridge will absorb the contaminant.

13.1.2 Atmosphere supplying

- 13.1.2.1 Escape Air Supplied Respirator -- This device is used for escape only from hazardous atmospheres. The respirator's plastic hood is for fresh air from a pack placed behind the neck.
- 13.1.2.2 Airline Respirator -- Air under pressure is fed to either a larger more flexible hose or regulator where the pressure reduced and the breathing air delivered to a flexible face piece. Types: demand and continuous flow pressure demand.
- 13.1.2.3 Airline Respirator with Self-contained Escape Cylinder -- This unit is similar to the airline respirator and includes a small compressed air bottle with regulator to provide breathable air for work in, and escape from, IDLH atmosphere.
- 13.1.2.4 Self-Contained Breathing Apparatus (SCBA) -- Demand and pressure demand SCBA units are used in operations for hazardous work or rescue. The SCBA equipment includes a compressed air cylinder, regulator, flexible hose to a full face piece, and shoulder harness.
- 13.1.2.5 Abrasive Blasting Hood -- A helmet and protection apron fed by air from a compressor or cascade of cylinders that is used for protection in sandblasting and may be fitted with a vortex tube to assist in cooling worker.

13.1.3 Airline respirator with escape bottle -- The airline respirator with full face piece in the pressure- demand mode is designed for use in atmospheres immediately dangerous to life or health when used with an approved emergency escape system. With the potential hazards involved when using this respirator, it is imperative that this type of equipment be inspected before and after each use.

13.1.3.1 Before entry into a hazardous area, check the following:

- 13.1.3.1.1 Hose length to the escape unit from a compressor or bottle cascade system should be adequate to perform all types of work, but not greater than 300 feet.
- 13.1.3.1.2 All connections should be tight and free of leaks. Rubber hose from the face piece to the regulator and hand disconnect union should be hand tight only.
- 13.1.3.1.3 The face piece and all hoses should be free of cracks and the regulators functioning normally at recommended pressures.
- 13.1.3.1.4 The air pressure in the emergency escape bottle should be approximately 2100 pounds per square inch (PSI).
- 13.1.3.1.5 Face seal on respirator should be good by using negative pressure test.

- 13.1.3.1.6 Make sure the respirator works properly before entering a contaminated area.
- 13.1.3.2 When using an airline respirator with an emergency escape bottle:
 - 13.1.3.2.1 Never over-pressure the regulator.
 - 13.1.3.2.2 The bottle should be used for escape from a hazardous atmosphere. Do not breathe from the bottle during normal work. Do not turn on the air supply from the bottle except to escape from a hazardous area, if the main air supply has been cut off.
 - 13.1.3.2.3 After the escape cylinder has been used or the air pressure is below the recommended level (2100 PSI), the foreman at the job site should be notified and the foreman should then see that this equipment is refilled with certified breathing air.
 - 13.1.3.2.4 Exposure to high levels of contaminants requires that all exposed skin be properly protected.
- 13.1.4 Self contained breathing apparatus -- Self contained breathing apparatus (SCBA) should be used for emergencies like clean-up of a large spill, fire fighting, or rescue from a hazardous area. The equipment must be checked before and after each use and at least monthly. Routine inspection of this equipment assures that it will be ready for use in an emergency.
 - 13.1.4.1 Thirty (30) minute SCBA units provide protection against most air-borne agents and are an excellent back-up system when tank cleaning, vessel entry or breaking into lines is done with airline-SCBA equipment.
 - 13.1.4.2 Before Using Any SCBA Equipment:
 - 13.1.4.2.1 Inspect the connections for tight fit and possible leaks.
 - 13.1.4.2.2 Inspect all parts of the respirator for damage or excessive wear. Check low air pressure alarm.
 - 13.1.4.2.3 Check the air pressure in the cylinder, it should read approximately 2100 PSI, and check the air flow to the face piece.
 - 13.1.4.2.4 Make sure you can get a good face seal. Use the negative pressure fitting test to check the fit. Do not wear this apparatus if you have a beard, long side burns or wear glasses.
 - 13.1.4.2.5 Be sure you have been properly instructed before using this equipment.

13.1.4.3 When Using SCBA Equipment:

13.1.4.3.1 Do not attach the hose from the respirator face piece until you are ready to enter the contaminated area. This will conserve the air supply in the cylinder.

13.1.4.3.2 If the alarm bell rings, signaling a lowered air supply, LEAVE THIS CONTAMINATED AREA AT ONCE!

13.1.4.3.3 If air flow is insufficient for any reason, turn on the bypass valve to increase air flow to the face piece and leave the area immediately. Do not return to the hazardous area until the equipment is repaired or a new SCBA unit is issued.

13.1.4.4. After Using SCBA Equipment:

13.1.4.4.1 Close all valves and then de-pressure the hose through the by-pass valve.

13.1.4.4.2 Tell the foreman that the cylinder has been discharged. The foreman should then see that the cylinder is properly charged with certified breathing air.

13.1.4.4.3 This equipment should be inspected, tagged and properly stored to protect against damage and to insure ready use.

14. Emergencies and Special Operations

14.1 Self-contained breathing apparatus may be required in specific areas for emergency use. This equipment will be used only by trained personnel when it is necessary to enter hazardous atmospheres. The following points should be considered:

14.1.1 All potential users will be fully trained in the use of this equipment.

14.1.2 When the equipment is used, it will be tested in an uncontaminated atmosphere prior to entering the hazardous area if possible.

14.1.3 An employee will not work with this apparatus in a hazardous atmosphere on an individual basis. At least one additional employee suitably equipped with a similar breathing apparatus must be in contact with the first employee and must be available to render assistance if necessary.

14.1.4 This equipment will be inspected monthly by trained department or group personnel.

14.2 There are certain situations where only one type of respiratory protection should be considered. For fire fighting and rescue from a hazardous atmosphere only self-contained breathing apparatus is acceptable. In confined spaces with IDLH atmospheres only SCBA, airline with escape bottle or other approved equipment should be used.

- 14.3 Emergencies, such as explosion and fire, release of high concentrations of toxic gas or vapor, and rescue will be discussed at those locations where incidents occur.
- 14.4 Special operations like tank cleaning, tower maintenance, turnarounds, clean up of large spills, etc., and the use of appropriate respirators, will be covered by safety personnel, superintendents or foremen.
- 14.5 Before entering areas that could be oxygen deficient or have chemical contaminants of unknown concentration, the work environment should be monitored with available equipment to determine exposure levels. If the proper equipment is not on hand or special monitoring is required, contact the Site Supervisor or the Company Safety Coordinator; if unavailable and on a client's work location, contact the client's safety personnel.

15. Additional Respirator Information

15.1 Canister Gas Masks

- 15.1.1 Some operations require the use of canister masks to protect against chemical contaminants. This equipment is designed to filter harmful chemical agents from the air; however, this is not multi-purpose equipment and will not afford protection for all exposures.
- 15.1.2 Each gas mask canister is made for protection from a certain agent or group of agents with similar properties. The manufacturer's instructions for proper use should be followed carefully.
- 15.1.3 Gas masks should not be used if any of the following conditions exists:
 - 15.1.3.1 Oxygen content in work area is below 19.5%.
 - 15.1.3.2 If contaminant concentrations are unknown or are likely to be very high.
 - 15.1.3.3 If the atmosphere has been determined to be immediately dangerous to life or health (IDLH).
 - 15.1.3.4 If any chemical agent in the work area has poor odor warning properties or is odorless like carbon monoxide.
 - 15.1.3.5 If the gas mask is not effective in filtering the chemical agent, i.e. H₂S - hydrogen sulfide.
- 15.1.4 If gas masks are used, then canisters must be used prior to the expiration date.
- 15.1.5 Wearer must leave the contaminated area if:
 - 15.1.5.1 Any odor is detected within mask, or
 - 15.1.5.2 The canister is noticeably causing an increase in breathing resistance.
- 15.1.6 Gas mask canisters should be changed after each use.

15.1.7 All instructions for proper use should be followed.

16. Maintenance & Care of Respirators

16.1 The following points should be considered for respirator inspection and maintenance:

16.1.1 The wearer of a respirator will inspect it daily whenever it is in use.

16.1.2 Supervisor, foreman, or group leader will periodically spot check respirators for fit, usage, and condition.

16.1.3 Respirators not discarded after one shift use will be cleaned on a daily basis, according to the manufacturer's instructions, by the assigned employee or other person designated by the respirator program coordinator.

16.1.4 Respirators not discarded after one shift use, will be stored in a suitable container away from areas of contamination.

16.1.5 Whenever feasible, respirators not discarded after one shift use, will be marked or stored in such a manner to assure that they are worn only by the assigned employee. If used by more than one employee is required, the respirator will be cleaned between uses.

16.2 Maintenance of respiratory protective equipment is essential to the overall effectiveness of the program. Wearing a poorly maintained or malfunctioning respirator could be more hazardous than not having any respirators available. A worker wearing a defective respirator thinks he is fully protected when, in reality, he may not be.

16.3 Emergency equipment must be maintained routinely. Self-contained breathing apparatus is generally used in the most hazardous and demanding circumstances; wearing a defective unit could have lethal results.

16.4 Equipment should be repaired by trained personnel or the manufacturer. Only designated replacement parts should be used when assembling respirators. Substitution of parts from a different brand or type of respirator invalidates approval of the device. All respiratory protective equipment should be cleaned and disinfected. For most respirators, hot soap and water and a hot rinse is adequate. Manufactured disinfectant solutions aid in sterilization. Respirators used in atmospheres immediately dangerous to life or health or for emergencies or rescue should be cleaned after each use.

16.5 Respirators should be stored to protect against dust, sunlight, heat, extreme cold, high humidity, corrosive conditions and contamination. Respirators should be protected and stored in a sealed plastic bag in a metal cabinet. If equipment is issued to an employee, it is his/her responsibility to keep it clean and store it in the proper manner.

16.6 Emergency equipment should be readily available for use, not under lock and key, and strategically placed for ready access in an emergency.

16.7 All respirators should be inspected to check for tightness of the connections, fit of component parts and adjustment of straps on the face piece as follows:

- 16.7.1 Air purifying - when inspecting this type of respirator, be sure to check the head straps for wear and cracks; face piece for broken element holders or split lens, sealing of exhalation valve, and air purifying elements for correct type, expiration date, gasket seal, and previous use. Reusable air purifying respirators should be inspected before and after each use.
- 16.7.2 Atmosphere supplying - although units differ in construction, examination should include: a check of head straps and face piece, condition of lines or hoses and connections, and inspection of regulators, valve, cylinders and warning alarms. Most important- respirators for emergency use should be inspected monthly; and the person initializing the record tag should make certain that the SCBA equipment is in good working order. Atmosphere supplying equipment not used routinely should be inspected after use before it is put back into service.

17. Breathing Air Quality and Use

- 17.1 This section will assure that breathing air for atmosphere supplied-air respirators is of high quality. When supplied-air is used the following will be required:
 - 17.1.1 Compressed breathing will be Type 1 - Grade D as described in ANSI/Compressed Gas Association Commodity Specification for Air, G-7.1-1989.
 - 17.1.2 Compressors used to supply breathing air will be constructed and situated to prevent entry of contaminated air into the air-supply system, minimize moisture, have suitable in-line air filters, will have a tag on the filter showing last date changed and signature of person changing filter.
 - 17.1.3 Oil lubricated compressors will have a high temperature alarm or CO alarm, or both; if only a high temperature alarm is used the air supply will be monitored at intervals sufficient to prevent CO in the breathing air from exceeding 10 PPM.
 - 17.1.4 Breathing air line couplings will be incompatible with non-respirable worksite air or gas systems. No asphyxiating substances will be introduced into the breathing air system.
 - 17.1.5 Pure oxygen will not be used in breathing air cylinders or systems.

18. Identification of Filters, Cartridges, and Canisters

- 18.1 All filters, cartridges and canisters used in the workplace will be labeled and color coded with the NIOSH approved label and that label will not be removed and will remain legible.

