Safety Policy

March 2024

Think Safety. Work Safely.

www.neielectric.com

Minnesota:
4815 White Bear Parkway, St. Paul, MN 55110
Phone: 651.771.1000 Fax: 651.771.9119

Wisconsin:
St. Croix Falls
605 Industrial Parkway, St. Croix Falls, WI 54024
Phone: 715.483.3854 Fax: 715.483.1107

Eau Claire
3233 Louis Avenue, Suite E, Eau Claire, WI 54703
Phone: 715.831.8752 Fax: 715.831.8786

Table of Contents

Contact Information/Phone Numbers

Emergency Medical Attention: 911

NEI Electric St. Paul, MN

Office main phone number: 651-771-1000

- After hours: 651-771-1000 – voice mail
- Non-emergency messages can be left in the general voice mail box.
- Emergency or "Urgent" calls will be redirected to an emergency call center. The call center will contact our on-call Service Coordinator and they will reach out to the right person to address the issue.

NEI Electric St. Croix Falls, WI

Office main phone number: 715-483-3854

- After hours: 715-483-3854 – voice mail
- Non-emergency messages can be left in the general voice mail box.
- Emergency or "Urgent" calls will be redirected to an emergency call center. The call center will contact our on-call Service Coordinator and they will reach out to the right person to address the issue.

NEI Electric Eau Claire, WI

Office main phone number: 715-831-8752

- After hours: 715-831-8752 – voice mail
- Non-emergency messages can be left in the general voice mail box.
- Emergency or "Urgent" calls will be redirected to an emergency call center. The call center will contact our on-call Service Coordinator and they will reach out to the right person to address the issue.

Report all accidents, near accidents or injuries as soon as possible to:

- Your immediate supervisor (foreman) who will assist you as needed (first aid, transportation, arrangements for professional medical care, provide the necessary reporting forms, etc.).
- If you are working by yourself and if possible: call the correct office and we will help you by whatever means possible.

A written report of the incident is required within 24 hours of an injury report. Call Larry Koenig (715-483-5952), Greg Orton (715-553-0434), Steve Broughton (651-287-3141), Andy Karstensen (715-829-9588), or Luke Stoll (651-287-3102) for assistance.

NEI Electric Safety Committee

- **Larry Koenig, Safety Director, 715-483-5952**
- Greg Orton, 715-553-0434
- Andy Karstensen, 715-829-9588
- Steve Broughton, 651-955-3087
- Andy Komp, 715-492-0721
- Kris Hayes, 715-492-0721
- John Muehlbauer, 651-287-3139
- Tim Zell, 715-579-8607
- Ken Lewis, 651-775-7935
- Travis Rasset, 763-226-1365
- Mac Broughton, 612-449-0899
- Tami Halliday, 651-287-3101
- Luke Stoll, 651-287-3102

This is the March 2024 NEI Electric Safety Policy. The rules of this Policy are as complete as we can reasonably make them; however, they are not necessarily all-inclusive because circumstances that we have not anticipated may arise. Please become familiar with the rules of this Policy and make suggestions to the Safety Committee with your ideas for clarification, areas for improvement and ideas to make our Company safer.

The Reporting Forms shown in this NEI Electric Safety Policy are available for your use. Copies of the Report Forms are available through your supervisor, in the project site job boxes and at each NEI office. In addition, some of the typical reporting forms are now available through 'Employee Access' on our website: www.neielectric.com.

Safety Statement

To All Employees,

I have the ultimate responsibility for the safety of the company and all of its employees. I take this responsibility very seriously; I do not want anyone to get injured. No job is so important in completing that an injury should occur.

Our policy is to provide you with a safe place to work, free from undue hazards that might cause injury or death, and to comply with all safety and health standards, rules, regulations and orders issued by OSHA, the joint Safety Committee, or governmental laws or rules. Depending on your job description, you may not be exposed to some of the safety concerns addressed in the Programs of this Safety Policy; however, as a NEI employee you should know of and abide by these rules should a safety concern become an occurrence in your work day.

We will not require you to work in surroundings or under conditions that are not safe. We will initiate and maintain safety programs, which, in part, shall consist of regular inspection of the job sites, materials and equipment (both employer and employee tools). The use of unsafe machinery, tools, material or equipment will not be permitted. We will provide you with personal protective equipment to safely do your job.

You also have responsibilities as an employee of our company. Your responsibilities include performing your job safely to prevent injury to yourself and others and to report unsafe conditions immediately to your foreman, supervisor or a member of the Safety Committee. As a NEI Electric employee, you are also required to comply with the safety requirements of the customer or general contractor for the site you are working at.

Our Safety Committee is the key decision-making body for safety in our company. Members of the Safety Committee meet regularly, monitor injuries and/or accidents and are assigned duties to ensure safe working conditions of all employees.

Please notify your foreman or a member of the Safety Committee of any questions that you have about this policy or company safety rules. They are responsible for bringing this issue to my attention.

NEI Electric,

Nanette Renstrom

Nanette Renstrom, CEO

Loss Prevention/AWAIR Program

NEI Electric has adopted our Loss Prevention Program to promote a safe working environment for our employees. This Loss Prevention Program is meant to fulfill the requirements of AWAIR (**A** **W**orkplace **A**ccident and **I**njury **R**eduction Act). Please read this information and remain constantly aware of our safety concerns at all times.

Company Safety Goals and Objectives

NEI Electric is committed to providing all employees with a safe and healthful working environment. To achieve this environment NEI Electric has established the following goals, objectives and tactics:

Goals

1. Annually reduce employee accidents and injuries until they stand at or near zero.
2. Have the lowest rate of injuries of any IBEW contractors.
3. Be regarded as a safe employer to work for, not only in word but also by practice.
4. Help develop safe work habits and attitudes among employees.
5. Provide a channel of communication between employees and management.

Objectives

1. Establish a Loss Prevention Program that will reduce the number of injuries and accidents to a minimum, not merely keeping with, but surpassing the best experience of other operations similar to ours.
2. Reduce time lost to injuries below the level of the prior year.

Tactics

1. Have daily pre-task meetings (a/k/a Daily Huddles) conducted by foremen, for employees to talk about what is happening in regard to specific safety on their job site for the day, as well as weekly. Use the Industry Toolbox Safety Talks to enhance workers' knowledge of general safety topics. Foremen to complete a daily/weekly check-off form.
2. Quarterly review by the Safety Committee of injuries, accidents and near misses and completion of an analysis of ways to prevent the same occurrence in the future.
3. Ask for employee and Safety Committee input of suggestions to make our company safer.
4. Provide safety training in specific areas that we have seen injuries or the potential for injuries.
5. Provide equipment that would help make jobs safer.
6. Perform semi-annual inspections of job sites to determine areas that need improvement.
7. Annually review our safety program, always looking for ways to make our program better.

Safety Responsibilities

NEI Electric safety responsibilities are assigned to the Safety Committee Members, the job Foreman, the Claims Coordinator, the Safety Director, and to all employees. Every NEI employee is responsible for safety in the workplace.

Safety Committee Member Responsibilities

The Safety Committee meets on a quarterly basis. The members of our Safety Committee have the responsibility of planning and implementation of safety in the company.

Members of the Safety Committee complete the following as assigned:

1. Conducts periodic safety inspections for recognition and correction of job site hazards.
2. Investigates all lost time accidents. If necessary, this includes visiting the scene of the accident to ensure that measures are taken to prevent reoccurrence.
3. Coordinate safety training as needed.
4. Keeps current on trends in accident prevention.
5. Provides information for first aid and medical procedures.
6. Arranges for availability of personal protection equipment and enforce use.
7. Reviews new equipment, procedures, operations, or jobs as they relate to prevention and control of accidents.
8. Monitors results of the safety program to be aware of potential problems and overall progress of the program.
9. Brings ideas and suggestions to management that will encourage safety awareness in all employees.

The Safety Committee members are listed on the first page of this manual. It is their responsibility to monitor the activities of our projects and to maintain a safe environment. Please contact any member of the committee with any safety concerns or suggestions you may have.

Foreman Responsibilities

Foremen are a key component in the success of our Loss Prevention Program. Their responsibilities must be met on a daily basis and with a high degree of proficiency. They must be able to communicate and enforce all NEI Electric safety policies and procedures. All employees must feel confident that the foreman cares about their personal safety.

Foreman complete the following as assigned:

1. Orients new employees to safe procedures, work assignments, project requirements and rules related to their job.
2. Reports any unsafe conditions or equipment; follows up to ensure that any defective equipment or unsafe conditions are corrected.
3. Brings forth information on all accidents, incidents and assists in determining steps to prevent recurrence.
4. Reviews the daily activities of each employee and assists the Safety Committee in enforcing the Loss Prevention Program and all company and/or project safety rules.
5. Maintains satisfactory standards of housekeeping throughout the organization.
6. Knows how to operate all emergency equipment in his or her area of responsibility.
7. Enforces the use of required personal protective equipment.
8. Thoroughly investigates all accidents and injuries; files all necessary reports in a timely manner.
9. Instructs employees involved in unsafe work practices on safer installation methods; retrains employees or provides additional training as necessary.

10. Makes periodic inspections of all areas of the organization to identify safety hazards. Acts to correct all unsafe conditions or behaviors and documents all corrective action in a timely manner.
11. Ensures compliance with all company, local, state and federal safety regulations.
12. Receive training and current certification in First Aid/CPR as required by the Collective Bargaining Agreement.

Employee Responsibilities

We want NEI Electric employees to be the safest, most knowledgeable and most conscientious employees in our industry. To develop and maintain this professional standard, NEI management will provide all employees with proper training. NEI Electric employees are required to:

1. Understand all company, industry and customer safety rules and work in such a manner that abides by these rules.
2. Maintain the physical and mental standards necessary for the job.
3. Daily inspect his or her assigned work area and equipment and immediately report any unsafe conditions. Refer to Company Hazard Report in this Policy.
4. Immediately report all accidents or near accidents involving property damage, regardless of who was at fault. All injuries must be reported as soon as possible. Refer to First Report of Injury/Accident/Incident/Near-Miss in this Policy
5. Make suggestions to the Safety Committee their ideas to make our company safer or areas that need improvement.
6. Become familiar with and abide by all local, state and federal regulations that apply to his or her job activity.
7. Attend all required safety meetings.
8. Help extend the life of equipment through proper operation and avoidance of abuse.
9. Use the required personal protective equipment; provide the proper maintenance of required personal protective equipment.

Safety Director Responsibilities

1. Provides leadership and guidance to the Safety Committee.
2. Provides resources for training and monitoring the Loss Prevention Program.
3. Directs the investigation of all lost time accidents.
4. Initiates and conducts activity to stimulate interest in safety.
5. Keeps current on new safety trends and in accident prevention.
6. Promotes and attends safety functions.

Claims Coordinator Responsibilities

1. Maintains record keeping system to meet regulatory requirements and track progress toward objectives.
2. Coordinate claims as they occur.

Provisions of the NEI Electric Safety Policy

The key provisions of our safety policy are:

1. We want **every** injury or accident reported, including near misses.

2. Every employee of NEI Electric is accountable for safety.
3. We will plan for safety through:
    a. Daily pre-task planning
    b. Job kickoff meetings
    c. Tool Box meetings
    d. Safety Committee meetings
    e. Training and education
4. We will work to take predictive or disciplinary action through
    a. Job site inspections
    b. Accident analysis

Report Every Accident or Injury, Including Near Misses

Report every accident or injury as soon as possible to the correct office location:
NEI-MN 651-771-1000 / NEI-SCF 715-483-3854 / NEI-EC 715-831-8752
Each person involved or witness is required to fill out a written report within 24 hours of the incident.

In case of an injury, NEI is required to complete a First Report of Injury, which is furnished to the State Commissioner of Labor through our Workers Compensation carrier.

We intend to conduct business so that injuries to people, damage to property and damage to the environment will be avoided. Every effort will be made to prevent accidents and illnesses by the timely recognition and correction of accident and illness causes. It is our intention to comply with all standards relating to safety and health matters that are enforced by local, state or federal authorities.

Everyone is Accountable for Safety

Line management shall be held accountable for the Accident Prevention Program through the project manager, job superintendents, foremen and crew members. The owners for NEI shall assist all levels of management in carrying out their duties.

Planning For Safety

We believe in planning for prevention of injuries and accidents rather than wait for an incident to occur and taking action at that point. Training and education is the key to our prevention of accidents and injuries. Projecting potential hazards should be done during all aspects of a project and should be addressed during the following meetings.

<u>Job Kickoff Meetings</u>
Prior to the start of a project, a job pre-start up meeting will be held. The attendees will include the job site foreman, the project manager, the materials and labor coordinator and a member of the Safety Committee (which may be one of the above.) Part of this meeting will be planning for the safety of the project and discussing any special needs, tools or safety equipment needed for this project. This meeting may be informal depending on the size and complexity of the project. If there are no exceptional safety difficulties anticipated, the materials and labor coordinator may not be required to attend.

Jobsite Safety – Daily/Weekly Meetings (a/k/a Daily Huddles) and Reporting

On-site project meetings are to be held a minimum of weekly to communicate project information or address potential hazards. These meetings should be short in duration and under the direction of the foreman in charge. Attendance sheets should be placed in the job site file box; the attendance sheets should include date, location, attendance, topic and outcome.

Tool Box Safety Meetings

These meetings should include discussion of any accidents or near accidents and ways to prevent a re-occurrence. Safe ways of performing work are good topics and all practical ideas developed need to be considered. On a rotating basis Safety Committee members should attend. Safety information will be distributed to all employees through payroll. It is mandatory to review all Tool Box Talks, they need to be signed and returned with completed timesheets to the office.

Safety Committee Meetings

The Safety Committee shall meet quarterly or more often if needed, to review accidents, discuss problems and establish needed corrective actions and determine equipment needs, employee training, etc. This group should attempt to be predictive rather than reactive; possible hazards and planned control methods should be considered for future work.

Training and Education

Training is an important management function in order to effectively communicate how job functions are to be accomplished. Accident prevention shall be included in each phase of the training so that safe operation procedures are routinely followed. Forms of training shall include:

- Company-wide safety meetings held annually
- Printed safety tips distributed by mail and electronically
- Safety posters in shop and on crew job sites
- Verbal safety tips at tool box meetings and on job site
- New employee safety orientation. Refer to new Employee Safety Orientation Checklist in this Policy.

Job Site Inspection

The recognition and correction of accident causes is a continuing duty of the Safety Committee. Safety inspections should be made of job sites on a semi-annual basis by a Safety Committee member. However, each employee is responsible to report unsafe working conditions immediately to a member of the Safety Committee. The Safety Committee member should take predictive or corrective action needed to correct any unsafe working conditions and should report on the issue and its resolution at the next Safety Committee meeting.

Accident Investigation

If an accident or injury occurs, the Investigation of Accident and Injuries Section (see Medical Care Program) shall be followed.

FORM: EMPLOYEE SAFETY ORIENTATION CHECKLIST

Job Name _____

The immediate supervisor/foreman/crew lead will instruct employee on how their job is important to the company and the job safety requirements. Check each item on checklist as it is covered for specific job/jobsite. When finished, both supervisor/foreman/crew lead and employee must sign the bottom and return to office to be filed in employee's file.

_____Fire Extinguishers

_____First Aid Supplies

_____Emergency Numbers

_____Safety Manual

_____Evacuation Routes and Storm Shelter

_____Lockout Devices

_____Safety Data Sheets (SDS)

_____OSHA Poster

_____Location of Hazard Report Forms

_____Personal Protective Equipment

_____Report all Work-Related Injuries / Accidents

_____Confined Space Program

_____Arc Flash NFPA 70E - must be NFPA 70E trained to do energized work.

_____Silica Exposure Control Program

_____Job Hazard Reporting/MOP

Instruct and/or demonstrate the proper use of following: (Use N/A if not applicable.)

_____ Eye and Face Protection

_____Hearing Protection (if needed)

_____ Spill Procedures

_____Proper Lifting Techniques

_____ Ladder Safety

_____Site Specific PPE

Discuss general operations and procedures used in specific jobs and duties.

Discuss hazardous elements of a specific job (routes), effects of overexposure (heat, noise, chemicals, machinery, etc.) on project site.

Job_____

Job_____

Hazard(s)_____

Hazard(s)_____

_____

_____

Each employee is required to read the safety rules and programs in the NEI Electric Safety Policy before beginning their assigned work task on a project site.

_____

Employee Date

_____

Supervisor/Foreman/Crew Lead Date

_____

Print Name

_____

Print Name

Medical Care Program

Non-Life-Threatening Injuries should be seen at the nearest local clinic to the job site. Use a clinic instead of hospital emergency room if the injury is not serious; typically you will receive faster treatment. Maps of the nearest clinics/hospitals are in kept in the job site file box.

CALL 911 for ANY LIFE-THREATENING INJURY - GO TO THE CLOSEST MEDICAL FACILITY.

Please give the following information when you register at the medical facility:

1. Company Name: ☐ NEI Electric MN ☐ NEI Electric WI-SCF ☐ NEI Electric WI-EC
2. Workers' Compensation Carrier: Amerisure
3. NEI contact person: Larry Koenig (715-483-5952) or Luke Stoll (651-287-3102).
4. Specify that your injury is work related.

Claims Coordinator

Luke Stoll has been assigned as the NEI Claims Coordinator. He will be responsible for reporting claims to the insurance company and discussing modified job duty possibilities with the injured worker, physician and representatives for Amerisure.

Please make sure to report all injuries even those not requiring medical attention to your job Foreman and then the Claims Coordinator as soon as possible.

Basic Procedures should an injury/accident occur:

1. Assess and secure the accident site to prevent injuries, call for assistance as needed.
2. Secure proper medical treatment for the injured employee.
3. Secure any NEI equipment or material involved in the accident for investigation.
4. Notify appropriate personnel as soon as possible by telephone call; follow up with a written report within 24 hours.
   a. Job Foreman - General Foreman – Supervisor
   b. Luke Stoll at 651-287-3102– Claims Coordinator

Investigation of Accidents or Near Accidents, Injuries & Incidents

Investigation Procedure

1. Job Foreman shall conduct initial investigation and report on the Injury/Accident/Incident Report form (Refer to: NEI Electric First Report of Injury/Accident/Incident in this Policy).
2. Each person involved shall complete the Injury/Accident/Incident form.
3. All reports shall be submitted to the NEI office within 24 hours of the accident/injury/ incident.
4. The Safety Committee will review each accident and/or injury to look for training, prevention or corrective action to be taken.
5. Within seven calendar days after notice of a work–related injury or illness an OSHA 300 log and 301 form must be completed by employer.
6. An OSHA 300 log will be maintained and updated.
7. At the end of each calendar year employer will complete and submit an OSHA 300–A form.
8. Records will be kept and reports submitted as per local, state or federal requirements.

All accidents/injuries require submission of a written report with detailed information about the incident. Private consultations or interviews with the Safety Committee are available if needed, confidentiality will be maintained.

The steps listed below should be used to fill out the First Report of Injury forms and to identify workplace hazards. Filling reports out accurately and thoroughly may prevent future legal and monetary expenses.

1. All near-misses, accidents or injuries need to be investigated. Minor injuries and near-misses occur at greater numbers than serious incidents; the records of these occurrences can be very helpful in identifying problem areas.
2. All reports must be filled out **AS SOON AS POSSIBLE** after an injury occurs and a copy of the report forwarded to the **Worker's Compensation Insurer** within 24 hours of the accident.
3. All injuries requiring medical attention must be reported **as soon as possible** to the Worker's Compensation Insurer.
4. Complete the accident investigation report (Refer to the NEI Electric First Report of Injury/Accident/Incident in this Policy), attach additional information as needed:
   4.1. Complete each section of the report form.
   4.2. Get the necessary facts by interviewing people who were injured and others who witnessed the injury or accident.
   4.3. Analyze step-by-step how the injury/accident occurred. Have the person show you or demonstrate what happened, being careful not to cause injury this time.
   4.4. Secure any NEI material and/or equipment involved in the incident; if possible, arrange to have it brought to the NEI office for safe-keeping and future investigation.
   4.5. Take photographs if possible; ask for permission as required.
   4.6. Determine what you feel caused the injury/accident/incident.
5. Determine the corrective actions needed. Maintain safety files for the OSHA 300 log, First Report of Injury and other statistics on accidents or injuries. These are to be used to analyze which tasks are causing the injuries.

The Safety Committee will review the accident investigation reports along with the internal inspections, injury statistics and hazard reports to identify and prioritize areas that need corrective actions/safety controls implemented.

Examples of corrective actions:

a. Establish new procedures

b. Train/re-train employees

c. Revise maintenance schedule of equipment

d. Replace broken/damaged equipment

e. Better housekeeping, etc.

Follow up on the corrective action to make sure that it has been done and that it is effective in preventing reoccurrence of the accident.

Return-to-Work Program

It is the policy of NEI Electric to return an employee with a work-related injury or illness to work as soon as he/she is capable of performing work. We will work with the injured worker, physician and worker's compensation carrier in determining what job functions and activities can be performed and what physical restrictions may be required.

Modified Duty Positions

We, along with our insurance carrier, will be encouraging injured workers to work part or full time in modified duty positions until they are ready to return to their former positions.

Our Return-to-Work Program will let employees know that they are valued, productive members of NEI Electric even though they are not 100% well. We believe it is important for the healing process to keep employees in the work setting even if they cannot handle their regular work assignments.