19. Employee Training and Information

- 19.1 The Company will provide effective training to employees who are required to use respirators. The training must be comprehensive and understandable. This includes providing basic information on respirators to employees who wear respirators when not required by OSHA or the Company to do so.
- 19.2 Additionally, employees who use respirators will be retrained annually, and also in the event of any of the following:

- 19.2.1 There are changes in the workplace or the type of respirator being used that contradict or make obsolete previous training;
 - 19.2.2 Observation or evaluation is made that indicate an employee's knowledge or use of a respirator is not in accordance with program requirements, or the individual has not retained the required training information, knowledge or skills; or
 - 19.2.3 Some other situation arises that indicates the need for retraining to ensure that employees are using respiratory equipment safely and in accordance with program requirements.
- 19.3 Regarding training objectives and requirements, each employee must demonstrate knowledge of at least the following:
- 19.3.1 Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator;
 - 19.3.2 What the limitations and capabilities of the respirator are;
 - 19.3.3 How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions;
 - 19.3.4 How to inspect, put on and remove, use, and check the seals of the respirator;
 - 19.3.5 What the procedures are for maintenance and storage of the respirator;
 - 19.3.6 How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators; and
 - 19.3.7 The general requirements of OSHA and the Company's safety program regarding safe use of respirators.
- 19.4 Each employee, upon assignment to an area requiring respirators, must be instructed by his superintendent, supervisor, foreman, or group leader relative to their responsibilities in the respiratory program. They will be instructed in need, use, limitations, and care of their respirator(s).
- 19.5 There are basic components of training that are common to both workers and supervisors. Each person must have an opportunity to handle the respirator, check different fitting techniques, test face piece-to-face seal, and to wear the respirator in normal air prior to starting a job. In addition there should be a discussion of engineering and administrative controls in use, and why respirators also are needed. The nature of the respiratory hazard and what happens if the respirator is not worn, or used improperly should be explained.
- 19.6 The employees should be informed why a particular type of respirator has been selected and how to use respirators in emergencies and special operations.
- 19.7 Supervisors who oversee the daily activities of workers who wear respirators should be familiar with the following:

- 19.7.1 Work requirements and conditions necessitating the use of respirator protective equipment. These may include:
 - 19.7.1.1 Time of exposure to a contaminant
 - 19.7.1.2 The activity and mobility of the worker
 - 19.7.1.3 Eye protection needed
 - 19.7.1.4 Temperature extremes
 - 19.7.1.5 Face piece-to-face seal of various types of equipment
- 19.7.2 Nature and extent of hazards to which a worker may be exposed.
 - 19.7.2.1 Type of contaminant and its concentration
 - 19.7.2.2 Acute (short term) or chronic (long term) exposure potential
- 19.7.3 The general operation of the program; maintenance and inspection of equipment, issuance of respirators, and control of their use.
- 19.7.4 Legal requirements pertinent to the use of respirators in a capacity as supervisor.
- 19.8 A Supervisor can get help and information from the Respirator Training Guide, Material Safety Data Sheets, or the Safety Director.
- 19.9 Since the worker will be directly exposed to contaminants, he/she must know:
 - 19.9.1 The nature of the hazard and what might happen if a selected respirator is not worn.
 - 19.9.2 What control measures are being considered in addition to wearing personal protective equipment?
 - 19.9.3 Why a particular respirator was selected for that job.
 - 19.9.4 The limitations of a specific respirator.
 - 19.9.5 How to use any respirator assigned to him/her and to adjust the unit for a proper fit.
 - 19.9.6 Maintenance, storage and cleaning of respirators.
 - 19.9.7 How to recognize an emergency and use the proper equipment.
- 19.10 The supervisor will provide training with help from the Safety Coordinator.
- 19.11 The most effective respiratory protective equipment is that equipment which is worn. The best way to insure that the respirators will be worn is to handle objections to wearing the

equipment. The worker must be motivated to wear the respirator by instilling in him the desire and need to wear the proper equipment. If objections to fit, size, type, etc., are handled, then there will be a greater likelihood that the worker will wear the respirator provided.

20. Program Evaluation

- 20.1 The Company will conduct evaluations of the workplace to ensure that the written respiratory protection program is being properly implemented, and to consult employees to ensure that they are using the respirators properly.
- 20.2 The Company will conduct evaluations of the workplace as necessary to ensure that the provisions of the current written program are being effectively implemented and that it continues to be effective.
- 20.3 The Company will regularly consult employees required to use respirators to assess the employees' views on program effectiveness and to identify any problems. Any problems that are identified during this assessment will be corrected. Factors to be assessed include, but are not limited to:
 - 20.3.1 Respirator fit (including the ability to use the respirator without interfering with effective workplace performance);
 - 20.3.2 Appropriate respirator selection for the hazards to which the employee is exposed;
 - 20.3.3 Proper respirator use under the workplace conditions the employee encounters; and
 - 20.3.4 Proper respirator maintenance.

21. Recordkeeping

- 21.1 The Company will establish and retain written information regarding medical evaluations, fit testing, employee training and the respirator program. This information will facilitate employee involvement in the respirator program, assist the employer in auditing the adequacy of the program, and provide a record for compliance determinations by OSHA.
- 21.2 Records of medical evaluations required by this section must be retained and made available in accordance with 29 CFR 1910.1020.
- 21.3 The employer will establish a record of the qualitative and quantitative fit tests administered to an employee including:
 - 21.3.1 The name or identification of the employee tested;
 - 21.3.2 Type of fit test performed;
 - 21.3.3 Specific make, model, style, and size of respirator tested;
 - 21.3.4 Date of test; and

- 21.3.5 The pass/fail results for QLFTs or the fit factor and strip chart recording or other recording of the test results for QNFTs.
- 21.4 Fit test records will be retained for respirator users until the next fit test is administered.
- 21.5 A written copy of the current respirator program will be retained by the Safety Coordinator.
- 21.6 Written materials required to be retained under this program will be made available upon request to affected employees and to the Assistant Secretary or designee for examination and copying.

Metro Electric Co., Inc. Riders



Frequently, during a job, every driver or operator of equipment is asked to transport someone to the other end of the job site. Everyone likes to do a favor, especially when it doesn't cost anything. However, if you grant the request and provide the ride are you really providing a favor?

The only safe place to ride on heavy equipment is on the seat beside the operator but ... there is only room for one! Riders on steps, buckets, push plates or any place else on heavy equipment is unsafe. An unexpected jolt could cause them to loose footing and fall off risking serious injury.

People can be carried on trucks if there is room on the seat beside the operator or in the back. If people are transported in the truck bed it is the operator's responsibility to make sure they are seated when the truck is in motion. No one should be transported on top of a load under any circumstances.

The next time you are asked to provide a lift, make sure you have safety in mind rather than doing a favor! You may be doing a bigger favor for that other worker by declining the request!

Metro Electric Co., Inc.

Rigging Policy



Purpose

The purpose of this policy is to establish requirements relative to the hazards associated with the use of cranes, hoists and slings in the work place. Lift planning and control involves identifying potential hazards and taking steps to mitigate them.

Procedure

Qualified Riggers. The qualified rigger shall observe the following practices when performing hoisting and rigging operations:

- Before each use, the sling and all attachments shall be inspected for damage or defects.
- Slings and attachments that are damaged or defective shall be tagged and removed from service immediately.
- Slings shall not be shortened with knots or bolts or other makeshift devices.
- Sling legs shall not be kinked.
- Slings shall not be loaded in excess of their rated capacities.
- Slings used in a basket hitch shall have their loads balanced to prevent slippage.
- Slings shall be securely attached to their loads.
- Slings shall be padded to protect them from the sharp edges of the loads.
- Suspended loads shall be kept clear of all obstructions.
- All employees shall be kept clear of loads about to be lifted and of suspended loads. Hands and fingers shall not be placed between the sling and its load while the sling is being tightened around the load.
- Shock loading of slings and other hoisting and rigging equipment is prohibited.
- A sling shall not be pulled from under a load when the load is resting on the sling.
- The qualified rigger or the supervisor shall determine when additional personnel will be required.
- The qualified rigger shall determine when a spotter(s) is required to provide an additional measure of safety to the lift.

Making the Lift

When making the lift, the following guidelines shall be followed:

- Identify the path of travel and the place where the load will be set down. Make certain the load will safely clear any obstructions.
- As the lift starts, check to see that the slings, chains or lifting devices being used are well secured and free of twists and kinks. Make sure the load is properly balanced before it is raised more than a few inches. If it is not, set it down and readjust the hook-up.
- Do not overload a hook or carry the load on the point of the hook. Always carry the load in the saddle of the hook.
- Do not guide position or alter a suspended load by hand if it has been raised above waist height. Use a tether rope having sufficient length to reach the floor or ground from the highest point the load can reach.

- When guiding a load, keep hands clear of pinch points. Anticipate a quick take-up of the slack of the tether rope.
- Do not walk or stand under a suspended load. Warn others to keep out from underneath the load being lifted by the crane. A hard hat area shall be established for all employees working close to a load, including employees managing a tag line.
- Never walk between a stationary object and an object which is being moved.
- Ensure that a clear line of communication exists at all times between the person directing the lift and the operator.

Inspections

Quarterly inspection of slings and rigging accessory shall be preformed by all supervisors. Color code will be the same as the extension cords. The Safety Director will inspect for this as part of job site audits. These audits will be written and documented on a standard check list. The following information is supplied to assist employees as well as supervisors what to look for.

Synthetic Slings: Synthetic slings shall be removed from service when any of the following deficiencies are visible:

- Acid or caustic burns.
- Melting or charring.
- More than 5 % of visible stitches or strands broken.
- Permanent elongation.
- Distorted fittings.
- Any other apparent defects which cause doubt as to the strength of the equipment.

Wire Rope Slings: Wire rope slings shall be removed from service when any of the following defects are visible:

- More than six randomly broken wires in one lay.
- Wear or scraping 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 heat damage.
- End attachments that are cracked, deformed or worn.
- Any signs of corrosion.
- Any other apparent defects which cause doubt as to the strength of the equipment.

Shackles, Rings, etc.: Shackles, rings, etc. , shall be removed from service when any of the following defects are visible:

- Wear, corrosion, spreading or deformation (greater than 10 percent of new condition).
- Visible cracking.
- Nonstandard shackle pins.
- Any other apparent defects which cause doubt as to the strength of the equipment.

Metro Electric Co., Inc. Safety Covers for Floor Openings



A carpenter working on the floor above called a laborer on the floor below to hand up a sheet of plywood. The laborer picked up a sheet of plywood laying on the floor and took a couple of steps forward in an attempt to set it upright. He fell through a hole in the floor to the floor below breaking both legs and causing serious injury to his back.

The plywood covered the hole in the floor but without a danger sign and without being tightly nailed or screwed to the floor. The message in this story is "**Anything less than total safety is no safety at all!**"

A total safety attitude must be in mind when covering floor openings!

- The hole should be covered securely with a cover large enough and rigid enough to support a heavy load.
- It must be marked with a danger warning.
- All employees on the job must be warned of the presence of a floor opening.

Safely covering floor openings with plywood requires more than laying material over the hole and more than nailing it in place. Total safety on the job means a total job of eliminating a hazard. Half a job ... an inadequate or incomplete job of covering a hole hazard results in half, inadequate and incomplete accident prevention.

Simply nailing a plywood cover to the floor is not enough. Nails can become loose with frequent traffic over the plywood. Do the whole job! Use screws, heavy plywood, danger signs and warn the workers!

Metro Electric Co., Inc.

Scaffold Safety



Applicable OSHA Standard: 29 CFR 1926 Subpart L

1. Purpose

- 1.1 The purpose of this program is to provide directions and instructions for Metro Electric requirements to be implemented with the construction, erection, and dismantling of scaffolds and ladders.

2. Scope

- 2.1 The scope of this program applies to all Metro Electric job site locations where scaffolds and ladders may be used. The requirements, as set forth in this program, should be implemented to the fullest extent possible.

3. Responsibilities

- 3.1 The primary responsibility for the implementation of the requirements of this program will rest with the Site Supervisor.
- 3.2 The Company Safety Representative or designee will be responsible to provide for the monitoring of work activities to assure compliance to the requirements of this program and compliance to the Customer/Client safety requirements.
- 3.3 The Site Supervisor and Company management will be responsible for the enforcement and disciplinary action resulting from violation or failure of assigned persons to implement the requirements of this program.

4. Requirements

- 4.1 A competent person will ensure that scaffolds are safe prior to and during use.
- 4.2 If unsafe equipment or conditions are observed, these will be tagged out by the competent person. All employees will comply with the tagout. Scaffolding that is tagged out as being unsafe will not be used.
- 4.3 Only qualified and competent personnel are allowed to modify scaffolding systems. Non-qualified personnel may create hazards and unsafe situations and are therefore prohibited from attempting to modify a scaffolding system.
- 4.4 The following requirements are applicable to all scaffolds:
 - 4.4.1 Guardrails and Toeboards:

- 4.4.1.1 Guardrails will be constructed of 2" X 4" lumber, ½ inch wire rope, angle iron or the prefabricated rail(s) supplied by the scaffold manufacturer.
- 4.4.1.2 Toprails will be approximately 42 inches above the working surface.
- 4.4.1.3 Midrails will be approximately 21 inches above the working surface.
- 4.4.1.4 Wire rope toprails and midrails will be stretched tight with no more than an approximate 2 inch deflection.
- 4.4.1.5 Toeboards will extend a minimum of 4 inches above the working surface.
- 4.4.1.6 When the placement of the scaffold work platform prevents the installation of guardrails, other fall protection equipment will be used.
- 4.4.1.7 Guardrails and toeboards will be installed on all open sides and ends of scaffolds.
- 4.4.1.8 Scaffolds and work platforms 4 feet to 10 feet high with a working surface of less than 45 inches will have standard guardrails installed on all open sides and ends of the scaffold or platform.

4.5 Working Surfaces:

- 4.5.1 Working surfaces will be constructed of scaffold plank, aluminum deck boards or ¾" construction grade plywood.
- 4.5.2 Scaffold planking will be scaffold grades or equivalent as recognized by approved grading rules for the species of wood used under the American Lumber Standards.
- 4.5.3 Working surfaces will be secured by nails, double wrap of #9 wire or cleats.
- 4.5.4 Lumber sizes, when used in this program, refer to nominal size/thickness except where otherwise stated.
- 4.5.5 Scaffold planks will extend a minimum of 6 inches and a maximum of 12 inches over the end supports.
- 4.5.6 If required, an access/egress ladder will be provided.
- 4.5.7 Scaffold planks will not span more than 8 feet between supports/vertical legs.
- 4.5.8 Scaffold planks and plywood will be free of splits and burns.

4.6 Scaffold Footing and Anchorage

- 4.6.1 The footing or anchorage will be capable of carrying the maximum intended load without settling or displacement.

4.6.2 The uprights/vertical legs will be plumb and securely braced to prevent swaying and displacement. NOTE: The requirements for specific types of scaffolds and ladders are described below.

4.6.2.1 Tubular Welded Frame:

- 4.6.2.1.1 Scaffold will be cross-braced to assure scaffold is plumb, square, and rigid.
- 4.6.2.1.2 Stacking pins will only be secured with the manufacturer's pins or recommended bolts.
- 4.6.2.1.3 Cross braces will be secured, as designed by the manufacturer.
- 4.6.2.1.4 Stationary scaffolds must be secured horizontally, every 26 feet of height and 30 feet horizontally, to prevent tipping.
- 4.6.2.1.5 The height of rolling scaffolds, measured from the ground to the top rail, will be no more than four times the minimum base dimension (length times the width).
- 4.6.2.1.6 All wheels/casters will be the same size, equipped with a positive locking device, and in good working condition.
- 4.6.2.1.7 Wheels will be locked while personnel are working from the scaffold.
- 4.6.2.1.8 Personnel will not be permitted on mobile scaffold while the scaffold is being moved.

4.6.2.2 Tube and Coupler (Tube-Lock):

- 4.6.2.2.1 Uprights will have a maximum spacing of 8 feet.
- 4.6.2.2.2 Uprights will be placed on secure bases and maintained plumb.
- 4.6.2.2.3 Scaffolds will be limited in heights and working levels to those permitted in Tables 2-10, 11, and 12 of OSHA 29 CFR 1926.451.
- 4.6.2.2.4 Horizontal braces will be installed completely around all exterior uprights and between interior uprights. Braces will be installed every 6 feet of height.
- 4.6.2.2.5 Platform supports will be coupled/clamped directly to the horizontal braces and extend 4 inches to 12 inches beyond the horizontal braces.

- 4.6.2.2.6 All horizontal bracing will be coupled/clamped directly to the uprights.
- 4.6.2.2.7 Diagonal bracing will be installed at alternating 45 degree angles beginning with the corner upright and repeating every 5th upright on the perimeter. An alternating bracing pattern should be used.
- 4.6.2.3 One and Two Point Suspension Scaffolds:
 - 4.6.2.3.1 Cable will be securely anchored and softeners will be used when necessary.
 - 4.6.2.3.2 Cable will be insulated at the anchor point from the motor to 4 feet above the motor and wherever the cable comes in contact with metal to prevent electrical arcing.
 - 4.6.2.3.3 Two-point suspension scaffold platforms will remain level while being raised or lowered.
 - 4.6.2.3.4 Each employee will wear a full body harness and be tied off to an independent lifeline. A lifeline will be supplied for each employee.
- 4.6.2.4 Knee Brace/Cantilever:
 - 4.6.2.4.1 Knee brace/cantilever scaffolding will be welded by a qualified welder and visually inspected before use.
- 4.6.2.5 Ladders:
 - 4.6.2.5.1 Ladders will extend 36 inches above the landing.
 - 4.6.2.5.2 Extension and job-built ladders will be secured to prevent movement or falling.
 - 4.6.2.5.3 Manufactured ladders will be Class I or Class IA with properly working feet.
 - 4.6.2.5.4 The slope of the ladder from the base of the support will be one(1) foot for every 4 feet of ladder length.
 - 4.6.2.5.5 All ladders will be set on a firm base to prevent shifting and tipping.
 - 4.6.2.5.6 Ladders with broken or missing rungs or steps, broken or split side rails, or faulty or defective construction, will not be used.
 - 4.6.2.5.7 Metal ladders will not be used.

- 4.6.2.5.8 Step ladders will not be used as a leaning ladder.
- 4.6.2.5.9 Employees will not work off the top two steps of a stepladder.
- 4.6.2.5.10 Personnel will have both hands free of tools, materials, or equipment, while climbing and descending ladders.
- 4.6.2.5.11 Personnel will face the ladder when climbing and descending.

5. Training Requirements

- 5.1 The Company will have each employee who performs work while on a scaffold trained by a person qualified in the subject matter to recognize the hazards associated with the type of scaffold being used and to understand the procedures to control or minimize those hazards. The training will include the following areas, as applicable:
 - 5.1.1 The nature of any electrical hazards, fall hazards and falling object hazards in the work area;
 - 5.1.2 The correct procedures for dealing with electrical hazards and for erecting, maintaining, and disassembling the fall protection systems and falling object protection systems being used;
 - 5.1.3 The proper use of the scaffold, and the proper handling of materials on the scaffold;
 - 5.1.4 The maximum intended load and the load-carrying capacities of the scaffolds used; and
 - 5.1.5 Any other pertinent requirements.
- 5.2 The Company will have each employee who is involved in erecting, disassembling, moving, operating, repairing, maintaining, or inspecting a scaffold trained by a competent person to recognize any hazards associated with the work in question. The training will include the following topics, as applicable:
 - 5.2.1 The nature of scaffold hazards;
 - 5.2.2 The correct procedures for erecting, disassembling, moving, operating, repairing, inspecting, and maintaining the type of scaffold in question;
 - 5.2.3 The design criteria, maximum intended load-carrying capacity and intended use of the scaffold;
 - 5.2.4 Any other pertinent requirements.
- 5.3 When the Company has reason to believe that an employee lacks the skill or understanding needed for safe work involving the erection, use or dismantling of scaffolds, the Company will retrain each such employee so that the requisite proficiency is regained. Retraining is required in at least the following situations:

- 5.3.1 Where changes at the worksite present a hazard about which an employee has not been previously trained; or
 - 5.3.2 Where changes in the types of scaffolds, fall protection, falling object protection, or other equipment present a hazard about which an employee has not been previously trained; or
 - 5.3.3 Where inadequacies in an affected employee's work involving scaffolds indicate that the employee has not retained the requisite proficiency.
- 5.4 The Site Supervisor will be responsible for implementing the employee training and information program. The format for the program may include classroom instruction, safety tool box meetings, and other forms of group or singular instructions. Instructions are normally communicated verbally or in writing through the employee's Supervisor.
- 5.5 The Site Supervisor is responsible for assuring Supervisors are qualified or competent in the following areas:
- 5.5.1 Fall hazards and falling object hazards.
 - 5.5.2 Electrical hazards (protection from electrical hazards for erecting, maintaining, and dismantling).
 - 5.5.3 Fall protection and protection systems.
 - 5.5.4 Proper and safe handling of materials.
 - 5.5.5 Trained in the maximum intended loads and load-carrying capacities.
 - 5.5.6 Any other pertinent requirements.
- 5.6 All Metro Electric employees will be trained in the above mentioned, along with any additional basic or site requirements.
- 5.7 Metro Electric will insure that each employee follows the safety guidelines as set forth in Safe Work Practices.

6. **Inspection & Tagging Procedures**

- 6.1 A competent person will tag all scaffolds, including a single plank working platform.
- 6.2 A competent person must inspect scaffolds and components before each work shift use and after any incident that could weaken it. The scaffold inspection form that has been adopted by the Company is included later in this program.
- 6.3 All scaffolds will be tagged with a Red, Yellow, or Green tag. Sample tags are included later in this program. In the event that the scaffold is modified or repaired in any way, the date of modification will be entered on the appropriate scaffold inspection tag.
 - 6.3.1 RED means the scaffold is unsafe or is under construction, and is not to be used.

- 6.3.2 YELLOW means the scaffold does not meet all requirements, and special equipment or rules are required in order to use the scaffold. These requirements must be posted (for example, 100% fall protection required for work performed on the scaffold).
- 6.3.3 GREEN means that the scaffold is SAFE FOR USE and meets all OSHA standards and can be used without any additional rules or equipment. This scaffold meets all load and level requirements, and is tagged with a competent person name and contact number.
- 6.4 If there is no tag, no one is allowed on scaffold.
- 6.5 The following must be completed for each tag:
 - 6.5.1 Date erected / tagged
 - 6.5.2 Inspected by (name of competent person -- printed name and signature
 - 6.5.3 Inspection date
 - 6.5.4 Company responsible for erection/maintaining/dismantling
- 6.6 GREEN TAG requirements
 - 6.6.1 Green tags will be hung on scaffolds that have been inspected and are safe for use.
 - 6.6.2 A green SAFE FOR USE tag will be attached to the scaffold at each access point after the initial inspection is complete.
- 6.7 YELLOW TAG requirements
 - 6.7.1 Yellow CAUTION tag(s) will replace all green SAFE FOR USE tag(s) whenever the scaffold has been modified to meet work requirements, and as a result could present a hazard to the user.
 - 6.7.2 This tag indicates special requirements are necessary for the scaffold to be used safely. Therefore the tag should be considered a supervisory tag and, as such, is to be managed by the Company with regard to employees who will work on the scaffolding, as well as the host employer and/or the scaffold erector.
 - 6.7.3 The yellow CAUTION tag as a minimum requirement will have:
 - 6.7.3.1 The unusual or potential hazard marked on the reverse.
 - 6.7.3.2 The preventative measures that must be taken prior to use to mitigate the hazard marked on the reverse.
 - 6.7.3.3 The name of the competent person authorizing the use of the yellow-tagged scaffold.

- 6.7.4 The yellow tag will not to be removed until the scaffold has been returned to a safe condition and an inspection by a competent person has been completed. Based on the results of that inspection the appropriate tag (red or green) will be hung on the scaffold and the yellow tag removed.
 - 6.7.5 All scaffolds that have been "Yellow Tagged" for CAUTION must still comply with the other provisions of this scaffold safety program and OSHA requirements.
 - 6.7.6 NOTE: Use of the "yellow tag" status is not intended to override the green tag system. All efforts should be made to return the scaffold to a Green Tag status as soon as possible.
- 6.8 RED TAG requirements
- 6.8.1 A red DANGER - UNSAFE FOR USE tag will be used during erection or dismantling when the scaffold is left unattended and replace all green SAFE FOR USE tags or yellow CAUTION tags in the event a scaffold has been deemed unfit for use.
 - 6.8.2 The red tag information will, as a minimum requirement, include:
 - 6.8.2.1 The work order number or project number, the inspection date and the name of the person who performed the inspection filled in on the front of the card.
 - 6.8.2.2 The designation, under erection, being dismantled, repairs required or overhead protection only, marked on the reverse.
- 6.9 Scaffold re-inspection
- 6.9.1 Scaffold re-inspections must be completed any time when conditions may have changed causing the integrity of the scaffold to be suspect, or at a frequency determined by the competent person or the host employer.
 - 6.9.2 This is in addition to the required initial inspection before each shift.

SCAFFOLDING INSPECTION REPORT

Client: _____

Job No: _____ Date: _____

Scaffold Location: _____ Time: ____ : ____ AM PM

Inspected by: _____

NOTE: Scaffold will not be used unless these items are found satisfactory.

SECTION 1.	Yes	No	Comments
1. Base plates/screw jacks on firm contact with sills/deck to prevent settling.	_____	_____	_____
2. Scaffold appears to be level and verticals are plumb.	_____	_____	_____
3. Safe, proper access and egress provided to all work platforms.	_____	_____	_____
4. All platforms properly/tightly planked and secured from movement.	_____	_____	_____
5. All toeboards secured in place.	_____	_____	_____
6. All guardrails and midrails in place.	_____	_____	_____
7. Are vertical legs rigidly braced to prevent swaying.	_____	_____	_____
8. Scaffold anchored or equalized (4 to 1) to prevent movement (butts/ties installed).	_____	_____	_____
9. No energized, unprotected electrical is within 12 feet of the scaffold.	_____	_____	_____
10. Has the scaffold been tagged and has not been altered.	_____	_____	_____

SECTION 2.	Yes	No	Comments
1. Scaffold planks construction grade lumber and in sound condition.	_____	_____	_____
2. Are all planking and toeboards in place and secured.	_____	_____	_____

	Yes	No	Comments
3. All guardrails and midrails in place and secured.	_____	_____	_____
4. All tools and material raised and lowered to locations just carried by employees.	_____	_____	_____
5. Working platforms clear of all loose tools, cords, material, etc.	_____	_____	_____
6. Exit ways and ladders clear and unobstructed.	_____	_____	_____
7. Stair and planks free of debris or slippery surface.	_____	_____	_____
8. Work being performed on the scaffold in accordance with load ratings.	_____	_____	_____
9. Have barricades been installed, scaffold tags been placed properly.	_____	_____	_____

Inspector: _____
 Print

 Sign

Supervisor: _____
 Print

 Sign

Scaffold Size: _____

NOTES:

SCAFFOLD SAFETY AND COMPLIANCE TEST

NAME: _____ DATE: _____ SCORE: _____

- _____ 1. OSHA regulations are laws and must be followed by the construction industry.
True or False
- _____ 2. The safe use of a scaffold is the responsibility of all people involved with the scaffold.
True or False
- _____ 3. Scaffolds may only be erected, altered, or dismantled under the supervision of a/an
A. Authorized Person
B. Competent Person
C. Skilled Person
D. Qualified Person
- _____ 4. All scaffolds must be built on
A. Anything that looks like it will hold the intended load firmly.
B. Base plates, mud sills, or other adequate firm foundation.
C. It makes no real difference as long as it is braced properly.
D. Solid ground.
- _____ 5. Scaffold mud sills help distribute the leg or vertical loads to the soil, asphalt, concrete, etc.
True or False
- _____ 6. Where should the bottom runners be placed on the scaffold?
A. Four inches from the bottom of the legs.
B. About knee high.
C. As close to the base as possible.
D. They should always be attached to the screw jacks.
- _____ 7. X-Bracing means to attach two braces on each side of the scaffold to form an X shape at all angles.
True or False
- _____ 8. How high above the base should handrails be?
A. 38 to 42 inches
B. 36 to 45 inches
C. 42 to 45 inches
D. None of the above

- _____ 9. An access ladder should be installed on all scaffolds more than
- A. 4 feet above or below a point of access
 - B. 3 feet above or below a point of access
 - C. 2 feet above or below a point of access
 - D. 1 foot above or below a point of access
- _____ 10. Ladders should be attached at a place on the scaffold that is less likely to cause
- A. Swaying
 - B. Damage
 - C. Tripping
 - D. Injury
- _____ 11. Each scaffold deck will be fully planked so that the gap between each plank is no more than
- A. 2 inches
 - B. 1 inch
 - C. 3 inches
 - D. There can be no gaps
- _____ 12. The minimum board overhang is 10 inches past the bearer bar.
- True or False
- _____ 13. The maximum overhang of a board 10 feet or less is
- A. 18 inches
 - B. 10 inches
 - C. 12 inches
 - D. 9 inches
- _____ 14. When planks are overlapped, the minimum overlap is
- A. 14 inches
 - B. 12 inches
 - C. 16 inches
 - D. 8 inches
- _____ 15. Toeboards are to be on all open sides of a scaffold when the deck is higher than
- A. 6 feet or more
 - B. 8 feet or more
 - C. 7½ feet or more
 - D. 10 feet or more

_____ 16. Toeboards must be at least 3½ inches high and have no more than ¼ inch gap between the toeboard and the deck.

True or False

_____ 17. All scaffold end frames must be locked together to prevent

- A. Tipping
- B. To help scaffold stay plumb
- C. Swaying
- D. Uplift

_____ 18. A tube and coupler scaffold more than 125 feet in height must be designed by a competent engineer with at least two years scaffold experience.