- The doctor should clearly outline any activity restrictions on the Report of Workability.
- Prior to the employee performing work duties, the supervisor/manager should discuss the restriction(s) with the employee to make sure that he/she understands these restrictions and understands what the temporary work assignment consists of.
- The employee has the responsibility to inform the supervisor of any progress or problems.
- The employee must provide a Report of Workability updating her/his progress each time she/he sees the treating doctor.
- The employee must inform the supervisor if she/he feels they cannot continue working due to pain, if the job is aggravating her/his injury, or if the job activities exceed her/his restrictions.
- The supervisor should express ongoing interest in the employee during the employee's recovery. The overall work environment should support the employee's return to work.
- Listed below are some example reasons to contact the Workers' Compensation Insurer:

    - The employee does not return to work.
    - Unsure of what the restrictions are.
    - Difficulty in identifying a work assignment for the employee.
    - General questions on the Return-to-Work Program.

FORM: NEI Electric First Report of Injury/Accident/Incident/Near-Miss

Employee Name: _____ Job Title: _____
Date of injury; accident or incident: _____
Time of injury; accident or incident: _____ ☐ a.m. ☐ p.m.
Jobsite Name/Address: _____ Jobsite Foreman: _____
Time employee began work on date of incident____ ☐ a.m. ☐ p.m.

Names of crew (and others on jobsite) that witnessed or were involved in the injury; accident or incident: _____

_____

What job was being performed at the time of injury; accident or incident? (Describe in detail; what objects, circumstances, or persons caused the incident or contributed to the incident.)

_____

_____

What was the injury; accident or incident? (Detail and identify which hand, right or left, which finger, etc.)

_____

What tools, equipment, machines, objects, or substances were involved? _____

_____

Has similar injury; accident or incident happened before? ☐ Yes (if yes, describe) ☐No

_____

Due to unsafe conditions, should employee(s) be removed from jobsite? ☐ Yes ☐No

What measures should be taken to avoid a reoccurrence?

_____

Have the details of incident been discussed with the shop? ☐ Yes ☐No

Who was notified: _____ Date: _____ Time: _____

INJURY INFORMATION

☐ **Check here if NO Medical attention was required.**

Name of Treating Physician/Clinic: _____

Time Injured: _____ am/pm Left Jobsite: ☐ Yes ☐No

Transported by: _____

Give any other information you think is important to this claim.

_____

Form information completed by: _____ Date completed: _____

All claims are to be reported to the office as soon as possible. This form is to be filled out by each person involved and returned to the office within 24 hours. Please call the office if you have a question.

Disciplinary Program

The purpose of the NEI Electric Disciplinary Program is to provide a method for ensuring compliance with the Company safety policies and procedures. This Disciplinary Program is applicable to all NEI employees. In accordance with the potential safety threat, NEI Electric will judge the circumstances of each case and will take disciplinary action when appropriate. Where possible and appropriate under the given circumstances and without risking the health and safety of others, the penalties will be assessed according to the following definitions:

First Degree - (Non-Serious Violation) a safety violation, which has a direct relationship to job safety and health, but in all probability, would not cause death or serious physical harm.

* Example: Failure of employee to wear eye, hearing or other protective equipment.

PENALTIES:

- 1st - Verbal Counseling. Violation addressed informally with immediate supervisor and job site steward if assigned. Conversation documented in file and copy sent to shop steward.
- 2nd - Written Warning. Violation addressed in personnel file and copy sent to attendees and shop steward. Formal meeting with employee, immediate supervisor and the job site steward if assigned.
- 3rd - Written Warning. Removed from premises for remainder of working day without pay. Formal meeting with the employee, immediate supervisor and job site steward if assigned. Meeting documented in file and copies to attendees and shop steward.

NOTE: Any or all violations after the 3rd Non-Serious Violation within a one-year period will be construed as a Serious or Willful Violation (see pertinent penalties below).

Second Degree - (Serious Violation) a safety violation where a substantial probability of death or serious physical harm could result.

* Example: Failure to lockout/tagout electrical equipment before performing repairs or adjustments.

PENALTIES:

- 1st - Written Warning. Up to one day off without pay. Violation addressed in personnel file and copies to attendees and shop steward. Formal meeting with employee, immediate supervisor and job site steward if assigned.
- 2nd - Suspension. Up to five days off without pay. Result in reinstatement or termination. Formal meeting with employee, immediate supervisor and shop/job site steward if assigned and copies to attendees.
- 3rd - Termination of employment. Suspension resulting in termination. Notification to shop/job site steward if assigned.

NOTE: A 2nd Serious Violation within a one-year period may be construed as a 2nd Willful Violation, and may result in termination of employment.

Third Degree - (Willful Violation) a safety violation in which the employee committed an intentional and knowing violation or is responsible for a hazardous condition and made no reasonable effort to correct the situation or notify his/her superior of the problem.

PENALTIES:

- 1st – Suspension. Minimum of five days off without pay; reinstatement or termination may follow. Result in reinstatement or termination. Formal meeting with immediate supervisor and shop/job site steward if assigned and copies to attendees.
- 2nd - Termination of employment. Notification to shop/job site steward if assigned.

NEI Electric management, however, reserves the right to impose any discipline it believes appropriate for infractions, irrespective of prior warnings or discipline.

NEI Electric Rules Regarding Employee Conduct and Discipline

These company-wide rules are also covered in the NEI Electric Employment Manual. NEI expects its employees to obey the NEI Rules of Conduct which are intended to protect the interests and safety of all employees and of the organization. In the event of discipline measures involving a bargaining unit employee, NEI will notify the appropriate union steward.

Documentation: use NEI Electric Personnel Action Notice form shown on the next page.

No Retaliation

The Company prohibits any form of discipline, reprisal, intimidation, or retaliation for:

- Reporting a violation of the Company's safety rules, a hazardous condition, or other safety concern.
- Reporting an injury or illness.
- Reporting an incident, accident, or near miss.
- Participating or cooperating in any investigation related to a safety issue, injury, illness, accident, or near miss.

If you believe that you or a coworker has been retaliated against for reporting a safety concern, injury, illness, accident, or near miss, you must report this conduct to your direct supervisor.

FORM: NEI ELECTRIC PERSONNEL ACTION NOTICE

Employee Name:_____ Job Title: _____

Date & Time of this report: _____

Jobsite Name/Address:_____ Jobsite Foreman: _____

☐ COMPLIMENT ☐ DOCUMENTATION ☐ WARNING ☐ SUSPENSION ☐ REINSTATEMENT ☐TERMINATION

(up to 5 scheduled working days pending investigation)

Explanation & Remarks

_____

_____

_____

_____

Employee Comment/Receipt

_____

_____

_____

_____

_____ _____

Supervisor Signature Date Employee Signature Date

☐ Check if employee refused to sign

Job Hazard Analysis Program

The purpose of the NEI Electric Job Hazard Analysis Program is to prevent potential injuries/accidents by pre-planning for safety. The Job Hazard Analysis (JHA) program will encompass the following steps:

JOB HAZARD ANALYSIS PROGRAM APPLICATION & DOCUMENTATION

Job Selection Criteria (example form, NEI Electric Hazard Report)

1. A job that has a high frequency of accidents.
2. Jobs that may produce a high frequency of disabling injuries.
3. Jobs with potential to cause severe injuries or loss.
4. New and/or revised jobs.
5. Job broken down into steps.
6. Select the right person to observe.
7. Each step completely described with employee verification.
8. Note possible deviations from regular procedures.

Identification of Hazards and Potential Accidents (example, Job Hazard Analysis-Safe Methods and Procedures)

1. Electrical exposure
2. Overexertion
3. Environmental (spills) and Physical hazards (burns chemical and thermal)
4. Possible slip, trip, fall, etc.
5. Danger of striking against, being struck by, or making harmful contact with an object.
6. Can employee be caught in, by, or between objects?

Solution Development (example form, Job Hazard Analysis-Safe Methods and Procedures)

1. Find a new way to do the job.
2. Change the physical conditions that create the hazard.
3. Change the work procedure and identify additional training for employees.
4. Implement engineering controls.
5. Use of personal protection equipment.
6. Use of proper equipment guards.

“Example”

Job Hazard Analysis

Safe Methods and Procedures

JHA NUMBER 156 TITLE OF JOB Changing stone on bench grinder DATE JHA WAS COMPLETED 08/17/023

PERSON COMPLETING JHA Sam Spitale PERSON ASSISTING IN JHA Peter Belanger

LOCATION/FACILITY Fabricating Plant DATE JHA WAS REVISED 10/20/23

RECOMMENDED PPE Safety glasses, gloves

BASIC JOB STEPS	HAZARDS PRESENT IN EACH JOB STEP	CORRECT AND SAFE PROCEDURES FOR COMPLETING THE JOB
1. Lockout bench grinder	1. No hazard	1. Pull wall plug on bench grinder and place end of plug in lockout device. Add completed tag to device. Place key in your pocket.
2. Remove guard	2. Contact with sharp edges	2. Using a screwdriver or wrench, remove side guard for the worn stone. Loosen spark shields, tongue guards and tool rests to move them out of the way. Wear gloves to protect the hands from sharp edges.
3. Remove worn stone	3. Contact with sharp edges	3. Place a wedge between the tool rest and the grinding wheel on the opposite side to remove the retaining nut on the worn stone. Remove the nut, washer and worn stone. Wear gloves to protect the hand from sharp edges.
4. Ring test new stone	4. No hazard	4. Support the center of the new stone with a wooden dowel. Tap the stone with a plastic handle of a screwdriver at 12, 3, 6 and 9 o’clock. Listen for the metallic ringing sound. If the stone does not ring, replace it.
5. Install stone	5. Contact with sharp edges	5. Slide new stone onto shaft, add washer and nut. Tighten nut with box-end wrench, per manufacturer’s guidelines, wearing gloves to protect the hands.
6. Install guard	6. Contact with sharp edges	6. Re-install side guard, place and tighten tool rest 1/8” from the stone. Place and tighten the upper tongue guard ¼”from the stone and reset the spark shield.
7. Remove lockout, test stone	7. Struck by stone fragments	7. Remove the lockout device. Plug in grinder. Stand off to side before grinder on to ensure it is operating properly.

FORM: NEI ELECTRIC HAZARD REPORT

Employee: _____

Please fill out and give to your supervisor or safety coordinator.

Date: Month/Date/Year ____/____/____

Time: Hour - Minute a.m./p.m. _____

Job Name: _____ Job Number: _____

Location of Hazard on Site: _____

Description of Hazard: _____

_____

_____

Suggestions to Correct Hazard: _____

_____

_____

Supervisor or Safety Coordinator:

Corrective action taken: _____

_____

_____

Corrected by: _____

Date corrected: Month/Date/Year ____/____/____

Time corrected: Hour - Minute a.m./p.m. _____

Comments: _____

_____

_____

Reviewed / inspected by: _____

_____

(Signature of Supervisor / Safety Coordinator)

NEI Electric Job Hazard Analysis-Safe Methods and Procedures

JHA NUMBER _____TITLE OF JOB _____ DATE JHA WAS COMPLETED _____

PERSON COMPLETING JHA_____PERSON ASSISTING IN JHA _____

LOCATION/FACILITY_____DATE JHA WAS REVISED _____

RECOMMENDED PPE _____

BASIC JOB STEPS	HAZARDS PRESENT IN EACH JOB STEP	CORRECT AND SAFE PROCEDURES FOR COMPLETING THE JOB

SAFE METHODS AND PROCEDURES, page 2

Machine:

Personal Protective Equipment:

Work Guidelines:

Shutdown Procedures:

FORM: MOP (Method of Procedure)

Date & Time of Scheduled Work:_____ Time_____ ☐ am, ☐ pm

Site Address in case of Emergency: _____

_____

_____

Job Number:_____ Lead Electrician: _____

Facility: _____

Facility Contact: _____

Location of Work: _____

Description of Work: _____

_____

_____

LOTO: ☐ Yes ☐ No

If yes, include LOTO form.

Voltage: _____

Ampacity: _____

Arc Flash Category/Boundary: _____

Qualified NFPA 70 E Certified Person: _____

Ground Cluster: ☐ Yes ☐ No Premises Generator: ☐ Yes ☐ No

Rotation: ☐ Yes ☐ No Premises UPS: ☐ Yes ☐ No

Project Duration: _____

NEI Personnel: _____

Safety Rules/Work Standards Program

General

No NEI Electric employee shall be required to work in surroundings or under working conditions which are unsafe, hazardous, or dangerous to his/her health or safety as provided in the Occupational Safety and Health Act (OSHA) and/or the Safety Manuals as adopted by the Joint Safety Committee of the Electrical Industry (I.B.E.W. Local Unions and N.E.C.A.).

NEI Electric employees are required to respect and follow the rules and programs of the NEI Electric Employment Manual and the NEI Electric Safety Policy as well as any specific project and/or customer rules regarding safety and personal conduct when working at the customer site.

Electrical Requirements

All electrical work shall be in accordance with the provisions of the National Electrical Code and local building codes governing such.

No employee shall work in such proximity to any part of an electrical power circuit that he/she may contact it in the course of his/her work unless he/she is protected against shock by de-energizing the circuit and grounding, or by guarding it by effective insulation or other means. Proper means shall be used to ensure that workspace for electrical equipment will not be used as a passageway during periods when energized parts of electrical equipment are exposed. The non-current carrying metal parts of portable and/or plug connected equipment shall be grounded.

Contagious Illnesses

To prevent an outbreak of influenza strains or other contagious illnesses among our employees and the possible transmission of illnesses to our customers and business associates, the policy of NEI Electric is to have sick workers stay home until they feel better. If you come to work and show signs of fever, extreme coughing & sneezing or other signs of illness, company management may ask that you return home until you know you feel better. The CDC (Centers for Disease Control & Prevention) guidelines state that symptoms and/or fever (without fever reduction medication) should be gone for 24 hours before you return to your normal day activities.

First Aid and Medical Attention

First aid kits will be provided for project sites and trucks; they will be regularly inspected by the job foreman and the person responsible for the truck or other persons as designated to ensure that they are properly maintained. Foremen shall be trained and certified in CPR and First Aid. Call 911 for any emergencies.

Bloodborne Pathogens

Bloodborne Pathogens are disease-causing microorganisms. Bloodborne pathogens are viruses or bacteria present in human blood and body fluids which can infect and cause disease in humans.

The two most notable are Human Immunodeficiency Virus (HIV) and Hepatitis B Virus (HBV).

Bloodborne pathogens spread in the workplace through any contact with infected blood, body fluids or an item with blood or body fluid on it carries the risk of potential infection.

How to Protect Yourself

- Treat all human blood and body fluids as infectious.
- Wear Personal Protective Equipment including gloves, gowns, face shields and eye protection during activities which may result in exposure to bloodborne pathogens.
- Clean and decontaminate infected surfaces and properly dispose of blood and body fluids in appropriately labeled container.
- Handle all trash as if it contains infectious items.

What should I do if exposed? An exposure incident is defined as a specific eye, mouth, nose or skin contact with potentially infectious materials. Contain the area of exposure to prevent others being exposed to potential infection. Flush the area that was exposed with warm water and then scrub with soap and water. Notify your supervisor and complete in full detail an Injury/Accident/Incident Report. Seek immediate medical attention.

Accident Prevention

Regular inspections of project sites, materials and equipment shall be made by Safety Committee members on a semi-annual basis at a minimum. The person making the inspection shall determine corrective or preventive action needed and shall be responsible to insure that the action recommended is taken, reporting to the Safety Committee at the next meeting. NEI Electric has made a company-wide commitment to the safety of our electricians; we stress the planning for prevention of injuries and accidents.

Each employee has the responsibility to report to the work site and perform the work assigned in accordance with your job classification or description and perform the assigned job in a safe manner to prevent injury to yourself and others.

- Employees shall not operate equipment or machinery for which they have not been qualified either by experience or, if required, by certified training.
- Employees are prohibited from using cellular phones while operating equipment or while working in areas where machinery or operations present potential injury.
- Dress appropriately for your work setting, wear clothes and foot wear that provide adequate physical protection. Make sure your clothes fit in a manner as not to cause a tripping hazard and to minimize possible contact with moving machinery. Wearing jewelry such as rings, necklaces or earrings on a construction site could be hazardous to the employee and shall not be worn if project and/or customer safety rules prohibit such.

NEI Electric Owned Equipment, Tools & Materials

Personal use of NEI Electric tools, materials, equipment, documents, property or vehicles without the specific, prior permission of company management is prohibited.

The use of defective NEI-owned or personal tools & equipment on a NEI project is not allowed. Defective NEI-owned tools & equipment are to be tagged 'out-of-service' and returned to the Company immediately. No defective or 'out-of-service' NEI-owned tools & equipment may be taken home by employees without permission of company management.

Personal Protective Equipment

Employees working in areas where there is a danger of head injury from impact or from falling or flying objects or from electrical shock and burns shall at all time be wearing and protected by approved hard hats.

All equipment shall be inspected before use.

Employees working in areas where machinery or operations present potential eye injury shall at all time be wearing and protected by approved safety glasses:

- Eye protection should be worn when drilling.
- Safety glasses should be of the type with side shields.
- Glasses shall be kept clean and in good repair. Prescription eyewear should meet ANSI Z87+ standards for safety eyewear and should have side shields attached.

Hearing Protection should be used when appropriate and/or required. As a general rule, if you have to raise your voice to be heard, then you should wear hearing protection.

In situations where there is a possible danger of exposure to toxic materials, a review should be taken first of ways to prevent exposure. Then, if so determined by reviewing SDS, PPE including respiratory protection shall be used at all times. Review additional information in the NEI Electric Respiratory Program of this Policy.

Gloves shall be worn for protection.

Neoprene (latex) gloves are to be worn when working with ballasts that might be leaking PCB (Polychlorinated Biphenyls.)

ANSI Class 2 cut resistant gloves are to be worn when using blades of any kind and or working around sharp objects.

In all instances where necessary, harnesses, lifelines, and lanyards shall be provided by NEI Electric and used by the employee. See additional detail in the Fall Prevention section.

Arc-Flash Protective Equipment

(Further detail in the ARC Flash Program included in this Policy)

It is the policy of NEI Electric that whenever possible, all equipment needs to be de-energized before working on it and to use a Lockout/Tagout procedure. If this is not possible, Personal Protective Equipment needs to be worn and used to protect the worker from possible injury due to electrical flash or burn. If this is the case, the foreman is to be notified and he will review the job function and determine what equipment to use based on the Hazard Risk Category Classifications Charts.

If you are working on energized equipment alone, you are required to call the Office before you begin your task to review the procedure and then call when you have completed the task.

NEI Electric will supply the appropriate Cal-rated suit for the requirement of the work to be performed (see charts in the ARC Flash Program section). These suits are to be inspected prior to each use for damage, wear and cleanliness. Electrician is responsible to contact office to have cleaned or replaced.

Housekeeping

Employees shall keep all debris cleared from work areas, passageways and stairs during the course of construction, alteration or repair. Yards, lots, job site office and storage containers, company vehicles, employee break areas and other areas shall be maintained in an orderly fashion. All garbage and other waste shall be disposed of in the containers or areas as designated and provided.

Tools, Hand and Power

All tools, whether furnished by the employer or the employee, shall be maintained in safe condition. All power tools shall be properly guarded when in use. All tools are to be returned to their storage case before storing. All tools shall be inspected regularly: tools or equipment determined to be unsafe shall be removed from service immediately, tagged “out of service” and sent back to the Office.

Powder Actuated Tools

Only employees who have been trained and hold a ‘certification’ in the operation of a particular brand of powder-actuated tool shall be allowed to use that specific type of tool. Review the instruction manual for a particular model of tool prior to using it. Never point a powder-actuated tool in the direction of another person. If the tool jams, please follow the instruction manual directions regarding clearing the jam. Loads for powder actuated tools (full or empty) are not to be left laying on the floor/ground. Clean the tool according to the instruction manual. These tools shall be unloaded and returned to their case at the end of each day.

Ladders

All ladders shall be inspected before use; evaluate the following to determine if your ladder is defective and needs replacement:

Step Ladder

- Steps – are they loose, cracked, bent, modified or missing?
- Rails (front & back) – are they cracked, bent, split or uneven?
- Top – is it loose, cracked, bent or missing?
- Spreader brace – is it loose, bent, will not lock, and corroded?
- Shoes – is the rubber pad worn, loose, or missing?
- Paint Shelf (if applicable) – is it bent, loose, missing or broken?
- General Condition – is there the presence of rust, corrosion or excessive dirt?
- Labels – are they missing or unreadable?

Extension Ladder

- Rungs – are they bent, loose, split or missing?
- Rails – are they cracked, bent, split or warped?
- Rung locks – are they corroded, loose, missing or broken?
- Hardware – is it loose, missing, corroded or altered?
- Rope & pulley – are they missing, frayed or not working?
- General condition – is there the presence of rust, corrosion or excessive dirt?
- Labels – are they missing or unreadable?

The use of defective ladders will not be allowed. When ladders with such defects are discovered, they shall be immediately taken out of service, properly tagged, taken back to the appropriate office and repaired or destroyed.

Periodic training for employees on proper use, selection and inspection of ladders should be performed.

Scaffolding

Scaffolding should be inspected prior to use. Make sure the wheels are locked on mobile scaffold and that the scaffold is secure. Please call your supervisor or a Company safety representative with questions on scaffolds.

1) Employees will not erect, disassemble, move, repair, operate, or inspect scaffolds unless they have received proper training.

2) A person trained and designated by NEI Electric as a competent person will inspect scaffolding prior to use for signs of damage to the support members, planks, guardrails, equipment or other damage. Inspections will be documented to meet OSHA requirements. Workers will not be allowed to work off scaffold that has not been approved for use by the competent person.

3) All scaffold platforms six (6) feet or higher will have standard guard rails (including a top rail, mid rail and toe-boards) installed on all open sides and ends of the platforms. A full body harness and

self-retracting life line may also be used in lieu of the guardrail requirement when working at heights of six (6) feet or greater.