True or False

_____ 19. Guys or ties should be placed as close to the verticals as possible.

True or False

_____ 20. The casters on mobile scaffolds should never be locked in case they need to be moved during emergencies.

True or False

_____ 21. Horizontal and diagonal bracing is not preferred on a mobile scaffold.

True or False

_____ 22. A scaffold that is made to be heavy-duty will hold 25 pounds per square foot.

True or False

_____ 23. A screw jack will be used on scaffolds to help

- A. Make it taller
- B. Level it
- C. Hold it in place
- D. Keep it from falling over

_____ 24. Knot holes in planks may be any size as long as they are not loose or missing.

True or False

- _____ 25. A scaffold plank must weigh at least
- A. 45 pounds
 - B. 55 pounds
 - C. 65 pounds
 - D. None of the above is correct
- _____ 26. Scaffold planks that are 10 feet long or more may hang beyond the bearer bar by a minimum/maximum of _____ per the construction standard 29 CFR 1926.450.
- A. 6 - 14 inches
 - B. 8 - 18 inches
 - C. 6 - 18 inches
 - D. 6 - 12 inches
- _____ 27. Saw kerfs do not damage the integrity of the plank.
- True or False
- _____ 28. Scaffold erectors do not need to have an understanding of all the factors which may affect the strength, stability, and the effectiveness of a completed scaffold.
- True or False
- _____ 29. Scaffolds and their components will be capable of supporting, without failure, at least four times the maximum intended load. This is known as a 4 to 1 safety factor.
- True or False
- _____ 30. On tube and coupler scaffold, the bearers will be at least _____ but not more than _____ inches longer than the post spacing or runner spacing.
- A. Not less than 4", not more than 12"
 - B. Not less than 2", not more than 6"
 - C. Not less than 6", not more than 14"
 - D. None of the above

SCAFFOLD SAFETY AND COMPLIANCE TEST

ANSWER SHEET

1. T
2. T
3. B
4. B
5. T
6. C
7. F
8. D
9. C
10. C
11. B
12. F
13. C
14. B
15. D
16. T
17. D
18. F
19. T
20. F
21. F
22. F
23. B
24. F
25. D
26. D
27. F
28. F
29. T
30. A

Scaffold identification tag information for the FRONT of ALL TAGS (GREEN, YELLOW & RED)

SCAFFOLDING IDENTIFICATION TAG

Scaffold ID# _____

Date Erected D / M / Y _____	Expected Removal Date D / M / Y _____
Project Name / Number / Scaffold Identification _____	
I have inspected and approved the scaffold built or erected, to which this tag is attached, and consider it to be _____ _____ SAFE for completion of work as specified _____ CAUTION - Potential or Unusual Hazard _____ UNSAFE FOR USE - Keep off scaffold	
Inspector's name PRINTED _____	Inspector's SIGNATURE _____
Date Inspected _____ Time _____ AM PM	

RE-INSPECTED

Name _____ Date _____	Name _____ Date _____	Name _____ Date _____
Name _____ Date _____	Name _____ Date _____	Name _____ Date _____
Name _____ Date _____	Name _____ Date _____	Name _____ Date _____

MODIFICATION

Name _____ Date _____	Name _____ Date _____	Name _____ Date _____
Name _____ Date _____	Name _____ Date _____	Name _____ Date _____
Name _____ Date _____	Name _____ Date _____	Name _____ Date _____

SCAFFOLDING IDENTIFICATION TAG

**The following Contractor / Company
has erected this scaffold:**

**SAFE
FOR
USE**

**DO NOT ALTER
DO NOT OVERLOAD**

SCAFFOLDING IDENTIFICATION TAG

The following **Competent Person** authorizes the use of this scaffold subject to fulfillment of the conditions listed under the preventive measures section of this tag.

Name: _____

CAUTION

Potential or Unusual Hazard

What is the Potential or Unusual Hazard _____

Preventive Measures to be Taken _____

SCAFFOLDING IDENTIFICATION TAG

The following Contractor / Company
has erected this scaffold:

**DANGER
UNSAFE
FOR USE**

UNDER ERECTION

BEING DISMANTLED

REPAIRS REQUIRED

OVERHEAD PROTECTION ONLY

Metro Electric Co., Inc.

Short Service Employee Program



Applicable OSHA Standards: Supplemental to OSHA Compliance

1. Purpose

- 1.1 Metro Electric Co., Inc recognizes that, despite pre-assignment safety and job orientations, newly hired employees do not have the same kind of recent work and safety experience with the Company as longer-term employees.
- 1.2 These short-service employees may be more vulnerable to accidents and injuries at work specifically because of their unfamiliarity with work situations and environments, as well as potential hazards and abnormal operating conditions.
- 1.3 Additionally, employees who have short service with the Company are not as experienced with safe work procedures as personnel who have longer service with the Company and first-hand safety and work experiences in their current job assignment.
- 1.4 This policy has been established to provide short-service employees with specific safety, supervisory, organizational and job site supplemental support during the first six months of employment with the Company. This support includes methods of visual recognition of a short-service employee on a job site or work location, and a process of mentoring for these individuals to help them gain experience and familiarity in their work assignments and job site environment.
- 1.5 Subcontractors retained by the Company will establish and practice a short service employee process that, at a minimum, meets the requirements of this program. This will be confirmed by the Company site superintendent or supervisor.

2. Scope

- 2.1 This policy applies to all employees and subcontractors working within Company controlled work sites.

3. Policy

- 3.1 Definition and applicability
 - 3.1.1 For purposes of this program, the term "short service" will mean a length of service less than six months from the date of current job assignment with the Company.
 - 3.1.2 Personnel who have previously been employed by the Company will be subject to requirements of this program if they are separated from Metro Electric Company Inc for longer that 90 days; or if the supervisor re-hiring the individual and/or the Safety Coordinator elect to classify the re-hired individual as a short-service employee for purposes of additional safety training, operator qualification, and/or extended

orientation about the work assignment or site specific situations, tasks or for other work-related reasons.

- 3.1.3 No short-service employee can be assigned to a one man crew. Crews of five or less will only be able to have one short-service employee on the crew. Crews operating with more than 20 percent short-service employees may only be permitted to work with a written variance. This will serve as a mitigation plan for the appropriate Supervisor or Manager.
- 3.1.4 All work to be done by Short Service Employees must be submitted on a Short Service Employee Form to the project coordinator, contract contact or on-site supervisor. Any Short Service Employee that is sent to work without the form being submitted is subject to being sent back to the contractor's facility at the contractor's expense. The Short Service Employee Forms will be retained in the original form in project files.
- 3.1.5 Company supervisors and managers at a work location subject to this program will oversee, monitor and enforce its provisions. If, at the conclusion of the six-month period, the short-service employee has worked safely, conformed to HSE policies and safe work procedures, and has no recordable incident attributed to him or her, the short-service employee designation and method of identification will be removed, to be replaced by the color or identifier used by regular-service employees. This will be done at the Company's discretion. Any short-service employee who does not complete the six-month period free of a recordable incident will require written approval of the operator, host employer or general contractor before changing to the color or identifier of a regular-service employee.
- 3.1.6 Supervisors and managers will not have the discretion to extend or impose the conditions and requirements placed by this program on short-service employees for any other reason or purpose.

4. Organizational Differentiation

- 4.1 For purposes of this program, the concept of organizational differentiation will mean that records are made which allow the Company to maintain and track information regarding each employee's term of employment so that short service employees can be readily identified for implementation of this program.
- 4.2 This includes tracking methods that identify when each individuals length of employment goes beyond six months and their status changes under this program, and that person is no longer classified as a short-service employee.

5. Visual Differentiation

- 5.1 To ensure that short-service employees are provided with supplemental assistance as described above, it is necessary that they be readily differentiated from longer-service employees. This includes use of some highly visible method of differentiating and recognizing short-service employees on a job site or work location. Generally, the method is to require short-service employees to wear yellow, orange or some other high visibility color hardhat or vest, so long as the color is distinctive to identification of short-service employees and is not worn by other personnel on the project location. The Company project superintendent or supervisor will

coordinate with the host employer representative or general contractor to select the color that will be utilized to identify short-service employees on a site-specific basis.

- 5.2 Any differentiation as described and required by this program is specifically for purposes of supporting this programs process. The status of short service employee is a non-discriminatory differentiation based on length of employment only.
- 5.3 No method of differentiation will ever be utilized for purposes of discrimination or preferential treatment of one employee over another, or as a way to embarrass or ridicule an employee, or to subject an employee to embarrassment or the ridicule of others.

6. Mentoring

- 6.1 As part of this program, the Company will designate one mentor to assist and support an individual short-service employee on a crew crew. The mentor will be on site with the short-service employee that he or she is mentoring.
- 6.2 Under this program, the term “mentor” will mean an experienced Company employee who is well regarded by the Company and specifically assigned by the Company to be available to an individual short-service employee in a support and advisory rather than supervisory capacity.
- 6.3 In this role the mentor will be available to that employee to answer questions, offer guidance and advice, and generally provide the benefit of the mentor’s experience, personal support and encouragement on a personal level.
- 6.4 In most situations, the mentor will be someone other than the short-service employee’s assigned supervisor or manager. At the same time, work situations and crew assignments may involve a limited number or employees at a particular work location, and the supervisor or manager in charge of the crew or workplace may serve in the role of mentor to one of these employees.
- 6.5 In every situation, additional mentor assistance will be available to every short-service employee on request by contacting the Safety Coordinator or the human resources department at the Company main office.

Metro Electric Co., Inc.

Site Safety Inspections



Inspection of work areas and audits of the overall safety program, as well as prevention practices such as satisfactory housekeeping and safe work behaviors, are elements of an effective safety inspection program. Measures such as monthly inspections and periodic audits can be used to identify problems and hazards before these conditions result in accidents or injuries. Periodic audits also help identify the effectiveness of safety program management, and the findings of an inspections, when combined with an analysis of past accidents, provide a basis necessary for developing and implementing corrective action

RESPONSIBILITIES

Each Employee

- Monitor daily their work areas and assess potential risk
- Notify their supervisor of risk or safety concerns so that the risk or hazard can be resolved.
- Maintain satisfactory housekeeping conducive to a safe work environment

Safety Director

- Conduct monthly safety inspections of each facility.
- Complete documentation of inspection.
- When deficiencies or hazards are found the safety director will follow-up until the deficiency is resolved.
- The safety director will advise the customer of any hazards found by the contractor.
- The Safety director will work with the supervisor at the start of a new job site to identify any customer safety regulation that must be followed.
- The safety director will report the findings of all site audits at the weekly management meetings, and at the safety committee meeting.

CORRECTIONS

- All safety deficiencies will be corrected as soon as possible if not immediately.
- Serious risk conditions found during the monthly inspection process or at other times warrant immediate response and should be remedied by the most appropriate means depending on the situation

RECORDS

All inspections and audits should be documented on a standard checklist report used by the safety director.

Metro Electric Co., Inc.

Stop Work Authority Program



1. Purpose

- 1.1 The purpose of this procedure is to ensure that all employees are given the responsibility and authority to stop work when employees believe that a situation exists that places them, their coworker(s), contracted personnel, or the public at risk or in danger; could adversely affect the safe operation or cause damage to the facility; or result in a release of radiological or chemical effluents to the environment above regulatory requirements or approvals; and provides a method.
- 1.2 This procedure extends the authority to stop work to situations where an employee believes there is a risk of danger at the jobsite.

2. Scope

- 2.1 This procedure is applicable to all contractors and subcontract personnel working at any site.

3. Responsibilities

3.1 Employees

- 3.1.1 In supporting safe execution of work, all personnel, have the following responsibilities:
 - 3.1.1.1 The responsibility and authority to stop work or decline to perform an assigned task without fear of reprisal, to discuss and resolve work and safety concerns. The Stop Work may include discussions with co-workers, supervision, or safety representative to resolve work related issues, address potential unsafe conditions, clarify work instructions, propose additional controls, etc.
 - 3.1.1.2 The responsibility and authority to initiate a Stop Work IMMEDIATELY, without fear of reprisal, when the employee believes a situation exists which places himself/herself, a coworker, or the environment in danger or at risk.
 - 3.1.1.3 The responsibility to report any activity or condition the employee believes is unsafe or for which they have initiated a Stop Work. Notification should be made to the affected workers and to the supervisor or their supervisor's designee at the location where the activity or condition exists.
 - 3.1.1.4 The responsibility to notify their supervisor if a raised Stop Work issue has not been resolved to their satisfaction through established channels prior to the resumption of work.

3.1.1.5 Employee can contact their safety representative or union safety representative with a concern or to initiate a stop work, if the employee prefers to remain anonymous.