4) Platforms **must** be fully planked or decked. Gaps between planks must be less than one (1) inch.

5) Wood scaffold plank will be cleated and extend beyond the supports a minimum of six (6) inches and a maximum of twelve (12) inches. Secure the planks to the scaffold supports whenever possible.

6) Scaffolds will be capable of supporting their own weight and at least four (4) times the maximum intended load. Ladders or frames with built-in stairways will be used for access to the working level of the scaffold. Climbing the cross-bracing to access scaffold is strictly prohibited.

7) Scaffolds will be located on a clean, level and solid base. Base plates or wheels are required at all times. Mud sills are to be used when the scaffold is being erected on dirt.

8) Use only pig tails or other fastening methods approved by the manufacturer for connecting components. Wire or welding rods are NOT approved connecting items.

9) All scaffolds will be properly braced. Mobile scaffold will have horizontal cross-bracing. When necessary, scaffold will be tied into the adjacent structure for additional support.

Lifts – Company Owned or Rentals

NEI-owned lifts shall be inspected on an annual basis by a third party. Inspections of rental lifts are performed by the mechanics at the rental company prior to delivery.

Lift operator training by a 'competent person' or representative of the equipment company is required. Harnesses and lanyards shall be provided and worn when required, either by lift type or by job site working conditions.

Guard railing on lifts should be inspected prior to the use of the lift. Do not tape guardrail gates in the "open position". Any crack or any other defect should be reported immediately, and the use of the equipment discontinued until authorized repairs are completed. Cracks in guard railings should never be taped up or fixed otherwise; by doing a quick fix, you are not only risking yourself but others who may not know of your repair.

Bucket Truck

Only authorized NEI employees are allowed to drive or operate NEI vehicles and equipment (see additional information in the NEI Electric Employment Manual). It is the policy of NEI Electric that if you are using the bucket truck alone you are to notify your supervisor or the NEI Electric office when you begin your task, give an estimate of time you will be in the bucket and then call again when you have completed the task.

The purpose of this requirement is that if you are alone and become disabled in the bucket, someone will try to contact you if you have not called back and if contact cannot be made then help will be sent to your work site.

Fall Prevention

It is our intention to prevent falls through proper planning. The key point in our fall protection program is the analysis of the job site for any fall hazards. The initial analysis should be completed in the job pre-start up meetings of the project manager and the foreman. A second analysis should be completed by the job site foreman through the daily pre-task meeting, prior to performing any work in an area which would have the potential for a fall. This analysis includes:

- Identification of any areas for which there would be a fall hazard
- Investigation of the protection options including the following
    - Determine if going into the area can be avoided
    - Determine whether the general contractor will be supplying a guard rail, etc.
- Acquisition of equipment needed to prevent the fall hazard, including personal protective equipment (PPE) is available from the shop.
- Proper and consistent use of the chosen form of equipment

All NEI employees have the responsibility to avoid fall hazards. No employees will be allowed to work in areas requiring fall protection unless trained in the proper use of the equipment. Please contact a member of the Safety Committee if you have any questions or concerns regarding the Fall Protection Program.

Kill Switches and Guards

Any modification to company equipment to disable kill switches, guards or any other safety component of a piece of equipment is prohibited and is considered a willful violation.

Recognition of Asbestos

If asbestos is identified in a worksite, remove yourself and all Company employees from the site. After removing yourself from the site of the asbestos, please contact a member of the Safety Committee for further instructions. Asbestos comes in many forms; however, typical areas where asbestos could be found include thermal insulation in pre-1980 buildings.

Underground Wiring / Trenching

For trenching provided by NEI Electric with trenching equipment or by hand shovel: prior to commencing the underground work, call your supervisor or NEI Office if you have any questions and/or safety concerns.

- Underground utility locations need to be marked and a valid Gopher State One-Call(MN) or Diggers Hotline(WI) authorization number and start date obtained at least 72 hours prior to any trenching being done by NEI Electric employees.
    - Gopher State One-Call – 651-454-0002 or gopherstateonecall.org (Password: Electric4815)
    - Diggers Hotline – 800-242-8511, Contractors #: 129846

- No trenching shall be started until a copy of the Gopher State One Call or Digger Hotline form is completely filled out and on hand. Verify if utility locators left a copy of a marked-up site plan

showing their location areas. It is recommended to take a photo of the markings prior to digging to prevent missed locations.

- Verify with the customer if there are any customer-owned buried utilities in the area that NEI Electric may come in contact with such as sprinkler systems, electric dog fences, buried power lines to remote buildings, etc.

- Before beginning to trench, verify that all safety equipment on the trenching equipment is operational and no safety devices have been bypassed on the trencher.

- Transporting trenching equipment: load and strap the trencher to the trailer per the instructions in the storage box on the trailer.

Equipment Transport

Only authorized NEI vehicle drivers with appropriate clearance (and DOT certification as required) are allowed to transport equipment and trailers. All equipment should be properly anchored to the trailer or the vehicle when being transported. Instructions and proper chains shall be available with the trailer. Please call your supervisor or the NEI office with questions and/or concerns on equipment anchoring before transporting.

Motor Vehicles

(Requirements for NEI vehicle use are also found in the NEI Electric Employee Manual)

All Company motor vehicles shall be maintained in safe conditions and shall comply with the applicable Minnesota/Wisconsin Department of Safety, Minnesota/Wisconsin Department of Transportation and the United States Department of Transportation regulations.

- Only current, authorized NEI Electric employees with valid driving licenses are allowed to drive or operate NEI vehicles and equipment; DOT certifications which include medical clearance are required on NEI vehicles. Call your supervisor or the NEI office with any questions.
- Visually inspect the NEI vehicle prior to each use and schedule regular maintenance to help preserve the life of the vehicle.
- Safety belts shall be fastened prior to the operation of any vehicle.
- Tools and materials carried in the same compartment as the employee shall be secured to prevent movement.
- Passengers are not allowed unless the vehicle is equipped with safety belts as required by law. Pre-approval from NEI management is required for personal use of any Company-owned vehicle or motorized equipment.
- All Company employees who operate Company-owned vehicles or equipment are required to notify the office immediately of any operation driving offenses that could restrict their driving privileges.

Boom and bucket trucks shall be visually inspected prior to their use. Extreme caution should be used when boom or bucket trucks are working in close proximity to overhead lines (within the swing radius of boom or load); a second employee shall be designated to observe clearances of the equipment. Vehicles equipped with outriggers shall have them extended before operations are started. Outriggers not on stable ground shall be supported with sufficient planking to withstand stress during

the operation of the lift. The bucket or boom shall be in a stored-position prior to movement of the vehicle. Harnesses with short lanyards shall be provided in bucket trucks and shall be used when appropriate. Hard hats shall be worn in and around booms and bucket trucks.

Other Specific Safety Requirements

The rules and programs in the NEI Electric Safety Policy will not cover every instance that you might run into during your workday. At all times, work safely with common knowledge of safety practices and policies. When in doubt, check with your immediate supervisor or a member of the Safety Committee. All questions with respect to safety shall be brought to the immediate attention of the foreman or member of the Safety Committee.

Employee training is extremely important to the success of our company-wide commitment to Safety. Each employee is encouraged to keep current with industry and safety education offered by the Local IBEW Unions or other accredited sources. The NEI Safety Committee will also coordinate company-wide training and use the NEI Electric Safety Meeting/Training form to document topics and attendance (sample form, next page).

Enforcement Procedures (also addressed in the NEI Electric Employment Manual)

It is the responsibility of all employees to understand and comply with these rules. Failure to comply with company policies or safety rules may subject the employee and others to harm or injury and NEI Electric to severe penalties and may result in disciplinary action being taken. Discipline can include re-training, job transfer, appearance before the Safety Committee or other discipline as needed.

FORM: NEI ELECTRIC SAFETY MEETING/TRAINING FORM

DATE: _____

INSTRUCTOR/LEADER: _____

INSTRUCTOR'S TITLE: _____

JOB SITE: _____

TOPIC TITLE: _____

SUBJECTS COVERED: _____

_____

_____

EMPLOYEE NAME (Printed)	EMPLOYEE NAME (Signature)	JOB TITLE

Assured Equipment Grounding Program

Temporary Wiring

Temporary wiring should be installed to meet National Electric Code (NEC) requirements and in accordance with OSHA provisions. Contact your supervisor or a Safety Committee member if you have questions or concerns.

Extension cords used with portable electrical tools and appliance shall be three-wire and heavy-duty use type. GFCI protection shall be provided and used for all extension cord use. All temporary wiring shall be effectively grounded in accordance with the provisions of the NEC and OSHA. Cords shall be kept clear of workspace, walkways, and other areas where they may be exposed to damage.

Inspections

Extension cords and equipment shall be inspected before each shift. All cord-supplied equipment will be visually inspected for ground problems, strain relief and cuts to cord insulation.

Lockout / Tagout System Program

General

Lockout is the preferred method of isolating machines or equipment from energy source.

Purpose

This procedure establishes the minimum requirements for the lockout/tagout of energy isolating devices. It shall be used to ensure that the machines or equipment are isolated from all potentially hazardous energy and locked-out or tagged-out before employees perform any servicing or maintenance activities where the unexpected energization, start-up or release of stored energy could cause injury.

Responsibility

Appropriate employees shall be instructed in safety significance of the lockout/tagout procedure including: General Foreman, Foreman, Journeymen, Apprentices, and other trade personnel on site. An authorized person shall instruct each new or transferred affected employee in the purpose and use of the lockout/tagout procedure. Other trade personnel whose work operations are or may be in the same area will be instructed by the on-site General Foreman or Foreman.

Preparation for Lockout/Tagout

Make a survey to locate and identify all isolating devices to be certain which switch(s), valves(s) or other energy isolation devices apply to the equipment to be locked or tagged out. More than one energy source (electrical, mechanical or other) may be involved. **The Lockout/Tagout System Form shall be filled out in its entirety.**

Sequence of Lockout/Tagout System Procedure

1. Notify all affected employees that a lockout/tagout system is going to be utilized and the reason therefore. The authorized employee shall know the type and magnitude of energy that the machine or equipment utilizes and shall understand the hazards thereof.

2. If the machine or equipment is operating, shut it down by the normal stopping procedure (depress stop button, open toggle switch, etc.).

3. Operate the switch, valve, or other energy isolating device(s) so that the equipment is isolated from its energy source(s). Stored energy (such as that in springs, elevated machine members, rotating flywheels, hydraulic systems, and air, gas, steam or water pressure, etc.) must be dissipated or restrained by methods such as re-positioning, blocking, bleeding down, etc.

4. Lockout/tagout the energy isolating devices with assigned individual lock(s) and tag(s).

5. After insuring that no personnel are exposed and double-checking the disconnected energy sources, operate the push button or other normal operating controls to make certain the equipment will not operate. CAUTION: Return operating control(s) to "Neutral" or "Off" position after the test.

6. The equipment is now locked out or tagged out.

Restoring Machines or Equipment to Normal Production Operations

1. After the servicing and/or maintenance is completed and equipment is ready for normal production operations, check the area around the machines or equipment to ensure that no person is exposed.

2. After all tools have been removed from the machine or equipment, guards have been reinstalled and employees are in the clear, remove all lockout/tagout devices. Operate the energy isolating devices to restore energy to the machine or equipment.

Procedure Involving More Than One Person

In the preceding steps, if more than one individual is required to lockout/tagout equipment, each shall place his/her own personal lockout device or tagout device on the energy isolating device(s). When an energy isolating device cannot accept multiple locks or tags, a multiple lockout or tagout device (hasp) may be used. If lockout is used, a single lock may be used to lockout the machine or equipment with the key being placed in a lockout box or cabinet, which allows the use of multiple locks to secure it. Each employee will then use his/her own lock to secure the box or cabinet. As each person no longer needs to maintain his or her lockout protection, that person will remove his/her lock from the box or cabinet.

Absent Employee Procedures

In the event that the employee who applied the lockout or tagout device is not at the facility when it needs to be removed, the supervisor should take certain actions to ensure full employee protection.

The supervisor should first verify that the employee is not at the facility. He should then make reasonable efforts to contact him and notify him that his device needs to be removed. The supervisor should call the Office and get approval for removal of the lock. Approval for removal of another employee's lock can only be given by a Company officer.

Basic Rules for Using Lockout/Tagout System Procedure

All equipment shall be locked out or tagged out to protect against accidental or inadvertent operation when such operation could cause injury to personnel. Do not attempt to operate any switch, valve, or other energy-isolating device when it is locked or tagged out.

FORM: NEI Electric Lockout / Tagout System Form

*Job #:_____ *Job Name: _____
(Required) (Required)

*Job Description: _____
(Required)

1. Company name where job is at: (location of equipment): _____
2. *Employees authorized to lockout or tagout: _____
3. Document LOTO on log at jobsite. Log to be filled out at morning huddles.
4. Identify lock # on log.
5. *List Equipment: _____
   _____
6. Review one-line drawing to make sure all energy sources have been disconnected.
7. Review with all employees what is going on and get buy-in from everyone working on the project.
8. Notify and review with facilities staff the task.
9. Write a MOP with step by step instructions.
10. Type(s) & magnitude(s) of energy and hazards: _____
11. _____Electrical - Volts_____Amps_____Other (specify)_____
12. Labels for branch circuits disconnect from breaker if LOTO can't be installed.
13. *(If this permit is covering multiple employees, list each individual employee participating in this LOTO, and have each individual print and sign their names at the bottom of this form.) Use back if more space is needed.*
14. Employees affected and how notified: _____
15. Type(s) & location of energy isolating means: _____
16. Type(s) of stored energy - methods used to dissipate or restrain: _____
17. Methods(s) of lockout/tagout selected/additional safety measures: _____
18. Equipment checked to insure disconnection: _____
19. Employees authorized for group lockout/tagout: _____

Additional Comments:

For any questions, or clarifications for completing this form, please call Andy Karstensen(715-829-9588), Steve Broughton(651-955-3087) or Greg Orton(715-553-0434).

_____ _____

*Print Name *Signature *Date

ARC Flash Program

NEI Electric policy is that all equipment needs to be de-energized before working on it and to use a Lockout/Tagout procedure.

If not possible, the appropriate NEI Electric furnished cal-rated Personal Protective Equipment needs to be worn to protect worker from possible injury due to electrical flash or burn. Only employees NFPA 70E trained are allowed to perform energized work. NFPA 70E training should be updated every 3 years or if an incident occurs and Safety Director determines retraining is required. All established procedures are to be followed and documented, **no exceptions.**

Working on Energized Circuits/Equipment - Method of Procedure

1. Employee must be NFPA 70E trained in order to perform any energized work. Determine if work can be performed de-energized or must be performed energized. Do not proceed if you have any questions or concerns; call your foreman or supervisor immediately.
2. If work is to be performed energized, call Greg Orton, Steve Broughton or Andy Karstensen to discuss and fill out the NEI Electric Energized Electrical Work Permit form (see sample next page). Customer or Facility Manager must be informed of the need to perform hot work, any hazards, measures to correct hazards and sign off on form before work begins. **All hot work needs to be coordinated with office.**

   Exemptions to work permit: related tasks such as testing, troubleshooting, voltage measuring etc. shall be permitted to be performed without an Energized Electrical Work Permit provided appropriate safe work practices and personal protective equipment are provided and used.
3. Complete a Shock Hazard Analysis and discuss with Customer or Facility Manager.
4. Determine a Hazard/Risk Category for the task to be performed and determine what personal protective equipment is required.
5. Inspect personal protective clothing and equipment for any damage before and after use. Check for tears, abrasions, or wear. If clothing becomes soiled after use, contact office to have cleaned or exchanged.
6. Use insulated tools and appropriate testing meters if required. Inspect before and after use. Verify test date is current and look for wear.
7. Establish and erect approach boundary with cones and marking tape.
8. Dress in appropriate fire-rated clothing.
9. Notify customer or facility manager before you begin work.
10. Notify the NEI foreman in charge or call Company office before you begin to work.
11. Notify customer or facility manager when work is completed.
12. Notify the NEI foreman in charge or call Company office when work is completed.
13. Remove approach boundary.

Any questions or concerns about any step of the Arc Flash Program should be addressed with the Foreman in charge and NEI management prior to the start of the work.

FORM: NEI ELECTRIC ENERGIZED ELECTRICAL WORK PERMIT

ENERGIZED ELECTRICAL WORK PERMIT

Part I – Request to Shutdown Equipment (To be completed by the person requesting the permit.

NPFA 70E trained person filling out this permit.

1. Site:_____ Area: _____

2. **JOB #:** / **JOB Name**: _____
   (***Enter Project # & Project Name – not description, see description below, item 4.)***

3. Planned start date:_____ Time:_____ Duration: _____

4. Description of work to be done: _____

_____

_____

5. The following equipment was requested to be shut down: _____

_____

☐ Until work is complete ☐ Temporarily, while barriers are being placed

6. Request by: (print name) _____

_____ _____ _____

Signature Title Date

Part II – Justification for Request to Shutdown Equipment To be completed by the person requesting the permit)

Check when complete

1. Detailed job description procedure to be used in performing the above-described work: ☐

_____

_____

2. Description of the safe work practices to be employed: _____ ☐

_____

3. Results of shock hazard analysis: (What is voltage?) _____ ☐
   a) Limited approach boundary: _____ (see Table 130.4 (E)(a)) ☐
   b) Restricted approach boundary: _____ (see Table 130.4 (E)(a)) ☐
   c) Necessary shock personal and other protective equipment to safely perform assigned task: _____ (see Table130.7(C)(15)(c)) ☐

Continuation of Part II – Justification for Request (To be completed by the person requesting the permit)

4. Results of the arc flash hazard analysis: Check when complete

a) Available incident energy or hazard/risk category: _____ ☐

- Current Owner posted analysis information: ☐
  Or if not available see Table 130.7 (C)(15)(a) and (b) ☐

b) Necessary arc flash personal and other protective equipment to safely perform the assigned task. ☐

- List protective equipment used: _____ (see Table 130.7 (C)(15)(c)) ☐ ☐

c) Arc flash boundary: _____ ☐

- 600V or less (see Table 130.7 (C)(15)(a)) ☐
- Over 600V call the office for Calculations: ☐
  - MN - Steve Broughton: 651-955-3087 ☐
  - MN/WI - Greg Orton: 715-553-0434 ☐
  - WI - Andy Karstensen: 715-829-9588

5. Means employed to restrict the access of unqualified persons from the work area: ☐
(See MOP & list what used, cones, marking tape, etc.)

_____

_____

6. Evidence of completion of job briefing, including discussion of any job-specific task: ☐ ☐
NEI - MOP to be done: ☐ Date / Time / Attended by: _____

7. Do you agree the work described above can be done safely? ☐ Yes ☐ No

- If NO explain: _____

_____

_____ _____
Signature, Electrically Qualified Person Date

_____ _____
Signature, Electrically Qualified Person Date

Part III – Customer approval to de-energize or reject (work energized) (To be completed by operations.)

1. Reason for live work request: Please check one box,

☐ If de-energizing the electrical circuit would result in an increased or additional hazard, the task may be performed with the circuit energized. An example of an additional hazard could be the loss of electrical power to life support equipment. An example of an increased hazard might be that loss of electrical power could result in an environmental spill.

☐ If de-energizing the electrical circuit is not feasible due to equipment design or operational limitations, the task may be performed with the circuit energized. (*An example of not feasible due to equipment design might be that removing the source of voltage for a single instrument circuit would require a complete shutdown of a continuous process.*)

2. The next available date for shutdown is: _____

3. I deny the request for shutdown and authorize the live work to be done. ☐
   - If DENIED explain: _____

_____

_____ _____
Signature, Customer / Operations, Maintenance Manager Date

_____ _____
Signature, General Manager Date

Charts provided are per the NFPA 70E 2024 Edition
Article 130, Work Involving Electrical Hazards

Energized Work Permit Flow Chart

J.2 Energized Electrical Work Permit. Figure J.2 illustrates items to consider when determining the need for an energized electrical work permit.