3.2 Management/Supervisor/Person in Charge / Field Work Supervisor

3.2.1 Management and supervision are committed to promptly resolve issues resulting from an employee-raised Stop Work. Supervisors responsibilities are to:

3.2.1.1 Resolve any issues that have resulted in an individual stopping a specific task or activity.

3.2.1.2 Provide feedback to individual/s and the affected work group who have exercised their Stop Work responsibility on the resolution of their concern prior to resuming work. If the employee that issued a stop work is not available due to reasons such as vacation, PTB, PTO, shift change, or training then the supervisor provides the feedback to the Safety Coordinator and the host facility representative before resuming work.

3.2.1.3 Notify the employer's Safety Representative when bargaining unit personnel are affected, if a raised stop work issue has not been resolved.

3.2.1.4 Ensure no actions are taken as reprisal or retribution against individuals who raise safety concerns or stop an activity they believe is unsafe.

3.3 Safety Representatives are Responsible to:

3.3.1 Assist employees, supervision and management in the resolution of safety issues and concerns.

3.3.2 Immediately contact management and work to resolve issues when an employee has called a situation to their attention that has not been resolved.

3.3.3 Discuss resolution with employees involved in a work stoppage where resolution was completed after their shift or when they were unavailable, or where he/she acted as their representative in reaching resolution.

3.3.4 Work as the agent of an employee that prefers to remain anonymous to work directly in the resolution of the stop work.

4. Implementation

4.1 Immediately

5. Process

5.1 Employee

5.1.1 Stop work if an activity or condition is believed to be unsafe, such as:

- 5.1.1.1 A situation exists that places them, their coworkers, contracted personnel, or the public at risk or in danger;
 - 5.1.1.2 A situation could adversely affect the safe operation or cause damage to the facility; or
 - 5.1.1.3 A situation could result in a release of radiological or chemical effluents to the environment above regulatory requirements or approvals.
 - 5.1.1.4 To clarify work instructions or to propose additional controls.
- 5.1.2 Ensure the work/activity is in, or placed in a safe condition and immediately notify supervision/management and affected workers when you stop work or decline to perform an activity.

5.2 Supervisor and Management

- 5.2.1 Resolve any issues that have resulted in an employee stopping work or an activity. Involve individuals who initiated the Stop Work or their appropriate safety representatives if the individual is not available, in reaching mutual agreement on the resolution or proposed actions necessary to return to work.
- 5.2.2 Be sure any necessary corrective or compensatory actions are taken before resuming an activity and are documented in accordance with Contractor procedures (logbook or other established method of reporting/tracking/ communicating safety issues and corrective action management).
- 5.2.3 If a Stop Work has not been resolved to the mutual agreement of manager and employee, then the stop work remains in place and the Supervisor/PIC/FWS will notify the appropriate company management, safety representative and union safety representative. Resolution of the stop work resides with the union safety representative and company management to resolve and/or propose actions necessary to return to work. Work may be resumed when union safety representation and management agree that the issue has been resolved. The objective is to reach resolution at the lowest levels of engagement. Notify the DOE Facility Representative that a Stop Work has resulted in an unresolved issue.
- 5.2.4 Review the Stop Work reports to measure participation, determine the quality of intervention and follow up, find common issues, find ways of improvement and share learning with others.

6. Training

- 6.1 All employees must be trained in Stop Work Authority prior to their initial work assignment.
- 6.2 The training must be documented with the employees' name, date, topic and trainer.

Metro Electric Co., Inc.

Subcontractor Safety Management Plan



Applicable Standard: OSHA co-employer safety responsibilities and interpretations

1. Overview

- 1.1 Metro Electric has established procedures to review and require that subcontractor safety programs, training, procedures and initiatives coordinate with the Company's own standards of safety.
- 1.2 The process is intended to help ensure that, in the event subcontractors are utilized by the Company as part of a work project, each subcontractor's safety programs, OSHA compliance, training, confirmations, documentations and statistical results of previous safety performance are in accordance with requirements of both the Company and host employer or general contractor.
- 1.3 Under this program and its associated processes, any subcontractor will be reviewed and qualified by the Company prior to performing work for a host employer or general contractor as part of a Company project.

2. Subcontractor Safety and Health Requirements

- 2.1 Pre-qualification by the Company will include review of the subcontractor's:
 - 2.1.1 Review of the subcontractor's OSHA 300 log for the last five years, or from the date the subcontractor began doing business if this time is less than five years;
 - 2.1.2 OSHA experience regarding any previous inspections or citations;
 - 2.1.3 Written safety and health programs as required by the Company and/or the respective host employer or general contractor;
 - 2.1.4 Written subcontractor procedures for at-work incident, injury, illness and emergency response, reporting and investigation requirements;
 - 2.1.5 Workers' compensation insurance EMR (Experience Modification Rating) information;
 - 2.1.6 A verification process must be completed to ensure that on-site subcontractors have the appropriate licenses, registrations, and insurance to complete their work.
 - 2.1.7 Documentation of required safety training of subcontractor employees that will be assigned in a safe and environmentally sound manner to the respective project, including supervisor, competent person training and site safety representative training;

- 2.1.8 Documentation of required Operator Qualification (OQ) and other individual qualifications or certifications as may be required by the project; and
- 2.1.9 Documentation may be available to explain the subcontractor's previous safety performance using a statistical method.
- 2.2 Review and evaluation will be performed by the Company Safety Coordinator, or a qualified third party as designated by the Safety Coordinator.
- 2.3 Written materials, submissions, results and documentations of subcontractor pre-qualification reviews will be maintained by the Safety Coordinator in a file for a period to be determined in coordination with the Company's designated legal counsel.

3. **Measurements of Workplace Safety and Health Results**

- 3.1 To manage a process or system, you must be able to measure it. This is why the Company measures safety performance and results as a tool toward identifying and eliminating hazards, mitigating risks and protecting employees and other individuals from workplace injuries and illnesses.
- 3.2 For purposes of this program, a safety *metric* will be considered as any such measurement of safety performance and injury/illness/incident prevention results.
- 3.3 Specific safety metrics to be considered during subcontractor pre-qualification will include, but are not limited to, items 2.1.1 through 2.1.9 above.
- 3.4 Safety metrics will be utilized to help evaluate when, where and how safety programs and initiatives have been successful, and also to identify areas that require additional attention.
- 3.5 Subcontractor safety performance will be reviewed and evaluated in part through comparisons of the subcontractor's safety metrics with levels of accomplishment as identified by the Company's written *Subcontractor Standards of Safety* for each project.
- 3.6 Subcontractors that evidence safety metrics that are not in accordance with project requirements will not be utilized for that specific project; or they will be utilized in roles and assignments that have lower levels of risk and are acceptable to the Company and host employer or general contractor.
- 3.7 All determinations of acceptability of a subcontractor's safety metrics, as requested and reviewed in accordance with this program, will be made by the Company and/or the host employer or general contractor for the respective project.

4. **Inclusion and Participation of Subcontractors in Project Safety Initiatives**

- 4.1 Subcontractors assigned by the Company to a project will attend initial safety and planning meetings; project safety orientations; incident, injury and illness response planning and coordination meetings. Prior to the start of work the contractor and subcontractor will define clear roles and responsibilities. Aligning the various interests and areas of responsibility requires good working relationships between the client, contractors and subcontractors. This is particularly true if the subcontractor activities are difficult to monitor (e.g. distributed work groups, remote locations, transportation).

- 4.2 Subcontractor personnel will participate in these and other such activities as required in preparation for working safely at the project location.
- 4.3 Subcontractor personnel will utilize, cooperate with, attend and support all pertinent components of safety programs and procedures; safety orientation, training, tailgate and daily meetings; qualification and/or certification requirements; periodic safety meetings and awareness activities; safety inspections; incident reporting and investigation procedures; and other such safety, health and incident prevention initiatives as may be established for all workers at a project location.
- 4.4 Subcontractor personnel will participate in and cooperate with Job Hazard Analysis (JHA), Job Safety Analysis (JSA) and Job Safety Observations (JSO) as established for the project workplace.

5. Requirements for Reporting Hazards, Incidents, Injuries and Illnesses

- 5.1 Subcontractor employees are responsible for reporting any observed near-miss, hazard or unsafe behavior of another person when there is a potential for causing an incident, chemical release, injury or illness in the project workplace.
- 5.2 First report will be made to the subcontractor's on-site supervisor or to the Company contact person if the supervisor is not readily available. Reporting should be made without delay to help facilitate intervention and preventive measures.
- 5.3 Subcontractor supervisors and/or management will forward any such report to their Company contact person so that additional communication can be made to establish clear lines of communication and/or actions taken if the Company deems this necessary.
- 5.4 Any on-the-job injury or illness that requires medical attention by a physician or professional medical provider will be reported immediately to the Company contact person after the individual(s) requiring treatment are in route to medical care.
- 5.5 Subcontractors will investigate near-misses, first aid injuries, and incidents, injuries or illnesses in the project workplace in accordance with requirements established for the project.

6. Post-Project Review of Subcontractor Safety Performance and Results

- 6.1 On conclusion of a project, the Company will make a timely review of each subcontractor's safety performance, incident and injury experience, and other factors that will be helpful in evaluating the subcontractor's suitability for future projects.
- 6.2 In the event that a subcontractor exits or is terminated from a project that remains in progress, a similar timely review as explained in 6.1 will be performed.
- 6.3 Post-project evaluations will be performed by the Company Safety Coordinator in coordination with Company managers and supervisors who worked with the subcontractor during the specific project under review.

Metro Electric Co., Inc.

Subcontractor Selection Policy



Due to the complex nature of our business, Metro Electric Co., Inc. does under circumstances employ subcontractors. The company recognizes the need for the use of subcontractors on those occasions in which time or expense can be reduced or the necessary expertise is not available within the company. This policy applies to those jobs.

Metro Electric will require subcontractors to have a written safety program. Metro Electric will review the subcontractors safety performance. All subcontractors will meet or exceed Metro Electric's safety performance and safety policies. The Safety Director with the assistance of the project manager will inform the subcontractor of all project requirements in regards to safety and special conditions. Metro Electric monitors the subcontractor's safety performance and safety meetings in the following areas:

- Compliance with all applicable codes and safe practices.
- Conduct safety meetings with subcontractor supervisors.
- Document enforcement of safety violations.
- Monitor subcontractor tool box safety meetings.

The following form will be used to collect information on subcontractors.

See attachment "A" for general rules.

Metro Electric Co., Inc.
Subcontractor Safety Program Evaluation

COMPANY INFORMATION:

Company Name: _____
 Address: _____

 Phone: _____
 Primary Contact: _____
 Contact Email: _____

SIC Code: _____
 UID No.: _____
 Fax No.: _____
 Phone No.: _____

SAFETY PROGRAM:

- Does your company have a full-time Safety Director? Yes No
- Does your company provide a Safety Orientation for new employees? Yes No
- Does your company require pre-employment drug screens? Yes No
- Does your company require random drug screens? Yes No
- Does your company require post-accident drug screens? Yes No
- Does your company have an OSHA-compliant written safety program? Yes No
- Do your employees attend regular safety meetings? Yes No
- Does your company conduct post-accident investigations? Yes No
- Does your company maintain an OSHA 300 log? Yes No
- Does your company conduct regular job site safety inspections? Yes No
- Does your company provide advanced safety training for field-level supervisors? Yes No

Safety Director or Representative: _____

Safety Director Phone & Email: _____

Note Well: An insurance certificate naming Metro Electric Co., Inc. as an additional insured must be on file prior to commencement of work. A sample certificate is attached.

SAFETY PERFORMANCE:

1. List your company or organization's EMR (Experience Modification Rate) for the last three years. If you are unaware of your EMR, it is generally issued by your insurance provider and indexes your company's safety performance against others in your SIC.

	YEAR	EMR
_____	_____	_____
_____	_____	_____

2. List your company or organization's OSHA Incident Rate (TCIR) for the last three years. Your OSHA Incident Rate can be found on your OSHA 200 or 300 log.

	YEAR	TCIR
_____	_____	_____
_____	_____	_____

3. Has your company suffered an on-the-job fatality in the last three years? Yes No

4. Has your company received any OSHA citations or penalties in the last three years? Yes No

If "Yes", please list the dates, locations, violations and severity of each of the citations: (Please use additional paper if necessary.)

I certify that all information provided in this form is true and accurate to the best of my knowledge.

 Name

 Signature

 Date

Client#: 234158

17METROELE

ACORD™ CERTIFICATE OF LIABILITY INSURANCE		DATE (MM/DD/YYYY) 09/19/05
PRODUCER AGENT	THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.	
	INSURERS AFFORDING COVERAGE	NAIC #
INSURED **SAMPLE**	INSURER A: "A" rated or better	
	INSURER B:	
	INSURER C:	
	INSURER D:	
	INSURER E:	

COVERAGES
THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. AGGREGATE LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR ADD'L LTR	INSRI	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIMITS
A		GENERAL LIABILITY <input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS MADE <input type="checkbox"/> OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input checked="" type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC	111	01/01/05	01/01/06	EACH OCCURRENCE \$1,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$50,000 MED EXP (Any one person) \$5,000 PERSONAL & ADV INJURY \$1,000,000 GENERAL AGGREGATE \$2,000,000 PRODUCTS - COMP/OP AGG \$2,000,000
A		AUTOMOBILE LIABILITY <input checked="" type="checkbox"/> ANY AUTO ALL OWNED AUTOS SCHEDULED AUTOS <input checked="" type="checkbox"/> HIRED AUTOS <input checked="" type="checkbox"/> NON-OWNED AUTOS <input checked="" type="checkbox"/> Drive Other Car	222	01/01/05	01/01/06	COMBINED SINGLE LIMIT (Ea accident) \$1,000,000 BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$ AUTO ONLY - EA ACCIDENT \$ OTHER THAN EA ACC \$ AUTO ONLY: AGG \$
		GARAGE LIABILITY <input type="checkbox"/> ANY AUTO				EACH OCCURRENCE \$ AGGREGATE \$ \$ \$
		EXCESS/UMBRELLA LIABILITY <input type="checkbox"/> OCCUR <input type="checkbox"/> CLAIMS MADE DEDUCTIBLE RETENTION \$				EACH OCCURRENCE \$ AGGREGATE \$ \$ \$
A		WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? If yes, describe under SPECIAL PROVISIONS below OTHER	333	01/01/05	01/01/06	<input checked="" type="checkbox"/> WC STATU-TORY LIMITS <input type="checkbox"/> OTH-ER E.L. EACH ACCIDENT \$100,000 E.L. DISEASE - EA EMPLOYEE \$100,000 E.L. DISEASE - POLICY LIMIT \$500,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES / EXCLUSIONS ADDED BY ENDORSEMENT / SPECIAL PROVISIONS
Metro Electric Co., Inc., its officers, directors, employees, agents, assigns, successors and interest, and representatives are named on the General Liability as Additional Insureds for work performed by the insured as required by written contract (including Completed Operations). Coverage for Additional Insured is on a primary non-contributory basis. Waiver of Subrogation applies in favor of the Additional Insured on the General Liability and applies to the Workers Compensation for work performed by the insured.

CERTIFICATE HOLDER	CANCELLATION
Metro Electric Co., Inc. 3350 Meeting Street Road Charleston, SC 29405	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING INSURER WILL ENDEAVOR TO MAIL <u>30</u> DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO DO SO SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE INSURER, ITS AGENTS OR REPRESENTATIVES. AUTHORIZED REPRESENTATIVE

ACORD 25 (2001/08) 1 of 3

#1587456

SBB

© ACORD CORPORATION 1988

ATTACHMENT "A"
GENERAL RULES

Subcontractor agrees to conform to the following safety policies in general. These policies will be strictly enforced and violators will be asked to leave the project site. Specific rules which will be enforced are:

1. No glass containers of any kind allowed on site (soft drink bottles, oil or gas containers, etc.).
2. No drinking or drugs. No warning will be given and violators will be dismissed immediately from the job site.
3. Hard hats & safety shoes must be worn at all times by everyone in the work area.
4. Everyone must wear shirts, long pants, and appropriate footwear. No tank tops, cut-offs, tennis shoes, etc. No provocative t-shirts.
5. Personal vehicles are not allowed on the construction site.
6. Telephone messages will be taken on incoming calls for emergencies only. Field office personnel will not deliver routine personal messages.
7. All accidents, regardless of severity, must be reported to the Contractor immediately.
8. Only authorized personnel are allowed in work areas. All visitors must report to the project site office and sign a liability release.
9. Goggles or shields must be worn when burning, cutting, grinding, chipping, welding, etc. is taking place.
10. Only operators of equipment should ride on the equipment. No one should hitch rides on equipment being moved.
11. All power tools, drop cords, and equipment will be inspected daily for safe operating conditions. Those found unsafe will not be operated until repaired.
12. All flammable liquids must be in approved safety containers and logged in at the project site office.
13. No open fires or rubbish burning is allowed unless prior approval is given by General Contractor.
14. No radios or loud music will be allowed.
15. The Subcontractor is to provide all scaffolding and ladders to complete his work. This equipment shall meet OSHA standard for safe installation of materials and equipment.
16. The Subcontractor shall in no way interfere with or endanger in normal pedestrian and vehicular traffic adjacent to the project site.
17. Weekly project safety meetings will be attended by Subcontractor's personnel.
18. Subcontractor agrees to comply with all requirements for segregation of trash and compliance with all other dumping regulations imposed upon Contractor. In the interest of safety, Contractor may waive notice requirements should Subcontractor fail to provide clean up services.
19. Subcontractor shall provide daily reports on a daily basis and attend meetings as required.
20. Subcontractor will be responsible for layout of his own work.
21. SAFETY

- Subcontractor agrees that the prevention of accidents to workmen engaged upon or in the vicinity of the work is its responsibility, even if Contractor establishes a safety program for the entire project. Subcontractor shall establish and implement safety measures, policies and standards conforming to those required or recommended by governmental and quasi-governmental authorities having jurisdiction and by Contractor and Owner, and insurance companies, including, but not limited to, any requirements imposed by the contract documents.
- Subcontractor accepts complete responsibility for the health and safety of its employees (its subcontractors' employees); the protection of the work; compliance with all applicable health and safety laws, including the regulations and standards of the Occupational Safety & Health Act of 1970 (OSHA), as amended. Subcontractor further agrees to indemnify Contractor and Owner against all claims for injury to persons or property, and against any fines and penalties if any such persons present on the project are using marijuana, illegal drugs, or alcohol.
- The taking of blood, urine or saliva for testing may be required from any Contractor or Subcontractor employee on the project who is reasonably suspected of being under the influence of drugs, alcohol, or who is involved in or causes an accident.

Subcontractor Initial _____

Contractor Initial _____

Metro Electric Co., Inc.

Temporary Stair Railings & Guard Rails



Temporary stair railings and guard rails are not a special luxury for select jobs - they are **REQUIRED BY OSHA ON ALL CONSTRUCTION PROJECTS** to protect workers from falls.

Since falls from upper levels account for such a high percentage of construction accidents, both stair railings and guard rails should be built in conjunction with the building progress, **NOT PUT OFF** to a later date or as time permits. Because of their importance, don't cheat on quality - **BUILD THEM RIGHT!**

A standard guard rail must be 42" high from floor to top of rail, its posts must not exceed 8' centers, it must have a mid-rail and a 4" high toe-board strong enough to stop tools, materials, etc. from sliding or rolling over the edge. If a 4" toe-board is not sufficient to restrain adjacent materials, then paneling or screening should be used. All guard rails must be capable of withstanding a 200 pound load in any direction.

The minimum requirements for wooden rails are 2" x 4" stock for posts and top rail with a 1" x 6" mid-rail. The material should be without defects and splinters. If steel is preferred, use 1 1/2" pipe or 2" x 2" x 3/8" angle for posts, top and mid-rail. Other materials of equal or greater strength may be substituted, however, due to its unpredictable strength and brittleness, re-bar is not acceptable material for use as a guard rail.

The construction of stair railings is similar to that of the guard rails mentioned above, except that the top surface of the railing should be a distance of 30 to 34 inches as measured from the top forward edge of the tread, (in line with the face of the riser below it), upward in a vertical line to the top of the railing. Landings and platforms require standard guard rails.

Wire rope has gained widespread application in the construction industry as a guard rail material, however, if a wire rope fails while in use it can result in serious injuries, fatalities or property damage.

The most common method used to make an eye or attach a wire rope to a piece of equipment is with cable or Crosby clips of the U-Bolt and saddle type.

U-Bolt clips must have the U-Bolt section on the dead or short end of the rope and the saddle on the live or long end of the rope. The wrong application of even one clip can reduce the strength of the connection to 40%.

Never use fewer than the number of clips recommended. Turn back the correct amount of rope for dead ending to permit proper spacing of the clips. Always use new clips. Reused clips will not develop the proper strength. It is equally important to always use a thimble to prevent the rope from wearing the eye and to provide a safer connection.

After the rope has been in operation for an hour or so, all nuts on the clip bolts will have to be re-tightened and they should be checked for tightness at frequent intervals thereafter. This is necessary because the rope will stretch slightly, causing a reduction in diameter resulting in loosening the clips.

Never use any kind of clip to directly connect two straight lengths of rope. If this is necessary, use the clips to form an eye in each length and connect the eyes together.

Metro Electric Co., Inc.

Tugger Safety



ALL TUGGERS SHALL BE USED ACCORDING TO MANUFACTURER STANDARDS:

This includes mounting and safety instructions.

- Each person who operates any tugger for Metro Electric Co., Inc. shall be trained by the Safety Director.
- All tuggers shall have a safety lanyard attached to the tugger and to a secure anchor point.
- All personnel are not allowed, at any time, to cross in front of or be directly behind the tugger while cable pulling is in progress.
- The operator will be responsible for stopping the pull if anyone crosses into the access areas.
- All equipment used (i.e., rollers, rope, slings) shall be of the same capacity to ensure a safe pull.
- A copy of the operators safety manual will be issued every time a tugger is checked out for use.
- Anyone who operates a tugger will have a personal qualification card in their pocket and will have received training from the Safety Director prior to any cable pulling.

Metro Electric Co., Inc. Welding Safety & Hot Work



Applicable OSHA Standard: 29 CFR 1910 Subpart Q

1. Purpose & Scope

- 1.1 This policy is intended as a guide for the safe use of welding and burning equipment.
- 1.2 This policy applies to all employees and subcontractors working within Metro Electric controlled job sites.

2. General

- 2.1 "Hot work" means riveting, welding, flame cutting or other fire or spark-producing operation.
- 2.2 Only properly trained and instructed employees will be permitted to use electric, oxygen and fuel gas welding, burning and cutting equipment. Supervisors will also be trained in these safety requirements so that they can effectively oversee, manage and enforce safe work operations.
- 2.3 Employees will be protected from radiant energy eye hazards by spectacles, cup goggles, helmets, hand shields or face shields with filter lenses. Filter lenses will have an appropriate shade number, as indicated in the following table for the work performed. Variations of one or two shade numbers are permissible to suit individual preferences.

Operation	Shade No.
Soldering	2
Torch Brazing	3 or 4
Lighting cutting, up to 1 inch	3 or 4
Medium cutting, 1-6 inches	4 or 5
Heavy cutting, over 6 inches	5 or 6
Light gas welding, up to 1/8"	4 or 5
Medium gas welding, 1/8 - 1/2"	5 or 6
Heavy gas welding, over 1/2"	6 or 8
Shielded Metal-Arc Welding 1/16 to 5/32 - inch electrodes.	10
Inert-gas Metal-Arc Welding (Non-ferrous) 1/16 to 5/32 - inch electrodes	11
Shielded Metal-Arc Welding: 3/16 to 1/4 - inch electrodes	12
5/16 and 3/8 - inch electrodes	14

- 2.4 Authorization from the Site Supervisor or, in the shop, the supervisor in charge, before cutting or welding is permitted. The area where hot work will be performed will be inspected by the Site Supervisor or the supervisor in charge. The supervisor will designate precautions to be followed in granting authorization to proceed preferably in the form of a written permit.
- 2.5 To the extent possible, hot work will be performed in designated locations that are free of hazards.
- 2.6 Hot work will not be performed in flammable or potentially flammable atmospheres, on or in equipment or tanks that have contained flammable gas or liquid or combustible liquid or dust-producing material, until a designated person has tested the atmosphere inside the equipment or tanks and determined that it is not hazardous.
- 2.7 Regarding fire hazards, if the object to be welded or cut cannot readily be moved, all movable fire hazards in the vicinity will be taken to a safe place.
- 2.8 When hot work must be performed in a location that is not free of fire hazards, all necessary precautions will be taken to confine heat, sparks, and slag so that they cannot contact flammable or combustible material. If the object to be welded or cut cannot be moved and if all the fire hazards cannot be removed, then guards will be used to confine the heat sparks and slag and to protect the immovable fire hazards.
- 2.9 If the safety requirements specified in this program cannot be followed, then welding and cutting will not be performed until it can be done safely and in compliance with company safety rules.
- 2.10 Drums and containers which contain or have contained flammable or combustible liquids will be kept closed. Empty containers will be removed from the hot work area.
- 2.11 Inspect all leads torches, hoses, gauges and other equipment daily before use.
- 2.12 The operator should report any equipment defect or safety hazard to his supervisor and the use of the equipment will be discontinued until its safety has been assured. Repairs will be made only by qualified personnel.
- 2.13 Always check around and below before commencing hot work operations. Use blankets or other protective devices where required. Cover electrical wires to prevent damage.
- 2.14 Wear an approved respirator or assure some means of local exhaust ventilation when performing hot work in an area subject to accumulation of fumes and vapor. When in doubt, ask the Site Safety Supervisor/Representative for assistance. Any employee exposed to the same atmosphere as the welder or burner will be protected by the same type of respiratory and other protective equipment as that worn by the welder or burner.
- 2.15 Hot work activities requiring local ventilation and/or respirators include:
- 2.16 Zinc bearing base or filler metal or metals coated with zinc bearing materials.
 - 2.16.1 Lead based metals; metals containing lead other than as an impurity or metals coated with lead bearing materials.
 - 2.16.2 Cadmium bearing filler materials; or cadmium coated base materials.

- 2.16.3 Chromium bearing metals or metals coated with chromium bearing materials.
- 2.16.4 Beryllium containing base or filler metals. Because of its high toxicity, work involving beryllium will be done with both local exhaust ventilation and air supplied respirators.
- 2.17 Adequate spark containment methods or barricades will be used when welding burning or cutting overhead.
- 2.18 Never heat an object lying flat on a concrete floor. Be sure to provide an air space between the material and the floor, as concrete will explode under extreme heat.