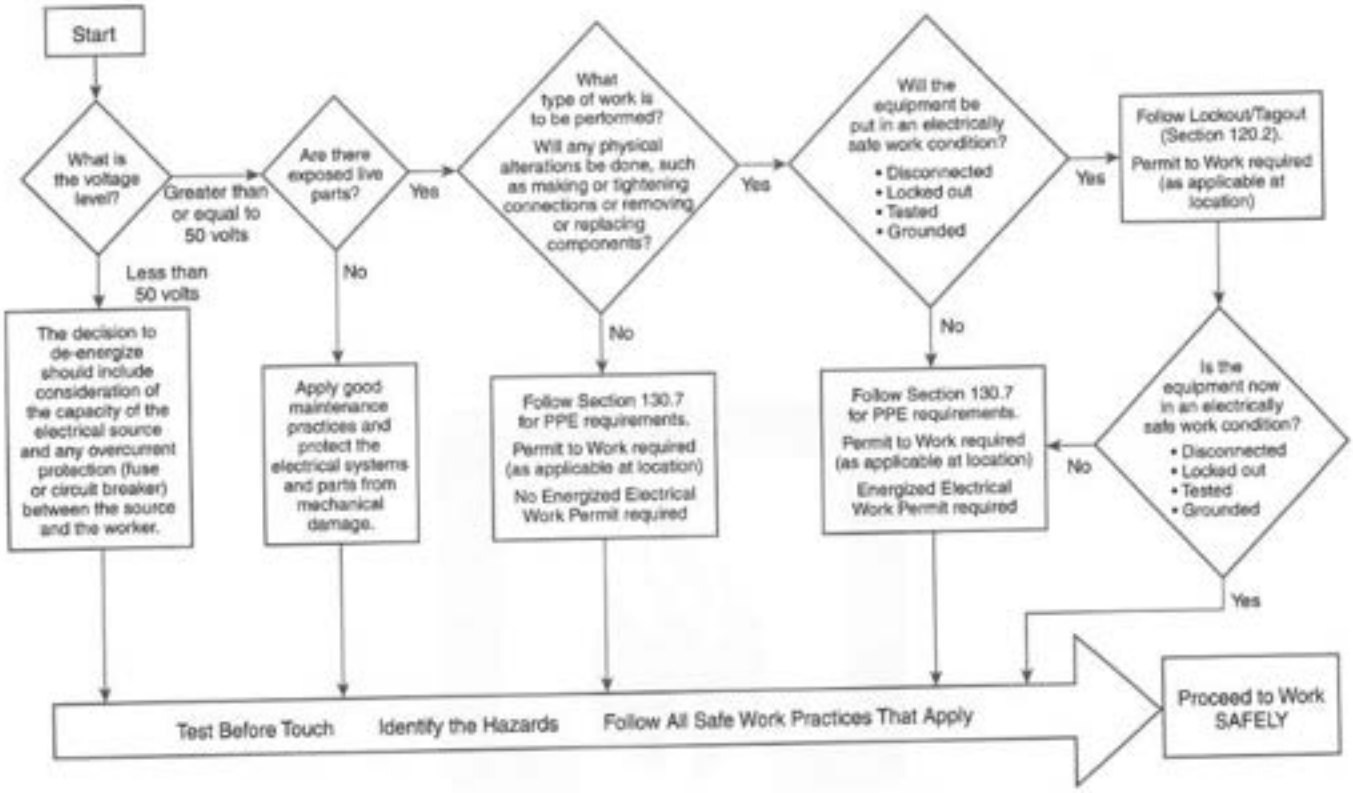


FIGURE J.2 Energized Electrical Work Permit Flow Chart.

#3 a, b Approach Boundaries – Table 130.4(E)(a)

Δ Table 130.4(E)(a) **Electric** Shock Protection Approach Boundaries to Exposed Energized Electrical Conductors or Circuit Parts for Alternating-Current Systems

(1)	(2)	(3)	(4)
	Limited Approach Boundary[b]		
Nominal System Voltage Range, Phase to Phase[a]	Exposed Movable Conductor[c]	Exposed Fixed Circuit Part	Restricted Approach Boundary[b,d]; Includes Inadvertent Movement Adder
Less than 50 V	Not specified	Not specified	Not specified
50 V–150 V[e]	3.1 m (10 ft 0 in.)	1.0 m (3 ft 6 in.)	Avoid contact
151 V–750 V	3.1 m (10 ft 0 in.)	1.0 m (3 ft 6 in.)	0.31 m (1 ft 0 in.)
751 V–5 kV	3.1 m (10 ft 0 in.)	1.0 m (3 ft 6 in.)	0.63 m (2 ft 1 in.)
5.1 kV–15 kV	3.1 m (10 ft 0 in.)	1.5 m (5 ft 0 in.)	0.65 m (2 ft 2 in.)
15.1 kV–36 kV	3.1 m (10 ft 0 in.)	1.8 m (6 ft 0 in.)	0.77 m (2 ft 7 in.)
36.1 kV–46 kV	3.1 m (10 ft 0 in.)	2.5 m (8 ft 0 in.)	0.84 m (2 ft 10 in.)
46.1 kV–72.5 kV	3.1 m (10 ft 0 in.)	2.5 m (8 ft 0 in.)	1.0 m (3 ft 4 in.)
72.6 kV–121 kV	3.3 m (10 ft 8 in.)	2.5 m (8 ft 0 in.)	1.2 m (3 ft 9 in.)
121.1 kV–145 kV	3.4 m (11 ft 0 in.)	3.1 m (10 ft 0 in.)	1.3 m (4 ft 4 in.)
145.1 kV–169 kV	3.6 m (11 ft 8 in.)	3.6 m (11 ft 8 in.)	1.5 m (4 ft 10 in.)
169.1 kV–242 kV	4.0 m (13 ft 0 in.)	4.0 m (13 ft 0 in.)	2.1 m (6 ft 8 in.)
242.1 kV–362 kV	4.7 m (15 ft 4 in.)	4.7 m (15 ft 4 in.)	3.5 m (11 ft 2 in.)
362.1 kV–420 kV	5.8 m (19 ft 0 in.)	5.8 m (19 ft 0 in.)	4.3 m (14 ft 0 in.)
420.1 kV–550 kV	5.8 m (19 ft 0 in.)	5.8 m (19 ft 0 in.)	5.1 m (16 ft 8 in.)
550.1 kV–800 kV	7.2 m (23 ft 9 in.)	7.2 m (23 ft 9 in.)	6.9 m (22 ft 7 in.)

Notes:
(1) For arc flash boundary, see 130.5(E).
(2) All dimensions are distance from exposed energized electrical conductors or circuit part to employee.
[a]For single-phase systems above 250 volts, select the range that is equal to the system's maximum phase-to-ground voltage multiplied by 1.732.
[b]See definition in Article 100 and text in 130.4(E)(3) and Informative Annex C for elaboration.
[c]*Exposed movable conductors* describes a condition in which the distance between the conductor and a person is not under the control of the person. The term is normally applied to overhead line conductors supported by poles.
[d]**The restricted approach boundary in Column 4 is based on an elevation not exceeding 900 m (3000 ft). For higher elevations, adjustment of the restricted approach boundary shall be considered.**
[e]This includes circuits where the exposure does not exceed 120 volts nominal.

Δ Table 130.4(E)(b) **Electric** Shock Protection Approach Boundaries to Exposed Energized Electrical Conductors or Circuit Parts for Direct-Current Voltage Systems

(1)	(2)	(3)	(4)[b]
	Limited Approach Boundary		
Nominal Potential Difference	Exposed Movable Conductor**	Exposed Fixed Circuit Part	Restricted Approach Boundary; Includes Inadvertent Movement Adder
Less than 50 V	Not specified	Not specified	Not specified
50 V–300 V	3.1 m (10 ft 0 in.)	1.0 m (3 ft 6 in.)	Avoid contact
301 V–1 kV	3.1 m (10 ft 0 in.)	1.0 m (3 ft 6 in.)	0.3 m (1 ft 0 in.)
1.1 kV–5 kV	3.1 m (10 ft 0 in.)	1.5 m (5 ft 0 in.)	0.5 m (1 ft 5 in.)
5.1 kV–15 kV	3.1 m (10 ft 0 in.)	1.5 m (5 ft 0 in.)	0.7 m (2 ft 2 in.)
15.1 kV–45 kV	3.1 m (10 ft 0 in.)	2.5 m (8 ft 0 in.)	0.8 m (2 ft 9 in.)
45.1 kV– 75 kV	3.1 m (10 ft 0 in.)	2.5 m (8 ft 0 in.)	1.0 m (3 ft 6 in.)
75.1 kV–150 kV	3.3 m (10 ft 8 in.)	3.1 m (10 ft 0 in.)	1.2 m (3 ft 10 in.)
150.1 kV–250 kV	3.6 m (11 ft 8 in.)	3.6 m (11 ft 8 in.)	1.6 m (5 ft 3 in.)
250.1 kV–500 kV	6.0 m (20 ft 0 in.)	6.0 m (20 ft 0 in.)	3.5 m (11 ft 6 in.)
500.1 kV–800 kV	8.0 m (26 ft 0 in.)	8.0 m (26 ft 0 in.)	5.0 m (16 ft 5 in.)

Note: All dimensions are distance from exposed energized electrical conductors or circuit parts to worker.
**Exposed movable conductor* describes a condition in which the distance between the conductor and a person is not under the control of the person. The term is normally applied to overhead line conductors supported by poles.
[b]The restricted approach boundary in **Column 4 is based** on an elevation **not exceeding 900 m (3000 ft). For higher elevations, adjustment of the restricted approach boundary shall be considered.**

#3(a), #4(b) Personal Protective Equipment (PPE) Table 130.7(C)(15)(c)

Δ Table 130.7(C)(15)(c) Personal Protective Equipment (PPE)

Arc-Flash PPE Category	PPE
1	**Arc-Rated Clothing, Minimum Arc Rating of 4 cal/cm² (16.75 J/cm²)[a]** Arc-rated long-sleeve shirt and pants or arc-rated coverall Arc-rated face shield[b] or arc flash suit hood Arc-rated jacket, parka, high-visibility apparel, rainwear, or hard hat liner (AN)[f] **Protective Equipment** Hard hat Safety glasses or safety goggles (SR) Hearing protection (ear canal inserts)[c] Heavy-duty leather gloves, arc-rated gloves, or rubber insulating gloves with protectors (SR)[d] Leather footwear[e] (AN)
2	**Arc-Rated Clothing, Minimum Arc Rating of 8 cal/cm² (33.5 J/cm²)[a]** Arc-rated long-sleeve shirt and pants or arc-rated coverall Arc-rated flash suit hood or arc-rated face shield[b] and arc-rated balaclava Arc-rated jacket, parka, high-visibility apparel, rainwear, or hard hat liner (AN)[f] **Protective Equipment** Hard hat Safety glasses or safety goggles (SR) Hearing protection (ear canal inserts)[c] Heavy-duty leather gloves, arc-rated gloves, or rubber insulating gloves with protectors (SR)[d] Leather footwear[e]
3	**Arc-Rated Clothing Selected so That the System Arc Rating Meets the Required Minimum Arc Rating of 25 cal/cm² (104.7 J/cm²)[a]** Arc-rated long-sleeve shirt (AR) Arc-rated pants (AR) Arc-rated coverall (AR) Arc-rated arc flash suit jacket (AR) Arc-rated arc flash suit pants (AR) Arc-rated arc flash suit hood Arc-rated gloves or rubber insulating gloves with protectors (SR)[d] Arc-rated jacket, parka, high-visibility apparel, rainwear, or hard hat liner (AN)[f] **Protective Equipment** Hard hat Safety glasses or safety goggles (SR) Hearing protection (ear canal inserts)[c] Leather footwear[e]
4	**Arc-Rated Clothing Selected so That the System Arc Rating Meets the Required Minimum Arc Rating of 40 cal/cm² (167.5 J/cm²)[a]** Arc-rated long-sleeve shirt (AR) Arc-rated pants (AR) Arc-rated coverall (AR) Arc-rated arc flash suit jacket (AR) Arc-rated arc flash suit pants (AR) Arc-rated arc flash suit hood Arc-rated gloves or rubber insulating gloves with protectors (SR)[d] Arc-rated jacket, parka, high-visibility apparel, rainwear, or hard hat liner (AN)[f] **Protective Equipment** Hard hat Safety glasses or safety goggles (SR) Hearing protection (ear canal inserts)[c] Leather footwear[e]

AN: As needed (optional). AR: As required. SR: Selection required.

[a] *Arc rating* is defined in Article 100.

[b] Face shields are to have wrap-around guarding to protect not only the face but also the forehead, ears, and neck, or, alternatively, an arc-rated arc flash suit hood is required to be worn.

[c] Other types of hearing protection are permitted to be used in lieu of or in addition to ear canal inserts provided they are worn under an arc-rated arc flash suit hood.

[d] Rubber insulating gloves with protectors provide arc flash protection in addition to electric shock protection. Higher class rubber insulating gloves with protectors, due to their increased material thickness, provide increased arc flash protection.

[e] Footwear other than leather or dielectric shall be permitted to be used provided it has been tested to demonstrate no ignition, melting or dripping at the minimum arc rating for the respective arc flash PPE category.

[f] The arc rating of outer layers worn over arc-rated clothing as protection from the elements or for other safety purposes, and that are not used as part of a layered system, shall not be required to be equal to or greater than the estimated incident energy exposure.

Arc-Flash Hazard PPE – Table 130.7 (C)(15)(a)

Δ Table 130.7(C)(15)(a) Arc Flash PPE Categories for Alternating Current (ac) Systems

#4 a and c

Equipment	Arc Flash PPE Category	Arc Flash Boundary
Panelboards or other equipment rated 240 volts and below Parameters: Maximum of 25 kA available fault current; maximum of 0.03 sec (2 cycles) fault clearing time; minimum working distance 455 mm (18 in.)	1	485 mm (19 in.)
Panelboards or other equipment rated greater than 240 volts and up to 600 volts Parameters: Maximum of 25 kA available fault current; maximum of 0.03 sec (2 cycles) fault clearing time; minimum working distance 455 mm (18 in.)	2	900 mm (3 ft)
600-volt class motor control centers (MCCs) Parameters: Maximum of 65 kA available fault current; maximum of 0.03 sec (2 cycles) fault clearing time; minimum working distance 455 mm (18 in.)	2	1.5 m (5 ft)
600-volt class motor control centers (MCCs) Parameters: Maximum of 42 kA available fault current; maximum of 0.33 sec (20 cycles) fault clearing time; minimum working distance 455 mm (18 in.)	4	4.3 m (14 ft)
600-volt class switchgear (with power circuit breakers or fused switches) and 600-volt class switchboards Parameters: Maximum of 35 kA available fault current; maximum of up to 0.5 sec (30 cycles) fault clearing time; minimum working distance 455 mm (18 in.)	4	6 m (20 ft)
Other 600-volt class (277 volts through 600 volts, nominal) equipment Parameters: Maximum of 65 kA available fault current; maximum of 0.03 sec (2 cycles) fault clearing time; minimum working distance 455 mm (18 in.)	2	1.5 m (5 ft)
NEMA E2 (fused contactor) motor starters, 2.3 kV through 7.2 kV Parameters: Maximum of 35 kA available fault current; maximum of up to 0.24 sec (15 cycles) fault clearing time; minimum working distance 910 mm (36 in.)	4	12 m (40 ft)
Metal-clad switchgear, 1 kV through 15 kV Parameters: Maximum of 35 kA available fault current; maximum of up to 0.24 sec (15 cycles) fault clearing time; minimum working distance 910 mm (36 in.)	4	12 m (40 ft)
Metal enclosed interrupter switchgear, fused or unfused type construction, 1 kV through 15 kV Parameters: Maximum of 35 kA available fault current; maximum of 0.24 sec (15 cycles) fault clearing time; minimum working distance 910 mm (36 in.)	4	12 m (40 ft)
Other equipment 1 kV through 15 kV Parameters: Maximum of 35 kA available fault current; maximum of up to 0.24 sec (15 cycles) fault clearing time; minimum working distance 910 mm (36 in.)	4	12 m (40 ft)
Arc-resistant equipment up to 600-volt class Parameters: DOORS CLOSED and SECURED; with an available fault current and a fault clearing time that does not exceed the arc-resistant rating of the equipment*	N/A	N/A
Arc-resistant equipment 1 kV through 15 kV Parameters: DOORS CLOSED and SECURED; with an available fault current and a fault clearing time that does not exceed the arc-resistant rating of the equipment*	N/A	N/A

N/A: Not applicable

Note:

For equipment rated 600 volts and below and protected by upstream current-limiting fuses or current-limiting molded case circuit breakers sized at 200 amperes or less, the arc flash PPE category can be reduced by one number but not below arc flash PPE category 1.

*For DOORS OPEN refer to the corresponding non-arc-resistant equipment section of this table.

Informational Note No. 1 to Table 130.7(C)(15)(a): The following are typical fault clearing times of overcurrent protective devices:

(1) 0.5 cycle fault clearing time is typical for current-limiting fuses and current-limiting molded case circuit breakers when the fault current is within the current limiting range.

(2) 1.5 cycle fault clearing time is typical for molded case circuit breakers rated less than 1000 volts with an instantaneous integral trip.

(3) 3.0 cycle fault clearing time is typical for insulated case circuit breakers rated less than 1000 volts with an instantaneous integral trip or relay operated trip.

(4) 5.0 cycle fault clearing time is typical for relay operated circuit breakers rated 1 kV to 35 kV when the relay operates in the instantaneous range (i.e., "no intentional delay").

(5) 20 cycle fault clearing time is typical for low-voltage power and insulated case circuit breakers with a short time fault clearing delay for motor inrush.

(6) 30 cycle fault clearing time is typical for low-voltage power and insulated case circuit breakers with a short time fault clearing delay without instantaneous trip.

Informational Note No. 2 to Table 130.7(C)(15)(a): See Table 1 of IEEE 1584, *Guide for Performing Arc Flash Hazard Calculations*, for further information regarding list items (2) through (4) in Informational Note No. 1.

Informational Note No. 3 to Table 130.7(C)(15)(a): See IEEE C37.20.7, *Guide for Testing Switchgear Rated Up to 52 kV for Internal Arcing Faults*, for an example of a standard that provides information for arc-resistant equipment referred to in Table 130.7(C)(15)(a).

Informational Note No. 4 to Table 130.7(C)(15)(a): See Informative Annex O.2.4(9) for information on arc-resistant equipment.

Arc-Flash Hazard PPE – Table 130.7 (C)(15)(b)

Δ **Table 130.7(C)(15)(b) Arc Flash PPE Categories for dc Systems**

#4 a and c

Equipment	Arc Flash PPE Category	Arc Flash Boundary
Storage batteries, dc switchboards, and other dc supply sources Parameters: Greater than 150 volts and less than or equal to 600 volts Maximum arc duration and minimum working distance: 2 sec @ 455 mm (18 in.)		
Available fault current less than 1.5 kA	2	900 mm (3 ft)
Available fault current greater than or equal to 1.5 kA and less than 3 kA	2	1.2 m (4 ft)
Available fault current greater than or equal to 3 kA and less than 7 kA	3	1.8 m (6 ft.)
Available fault current greater than or equal to 7 kA and less than 10 kA	4	2.5 m (8 ft)

Notes:

(1) Apparel that can be expected to be exposed to electrolyte must meet both of the following conditions:

(a) Be evaluated for electrolyte protection

Informational Note: See ASTM F1296, *Standard Guide for Evaluating Chemical Protective Clothing*, for information on evaluating apparel for protection from electrolyte.

(b) Be arc rated

Informational Note: See ASTM F1891, *Standard Specification for Arc and Flame Resistant Rainwear*, for information on evaluating arc-rated apparel.

(2) A two-second arc duration is assumed if there is no overcurrent protective device (OCPD) or if the fault clearing time is not known. If the fault clearing time is known and is less than 2 seconds, an incident energy analysis could provide a more representative result.

Informational Note No. 1: See D.5 for the basis for table values and alternative methods to determine dc incident energy. Methods should be used with good engineering judgment. When determining available fault current, the effects of cables and any other impedances in the circuit should be included. Power system modeling is the best method to determine the available short-circuit current at the point of the arc. Battery cell short-circuit current can be obtained from the battery manufacturer.

Informational Note No. 2: The methods for estimating the dc arc flash incident energy that were used to determine the categories for this table are based on open-air incident energy calculations. Open-air calculations were used because many battery systems and other dc process systems are in open areas or rooms. If the specific task is within an enclosure, it would be prudent to consider additional PPE protection beyond the value shown in this table.

Informational Note No. 3: See the following references for dc voltages below 150 volts nominal:

(1) J. G. Hildreth and K. Feeney, "Arc Flash Hazards Station Battery Systems," 2018 IEEE Power & Energy Society General Meeting (PESGM), 2018, pp. 1–5.

(2) US Department of Energy Bonneville Power Administration Engineering and Technical Services Report BPA F 5450.05, "DC Arc Flash: 125V, 1500 amp-hour battery," May 11, 2017, doi: 10.1109/PESGM.2018.8586181.

(3) K. Gray, S. Robert, and T. L. Gauthier, "Low Voltage 100–500 Vdc Arc Flash Testing," 2020 IEEE IAS Electrical Safety Workshop (ESW), 2020, pp. 1–7, doi: 10.1109/ESW42757.2020.9188356.

Safety Related Work Practice Definitions

Δ

ARTICLE 100
Definitions

Scope. This article contains only those definitions essential to the proper application of this standard. It is not intended to include commonly defined general terms or commonly defined technical terms from related codes and standards. An article number in parentheses following the definition indicates that the definition only applies to that article.

Accessible (as applied to equipment). Admitting close approach; not guarded by locked doors, elevation, or other effective means. [70:100]

Approved. Acceptable to the authority having jurisdiction.

Arc Flash Suit. A complete arc-rated clothing and equipment system that covers the entire body, except for the hands and feet.

Informational Note: An arc flash suit may include pants or overalls, a jacket or a coverall, and a beekeeper-type hood fitted with a face shield.

Δ **Arc Rating.** The value attributed to materials that describes their performance to exposure to an electrical arc discharge. The arc rating is expressed in cal/cm^2 and is derived from the determined value of the arc thermal performance value (ATPV) or energy of breakopen threshold (E_{BT}) (should a material system exhibit a breakopen response below the ATPV value). Arc rating is reported as either ATPV or E_{BT}, whichever is the lower value.

Informational Note No. 1: Arc-rated clothing or equipment indicates that it has been tested for exposure to an electric arc. Flame-resistant clothing without an arc rating has not been tested for exposure to an electric arc. All arc-rated clothing is also flame resistant.

Informational Note No. 2: See ASTM F1959/F1959M, *Standard Test Method for Determining the Arc Rating of Materials for Clothing*, which defines ATPV as the incident energy (cal/cm^2) on a material or a multilayer system of materials that results in a 50 percent probability that sufficient heat transfer through the tested specimen is predicted to cause the onset of a second degree skin burn injury based on the Stoll curve.

Attachment Plug (Plug Cap) (Plug). A device that, by insertion in a receptacle, establishes a connection between the conductors of the attached flexible cord and the conductors connected permanently to the receptacle. [70:100]

Authority Having Jurisdiction (AHJ). An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure.

Informational Note: The phrase "authority having jurisdiction," or its acronym AHJ, is used in NFPA documents in a broad manner, since jurisdictions and approval agencies vary, as do their responsibilities. Where public safety is primary, the authority having jurisdiction may be a federal, state, local, or other regional department or individual such as a fire chief; fire marshal; chief of a fire prevention bureau, labor department, or health department; building official; electrical inspector; or others having statutory authority. For insurance purposes, an insurance inspection department, rating bureau, or other insurance company representative may be the authority having jurisdiction. In many circumstances, the property owner or his or her designated agent assumes the role of the authority having jurisdiction; at government installations, the commanding officer or departmental official may be the authority having jurisdiction.

N **Authorized Personnel.** The person in charge of the premises, or other persons appointed or selected by the person in charge of the premises who performs certain duties associated with stationary storage batteries. (320)

Automatic. Performing a function without the necessity of human intervention.

Balaclava. An arc-rated head-protective fabric that protects the neck and head except for a small portion of the facial area.

Informationsal Note: Some balaclava designs protect the neck and head area except for the eyes while others leave the eyes and nose area unprotected.

Barricade. A physical obstruction such as tapes, cones, or A-frame-type wood or metal structures intended to provide a warning and to limit access.

Barrier. A physical obstruction that is intended to prevent contact with equipment or energized electrical conductors and circuit parts.

N **Battery.** A system consisting of two or more electrochemical cells connected in series or parallel and capable of storing electrical energy received and that can give it back by reconversion. (320)

N **Battery Effect.** A voltage that exists on the electrolytic cell line after the power supply is disconnected. (310)

Bonding Conductor or Jumper. A reliable conductor to ensure the required electrical conductivity between metal parts required to be electrically connected. [70:100]

Boundary, Arc Flash. (Arc Flash Boundary) When an arc flash hazard exists, an approach limit from an arc source at which incident energy equals 1.2 cal/cm² (5 J/cm²).

Informational Note: According to the Stoll skin burn injury model, the onset of a second degree burn on unprotected skin is likely to occur at an exposure of 1.2 cal/cm² (5 J/cm²) for one second.

N **Boundary, Hearing Protection. (Hearing Protection Boundary)** Worker distance at which a 1 percent probability of ear damage exists from a 20 kPa (3.0 psi) shock wave. (360)

Boundary, Limited Approach. (Limited Approach Boundary) An approach limit at a distance from an exposed energized electrical conductor or circuit part within which an electric shock hazard exists.

N **Boundary, Lung Protection. (Lung Protection Boundary)** Worker distance at which a 1 percent probability of lung damage exists from a 70 kPa (10 psi) shock wave. (360)

Boundary, Restricted Approach. (Restricted Approach Boundary) An approach limit at a distance from an exposed energized electrical conductor or circuit part within which there is an increased likelihood of electric shock, due to electrical arc-over combined with inadvertent movement.

Building. A structure that stands alone or that is cut off from adjoining structures by fire walls with all openings therein protected by approved fire doors. [**70:**100]

Cabinet. An enclosure that is designed for either surface mounting or flush mounting and is provided with a frame, mat, or trim in which a swinging door or doors are or can be hung. [**70:**100]

N **Cell.** The basic electrochemical unit, characterized by an anode and a cathode used to receive, store, and deliver electrical energy. (320)

N **Cell, Valve-Regulated Lead Acid (VRLA). (Valve-Regulated Lead Acid Cell)** A lead-acid cell that is sealed with the exception of a valve that opens to the atmosphere when the internal pressure in the cell exceeds atmospheric pressure by a preselected amount, and that provides a means for recombination of internally generated oxygen and the suppression of hydrogen gas evolution to limit water consumption. (320)

N **Cell, Vented. (Vented Cell)** A type of cell in which the products of electrolysis and evaporation are allowed to escape freely into the atmosphere as they are generated. (Also called "*flooded cell.*") (320)

N **Charge Transfer.** Improper discharging of capacitor networks that results in transferring charge from one capacitor to another capacitor instead of fully discharging the stored energy. (360)

Circuit Breaker. A device designed to open and close a circuit by nonautomatic means and to open the circuit automatically on a predetermined overcurrent without damage to itself when properly applied within its rating. [**70:**100]

Informational Note: The automatic opening means can be integral, direct acting with the circuit breaker, or remote from the circuit breaker.

N **Competent Person.** A person who meets all the requirements of *qualified person*, and who, in addition, is responsible for all work activities or safety procedures related to custom or special equipment and has detailed knowledge regarding the exposure to electrical hazards, the appropriate control methods to reduce the risk associated with those hazards, and the implementation of those methods. (350)

Conductive. Suitable for carrying electric current.

Conductor, Bare. (Bare Conductor) A conductor having no covering or electrical insulation whatsoever. [**70:**100]

Conductor, Covered. (Covered Conductor) A conductor encased within material of composition or thickness that is not recognized by *NFPA 70, National Electrical Code*, as electrical insulation. [**70:**100]

Conductor, Insulated. (Insulated Conductor) A conductor encased within material of composition and thickness that is recognized by *NFPA 70, National Electrical Code*, as electrical insulation. [**70:**100]

Controller. A device or group of devices that serves to govern, in some predetermined manner, the electric power delivered to the apparatus to which it is connected. [**70:**100]

Current-Limiting Overcurrent Protective Device. A device that, when interrupting currents in its current-limiting range, reduces the current flowing in the faulted circuit to a magnitude substantially less than that obtainable in the same circuit if the device were replaced with a solid conductor having comparable impedance.

Cutout. An assembly of a fuse support with either a fuseholder, fuse carrier, or disconnecting blade. The fuseholder or fuse carrier may include a conducting element (fuse link), or may act as the disconnecting blade by the inclusion of a nonfusible member.

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.

Device. A unit of an electrical system, other than a conductor, that carries or controls electric energy as its principal function. [**70:**100]

N **Dielectric Absorption.** The property of certain capacitors to recharge after being discharged. (360)

Informational Note: A voltage recharge from 0.02 percent (polystyrene and polypropylene) up to 10 percent (some electrolytics) can occur a few minutes after the grounding or shorting device has been removed.

N **Discharge Time.** The time required to discharge a capacitor to below electrical hazard thresholds. (360)

Disconnecting Means. A device, or group of devices, or other means by which the conductors of a circuit can be disconnected from their source of supply. [**70:**100]

Disconnecting (or Isolating) Switch (Disconnector, Isolator). A mechanical switching device used for isolating a circuit or equipment from a source of power.

Dwelling Unit. A single unit providing complete and independent living facilities for one or more persons, including permanent provisions for living, sleeping, cooking, and sanitation. [**70:**100]

Electrical Safety. Identifying hazards associated with the use of electrical energy and taking precautions to reduce the risk associated with those hazards.

Electrical Safety Program. A documented system consisting of electrical safety principles, policies, procedures, and processes that directs activities appropriate for the risk associated with electrical hazards.

Δ **Electrically Safe Work Condition.** A state in which an electrical conductor or circuit part has been disconnected from energized parts, locked/tagged in accordance with established standards, tested for the absence of voltage, and, if necessary, temporarily grounded for personnel protection.

N **Electrolyte.** A solid, liquid, or aqueous immobilized liquid medium that provides the ion transport mechanism between the positive and negative electrodes of a cell. (320)

Enclosed. Surrounded by a case, housing, fence, or wall(s) that prevents persons from unintentionally contacting energized parts.

Enclosure. The case or housing of apparatus — or the fence or walls surrounding an installation to prevent personnel from unintentionally contacting energized electrical conductors or circuit parts or to protect the equipment from physical damage.

Energized. Electrically connected to, or is, a source of voltage. [**70**:100]

Equipment. A general term, including fittings, devices, appliances, luminaires, apparatus, machinery, and the like, used as a part of, or in connection with, an electrical installation. [**70**:100]

Equipment, Arc-Resistant. (Arc-Resistant Equipment) Equipment designed to withstand the effects of an internal arcing fault and that directs the internally released energy away from the employee.

Informational Note No. 1: See IEEE C37.20.7, *Guide for Testing Switchgear Rated Up to 52 kV for Internal Arcing Faults*, as an example of a standard that provides information for **arc-resistant** equipment.

Informational Note No. 2: See Informative Annex O.2.4(9) for information on arc-resistant equipment.

Exposed (as applied to energized electrical conductors or circuit parts). Capable of being inadvertently touched or approached nearer than a safe distance by a person. It is applied to electrical conductors or circuit parts that are not suitably guarded, isolated, or insulated.

Exposed (as applied to wiring methods). On or attached to the surface or behind panels designed to allow access. [**70**:100]

Fault Current. The amount of current delivered at a point on the system during a short-circuit condition.

Δ **Fault Current, Available. (Available Fault Current)** The largest amount of current capable of being delivered at a point on the system during a short-circuit condition.

Informational Note No. 1: See Informational Note Figure 100.0 A short circuit can occur during abnormal conditions such as a fault between circuit conductors or a ground fault.

Informational Note No. 2: If the dc supply is a battery system, the term *available fault current* refers to the prospective short-circuit current.

Informational Note No. 3: The available fault current varies at different locations within the system due to the location of sources and system impedances.

N **Field Evaluated.** An evaluation of nonlisted or modified equipment in the field that is performed by persons or parties acceptable to the authority having jurisdiction. (330, 350)

Informational Note No. 1: The evaluation approval ensures that the equipment meets appropriate codes and standards or is similarly found suitable for a specified purpose.

Informational Note No. 2: See NFPA 791, *Recommended Practice and Procedures for Unlabeled Electrical Equipment Evaluation*, for additional information on recommended practices and procedures for the field evaluation of nonlisted equipment.

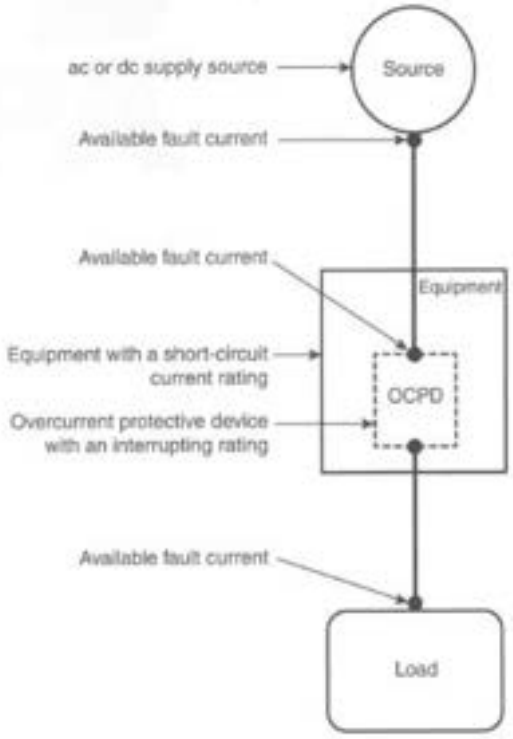
Informational Note No. 3: See NFPA 790, *Standard for Competency of Third-Party Field Evaluation Bodies*, for requirements on evaluating third-party entities.

Fitting. An accessory such as a locknut, bushing, or other part of a wiring system that is intended primarily to perform a mechanical rather than an electrical function. [**70**:100]

Fuse. An overcurrent protective device with a circuit-opening fusible part that is heated and severed by the passage of overcurrent through it.

Informational Note: A fuse comprises all the parts that form a unit capable of performing the prescribed functions. It may or may not be the complete device necessary to connect it into an electrical circuit.

Ground. The earth. [**70**:100]



Informational Note Figure 100.0 Available Fault Current.

Ground Fault. An unintentional, electrically conductive connection between an ungrounded conductor of an electrical circuit and the normally non–current-carrying conductors, metallic enclosures, metallic raceways, metallic equipment, or earth. [**70:**100]

N **Ground Stick.** A device that is used to ensure that the capacitor is discharged by applying it to all terminals of the capacitor element. (360)

Informational Note: This is also called a ground hook and could incorporate power-rated discharge resistors for high-energy applications.

Grounded Conductor. A system or circuit conductor that is intentionally grounded. [**70:**100]

Grounded (Grounding). Connected (connecting) to ground or to a conductive body that extends the ground connection. [**70:**100]

Grounded, Solidly. (Solidly Grounded) Connected to ground without inserting any resistor or impedance device. [**70:**100]

Δ **Ground-Fault Circuit Interrupter (GFCI).** A device intended for the protection of personnel that functions to de-energize a circuit or portion thereof within an established period of time when a current to ground exceeds the values established for a Class A device. [**70:**100]

Informational Note: See UL 943, *Ground-Fault Circuit Interrupters*, for further information. Class A ground-fault circuit interrupters trip when the ground-fault current is 6 mA or higher and does not trip when the ground-fault current is less than 4 mA.

Grounding Conductor, Equipment (EGC). (Equipment Grounding Conductor) The conductive path(s) that provides a ground-fault current path and connects normally non-current-carrying metal parts of equipment together and to the system grounded conductor or to the grounding electrode conductor, or both. [**70:**100]

Informational Note No. 1: It is recognized that the equipment grounding conductor also performs bonding.

Informational Note No. 2: See 250.118 of *NFPA 70, National Electrical Code*, for a list of acceptable equipment grounding conductors.

Grounding Electrode. A conducting object through which a direct connection to earth is established. [**70:**100]

Grounding Electrode Conductor. A conductor used to connect the system grounded conductor or the equipment to a grounding electrode or to a point on the grounding electrode system. [**70:**100]

N **Grounding, Hard (Low-Z). (Hard Grounding)** The practice of discharging a capacitor through a low impedance, also called Low-Z (impedance) grounding. (360)

N **Grounding, Soft (High-Z). (Soft Grounding)** The practice of connecting a capacitor to ground through a power resistor to avoid the hazards related with hard grounding. (360)

Guarded. Covered, shielded, fenced, enclosed, or otherwise protected by means of suitable covers, casings, barriers, rails, screens, mats, or platforms to remove the likelihood of approach or contact by persons or objects to a point of danger. [**70:**100]

Hazard. A source of possible injury or damage to health.

N **Hazard, Arc Blast (as applied to capacitors). (Arc Blast Hazard)** A source of possible injury or damage to health from the energy deposited into acoustical shock wave and high-velocity shrapnel. (360)

Δ **Hazard, Arc Flash. (Arc Flash Hazard)** A source of possible injury or damage to health associated with the release of energy caused by an electric arc.

Informational Note No. 1: See 110.2(B) Exception No. 1 for further information regarding normal operation. The likelihood of occurrence of an arc flash incident increases when energized electrical conductors or circuit parts are exposed or when they are within equipment in a guarded or enclosed condition, provided a person is interacting with the equipment in such a manner that could cause an electric arc. An arc flash incident is not likely to occur under normal operating conditions when enclosed energized equipment has been properly installed and maintained.

Informational Note No. 2: See Table 130.5(C) for examples of tasks that increase the likelihood of an arc flash incident occurring.

Hazard, Electric Shock. (Electric Shock Hazard) A source of possible injury or damage to health associated with current through the body caused by contact or approach to exposed energized electrical conductors or circuit parts.

Informational Note: Injury and damage to health resulting from electric shock is dependent on the magnitude of the electrical current, the power source frequency (e.g., 60 Hz, 50 Hz, dc), and the path and time duration of current through the body. The physiological reaction ranges from perception, muscular contractions, inability to let go, ventricular fibrillation, tissue burns, and death.

Hazard, Electrical. (Electrical Hazard) A dangerous condition such that contact or equipment failure can result in electric shock, arc flash burn, thermal burn, or arc blast injury.

Informational Note: Class 2 power supplies, listed low voltage lighting systems, and similar sources are examples of circuits or systems that are not considered an electrical hazard.

Hazardous. Involving exposure to at least one hazard.

Incident Energy. The amount of thermal energy impressed on a surface, a certain distance from the source, generated during an electrical arc event. Incident energy is typically expressed in calories per square centimeter (cal/cm^2).

Incident Energy Analysis. A component of an arc flash risk assessment used to predict the incident energy of an arc flash for a specified set of conditions.

Insulated. Separated from other conducting surfaces by a dielectric (including air space) offering a high resistance to the passage of current.

Informational Note: When an object is said to be insulated, it is understood to be insulated for the conditions to which it is normally subject. Otherwise, it is, within the purpose of these rules, uninsulated.

Interrupter Switch. A switch capable of making, carrying, and interrupting specified currents.

Interrupting Rating. The highest current at rated voltage that a device is identified to interrupt under standard test conditions. [**70:**100]

Informational Note: Equipment intended to interrupt current at other than fault levels may have its interrupting rating implied in other ratings, such as horsepower or locked rotor current.

Isolated (as applied to location). Not readily accessible to persons unless special means for access are used. [**70:**100]

Labeled. Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization that is acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials, and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

N **Laboratory.** A building, space, room, or group of rooms intended to serve activities involving procedures for investigation, diagnostics, product testing, or use of custom or special electrical components, systems, or equipment. (350)

N **Laser.** A device that produces radiant energy at wavelengths between 180 nm (nanometer) and 1 mm (millimeter) predominantly by controlled stimulated emission. Laser radiation can be highly coherent temporally, spatially, or both. (330)

N **Laser Energy Source.** Any device intended for use in conjunction with a laser to supply energy for the excitation of electrons, ions, or molecules. (330)

N **Laser Radiation.** All electromagnetic radiation emitted by a laser or laser system between 180 nm (nanometers) and 1 mm (millimeters) that is produced as a result of a controlled stimulated emission. (330)

N **Laser System.** A laser in combination with an appropriate laser energy source with or without additional incorporated components. (330)

Listed. Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that either the equipment, material, or service meets appropriate designated standards or has been tested and found suitable for a specified purpose.

Informational Note: The means for identifying listed equipment may vary for each organization concerned with product evaluation; some organizations do not recognize equipment as listed unless it is also labeled. The authority having jurisdiction should utilize the system employed by the listing organization to identify a listed product.

Luminaire. A complete lighting unit consisting of a light source, such as a lamp or lamps, together with the parts designed to position the light source and connect it to the power supply. It may also include parts to protect the light source or the ballast or to distribute the light. A lampholder itself is not a luminaire. [**70:**100]

Maintenance, Condition of. (Condition of Maintenance) The state of the electrical equipment considering the manufacturers' instructions, manufacturers' recommendations, and applicable industry codes, standards, and recommended practices.

Motor Control Center. An assembly of one or more enclosed sections having a common power bus and principally containing motor control units. [**70:**100]

Outlet. A point on the wiring system at which current is taken to supply utilization equipment. [**70:**100]

Overcurrent. Any current in excess of the rated current of equipment or the ampacity of a conductor. It may result from overload, short circuit, or ground fault. [**70:**100]

Informational Note: A current in excess of rating may be accommodated by certain equipment and conductors for a given set of conditions. Therefore, the rules for overcurrent protection are specific for particular situations.

Overload. Operation of equipment in excess of normal, full-load rating, or of a conductor in excess of rated ampacity that, when it persists for a sufficient length of time, would cause damage or dangerous overheating. A fault, such as a short circuit or ground fault, is not an overload. [**70:**100]

Panelboard. A single panel or group of panel units designed for assembly in the form of a single panel, including buses and automatic overcurrent devices, and equipped with or without switches for the control of light, heat, or power circuits; designed to be placed in a cabinet or cutout box placed in or against a wall, partition, or other support; and accessible only from the front. [**70:**100]

N **Pilot Cell.** One or more cells chosen to represent the operating parameters of the entire battery (sometimes called "temperature reference" cell). (320)

Premises Wiring (System). Interior and exterior wiring, including power, lighting, control, and signal circuit wiring together with all their associated hardware, fittings, and wiring devices, both permanently and temporarily installed. This includes: (a) wiring from the service point or power source to the outlets; or (b) wiring from and including the power source to the outlets where there is no service point.

Such wiring does not include wiring internal to appliances, luminaires, motors, controllers, motor control centers, and similar equipment. [**70:**100]

Informational Note: Power sources include, but are not limited to, interconnected or stand-alone batteries, solar photovoltaic systems, other distributed generation systems, or generators.

N **Protective Barrier.** Prevents user access to a hazardous voltage, current, or stored energy area. (330)

N **Protector.** A glove or mitten designed to be worn over rubber insulating gloves.

Qualified Person. One who has demonstrated skills and knowledge related to the construction and operation of electrical equipment and installations and has received safety training to identify the hazards and reduce the associated risk.

Raceway. An enclosed channel of metal or nonmetallic materials designed expressly for holding wires, cables, or busbars, with additional functions as permitted in this standard. [**70:**100]

N **Radiation, Ionizing. (Ionizing Radiation)** Radiation consisting of particles, X-rays, or gamma rays with sufficient energy to cause ionization of atoms or molecules through which it passes. (340)

N **Radiation, Nonionizing. (Nonionizing Radiation)** Static electric and magnetic (0 to 1 Hz), sub radiofrequency (1Hz to 3 kHz), radiofrequency (3 kHz to 300 GHz) fields, and infrared, visible

light, and near ultraviolet (near UV) that cannot ionize an atom or molecule. (340)

Receptacle. A contact device installed at the outlet for the connection of an attachment plug, or for the direct connection of electrical utilization equipment designed to mate with the corresponding contact device. A single receptacle is a single contact device with no other contact device on the same yoke. A multiple receptacle is two or more contact devices on the same yoke. [**70:**100]

N **Research and Development (R&D).** An activity in an installation specifically designated for research or development conducted with custom or special electrical equipment. (350)

N **Resistor, Bleeder. (Bleeder Resistor)** A resistor or resistor network connected in parallel with a capacitor's terminals that dissipates the stored energy after power has been disconnected. (360)

Risk. A combination of the likelihood of occurrence of injury or damage to health and the severity of injury or damage to health that results from a hazard.