3. **Electric Arc Welding and Cutting**

- 3.1 Personnel designated to operate arc welding equipment will have been properly instructed and qualified to operate such equipment. Personnel assigned to operate or maintain arc welding equipment will be acquainted with both company safety rules and OSHA requirements under Part 1910 Subpart Q - Welding, Cutting, and Brazing.
- 3.2 Personnel performing gas-shielded arc welding will comply with Recommended Safe Practices for Gas-Shielded Arc Welding, A6.1-1966, American Welding Society.
- 3.3 All work will have a separate and adequate ground.
- 3.4 Welding leads will not be placed in aisles, stairways or landings where they will present tripping hazards. Excessive leads and hoses should be avoided.
- 3.5 Only manual electrode holders intended for arc welding and cutting and capable of handling the maximum current required for such welding or cutting will be used.
- 3.6 Current-carrying parts passing through those portions of the holder gripped by the user and through the outer surfaces of the jaws of the holder will be insulated against the maximum voltage to ground.
- 3.7 Arc welding and cutting cables will be insulated, flexible and capable of handling the maximum current required by the operations, taking into account the duty cycles.
- 3.8 Only cable free from repair or splice for 10 feet (3 m) from the electrode holder will be used unless insulated connectors or splices with insulating quality equal to that of the cable are provided.
- 3.9 Insulated connectors of equivalent capacity will be used for connecting or splicing cable. Cable lugs, where used as connectors, will provide electrical contact. Exposed metal parts will be insulated.
- 3.10 Ground return cables will have current-carrying capacity equal to or exceeding the total maximum output capacities of the welding or cutting units served.
- 3.11 Before use, arc welding and cutting machine frames will be grounded, either through a third wire in the cable containing the circuit conductor or through a separate wire at the source of

the current. Grounding circuits will have resistance low enough to permit sufficient current to flow to cause the fuse or circuit breaker to interrupt the current.

- 3.12 When electrode holders are left unattended, electrodes will be removed and holders placed to prevent employee injury.
- 3.13 Hot electrode holders will not be dipped in water.
- 3.14 When arc welders or cutters leave or stop work or when machines are moved, the power supply switch will be kept in the off position.
- 3.15 Arc welding or cutting equipment having a functional defect will not be used.
- 3.16 Arc welding and cutting operations will be separated from other operations by shields, screens, or curtains to protect employees in the vicinity from the direct rays and sparks of the arc.

4. Gas Welding & Cutting

- 4.1 Compressed gas cylinders:
 - 4.1.2 Will have valve protection caps in place except when in use, hooked up or secured for movement. Oil will not be used to lubricate caps;
 - 4.1.3 Will be hoisted only while secured, as on a cradle or pallet, and will not be hoisted by mallet, choker sling or cylinder caps;
 - 4.1.4 Will be moved only by tilting or rolling on their bottom edges;
 - 4.1.5 Will be secured when moved by vehicle;
 - 4.1.6 Will be secured while in use;
 - 4.1.7 Will have valves closed when cylinders are empty, being moved or stored;
 - 4.1.8 Will be secured upright except when hoisted or carried;
 - 4.1.9 Will not be freed when frozen by prying the valves or caps with bars or by hitting the valve with a tool;
 - 4.1.10 Will not be thawed by boiling water;
 - 4.1.11 Will not be exposed to spark, hot slag, or flame;
 - 4.1.12 Will be kept away from radiators and other sources of heat;
 - 4.1.13 Will not be permitted to become part of electrical circuits or have electrodes struck against them to strike arcs;
 - 4.1.14 Will not be used as rollers or supports;
 - 4.1.15 Will not have contents used for purposes not authorized by the supplier;

- 4.1.16 Will not be used if damaged or defective;
 - 4.1.17 Will not have gases mixed within, except by gas suppliers;
 - 4.1.18 Will be stored so that oxygen cylinders are separated from fuel gas cylinders and combustible materials by either a minimum distance of 20 feet (6 m) or a barrier having a fire-resistance rating of 30 minutes;
 - 4.1.19 Will not have objects that might either damage the safety device or obstruct the valve placed on top of the cylinder when in use.
- 4.2 Fuel gas will be used only as follows:
- 4.2.1 Before regulators are connected to cylinder valves, the valves will be opened slightly (cracked) and closed immediately to clear away dust or dirt. Valves will not be cracked if gas could reach possible sources of ignition;
 - 4.2.2 Cylinder valves will be opened slowly to prevent regulator damage and will not be opened more than 1 ½ turns. Any special wrench required for emergency closing will be positioned on the valve stem during cylinder use. For “manifolded” or coupled cylinders, at least one wrench will be immediately available. Nothing will be placed on top of a cylinder or associated parts when the cylinder is in use.
 - 4.2.3 Pressure-reducing regulators will be attached to cylinder valves when cylinders are supplying torches or devices equipped with shut-off valves;
 - 4.2.4 Cylinder valves will be closed and gas released from the regulator or manifold before regulators are removed;
 - 4.2.5 Leaking fuel gas cylinder valves will be closed and the gland nut tightened. If the leak continues, the cylinder will be tagged, removed from service, and moved to a location where the leak will not be hazardous. If a regulator attached to a valve stops a leak, the cylinder need not be removed from the workplace but will be tagged and may not be used again before it is repaired;
 - 4.2.6 If a plug or safety device leaks, the cylinder will be tagged, removed from service, and moved to a location where the leak will not be hazardous.
- 4.3 Fuel gas and oxygen hoses will be easily distinguishable from each other by color or sense of touch. Oxygen and fuel hoses will not be interchangeable. Hoses having more than one gas passage will not be used.
- 4.4 When oxygen and fuel gas hoses are taped together, not more than four (4) of each 12 inches (10.2 cm of each 30.5 cm) will be taped.
- 4.5 Hose will be inspected before use. Hose subjected to flashback or showing evidence of severe wear or damage will be tested to twice the normal working pressure but not less than 200 p.s.i. (1378.96 kPa) before reuse. Defective hose will not be used.
- 4.6 Hose coupling will not unlock or disconnect without rotary motion.

- 4.7 Hose connections will be clamped or securely fastened to withstand twice the normal working pressure but not less than 300 p.s.i. (2068.44 kPa) without leaking.
- 4.8 Gas hose storage boxes will be ventilated.
- 4.9 Torch tip openings will only be cleaned with devices designed for that purpose.
- 4.10 Torches will be inspected before each use for leaking shut-off valves, hose couplings and tip connections. Torches with such defects will not be used.
- 4.11 Personnel in charge of the oxygen or fuel-gas supply equipment, including generators, and oxygen or fuel-gas distribution piping systems will be instructed and judged competent by their employers for this important work before being left in charge. Rules and instructions covering the operation and maintenance of oxygen or fuel-gas supply equipment including generators, and oxygen or fuel-gas distribution piping systems will be readily available.

5. Fire Watch Requirements

- 5.1 Fire watchers will be required whenever welding or cutting is performed in locations where other than a minor fire might develop, or any of the following conditions exist:
 - 5.1.1 Appreciable combustible material, in building construction or contents, closer than 35 feet (10.7 m) to the point of operation.
 - 5.1.2 Appreciable combustibles are more than 35 feet (10.7 m) away but are easily ignited by sparks.
 - 5.1.3 Wall or floor openings within a 35-foot (10.7 m) radius expose combustible material in adjacent areas including concealed spaces in walls or floors.
 - 5.1.4 Combustible materials are adjacent to the opposite side of metal partitions, walls, ceilings, or roofs and are likely to be ignited by conduction or radiation.
- 5.2 Fire watchers will have fire extinguishing equipment readily available and be trained in its use. They will be familiar with facilities for sounding an alarm in the event of a fire. They will watch for fires in all exposed areas, try to extinguish them only when obviously within the capacity of the equipment available, or otherwise sound the alarm. A fire watch will be maintained for at least a half hour after completion of welding or cutting operations to detect and extinguish possible smoldering fires.
- 5.3 Fire Watches will be trained at the worksite by the Site Supervisor. Training is to be documented and employees training files updated to reflect the training.
- 5.4 Training will be done when employees are initially hired and annually thereafter.
- 5.5 Refer to Appendix 1 of this section for specific policies and procedures regarding Fire Watch assignment and responsibilities.

6. Working In Confined Spaces

- 6.1 When hot work, welding, cutting or brazing must be performed in a confined space, only personnel who have successfully completed the company's safety training program and certification for confined space entry will perform such work; and then only with prior authorization from the Site Supervisor utilizing written permit procedures as specified in the company's Confined Space Entry written safety program.
- 6.2 For purposes of this section, a confined space will mean a relatively small or restricted space (with comparatively examples cited by OSHA being a tank, boiler, pressure vessel, or small compartment of a ship).
- 6.3 Ventilation is a prerequisite to work in confined spaces.
- 6.4 When welding or cutting is being performed in any confined spaces the gas cylinders and welding machines will be left on the outside. Before operations are started, heavy portable equipment mounted on wheels will be securely blocked to prevent accidental movement.
- 6.5 Where a welder must enter a confined space through a manhole or other small opening, means will be provided for quickly removing him in case of emergency. When safety belts and lifelines are used for this purpose they will be so attached to the welder's body that his body cannot be jammed in a small exit opening. An attendant with a preplanned rescue procedure will be stationed outside to observe the welder at all times and be capable of putting rescue operations into effect.
- 6.6 When arc welding is to be suspended for any substantial period of time, such as during lunch or overnight, all electrodes will be removed from the holders and the holders carefully located so that accidental contact cannot occur and the machine disconnected from the power source.
- 6.7 In order to eliminate the possibility of gas escaping through leaks of improperly closed valves, when gas welding or cutting, the torch valves will be closed and the fuel-gas and oxygen supply to the torch positively shut off at some point outside the confined area whenever the torch is not to be used for a substantial period of time, such as during lunch hour or overnight.
- 6.8 Where practicable the torch and hose will also be removed from the confined space.
- 6.9 After welding operations are completed, the welder will mark the hot metal or provide some other means of warning other workers.

7. **Health Precautions & Ventilation**

- 7.1 The following requirements have been established on the basis of the following three factors in arc and gas welding which govern the amount of contamination to which welders may be exposed:
 - 7.1.1 Dimensions of space in which welding is to be done (with special regard to height of ceiling).
 - 7.1.1.1 Number of welders.
 - 7.1.1.2 Possible evolution of hazardous fumes, gases, or dust according to the metals involved.

- 7.2 When welding must be performed in a space entirely screened on all sides, the screens will be so arranged that no serious restriction of ventilation exists. It is desirable to have the screens so mounted that they are about 2 feet (0.61 m) above the floor unless the work is performed at so low a level that the screen must be extended nearer to the floor to protect nearby workers from the glare of welding.
- 7.3 Local exhaust or general ventilating systems will be provided and arranged to keep the amount of toxic fumes, gases, or dusts below the maximum concentration allowed by OSHA.
- 7.4 A number of potentially hazardous materials are employed in fluxes, coatings, coverings, and filler metals used in welding and cutting or are released to the atmosphere during welding and cutting. The suppliers of welding materials will determine the hazard, if any, associated with the use of their materials in welding, cutting, etc.
- 7.5 All filler metals and fusible granular materials will carry the following notice, as a minimum, on tags, boxes, or other containers:

CAUTION

**Welding may produce fumes and gases hazardous to health.
Avoid breathing these fumes and gases. Use adequate ventilation.
See ANSI Z49.1-1967 Safety in Welding and Cutting published by the
American Welding Society.**

- 7.6 Brazing (welding) filler metals containing cadmium in significant amounts will carry the following notice on tags, boxes, or other containers:

WARNING

**CONTAINS CADMIUM -- POISONOUS FUMES
MAY BE FORMED ON HEATING**

**Do not breathe fumes. Use only with adequate ventilation such as fume
collectors, exhaust ventilators, or air-supplied respirators.
See ANSI Z49.1-1967. If chest pain, cough, or fever develops
after use, call physician immediately.**

- 7.7 Brazing and gas welding fluxes containing fluorine compounds will have a cautionary wording to indicate that they contain fluorine compounds. One such cautionary wording recommended by the American Welding Society for brazing and gas welding fluxes reads as follows:

**CAUTION
CONTAINS FLUORIDES**

This flux when heated gives off fumes that may irritate eyes, nose and throat.

Avoid fumes - use only in well-ventilated spaces.

Avoid contact of flux with eyes or skin.

Do not take internally.

- 7.8 Ventilation for general welding and cutting
- 7.8.1 Special safety procedures will be taken when welding, cutting or hot work are performed involving fluorine compounds, zinc, lead, beryllium, cadmium, mercury, cleaning compounds, stainless steel, or other exotic metals or paints that release toxic fumes during hot work.
- 7.8.2 When other metals are welded or cut through hot work, mechanical ventilation will be provided:
- 7.8.2.1 In a space of less than 10,000 cubic feet (284 m³) per welder.
- 7.8.2.2 In a room having a ceiling height of less than 16 feet (5 m).
- 7.8.2.3 In confined spaces or where the welding space contains partitions, balconies, or other structural barriers to the extent that they significantly obstruct cross ventilation.
- 7.8.3 Minimum rate. Such ventilation will be at the minimum rate of 2,000 cubic feet (57 m³) per minute per welder, except where appropriate local exhaust hoods and booths, or airline respirators approved by the U.S. Bureau of Mines for such purposes are provided. Natural ventilation is considered sufficient for welding or cutting operations, except for hot work involving fluorine compounds, zinc, lead, beryllium, cadmium, mercury, cleaning compounds, stainless steel or other exotic metals or paints that release toxic fumes during hot work.
- 7.8.4 Mechanical local exhaust ventilation may be by means of either of the following:
- 7.8.4.1 Freely movable hoods intended to be placed by the welder as near as practicable to the work being welded and provided with a rate of air-flow sufficient to maintain a velocity in the direction of the hood of 100 linear feet (30 m) per minute in the zone of welding when the hood is at its most remote distance from the point of welding. The rates of ventilation required to accomplish this control velocity using a 3-inch (7.6 cm) wide flanged suction opening are shown in the following table:

Welding Zone	Minimum air flow (1) cubic ft/mins	Duct diameter, inches (2)
4 to 6 inches from arc or torch	150	3
6 to 8 inches from arc or torch	275	3 ½
8 to 10 inches from arc or torch	425	4 ½
10 to 12 inches from arc or torch	600	5 ½
Footnote (1): When brazing with cadmium bearing materials or when cutting on such materials increased rates of ventilation may be required.		
Footnote (2): Nearest half-inch duct diameter based on 4,000 feet per minute velocity in pipe.		