Risk Assessment. An overall process that identifies hazards, estimates the likelihood of occurrence of injury or damage to health, estimates the potential severity of injury or damage to health, and determines if protective measures are required.

Informational Note: As used in this standard, *arc flash risk assessment* and *electric shock risk assessment* are types of risk assessments.

N **Safeguarding.** Safeguards for personnel include the consistent administrative enforcement of safe work practices. Safeguards include training in safe work practices, cell line design, safety equipment, PPE, operating procedures, and work checklists. (310)

Service Drop. The overhead conductors between the utility electric supply system and the service point. [**70:**100]

Service Lateral. The underground conductors between the utility electric supply system and the service point. [**70:**100]

Service Point. The point of connection between the facilities of the serving utility and the premises wiring. [**70:**100]

Informational Note: The service point can be described as the point of demarcation between where the serving utility ends and the premises wiring begins. The serving utility generally specifies the location of the service point based on the conditions of service.

N **Short-Circuit Current, Prospective. (Prospective Short-Circuit Current)** The highest level of fault current that could theoretically occur at a point on a circuit. This is the fault current that can flow in the event of a zero impedance short circuit and if no protection devices operate. (320)

Informational Note: Some batteries have built-in management devices to limit maximum short-circuit current. The determination of the prospective short-circuit current for these batteries assumes that the internal battery management system protection devices are operable.

Short-Circuit Current Rating. The prospective symmetrical fault current at a nominal voltage to which an apparatus or system is able to be connected without sustaining damage exceeding defined acceptance criteria. [**70:**100]

Single-Line Diagram. A diagram that shows, by means of single lines and graphic symbols, the course of an electric circuit or system of circuits and the component devices or parts used in the circuit or system.

Special Permission. The written consent of the authority having jurisdiction. [**70:**100]

Step Potential. A ground potential gradient difference that can cause current flow from foot to foot through the body.

Structure. That which is built or constructed. [**70:**100]

Switch, Isolating. (Isolating Switch) A switch intended for isolating an electric circuit from the source of power. It has no interrupting rating, and it is intended to be operated only after the circuit has been opened by some other means. [**70:**100]

Switchboard. A large single panel, frame, or assembly of panels on which are mounted on the face, back, or both, switches, overcurrent and other protective devices, buses, and usually instruments. These assemblies are generally accessible from the rear as well as from the front and are not intended to be installed in cabinets. [**70:**100]

Switchgear, Metal-Clad. (Metal-Clad Switchgear) A switchgear assembly completely enclosed on all sides and top with sheet metal, having drawout switching and interrupting devices, and all live parts enclosed within grounded metal compartments.

Switchgear, Metal-Enclosed. (Metal-Enclosed Switchgear) A switchgear assembly completely enclosed on all sides and top with sheet metal (except for ventilating openings and inspection windows), containing primary power circuit switching, interrupting devices, or both, with buses and connections. This assembly may include control and auxiliary devices. Access to the interior of the enclosure is provided by doors, removable covers, or both. Metal-enclosed switchgear is available in non-arc-resistant or arc-resistant constructions.

Switching Device. A device designed to close, open, or both, one or more electric circuits.

N **Time Constant.** The time it takes for voltage to drop by ~63 percent (1/e) during discharge. (360)

Touch Potential. A ground potential gradient difference that can cause current flow from hand to hand, hand to foot, or another path, other than foot to foot, through the body.

Ungrounded. Not connected to ground or to a conductive body that extends the ground connection. [**70:**100]

Unqualified Person. A person who is not a qualified person.

Utilization Equipment. Equipment that utilizes electric energy for electronic, electromechanical, chemical, heating, lighting, or similar purposes. [**70:**100]

Voltage (of a Circuit). The greatest root-mean-square (rms) (effective) difference of potential between any two conductors of the circuit concerned. [**70:**100]

Informational Note: Some systems, such as three-phase 4-wire, single-phase 3-wire, and 3-wire direct-current, may have various circuits of various voltages.

Δ **Voltage, Nominal. (Nominal Voltage)** A nominal value assigned to a circuit or system for the purpose of conveniently designating its voltage class (e.g., 120/240 volts, 480Y/277 volts, 600 volts). [**70:**100]

Informational Note No. 1: The actual voltage at which a circuit operates can vary from the nominal within a range that permits satisfactory operation of equipment.

Informational Note No. 2: See ANSI C84.1, *Electric Power Systems and Equipment — Voltage Ratings (60 Hz)*.

***N* Voltage, Nominal (as applied to cell or battery). (Nominal Voltage)** The value assigned to a cell or battery of a given voltage class for the purpose of convenient designation; the operating voltage of the cell or system may vary above or below this value. (320)

Informational Note: The most common cell voltages are 2.0 volts per cell for lead-acid batteries, 1.2 volts per cell for alkali batteries, and 3.2 to 3.8 volts per cell for Li-ion batteries. Nominal voltages might vary with different chemistries.

Δ Working Distance. The distance between a person's face and chest area and a prospective arc source.

Informational Note: See 130.5(G) for further information. Incident energy increases as the distance from the arc source decreases.

Δ Working On (energized electrical conductors or circuit parts). Intentionally coming in contact with energized electrical conductors or circuit parts with the hands, feet, or other body parts, with tools, probes, or with test equipment, regardless of the personal protective equipment (PPE) a person is wearing.

Informational Note: Examples of "working on" can include but are not limited to *diagnostic testing* (such as taking readings or measurements of electrical equipment, conductors, or circuit parts with approved test equipment that does not require making any physical change to the electrical equipment, conductors, or circuit parts) and *repair* or physical alteration of electrical equipment, conductors, or circuit parts (such as making or tightening connections, removing or replacing components, etc.).

Section 1 - Introduction and Scope

Introduction

NEI Electric herby adopts this Written Respirable Crystalline Silica Exposure Control Plan for all employees and personnel under the supervision responsibility of this organization who are potentially exposed to airborne respirable crystalline silica particle. This may include contractors, sub-contractors, consultants and temporary workers as defined by the Department of Labor (DOL) and the Occupational Safety and Health Administration (OSHA) if applicable.

The OSHA regulations require the Company to limit worker exposures to respirable crystalline silica and to take other steps to protect workers where concentration of silica is at or could exceed the regulatory limits and action levels as defined by the Final Rule on Silica. This regulation provides flexible alternatives, construction employers can either use a control method listed in Table 1 of the construction standard, or they can measure workers' exposure to silica and independently decide which dust controls work best to limit exposures to the PEL in their workplaces.

Regardless of which exposure control method is used, all construction employers covered by these regulations are required to:

- Establish and implement a written exposure control plan that identifies tasks that involve exposure and methods used to protect workers, including procedures to restrict accessto work areas where high exposures may occur.
- Designate a competent person to implement the written exposure control plan.
- Restrict housekeeping practices that expose workers to silica where feasible alternatives are available.
- Offer medical exams—including chest X-rays and lung function tests—every three years for workers who are required by the standard to wear a respirator for 30 or more days per year.
- Train workers on work operations that result in silica exposure and ways to limit exposure.
- Keep records of workers' silica exposure and medical exams

Employers who choose the specified exposure controls option must fully and properly implement protections for the tasks or equipment listed in Table 1 of the standard. **Employers who fully and properly implement the controls in Table 1 do not have to assess employees' silica exposure levels or keep employee exposures at or below the permissible exposure limit (PEL).**

Employers who follow alternative exposure control methods must:

- Determine the levels of respirable crystalline silica that employees are exposed to;
- Limit employee exposures to a PEL of 50 micrograms per cubic meter of air (50 µg/m3) as an 8-hour time-weighted average (TWA);
- Use engineering and work practice controls, to the extent feasible, to limit employee exposures to the PEL, and supplement the controls with respiratory protection when necessary;
- Keep records of employee exposure to respirable crystalline silica.

NEI Electric intends ***to comply with 29 CFR 1926.1153 Table 1 requirements and controls as part of this Company's written Silica Exposure Control plan.***

Scope

This plan identifies the following hazards that potential have an exposure to airborne respirable crystalline silica. They include but are not limited to the following:

- Drilling concrete, masonry block or gypsum board to install approved anchoring mechanisms used for mounting and securing electrical equipment in a safe and secure location.
- Using Core-Drilling machines to create access and pathways for electrical raceways and cabling as permitted by the National Electrical Code, NFPA-70.
- Using handheld, stationary or walk behind saws used for the cutting asphalt, concrete, masonry block, gypsum board and other material containing any silica or quartz product that could generate airborne respirable crystalline silica particles.
- Mixing, setting and finishing of any concrete mixture containing respirable crystalline silica material.
- Excavations in areas that contain natural concentrations of quartz that exceed or could potentially exceed the permissible exposure limits as promulgated by OSHA regulations.
- Installation, preparation, finishing and demolition operations where sheet rock is found including tapping, mudding, and texturizing work is performed.
- Using jackhammers or other impact tools used for chipping or demolition of concrete or other masonry material.
- All clean-up and housekeeping activities used in conjunction or as a result of the above activities listed above.

Workers and personnel in areas where these activities are or could be present shall be familiar with the proper safe work practices, engineering controls and precautions associated with respirable crystalline silica. If you should have any questions or concerns, please contact a member of the Safety Committee or a member of Management.

Section 2 - Regulations

Occupational Safety and Health Administration (OSHA) 29 CFR 1926.1153: Respirable Crystalline Silica (Construction Industry) and 29 CFR 1910.1053: Respirable Crystalline Silica (General Industry), contain regulatory requirements specific to respirable crystalline silica. This Written Exposure Control Plan is developed in accordance with the requirements in 29 CFR 1926.1153(g).

Additional regulations applicable to this written program are (OSHA) 29 CFR 1910.134, Respiratory Protection Standard and (OSHA) 29 CFR 1910.1200, the Hazard Communication Standard. The respiratory program may include but is not limited to medical evaluations, fit testing and the proper selection and use of respirators. The hazard communication program must include training, labeling and access to safety data sheets (SDS) for associated hazards.

Section 3 - Training

NEI Electric will train all employees who will be working in areas where respirable crystalline silica could be present, and a possible exposure could occur. This training will include methods to identify possible silica containing material, the means to mitigate exposure and the proper personal

protective equipment that must be used when a possible exposure could exist. NEI Electric will also train employees on the requirements found in 29 CFR 1926.1153 Table 1 and the activities, hazards and control methods listed to be in compliance with the regulation.

NEI Electric intends to comply with 29 CFR 1926.1153 Table 1 requirements and controls as part of this company's written silica exposure control plan.

Section 4 - Competent Person

> ***Competent person*** *- means an individual who is capable of identifying existing and foreseeable respirable crystalline silica hazards in the workplace and who has authorization to take prompt corrective measures to eliminate or minimize them. The competent person must have the knowledge and ability necessary to implement the written exposure control plan required under the standard.*

NEI Electric shall identify a competent person responsible for the inspection and management of this written Silica Exposure Control Program and identifying any possible activities where an exposure could occur. The competent person, as appointed by NEI Electric, will be responsible for oversight and implementation of the Company's written Silica Exposure Control Plan and shall be trained in the regulations found in (OSHA) 29 CFR 1926.1153 standards. The competent person will also be trained in the inspection process of work areas and equipment that is or could be related to airborne respirable crystalline silica and associated activities.

Section 5 - Medical Surveillance Requirements

NEI Electric shall institute medical surveillance for any employees required by this Plan to wear a respirator 30 or more days per year. By definition, if a respirator is worn for any portion of a day, it counts as 1 day for the purpose of this 30-day provision. Initial medical surveillance consists of medical and work history with emphasis on: past, present, and anticipated exposure to silica, dust and other agents affecting the respiratory system. This medical surveillance program will follow the guidelines set for in (OSHA) 29 CFR 1926.1153 and all applicable regulations. All subcontractors, consultants and temporary staffing agencies will be responsible for implementing a medical surveillance program for their own employees.

Section 6 - Exposure Assessment

NEI Electric will comply with and implement all controls required by 1926.1153 Table 1- Exposure Control Methods for Selected Construction Operations or as an alternative conduct an initial determination in accordance with 29 CFR 1926.1153(d)(2).

- The competent person will make an initial assessment of exposure to determine the appropriate Table 1 control method to protect employees and others in the affected area.
- The competent person will inspect the work area and ensure all appropriate personal protective equipment is provided and is in good working order.
- The competent person will determine the appropriate respiratory protection that is required and ensure all workers are properly provided with and trained in the use and care of all respiratory equipment that is used.
- If engineering and control methods are used in silica control and abatement processes, the competent person will ensure these measures offer satisfactory protection for all

employees and other that could be in the affect area and also maintained in good and proper working order.

- If conditions warrant or alternative measures are employed, the competent person will engage an Industrial Hygienist (IH) to review, inspect and implement proper control measures necessary for compliance.

Section 7 - Engineering Controls and Work Methods

If silica exposures exceed or are expected to exceed action levels and/or permissible exposure limits (PELs), engineering and work practice control methods will be implemented to reduce all exposures to nonhazardous levels below the PEL.

Engineering Controls include but are not limited to the following:

- Water Delivery Systems - Integrated water delivery systems are required for several types of equipment in Table 1. Integrated water systems must be developed specifically for the type of tool in use so they will apply water at the appropriate dust emission points based on tool configuration and do not interfere with other tool components or safety devices. Water systems designed for blade cooling also suppress dust and meet the requirements for Table 1. Any slurry generated when using water to suppress dust should be cleaned up to limit secondary exposure to silica dust when the slurry dries following procedures described in the employer's *Written Exposure Control Plan*.
- Dust Collection Systems - Commercially available dust collection systems are required for several types of equipment in Table 1. This equipment may be integral to the tool or provided as an external option to comply with the provisions of this engineering control. This requirement ensures that employers use equipment that is designed to effectively capture dust generated by the tool being used and does not introduce new hazards such as obstructing or interfering with safety mechanisms.
- Enclosed Cabs or Booths - Enclosed cabs or booths are specified for rock drilling, crushers, and heavy equipment and not generally used in electrical construction.
- If administrative controls are used to limit exposure, the competent person will establish and implement a job rotation schedule that includes employee identification as well as the duration and exposure levels at each job or work station where each affected employee is located.

Work practice controls involve performing a task in a way that reduces the likelihood or levels of exposure. Work practice controls are often used with engineering controls to protect employees. Employees must know the appropriate work practices for maximizing the effectiveness of controls and minimizing exposures. Examples of work practice controls include:

- Using water spray nozzles at the point of dust generation as a wet-control method and minimize exposure.
- Making sure all hoses for water and dust collection systems are free from any obstructions that could affect proper operation.
- Wetting down or using approved material to minimize dust during sweeping and/or clean-up operations.
- Scheduling work when no other employees will be exposed to any hazardous dust.

Reducing exposures through the primary use of engineering and work practice controls is also known as the hierarchy of controls.

Section 8 - Personal Protective Equipment (PPE)

NEI Electric will provide employees, at no cost to the individual, protective work clothing and equipment including cotton coveralls or similar full-body clothing, gloves, hats, shoes or disposable shoe coverlets, face shields, vented goggles, or other appropriate PPE where necessary.

Personal protective equipment for the control of respirable crystalline silica includes but not limited to the following:

- Respirators – See 29 CFR 1910.134 for requirements of a written respirator program.
- Garments or other coveralls that can be worn to prevent contamination of a worker's personal garments and prevent cross contamination.
- Gloves.
- Eye and face protection.

Ensure that:

- PPE is properly evaluated for the exposure and is appropriate for the environment;
- PPE is stored and maintained properly and in good working order;
- You have been provided with training and proper instructions on the use and limitation of the PPE that is provided.

Section 9 - Housekeeping

NEI Electric has developed this written plan and procedures to minimize generating airborne respirable crystalline silica. This program generally prohibits dry sweeping, dry brushing or using compressed air when respirable silica particles are present. This program also includes a plan for when other approved methods may not be available. This includes the following:

- Restricting housekeeping practices that expose employees to respirable crystalline silica where feasible alternatives are available.
- What methods the employer will permit and prohibit to minimize airborne silica.
- Instructions for compliance with manufacturer's instructions and accepted safe work practices used during the cleanup process.
- Not allow dry brushing or dry sweeping, unless methods such as wet sweeping and HEPA-filtered vacuuming are not feasible.
- Proper individual hygiene when working with and around respirable crystalline silica.
- When and where a respirator is required or if there are any specific precautions when using a specified housekeeping procedure.
- Not allow cleaning of surfaces or clothing with compressed air, unless the compressed air is used together with a ventilation system that effectively captures the dust cloud or no other cleaning method is feasible.

Description of procedures to restrict access in detail:

- The company intends to restrict access to other employees and non-employees in areas where exposure levels could exceed permissible limits and where a respirator may be required by using warning signs, barricades and other notification procedures.
- This information be communicated during job briefings, safety talks and host/employer construction meetings and with all company employees, general contractor employees, sub-contractor employees and temporary workers.
- This procedure may include the scheduling of work when other employees and non-employees would not be in the affected area(s).

Review and Evaluate Effectiveness Annually

This written plan and the procedures found within should be reviewed at least annually and when there is any change in procedure, methods or exposures that could affect employees and non-employees.

There is also a basic site-specific Silica Control Plan the covers the basic day-to-day tasks for electrical construction. If there is a task outside of this plan, please work with the office to develop a specific control plan for your site or task.

NEI Electric - Silica Control Plan

Company: NEI Electric Date:

Person Completing the Plan/Title: Larry Koenig / Safety Director

Jobsite / Project :

Description of Work: Using hammer drill to provide area to attach electrical components to block walls, precast or drywall

Competent Person:

**If you have questions please contact the office.

1. **Material:** Concrete **Task:** Drilling/coring

   Equipment and Control (s)
   - Core Drill with Water (Table 1 Entry)
   - Hand-Held Drill with Vacuum (Table 1 Entry) or (objective data)

   Task/Control Description
   - Hammer drilling into precast ceiling or walls to place electrical components

2. **Material:** Concrete **Task:** Sweeping/cleaning up

   Equipment and Control (s)
   - Sweeping Compound or properly rated HEPA vacuum

   Task Control Description
   - Sweep up with compound and or vacuum up any residue on floor from drilling tasks

3. **Material:** Concrete Block **Task:** Drilling/coring

   Equipment and Control (s)
   - Hand-Held Drill with Vacuum (Table 1 Entry) or (objective data)

   Task Control Description
   - Hammer drill into block with vacuum suction attached

4. **Material:** Concrete Block **Task:** Sweeping/Cleaning Up

   Equipment and Control (s)
   - Sweeping Compound or properly rated HEPA vacuum

   Task/Control Description
   - Sweep up with compound and or vacuum up any residue on floor from drilling tasks

5. **Material:** Drywall **(if it contains Silica, see SDS sheet) Task:** Drilling/coring/cutting

   Equipment and Control (s)
   - General N95 Respiratory Protection

   Task/Control Description
   - Drill/cut into drywall to place electrical components
   - Use 8511 3M disposable respirator

6. **Material:** Drywall **Task:** Sweeping/cleaning up

   Equipment and Control (s)
   - Sweeping Compound or properly rated HEPA vacuum

   Task/Control Description
   - Sweep up with compound and or vacuum up any residue on floor from drilling and cutting tasks

Safety of Others:
Electricians are mainly hammer drilling intermittently and not exposing other employees to a silica hazard. Drilling is typically done by one electrician as part of the regular scope of work.

Worker Training:
Workers will be provided new silica standard.
Silica hazards will be discussed at safety meetings, through tool box talk and on-site training.
Respiratory training will be completed along with completion of a pulmonary questionnaire as required.
Appropriate dust collection equipment will be used on tools such as drills and vacuums.

Housekeeping:
Housekeeping (sweeping) will be done by broom and compound or HEPA vacuum.

Medical Surveillance:
Medical surveillance will be available to any worker who is exposed to silica dust greater than 30 days per calendar year.

Other Considerations:
Coordinate activity with other trades on site and the controlling contractor.

Table 1: Specified Exposure Control Methods

TABLE 1: SPECIFIED EXPOSURE CONTROL METHODS WHEN WORKING WITH MATERIALS CONTAINING CRYSTALLINE SILICA[1]				
Equipment/Task	**Engineering and Work Practice Control Methods**	**Required Respiratory Protection and Minimum Assigned Protection Factor (APF)**		**What does *full and proper* implementation require?•**
		≤ 4 hours /shift	**> 4 hours /shift**	
(i) Stationary masonry saws 	Use saw equipped with integrated water delivery system that continuously feeds water to the blade. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	None	Water Controls: • An adequate supply of water for dust suppression is used; • The spray nozzle is working properly to apply water at the point of dust generation; • The spray nozzle is not clogged or damaged; and • All hoses and connections are intact.
(ii) Handheld power saws (any blade diameter) 	Use saw equipped with integrated water delivery system that continuously feeds water to the blade. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. • When used outdoors. • When used indoors or in an enclosed area.	None APF 10	APF 10 APF 10	Water Controls: • An adequate supply of water for dust suppression is used; • The spray nozzle is working properly to apply water at the point of dust generation; • The spray nozzle is not clogged or damaged; • All hoses and connections are intact.

TABLE 1: SPECIFIED EXPOSURE CONTROL METHODS WHEN WORKING WITH MATERIALS CONTAINING CRYSTALLINE SILICA[1]				
Equipment/Task	**Engineering and Work Practice Control Methods**	**Required Respiratory Protection and Minimum Assigned Protection Factor (APF)**		**What does *full and proper* implementation require?•**
		≤ 4 hours /shift	**> 4 hours /shift**	
(iii) Handheld power saws for cutting fiber-cement board (with blade diameter of 8 inches or less) 	For tasks performed outdoors only: • Use saw equipped with commercially available dust collection system. • Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. • Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency.	None	None	Dust Collection Systems: • The shroud or cowling is intact and installed in accordance with the manufacturer's instructions; • The hose connecting the tool to the vacuum is intact and without kinks or tight bends; • The filter(s) on the vacuum are cleaned or changed in accordance with the manufacturer's instructions to prevent clogging; and • The dust collection bags are emptied to avoid overfilling.
(iv) Walk-behind saws 	Use saw equipped with integrated water delivery system that continuously feeds water to the blade. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. • When used outdoors. • When used indoors or in an enclosed area.	None APF 10	None APF 10	Water Controls: • An adequate supply of water for dust suppression is used; • The spray nozzles are working properly to apply water at the point of dust generation; • The spray nozzles are not clogged or damaged; and • All hoses and connections are intact.

TABLE 1: SPECIFIED EXPOSURE CONTROL METHODS WHEN WORKING WITH MATERIALS CONTAINING CRYSTALLINE SILICA[1]				
Equipment/Task	**Engineering and Work Practice Control Methods**	**Required Respiratory Protection and Minimum Assigned Protection Factor (APF)**		**What does *full and proper* implementation require?•**
		≤ 4 hours /shift	**> 4 hours /shift**	
(v) Drivable saws 	For tasks performed outdoors only: ▪ Use saw equipped with integrated water delivery system that continuously feeds water to the blade. ▪ Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	None	Water Controls: ▪ An adequate supply of water for dust suppression is used; ▪ The spray nozzles produce a pattern that applies water at the point of dust generation; ▪ The spray nozzles are not clogged or damaged; and ▪ All hoses and connections are intact.
(vi) Rig-mounted core saws or drills 	▪ Use tool equipped with integrated water delivery system that supplies water to cutting surface. ▪ Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	None	Water Controls: ▪ An adequate supply of water for dust suppression is used; ▪ The spray nozzles produce a pattern that applies water at the point of dust generation; ▪ The spray nozzles are not clogged or damaged; and ▪ All hoses and connections are intact.

TABLE 1: SPECIFIED EXPOSURE CONTROL METHODS WHEN WORKING WITH MATERIALS CONTAINING CRYSTALLINE SILICA[1]				
Equipment/Task	**Engineering and Work Practice Control Methods**	**Required Respiratory Protection and Minimum Assigned Protection Factor (APF)**		**What does *full and proper* implementation require?•**
		≤ 4 hours /shift	**> 4 hours /shift**	
(vii) Handheld and stand-mounted drills (including impact and rotary hammer drills) 	▪ Use drill equipped with commercially available shroud or cowling with dust collection system. ▪ Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. ▪ Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism. ▪ Use a HEPA-filtered vacuum when cleaning holes.	None	None	Dust Collection Systems: ▪ The shroud or cowling is intact and installed in accordance with the manufacturer's instructions; ▪ The hose connecting the tool to the vacuum is intact and without kinks or tight bends; ▪ The filter(s) on the vacuum are cleaned or changed in accordance with the manufacturer's instructions; and ▪ The dust collection bags are emptied to avoid overfilling.

TABLE 1: SPECIFIED EXPOSURE CONTROL METHODS WHEN WORKING WITH MATERIALS CONTAINING CRYSTALLINE SILICA[1]				
Equipment/Task	**Engineering and Work Practice Control Methods**	**Required Respiratory Protection and Minimum Assigned Protection Factor (APF)**		**What does *full and proper* implementation require?•**
		≤ 4 hours /shift	**> 4 hours /shift**	
(viii) Dowel drilling rigs for concrete 	For tasks performed outdoors only: ▪ Use shroud around drill bit with a dust collection system. Dust collector must have a filter with 99% or greater efficiency and a filter-cleaning mechanism. ▪ Use a HEPA-filtered vacuum when cleaning holes.	APF 10	APF 10	Dust Collection Systems: ▪ The shroud is intact and installed in accordance with the manufacturer's instructions; ▪ The hose connecting the tool to the vacuum is intact and without kinks or tight bends; ▪ The filter(s) on the vacuum are cleaned or changed in accordance with the manufacturer's instructions; and ▪ The dust collection bags are emptied to avoid overfilling.

TABLE 1: SPECIFIED EXPOSURE CONTROL METHODS WHEN WORKING WITH MATERIALS CONTAINING CRYSTALLINE SILICA[1]				
Equipment/Task	**Engineering and Work Practice Control Methods**	**Required Respiratory Protection and Minimum Assigned Protection Factor (APF)**		**What does *full and proper* implementation require?•**
		≤ 4 hours /shift	**> 4 hours /shift**	
(ix) Vehicle-mounted drilling rigs for rock and concrete 	Use dust collection system with close capture hood or shroud around drill bit with a low-flow water spray to wet the dust at the discharge point from the dust collector. OR Operate from within an enclosed cab and use water for dust suppression on drill bit.	None None	None None	Dust Collection Systems: ▪ The shroud or hood is intact and installed in accordance with the manufacturer's instructions; ▪ The hose connecting the tool to the vacuum is intact and without kinks or tight bends; ▪ The filter(s) on the vacuum are cleaned or changed in accordance with the manufacturer's instructions; and ▪ The dust collection bags are emptied to avoid overfilling. Water Controls: ▪ An adequate supply of water for dust Suppression is used; ▪ The spray nozzles are working properly and produce a pattern that applies water on the discharge point from the dust collector; ▪ The spray nozzles are not clogged or damaged; and ▪ All hoses and connections are intact.

TABLE 1: SPECIFIED EXPOSURE CONTROL METHODS WHEN WORKING WITH MATERIALS CONTAINING CRYSTALLINE SILICA[1]				
Equipment/Task	**Engineering and Work Practice Control Methods**	**Required Respiratory Protection and Minimum Assigned Protection Factor (APF)**		**What does *full and proper* implementation require?•**
		≤ 4 hours /shift	**> 4 hours /shift**	
(x) Jackhammers and handheld powered chipping tools 	Use tool with water delivery system that supplies a continuous stream or spray of water at the point of impact. ▪ When used outdoors. ▪ When used indoors or in an enclosed area. OR Use tool equipped with commercially available shroud and dust collection system. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism. ▪ When used outdoors. ▪ When used indoors or in an enclosed area.	None APF 10 None APF 10	APF 10 APF 10 APF 10 APF 10	Water Controls[2]: ▪ An adequate supply of water for dust suppression is used; ▪ The water sprays are working properly and produce a pattern that applies water at the point of dust generation; ▪ The spray nozzles are not clogged or damaged; and ▪ All hoses and connections are intact. Dust Collection Systems: ▪ The shroud is intact and installed in accordance with the manufacturer's instructions; ▪ The hose connecting the tool to the vacuum is intact and without kinks or tight bends; ▪ The filter(s) on the vacuum are cleaned or changed in accordance with the manufacturer's instructions; and ▪ The dust collection bags are emptied to avoid overfilling.

TABLE 1: SPECIFIED EXPOSURE CONTROL METHODS WHEN WORKING WITH MATERIALS CONTAINING CRYSTALLINE SILICA[1]				
Equipment/Task	**Engineering and Work Practice Control Methods**	**Required Respiratory Protection and Minimum Assigned Protection Factor (APF)**		**What does *full and proper* implementation require?•**
		≤ 4 hours /shift	**> 4 hours /shift**	
(xi) Handheld grinders for mortar removal (i.e., tuckpointing) 	Use grinder equipped with commercially available shroud and dust collection system. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism.	APF 10	APF 25	Dust Collection Systems: ▪ The shroud is intact, encloses most of the grinding blade, and is installed in accordance with the manufacturer's instructions; ▪ The hose connecting the tool to the vacuum is intact and without kinks or tight bends; ▪ The filter(s) on the vacuum are cleaned or changed in accordance with the manufacturer's instructions; ▪ The dust collection bags are emptied to avoid overfilling; ▪ The blade is kept flush against the surface whenever possible; and ▪ The tool is operated against the direction of blade rotation, whenever practical.

TABLE 1: SPECIFIED EXPOSURE CONTROL METHODS WHEN WORKING WITH MATERIALS CONTAINING CRYSTALLINE SILICA[1]				
Equipment/Task	**Engineering and Work Practice Control Methods**	**Required Respiratory Protection and Minimum Assigned Protection Factor (APF)**		**What does *full and proper* implementation require?•**
		≤ 4 hours /shift	**> 4 hours /shift**	
(xii) Handheld grinders for uses other than mortar removal 	For tasks performed outdoors only: Use grinder equipped with integrated water delivery system that continuously feeds water to the grinding surface. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. OR Use grinder equipped with commercially available shroud and dust collection system. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism. ▪ When used outdoors. ▪ When used indoors or in an enclosed area.	None None None	None None APF 10	Water Controls[8]: ▪ An adequate supply of water for dust suppression is used; ▪ The spray nozzles are working properly and produce a pattern that applies water at the point of dust generation; ▪ The spray nozzles are not clogged or damaged; and ▪ All hoses and connections are intact. Dust Collection Systems: ▪ The shroud is intact and installed in accordance with the manufacturer's instructions; ▪ The hose connecting the tool to the vacuum is intact and without kinks or tight bends; ▪ The filter(s) on the vacuum are cleaned or changed in accordance with the manufacturer's instructions; and ▪ The dust collection bags are emptied to avoid overfilling.

TABLE 1: SPECIFIED EXPOSURE CONTROL METHODS WHEN WORKING WITH MATERIALS CONTAINING CRYSTALLINE SILICA[1]				
Equipment/Task	**Engineering and Work Practice Control Methods**	**Required Respiratory Protection and Minimum Assigned Protection Factor (APF)**		**What does *full and proper* implementation require?•**
		≤ 4 hours /shift	**> 4 hours /shift**	
(xiii) Walk-behind milling machines and floor grinders 	Use machine equipped with integrated water delivery system that continuously feeds water to the cutting surface. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. OR Use machine equipped with dust collection system recommended by the manufacturer. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. Dust collector must provide the air flow recommended by the manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism. When used indoors or in an enclosed area, use a HEPA-filtered vacuum to remove loose dust in between passes.	None None	None None	Water Controls: ▪ An adequate supply of water for dust suppression is used; ▪ The spray nozzles are working properly and produce a pattern that applies water at the point of dust generation; ▪ The spray nozzles are not clogged or damaged; and ▪ All hoses and connections are intact. Dust Collection Systems: ▪ The hose connecting the tool to the vacuum is intact and without kinks or tight bends; ▪ The filter(s) on the vacuum are cleaned or changed in accordance with the manufacturer's instructions to prevent clogging; and ▪ The dust collection bags are emptied to avoid overfilling.

TABLE 1: SPECIFIED EXPOSURE CONTROL METHODS WHEN WORKING WITH MATERIALS CONTAINING CRYSTALLINE SILICA[1]				
Equipment/Task	**Engineering and Work Practice Control Methods**	**Required Respiratory Protection and Minimum Assigned Protection Factor (APF)**		**What does *full and proper* implementation require?•**
		≤ 4 hours /shift	**> 4 hours /shift**	
(xiv) Small drivable milling machines (less than half-lane) 	Use a machine equipped with supplemental water sprays designed to suppress dust. Water must be combined with a surfactant. Operate and maintain machine to minimize dust emissions.	None	None	Water Controls: ▪ An adequate supply of water for dust suppression is used; ▪ The spray nozzles are working properly and produce a pattern that applies water at the point of dust generation; ▪ The spray nozzles are not clogged or damaged; and ▪ All hoses and connections are intact.

TABLE 1: SPECIFIED EXPOSURE CONTROL METHODS WHEN WORKING WITH MATERIALS CONTAINING CRYSTALLINE SILICA[1]				
Equipment/Task	**Engineering and Work Practice Control Methods**	**Required Respiratory Protection and Minimum Assigned Protection Factor (APF)**		**What does *full and proper* implementation require?•**
		≤ 4 hours /shift	**> 4 hours /shift**	
(xv) Large drivable milling machines (half-lane and larger) 	For cuts of any depth on asphalt only: Use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust. Operate and maintain machine to minimize dust emissions. For cuts of four inches in depth or less on any substrate: Use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust. Operate and maintain machine to minimize dust emissions. OR Use a machine equipped with supplemental water spray designed to suppress dust. Water must be combined with a surfactant. Operate and maintain machine to minimize dust emissions.	None None None	None None None	No additional information provided. Refer to the engineering and work practice control methods outlined.

TABLE 1: SPECIFIED EXPOSURE CONTROL METHODS WHEN WORKING WITH MATERIALS CONTAINING CRYSTALLINE SILICA[1]				
Equipment/Task	**Engineering and Work Practice Control Methods**	**Required Respiratory Protection and Minimum Assigned Protection Factor (APF)**		**What does *full and proper* implementation require?•**
		≤ 4 hours /shift	**> 4 hours /shift**	
(xvi) Crushing machines 	Use equipment designed to deliver water spray or mist for dust suppression at crusher and other points where dust is generated (e.g., hoppers, conveyers, sieves/sizing or vibrating components, and discharge points). Operate and maintain machine in accordance with manufacturer's instructions to minimize dust emissions. Use a ventilated booth that provides fresh, climate-controlled air to the operator, or a remote control station.	None	None	Water Controls[††]: ▪ Nozzles are located upstream of dust generation points and positioned to thoroughly wet the material; ▪ The volume and size of droplets is adequate to sufficiently wet the material (optimal droplet size is between 10 and 150 µm); and ▪ Spray nozzles are located far enough from the target area to provide complete water coverage but not so far that the water is carried away by wind.

TABLE 1: SPECIFIED EXPOSURE CONTROL METHODS WHEN WORKING WITH MATERIALS CONTAINING CRYSTALLINE SILICA[1]				
Equipment/Task	**Engineering and Work Practice Control Methods**	**Required Respiratory Protection and Minimum Assigned Protection Factor (APF)**		**What does *full and proper* implementation require?•**
		≤ 4 hours /shift	**> 4 hours /shift**	
(xvii) Heavy equipment and utility vehicles used to abrade or fracture silica-containing materials (e.g., hoe-ramming, rock ripping) or used during demolition activities involving silica-containing materials†† 	Operate equipment from within an enclosed cab. When employees outside of the cab are engaged in the task, apply water and/or dust suppressants as necessary to minimize dust emissions.	None None	None None	No additional information provided. Refer to the engineering and work practice control methods outlined.

TABLE 1: SPECIFIED EXPOSURE CONTROL METHODS WHEN WORKING WITH MATERIALS CONTAINING CRYSTALLINE SILICA[1]				
Equipment/Task	**Engineering and Work Practice Control Methods**	**Required Respiratory Protection and Minimum Assigned Protection Factor (APF)**		**What does *full and proper* implementation require?•**
		≤ 4 hours /shift	**> 4 hours /shift**	
(xviii) Heavy equipment and utility vehicles for tasks such as grading and excavating but not including: demolishing, abrading, or fracturing silica-containing materials 	Apply water and/or dust suppressants as necessary to minimize dust emissions. OR When the equipment operator is the only employee engaged in the task, operate equipment from within an enclosed cab.	None None	None None	The following scenarios are examples of when the employer must use water and/or dust suppressants as necessary to minimize dust emissions: ▪ Equipment for grading and excavating is not equipped with enclosed, pressurized cabs. OR ▪ Employees other than the operator are engaged in the task. If water or dust suppressants are applied as necessary to minimize visible dust, the employer need not provide an enclosed, filtered cab for the operator.

APF 10 (requires fit testing)		APF 25	
			
Dust Mask/Half Mask	Half Mask (Elastomeric)	Loose-Fitting Powered Air-Purifying Respirator (PAPR)	Hooded Powered Air-Purifying Respirator (PAPR)

[1] (1) When implementing the control measures specified in Table 1, each employer shall:

i. *For tasks performed using wet methods*, apply water at flow rates sufficient to minimize release of visible dust. The appropriate water flow rates for controlling silica dust emissions can vary; therefore, it is necessary to follow manufacturers' instructions when determining the required flow rate for dust suppression systems on a given worksite. Integrated water systems must be developed specifically for the type of tool in use so they will apply water at the appropriate dust emission points based on tool configuration and do not interfere with other tool components or safety devices.

Any slurry generated when using water to suppress dust should be cleaned up to limit secondary exposure to silica dust when the slurry dries following procedures described in the employer's *Written Exposure Control Plan*.

When working in cold temperatures, where there is a risk of water freezing, additional work practices such as insulating drums, wrapping drums with gutter heat tape or adding environmentally-friendly antifreeze.

ii. *For tasks performed using commercially available, dust collection systems (i.e. LEV)*, use equipment that is designed to effectively capture dust generated by the tool being used and does not introduce new hazards such as obstructing or interfering with safety mechanisms. The "commercially available" limitation is meant only to eliminate on-site improvisations of equipment by the employer. When employers use methods other than commercially available systems for dust suppression, they must conduct exposure assessments and comply with the PEL.

Some Table 1 entries for dust collection systems specify use of cyclonic pre-separators and filter cleaning mechanisms to prevent buildup of debris on filters that result in less dust capture. A cyclonic pre-separator collects large debris before the air reaches the filters. A filter cleaning mechanism prevents the need for manually cleaning filters to prevent buildup of debris (caking). Some vacuums are equipped with a gauge indicating filter pressure or an equivalent device (*e.g.*, timer to periodically pulse the filter) to help employees in determining when it is time to run a filter cleaning cycle.

i. *For tasks performed indoors or in enclosed areas*, provide a means of exhaust as needed to minimize the accumulation of visible airborne dust. Indoors or in an enclosed areas mean areas where airborne dust can build up unless additional exhaust is used. Sufficient air circulation in enclosed or indoor environments is important to ensure the effectiveness of the control strategies and to prevent the accumulation of airborne dust. The means of exhaust necessary could include: the use of portable fans (box fans, floor fans, and axial fans), portable ventilation systems, or other systems that increase air movement and assist in the removal and dispersion of airborne dust. To be effective, the ventilation must be set up so that movements of employees during work, or the opening of doors and windows, will not negatively affect the airflow.

ii. *For measures implemented that include an enclosed cab or booth*, ensure that the enclosed cab or booth:
   a. Is maintained as free as practicable from settled dust;
   b. Has door seals and closing mechanisms that work properly;
   c. Has gaskets and seals that are in good condition and working properly;
   d. Is under positive pressure maintained through continuous delivery of fresh air;
   e. Has intake air that is filtered through a filter that is 95% efficient in the 0.3-10.0 µm range (e.g., MERV-16 or better); and
   f. Has heating and cooling capabilities.

(2) Where an employee performs more than one task on Table 1 during the course of a shift, and the total duration of all tasks combined is more than four hours, the required respiratory protection for each task is the respiratory protection specified for more than four hours per shift. If the total duration of all tasks on Table 1 combined is less than four hours, the required respiratory protection for each task is the respiratory protection specified for less than four hours per shift.

* Refer to OSHA's Small Entity Compliance Guide for more information.

‖ The water delivery system is not required to be integrated or mounted on the tool; it can be assembled and installed by the employer. Acceptable water delivery systems include direct connections to fixed water lines or portable water tank systems. These water delivery systems can be operated by one worker or could require a second worker to supply the water at the point of impact.

‖ The integrated water delivery system can be a free-flowing water system designed for blade cooling as well as manufacturers' systems designed for dust suppression alone. This option applies only when grinders are used outdoors.

†† The water spray systems can be installed so that they can be activated by remote control.

** NOTE: When the operator exits the enclosed cab and is no longer actively preforming the task, the operator is considered to have stopped the task. However, if other abrading, fracturing, or demolition work is performed by other heavy equipment and utility vehicles in the area while an operator is outside the cab, that operator is considered to be an employee "engaged in the task" and must be protected by the application of water and/or dust suppressants.

Respiratory Program

NEI Electric policy is that prior to any employee performing work that may require a respirator, that employee must complete all requirements as outlined in this program.

Respirator Selection

Respirator selection will be made upon completion of a workplace evaluation, user factors, filter protection, and a medical evaluation. A sufficient number of respirator models will be offered to employees to ensure an adequate fit. Respirators will be assigned and provided at no cost to employees for their exclusive use.

Workplace Evaluation:

- Identification of respiratory hazards, health effects, and symptoms.
- Hazard properties of contaminants in their chemical state and physical form.
- Air quality monitoring to determine the concentration of contaminants may be implemented.
- Assessment of workplace conditions, temperatures, and workload of affected employees.

User Factors:

- Assessment of how environmental stress factors and contaminants may affect the respirator performance.
- Identification of eye or face hazards from contaminant.
- Limitations to affected employees caused by respiratory protection use.

Filter Selection:

- Only filters and respirators with NIOSH/DHHS certification may be used.
- Particulate filter selection must be made from NIOSH rating system.
- Protection factors must be adequate for known contaminants, concentrations, and environmental stress factors.

Medical Evaluation:

- Affected employees must complete a medical evaluation to determine their ability to wear a respirator.
- NEI Electric and the employee will follow any restrictions imposed by a physician or licensed health care professional.

There are three categories of respirators to select from when limiting workplace exposures.

Negative Pressure Respirator: A respirator in which the air pressure inside the facepiece is negative during inhalation with respect to the air pressure outside the respirator.

- Contaminated air is drawn through filters, which capture specific contaminant(s).
- Air is released through the exhalation valve, which then closes to prevent contaminated air from being drawn in.
- A full-face piece option is available to provide eye and face protection.

Positive Pressure Respirator: A respirator in which the pressure inside the respiratory inlet covering exceeds the ambient pressure outside the respirator.

- Self Contained Breathing Apparatus (SCBA), and Supplied Air Respirators (SAR's), provide an atmospheric supply of air to the user.
- Powered Air Purifying Respirators (PAPR's), uses a blower to force ambient air through air-purifying elements to the respirator.
- A full-face piece option is available to provide eye and face protection.