7.8.5 A fixed enclosure with a top and not less than two sides which surround the welding or cutting operations and with a rate of airflow sufficient to maintain a velocity away from the welder of not less than 100 linear feet (30 m) per minute.

7.9 Ventilation in confined spaces.

7.9.1 Air replacement. All welding and cutting operations carried on in confined spaces will be adequately ventilated to prevent the accumulation of toxic materials or possible oxygen deficiency. This applies not only to the welder but also to helpers and other personnel in the immediate vicinity. All air replacing that withdrawn will be clean and respirable.

7.9.2 Airline respirators. In circumstances for which it is impossible to provide such ventilation, airline respirators or hose masks approved for this purpose by the National Institute for Occupational Safety and Health (NIOSH) under 42 CFR part 84 must be used.

7.9.3 In areas immediately hazardous to life, a full-face piece, pressure-demand, self-contained breathing apparatus or a combination full-face piece, pressure-demand supplied-air respirator with an auxiliary, self-contained air supply approved by NIOSH under 42 CFR part 84 must be used.

7.9.4 Where welding operations are carried on in confined spaces and where welders and helpers are provided with hose masks, hose masks with blowers or self-contained breathing equipment approved by the Mine Safety and Health Administration and the National Institute for Occupational Safety and Health, a worker will be stationed on the outside of such confined spaces to insure the safety of those working within.

7.9.5 Oxygen will NEVER be used for ventilation.

8. First Aid

8.1 First aid equipment will be available at all times in areas where hot work, welding, cutting or brazing are being performed.

8.2 All injuries will be reported as soon as possible for medical attention.

8.3 First aid will be rendered until medical attention can be provided.

APPENDIX 1
Fire Watch & Fire Protection Training

Applicable OSHA Standards: 29 CFR 1910 Subpart L, 1926 Subpart F

1. Purpose & Scope

- 1.1 To establish methods and guidelines for the training of personnel in fire watch and fire protection.
- 1.2 This policy applies to all employees and subcontractors working within Metro Electric controlled job sites.

2. Introduction

- 2.1 The Company is responsible for the development and maintenance of an effective fire protection and prevention program at each job site throughout all phases of the construction, repair, alteration, or any demolition work. This training policy/module is intended for personnel working as Fire Watch during burning or welding performed during these activities.

3. Requirements

- 3.1 Fire Watches will be trained at the worksite by the Site Supervisor.
- 3.2 Training is to be documented and employees training files updated to reflect the training.
- 3.3 Training will be done when employees are initially hired and annually thereafter.

4. Training Program Content

4.1 Cause and Prevention:

- 4.1.1 Fires do not just happen. They are caused by carelessness in operating equipment, handling hazardous materials and personal habits, such as smoking. Even though these actions are not usually deliberate, this still does not lessen the results.
- 4.1.2 Only individual employees can protect themselves against these hazards by learning carefully how to prevent fires.

4.2 The three main components of fire prevention are:

- 4.2.1 Be alert for trouble before a fire starts.
- 4.2.2 Eliminate unsafe habits that can lead to fires.
- 4.2.3 Conduct a fire prevention investigation of your work area prior to work start to remove any potential fire hazards.

4.3 General Fire Prevention Rules:

- 4.3.1 Employees will become familiar with the four classes of fire, their burning characteristics and the proper extinguishing agent for each:
- 4.3.1.1 Class A fires involve normal combustibles such as wood or paper. Water is a proper extinguisher.
 - 4.3.1.2 Class B fires involves oils and flammable liquids. CO2 and dry chemicals are the correct extinguishers.
 - 4.3.1.3 Class C fires involve electrical equipment. CO2 and dry chemicals are the correct extinguishers. Never use water on fires involving energized electrical equipment to avoid electrical shock and spreading of fire.
 - 4.3.1.4 Class D fires involve combustible metals and require special approved extinguishing agents.
- 4.4 Employees must never tamper with or move fire fighting equipment except for actual use.
- 4.5 Report any equipment defects to your supervisor.
- 4.6 Employees must know the location and proper operation of all protective fire equipment in the vicinity of their work areas.
- 4.7 Material and supplies must be stored carefully to prevent falling, spilling, etc.
- 4.8 All chemicals and solvents must be kept in properly labeled and approved containers.
- 4.9 Used rags must be kept in metal or metal lined containers having metal covers.
- 4.10 Never use flammable liquids for cleaning purposes.
- 4.11 Before using solvents, discuss needed precautions with your supervisor and other parties involved.
- 4.12 To extinguish a clothing fire on yourself or another person, DROP to the ground AND ROLL to cause a smothering effect or use a fire blanket or other means if available.
- 4.13 Know primary and secondary exit routes from your area. When an alarm sounds, evacuate immediately. Know site specific codes for emergency pages.

5. Fire Extinguisher & Other General Information

NOTE: DO NOT ATTEMPT TO FIGHT A FIRE IF:

- You do not know what is burning;
- The fire is spreading rapidly out of control;
- The fire is between you and your exit or escape path;
- You don't have adequate equipment; or
- You might inhale toxic smoke.

Only trained and qualified personnel are permitted to fight fires. Your training covers only small smolders and fires that are easily put out with a fire extinguisher.

- 5.1 Employees whose work assignment may require them to use a fire extinguisher shall be trained in such use prior to the job assignment. Training information and instructions on how to use a fire extinguisher safely are explained in Section 7 below.
- 5.2 All fire extinguishers shall be placed in conspicuous locations near the work area. Know where the nearest fire extinguisher is located, the type of fire it should be used on and how to operate it.
- 5.3 A fire extinguisher will be within 20-30 feet of flame or ignition type operations in progress.
- 5.4 All fires, whether they are ignitions or smolders, must be reported to the Site Supervisor, so that an investigation can be initiated to determine cause.
- 5.5 Any fire extinguisher that has been used shall be returned to the Site Supervisor for replacement.
- 5.6 Supervisors shall make sure that all employees under their supervision understand the proper use of a fire extinguisher.
- 5.7 Keep work areas clean and orderly, free of trash and scrap materials as this could prevent small fires from becoming major disasters.
- 5.8 Keep all passageways, work areas and aisles clean to facilitate evacuation should a fire start.
- 5.9 Equipment must never be refueled while running or when hot.
- 5.10 If the piece to be welded or cut cannot be moved to an area free of fire hazards, that hazards shall be removed from the hot work area prior to commencing work. All combustible materials under or near welding or burning operations must be moved to a safe distance away or covered with fire retardant material.
- 5.11 Guarding shall be used if the object to be welded or cut cannot be moved and if all the fire hazards cannot be removed. Guarding shall effectively confine the heat, sparks, and slag, and to protect the immovable fire hazards.
- 5.12 Smoking is not allowed on the project except in areas designated as smoking areas. Discard butts in approved containers, not on the floor or in trash cans.
- 5.13 All fires start because of a combination of ignition source, heat, fuel, and oxygen.
- 5.14 The primary cause of workplace fires is electrical equipment. These include:
 - 5.14.1 Damaged electrical cords
 - 5.14.2 Loose electrical connections
 - 5.14.3 Overloaded circuits
 - 5.14.4 Defective power tools

5.15 Other common causes of workplace fires include:

5.15.1 Welding and cutting operations

5.15.2 Chemical reactions

5.15.3 Heaters

6. Fire Watch For Welding & Cutting Operations

6.1 Fire Watch personnel shall be aware that welding sparks can travel as far as 35 feet. Safe procedures prior to and during welding operations are:

6.1.1 Ensure that the area has been checked by an authorized person with a meter for flammable gases and vapors;

6.1.2 Remove any combustibles such as paper, rags, etc;

6.1.3 Have a fire extinguisher and misting hose (if required) on hand;

6.1.4 Assure that proper PPE is on hand and being used; and

6.1.5 Remain 30 minutes after spark producing and welding operations are over to assure that no smoldering or fires break out.

7. How To Safely Use A Fire Extinguisher (Instruction for Employees)

7.1 First rule of thumb is "DON'T PANIC." Keep your calm and wits about you, do not let an adrenaline rush cause you to lose control.

7.2 Use the extinguisher only for incipient stage fires. In this situation, incipient is defined as the initial or beginning stage when a fire can controlled or extinguished by portable fire extinguishers.

7.3 Remain at least 8 to 12 feet from the fire as protection from the extinguisher stream blowing hot or burning material to where it could come back at you.

7.4 Remember the word PASS, which stands for Pull the pin, Aim, Squeeze, and Sweep:

7.4.1 PULL THE PIN - This will allow you to use the extinguisher.

7.4.2 AIM AT THE BASE OF THE FIRE - In order to extinguish a fire you must put out the ignition source at the base of the fire. Stand eight to ten feet from the blaze (if you believe this is a safe-enough distance so that sparks, embers and burning residue will not blow back at you due to the pressure of the extinguisher chemical stream).

7.4.3 SQUEEZE THE TOP HANDLE OR LEVER - This releases the pressurized extinguishing agent in the extinguisher.

7.4.4 SWEEP FROM SIDE TO SIDE - Until the fire is completely out. Do not sweep up and down. Then move a safe distance away until you are sure the fire is out.

7.5 Hands-on instruction will be used for demonstration.

8. **Testing Requirements**

8.1 On completion of training, participants will be given a written test to support and help ensure their understanding of the information presented.

8.2 A score of 80% to 99% will require a review of missed questions, with the score corrected to 100% for successful completion of training.

8.3 A score of below 80% will require complete retraining and re-testing.

9. Fire Watch Test

The following testing format shall be used to help ensure that individuals trained in Fire Watch safety procedures understand the information presented in training:

Circle the most correct answer.

1. T - F Fires are caused by carelessness.
2. T - F There are four (4) classes of fires A, B, C, and D.
3. T - F A Fire Watch is responsible for knowing the location of all fire fighting equipment in the vicinity of their work area.
4. T - F To extinguish a clothing fire, the rule is to drop and roll.
5. T - F Know all exit routes in the vicinity of your work area.
6. A fire extinguisher must be within _____ feet of a flame or ignition source.
10 to 15 feet 35 to 40 feet 20 to 30 feet 50 or more feet
7. T - F All fires must be reported to the safety department.
8. T - F Fire extinguishers can be used more than once without being replaced.
9. T - F It is all right to re-fuel equipment while equipment is still running.
10. T - F Fuel, Heat and Oxygen must be present for fires to start.
11. T - F The number one cause of workplace fires is carelessness.
12. T - F Anyone can fight a fire.
13. Welding sparks can travel as far as _____.
10 feet 25 feet 35 feet 50 feet
14. T - F A Fire Watch must remain a minimum of 30 minutes after spark producing and welding operations.
15. T - F Before work begins, a Fire Watch is responsible for checking the area for combustibles.
16. T - F It is all right to start welding without checking the area for gas and vapors first.
17. T - F A fire hose set on MIST may be required to wet down areas where welding operations are being performed.

18. T - F An up and down motion of a fire extinguisher is used to put out a fire.
19. T - F It is all right to tamper with fire fighting equipment.
20. T - F A Fire Watch must be alert for potential fire sources in their work area at all times.

Metro Electric Co., Inc.

Working Alone



1. Purpose

- 1.1 The Safety Coordinator or supervisor must identify what type of work and duties which may or may not be conducted while the employee is working alone. A decision must be made to decide which conditions for working alone is permitted. Special arrangements must be made especially after regular hours, because these situations pose an additional risk to life and property. It is strongly recommended that handling of hazardous materials or performing hazardous activities be prohibited when the employee is working alone.

2. Scope

- 2.1 This procedure is applicable to all contractors and subcontract personnel working alone at any site.

3. Responsibilities

3.1 Employers

- 3.1.1 Safety Coordinators and supervisors are required to ensure that they fulfill and document the following responsibilities:
 - 3.1.1.1 Review all workplaces under their jurisdiction and identify employees who are required to work alone.
 - 3.1.1.2 Perform a hazard assessment for working alone. When performing the hazard assessment, factor in travel time to and from the jobsite, the weather, communication, type of work to be performed, employee medical conditions and training.
 - 3.1.1.3 Identify control measures to minimize risk of working alone.
 - 3.1.1.4 Describe conditions when working alone is permitted and indicate which duties may be conducted and which are prohibited.
 - 3.1.1.5 Identify risks to the employee in terms of the nature of their work, isolation, and conditions at the worksite.
 - 3.1.1.6 Identify and take any necessary steps to eliminate or reduce identified risks. The steps taken should include:
 - 3.1.1.6.1 A communication system with the lone employee should be set up by way of a two way radio, a cellular or satellite phone, a land line phone, electronic monitoring device or another form of direct and reliable correspondence.

- 3.1.1.6.2 Providing sufficient training and instruction for safe work practices and ensuring minimum standards of competence.
- 3.1.1.6.3 Provide the employee with adequate personal protective equipment for the job. This will be provided at no charge to the employee.
- 3.1.1.6.4 Regular contact must be maintained with the employee working alone either by monitor or by the employee checking in with the office at regular intervals. A first aid box and survival supplies for working under extreme conditions will be supplied to the employee.
- 3.1.1.6.5 The Safety Coordinator or a supervisor will be responsible for maintaining regular contact with the employee who is working alone. A backup form of communication shall be maintained in case the primary source of communication fails. The communications with the lone employee must be documented which shall include the employee status at the check in intervals.
- 3.1.1.6.6 Procedures for emergency response shall also include provisions for contacting local officials in the event of an emergency. The program will identify specific criteria for determining when an employee search is necessary.
- 3.1.1.6.7 Employees who work alone must be trained on these procedures and the policy must be reviewed and updated constantly, as conditions can change rapidly.