Filtering Facepiece *(Dust Mask)*: A negative pressure particulate respirator with a filter as an integral part of the facepiece, or with the entire facepiece composed of the filtering medium.

- Only 2 strap dust masks are approved by NIOSH and may be used in the workplace.

Medical Evaluations

This evaluation is used to identify potential physiological and/or workplace burdens that may affect the employees' ability to safely use a respirator. Initial medical screenings will be completed through the 3M Respirator Website. After completion of the online screening, those approved for respirator use will proceed with fit testing and training requirements. Those not passing the initial online screening will be referred to a designated Occupational Medical Clinic for further testing. All medical evaluations and screenings are to be conducted on company time.

Some items that may affect an employee's ability to wear a respirator may include:

- Growth of a beard, sideburns and long hair that interferes with the proper seal of a respirator.
- Temple bars on eyeglasses that interferes with the seal of a full-face respirator (half-face respirators may be allowed).
- Weight fluctuations that may affect the seal.
- Absence of one or both dentures that can seriously affect the fit of the facepiece.
- Psychological issues that may lead to feelings of anxiety, shortness of breath or panic attacks.
- Wearing contact lenses in contaminated atmospheres will not be permitted.

Fit Testing

Employees required to wear a respirator must first be fit tested using the same make, model, style and size respirator that will be used. The following procedures and conditions will be followed for conducting fit testing:

- Employees must pass appropriate Qualitative Fit Test (QLFT) or Quantitative Fit Test (QNFT).
- Fit testing must occur prior to initial use, when a different model is used, and at least annually.
- Upon notification by employee, supervisor, or health care professional, that physical changes have occurred that could affect respirator fit and seal.

Training

All employees required to wear respirators must receive comprehensive training annually or as required by any changes or employee inadequacies within the workplace. Training must be understandable to all employees and occur prior to requiring employee to use the respirator. Training will ensure that employees can demonstrate knowledge of the following:

- Why the respirator is necessary and how improper fit, usage, or lack of maintenance may compromise effectiveness.
- Respirator limitations and capabilities.
- Instructions for emergency situations, and respirator malfunctions.
- Directions on proper inspection, use, putting on and removal, and performing user seal checks.
- Procedures for respirator maintenance and storage.
- Identifying medical signs and symptoms limiting or preventing effective respirator use.

Respirator Inspections

Routine inspections of respirators need to be performed before and after **each use**. The procedures below are to be followed for respirator inspection.

Examine rubber facepiece for:

- Dirt, grease or contaminants.
- Cracks, tears, inflexibility or distortion from improper storage.
- Broken or missing mounting clips.
- Badly worn threads and missing pieces.

Examine the head straps and harness for:

- Breaks or tears.
- Loss or elasticity.
- Broken or malfunctioning buckles and attachments.

Examine the exhalation valve for:

- Detergent residue, dust and hair on the valve seat.
- Cracks, tears or distortion of valve material.
- Improper insertion of the valve body.
- Missing or defective valve cover.

Examine air-purifying cartridge for:

- Incorrect cartridge or canister for the hazard.
- NIOSH and DHHS approval designation.
- Incorrect installation or loose connections.
- Missing or worn gaskets.
- Cross-threading in the holder.
- Expired shelf life date of cartridges.
- Cracks or dents in filter housing.

Using a Respirator

Half Mask Respirator:

- Check respirator for any defects, cleanliness, and ensure that straps are pulled back to allow for maximum length.
- Remove glasses prior to putting on or fitting respirator.
- Attach lower strap behind the neck and below the ears.
- Hold respirator against face, and carefully pull upper headband above the ears, placing both sides of the cradle around the crown of the head.
- Adjust straps for fit and comfort.
    1. A respirator that is too small will pinch or apply excessive pressure on any part of face.
    2. A respirator that is too large will slip or pull away from the face.
    3. If respirator does not fit adequately, notify your supervisor.
- Perform positive and negative pressure fitting checks accordingly.

Full Face Respirator:

- Check respirator for any defects and cleanliness.
- Ensure that straps are pulled back to allow for maximum length.
- Remove glasses prior to putting on or fitting respirator. Only prescription glass inserts may be worn with a full-face respirator.
- Hold respirator above head, pull straps back, and slide respirator down over head so that chin is resting on lower seal.
- Adjust respirator for fit and comfort by slowly pulling on free end of straps. Be careful not to

get hair caught in straps or respirator seal.
- Perform positive and negative pressure fitting checks accordingly.

To verify that a respirator has been applied properly to the face, both of the following user seal checks must be conducted each time the respirator is worn. If leakage is detected for either test, reposition the respirator on the face and/or readjust the tension of the straps. Repeat testing until no leakage is detected, or upon determination that a different size/model respirator is needed.

Negative Pressure Test:
- Close off the inlet openings of cartridges by using the palms of your hands, or a latex type glove, so that air cannot be drawn into the respirator.
- Inhale gently so that the facepiece collapses slightly and hold the breath for ten seconds. Face-piece should hold collapsed position with no leakage of air.

Positive Pressure Test:
- Close off the exhalation valve and exhale gently into the facepiece.
- Face fit is satisfactory if the face-piece bulges slightly, and no air leaks around the facepiece seal.

Respirator Cleaning, Storage, and Repair

To ensure the integrity and effectiveness of respirators, proper cleaning and disinfecting is required after each use. The following procedures are to be followed when cleaning and disinfecting a respirator:

1) Remove cartridges and/or filters and inspect for clogging. Cartridges should never get wet.
2) Carefully disassemble and inspect respirator, including valve assemblies, diaphragms, hoses, etc.
3) Wash the respirator parts with an approved mild disinfecting solution. Never use solvents to clean respirator parts, as this will cause deterioration.
4) Rinse all parts completely with warm water. Failure to rinse adequately may result in dermatitis around the seal, or possible damage to respirator material.
5) Hand dry with clean lint-free towel or allow to air dry in clean area. Do not use compressed air nozzle to dry parts.
6) Carefully reassemble respirator, inspecting and ensuring that all parts work properly. If respirator needs repair, apply a *"Do Not Use"* tag, and remove from service until proper repairs are made.
7) Place respirator in a clean bag, and store in safe place that will not apply pressure or distort respirator shape.

Cleaning:
- Respirators issued for the exclusive use of one employee will be cleaned and disinfected daily (if used daily).
- Respirators used by more than one employee will be cleaned and disinfected after each use.
- Not applicable for disposable respirators.

Storage:
- Respirators need to be stored in a convenient, clean, and sanitary location to protect against dust, sunlight, heat, extreme cold, excessive moisture, or damaging chemicals.
- Respirators need to be packed or stored so that the face piece and exhalation valve will rest in a normal position to protect from distortion; avoid the weight or pressure of surrounding objects.

Repairs:

- Repairs or adjustments to respirators may only be made by appropriately trained personnel.
- Only NIOSH approved parts from the respirators manufacture may be used for repairs.
- Repairs may only be made in accordance to manufacturer recommendations and specifications.

Voluntary Use of Respirators

The voluntary use of respirators by employees is permitted under the following conditions:

- Respirator use is not a requirement of employees' job description.
- Workplace evaluation has not determined a respiratory hazard.
- NEI Electric and the employee have determined that respirator use itself will not present a hazard.

Upon determination that employee may voluntarily wear a respirator, one of the two following requirements below must be completed prior to employee wearing respirator.

Negative or positive pressure respirator:

- Complete medical evaluation, including any required follow-up examinations.
- Select proper make, model, style, and size respirator.
- Training on respirator use, maintenance, cleaning, and storage.
- Employee will receive a copy of appendix D, "Information for Employees Using Respirators When Not Required under the Standard" (included in this safety manual).

Filtering Facepiece (2 strap Dust Mask):

- Employee only needs to receive a copy of appendix D, "Information for Employees Using Respirators When Not Required under the Standard".

Recordkeeping

Required medical evaluations will be established and maintained by NEI Electric and the Occupational Medical Clinic or other approved clinic, in accordance with 29 CFR 1910.1020. The following fit testing records will also be maintained:

- Name or identification of employee tested.
- Type of fit test performed.
- Specific make, model, style, and size of respirator tested.
- Date of test.
- Pass/fail results for Qualitative Fit Tests (QLFT's), or the fit factor and strip chart recording or the test results for Quantitative Fit Tests (QNFT's).

Annual Program Evaluation

NEI Electric and the affected employees will annually evaluate the respiratory program and make necessary corrections to ensure the continual effectiveness of protecting the employees. The following factors will be assessed during the evaluation:

- Respirator fit, seal, and potential problems affecting ability to perform work.
- Appropriate respirator selection for exposed hazard.
- Proper respirator usage for workplace conditions.
- Adequate maintenance of respirators.

Appendix D: NEI Electric Non-Mandatory Respiratory Protection

Appendix D to Section 1910.134 (Non-Mandatory): Information for Employees Using Respirators When Not Required Under the Standard

Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged, even when exposures are below the exposure limit, to provide an additional level of comfort and protection for workers. However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the worker. Sometimes, workers may wear respirators to avoid exposures to hazards, even if the amount of hazardous substance does not exceed the limits set by OSHA standards. If your employer provides respirators for non-mandatory use, or if you provide your own respirator, you need to take certain precautions to be sure the respirator itself does not present a hazard. You should do the following:

1. Receive respirator training and a medical evaluation for the use of all respirators except for two-strap, paper or cloth, disposable respirator.

2. Read and heed all instructions provided by the manufacturer on use, maintenance, cleaning and care, and warnings regarding the respirator's limitations.

3. Choose respirators certified for use to protect against the contaminant or concern. NIOSH, the National Institute for Occupational Safety and Health of the U.S. Department of Health and Human Services, certifies respirators. A label or statement of certification should appear on the respirator or respirator packaging; it will tell you what the respirator is designed for and how much it will protect you.

4. Do not wear your respirator into atmospheres containing contaminants for which your respirator is not designed to protect against. For example, a respirator designed to filter dust particles will not protect you against gasses, vapors, or very small solid particles or fumes or smoke.

5. Keep track of your respirator so that you do not mistakenly use someone else's respirator.

I have received a copy of the above information. I understand that my use of a respirator in a non-mandatory situation is not a requirement of my work functions. I also understand the limitations of respirators, proper procedure for putting respirator on and inspection procedures, and the need for required maintenance.

_____		_____
Employee Signature	Print Name	Date

Infection Control & Risk Assessment (ICRA), Interim Life Safety Measures (ILSM) Program

Infection Control & Risk Assessment (ICRA), Interim Life Safety Measures (ILSM) & Infection Control Measures Program

NEI Electric Policy

NEI Electric employees are required to cooperate and follow direction and policy of the General Contractor and/or the Facility Infection Control Person, the Owner Representative, of the Project. Completion of the Infection Control & Risk Assessment (ICRA) form will identify the **Project Risk Assessment,** the **Interim Life Safety Measures (ILSM)** and **Infection Control Measures** for that Project**;** forms must be completed at the Pre-Construction meeting by either NEI Electric or the General Contractor in conjunction with the Facility Infection Control Person. Signatures of all parties shall be obtained. NEI Electric employees are not to perform any work until the Notice to Proceed has been issued and this form/process is completed.

Description

This section specifies the control of environmental infection control and risk assessment that NEI Electric must consider for construction & renovation projects in medical or medical manufacturing type facilities: it includes precautionary management of, inspections and non-invasive activities, small scale, short duration activities, that creates minimal dust; major demolition and construction projects that generates moderate to high levels of dust; movement of materials and equipment, and resources that are encountered or generated by our activities. NEI Electric is obligated to consider the specified control measures within the various items of work.

Infection Control risk and damage is defined as the presence of chemical, physical, or biological elements or agents which:

1. Adversely affect human health or welfare,
2. Unfavorably alter ecological balances of importance to human life.

NEI Electric Policy

Follow all steps of the Project Risk Assessment and Interim Life Safety Measures forms. Match the **Construction Type** (A, B, C) with the appropriate **Risk Area** (Low, Moderate, High) to establish the **Class Project** (I, II, III). Follow the appropriate Infection Control measures established by the **Class Project.** Determine **Interim Life Safety Measures (ILSM)** requirements for the project and follow Notifications & Training requirements.

Follow direction and policy of the General Contractor and/or the Facility Infection Control Person of the Project and complete the **NEI Electric Infection Control Construction Monitoring Form**.

Sample forms are attached. These forms may be changed or adapted to comply with the Project requirements, the General Contractor and/or the Facility Infection Control Person representing the Owner.

FORM - NEI Electric - Infection Control & Risk Assessment (ICRA) Program

Project Title: _____ Project #: _____
Location: _____ *Project Coord:* _____
Start Date: _____ *Phone:* _____

PRE-CONSTRUCTION RISK ASSESSMENT	***YES***	***N/A***
Off Tour Construction Necessary?		
Permit Required Confined Space (PCRS) Entry Necessary?		
Cutting, Burning, Or Welding Necessary?		
Asbestos/Lead Or Other Hazardous Abatement Necessary?		

Lock-Out/Tag-Out Of Any Of The Following Systems Will Be Necessary

___ Domestic Water _____Electrical Systems ___HVAC Systems

___ Medical Gases _____Steam Systems ___Security Alarms

The Following Disciplines/Shops Will Be Involved In This Project

____ Infection Control _____ Construction _____ Paint Shop _____ Engineering _____ Biomed Patient

____ Safety ___Safety ___Carpenter ___IRM _____Other

This Project Will Require Infection Control Measures If Any Of The Following Are Checked Yes	***YES***	***NO***
TYPE A -- Will generate a minimal amount of dust, fumes/odors, noise, or vibration		
TYPE B -- Will generate a moderate amount of dust, fumes/odors, noise, or vibration		
TYPE C -- Will generate a major amount of dust, fumes/odors, noise, or vibration		

I. LOW Risk Area (affects one or more of the following areas):

___ Office Areas/Shops ____Locker Rooms _____Mech Equip Rooms ____ Non Public Access Areas

___ Equip Store Rooms ____Boiler/Chiller Plants _____Other:

II. MODERATE Risk Area (affects one or more of the following areas):

___ Medical Inpatient Units_____Outpatient Clinics ___Canteen, Kitchen Areas

___ PT ____Psych Inpatient ___Other:

III. HIGH RISK AREA (affects one or more of the following areas):

___ Cardiology ___Resp Therapy ___ER ___Endoscopy Echo-Cardiograph ____Cardiac Cath Lab

___ Radiology/MRI/CT ___Sterile Supply ___Nuc Med ___Laboratoires ____Out-patient Surg_____Pharmacy

___ Surgical Inpatient Area ___ ICUs ___ Oncology ___ Operating Rooms ____ SPD ___ Surg Recov. Unit

___ Immuno-compromised patient areas or negative pressure Isolation Rooms

USING THE FOLLOWING TABLE, IDENTIFY THE CLASS PROJECT	***A***	***B***	***C***
LOW Risk Area	**I**	**II**	**II**
MODERATE Risk Area	**I**	**II**	**III**
HIGH Risk Area	**II**	**III**	**III**

CLASS PROJECT (I,II OR III) _____

INFECTION CONTROL MEASURES REQUIRED FOR THIS PROJECT (SEE ATTACHED): **YES** **NO**

THIS PROJECT WILL REQUIRE INTERIM LIFE SAFETY MEASURES IF ANY OF THE FOLLOWING ARE CHECKED YES	***YES***	***NO***
Approved exits/means of egress passages will be obstructed		
Emergency access ways will be obstructed		
Fire alarm/detection/suppression system(s) will be impaired longer than 4 hrs		
Smoke barrier or vertical shaft way will be compromised		
Removal of any corridor or more than 5% of a rooms ceiling tiles		
Floor or ceilings will be penetrated during construction		
Significant renovation of an occupied floor		

ILSM MEASURES ARE REQUIRED FOR THIS PROJECT	_____YES	_____ NO

DURING ALL CONSTRUCTION PROJECTS	*YES*
Negative pressure exhaust will be in place, unused doors sealed with duct tape, air supply/exhaust vents are to be sealed off	
"Sticky" dust mats & carpeting remnants will be installed at all construction entrances & exits to reduce dust	
Contractors to thoroughly sweep & mop construction & entrance/exit areas daily	
Area is broom-cleaned at end of the day, no trash is left on site (to prevent vermin)	
Project coordinator to check site daily & log in project folder	
Appropriate safety and project signage will be posted	
All doors into area are smoke tight, self closing and self locking	
Temporary partitions separating construction from occupied area's will be smoke tight, all penetrations will be maintained in a smoke tight condition by the use of approved/rated materials	
Firefighting equipment will be in place & accessible	
Ceiling tiles are replaced as soon as possible so as not to impair sprinklers	
All power equipment is UL listed, outlets are GFCI, equipment is properly grounded, extension cords & wiring is protected, open conductors are secured at 10 foot intervals, and temporary lighting, heating or electrical devices are in accordance with NEC standards	
Flammable & combustible liquids/gases/solids shall be used/stored properly	
No smoking policy will be enforced	
Smoke detectors will be covered to prevent dust contamination -- covers to be removed at end of each workday	
Trailers, sheds, and dumpsters will be no closer than 10 feet from buildings	
Gang boxes and tool carts will be secured at all times whenever accessible	
Hard hats will be required for this project when appropriate	
UPON PROJECT COMPLETION	
▪ **Wipe work surfaces with disinfectant** ▪ **Wet mop entire area** ▪ **Remove isolation of HVAC system in areas where work is being performed** ▪ **Remove barrier materials carefully to minimize spreading of dirt and debris associated with construction**	

DURING CLASS II CONSTRUCTION PROJECTS	*UPON PROJECT COMPLETION*
Above Measures <u>PLUS</u>: ▪ Exhaust fan with HEPA filter is in place to prevent airborne dust from dispersing into atmosphere (negative air pressure maintained) ▪ **HVAC system in area is removed or isolated to prevent contamination of duct system**	**Above Measures <u>PLUS:</u>** ▪ Wet mop area with disinfectant ▪ Vacuum with HEPA Filtered Vacuum
DURING CLASS III CONSTRUCTION PROJECTS	*UPON PROJECT COMPLETION*
Above Measures <u>PLUS:</u> ▪ Anteroom in place, and all personnel pass through so they can be vacuumed using a hepa vacuum cleaner before leaving work site **OR** wear jumpsuits that are removed each time they leave the work site…	**Above Measures <u>PLUS</u>:** ▪ ALL ABOVE MEASURES TO BE TAKEN AT THIS CLASS PROJECT

PROJECT COORDINATOR CONDUCTED CONTRACTOR BRIEFINGS & TRAINING	*N/A*	*DATE & INITIALS*
Ensuring free and unobstructed access to emergency department/services and for emergency forces.		

Ensuring fire alarm, detection, and suppression systems are not impaired, a temporary, but equivalent system shall be provided when any fire system is impaired.		
Contractor will schedule work to minimize time systems are impaired and to notify safety section prior to system being impaired.		
Ensuring temporary construction partitions are smoke tight and built of noncombustible or limited combustible materials that will not contribute to the development or spread of fire.		
Providing additional fire-fighting equipment and use training for personnel.		
Developing and enforcing storage, housekeeping, and debris removal practices that reduce the flammable and combustible fire load of the building to the lowest necessary level for daily operation.		

WHEN INFECTION CONTROL MEASURES ARE IN PLACE I/C STAFF HAS CONDUCTED CONTRACTOR BRIEFINGS & TRAINING	***N/A***	***DATE & INITIALS***
Met with Services/Sections surrounding construction site to inform them of impact/precautions to be taken & to instruct them in basic I/C requirements (see attached).		
Met with the Construction Manager, Construction Crews, and Sub-Contractors to inform them of impact/precautions to be taken & to instruct them in Basic I/C requirements.		
Informed the Project Coordinator that barriers are not to be removed from work area until completed project is inspected by the Safety and Infection Control Sections and thoroughly cleaned by Environmental Management Service.		

WHEN ILSM'S ARE IN PLACE SAFETY STAFF HAS CONDUCTED NOTIFICATIONS & TRAINING	***N/A***	***DATE & INITIALS***
Police/VAfFD have been notified to conduct a fire watch at least once per shift during non-business hours whenever any portion of the alarm, detection, or suppression system is impaired for more than four hours within a twenty-four hour period.		
If exits are obstructed, then personnel in building were trained on alternate routes and exits.		
Construction areas will have designated and marked exits, maps delineating new exit pathways are in place.		
Staff In affected area(s) will receive 2 additional fire drills per shift		

Safety	Date	Phone #
Infection Control	Date	Phone #
Facility Management	Date	Phone #
NEI Electric	Date	Phone #

NEI Electric Infection Control - Construction Monitoring Form

Project Name:_____ Date:_____

Monitor/Standard	**Met**	**Not Met**	**N/A**	**Comments**	**Conducted by:**
Areas are clean and free of debris.					

NEI & Subcontractor Personnel wearing PPEs as appropriate to task.					
Barriers adequate to prevent entry of unauthorized persons.					
Negative pressure maintained. HEPA unit functioning, air quality adequate, no excess fumes/vapors/dust.					
Walk-off mats: Clean and adequate to contain construction dust, no tracking.					
Construction barriers appropriate and integrity intact.					
Patient care equipment and items removed from Construction Area.					
Construction entry and adjacent areas free of dust and debris.					
Portable HEPA unit in use and pre-filters are free of debris and dust.					
Doors closed and signage in place.					
No visible signs of mice, insects, birds, squirrels or other vermin.					
No signs of water leakage.					
Construction carts covered during transport of materials.					
Construction personnel and materials transported on dedicated elevators.					

Employee Right-to-Know Program

NEI Electric has developed an Employee-Right-to-Know program to enhance our employees' health and safety. As a company, we intend to provide information about chemical hazards, hazardous substances, harmful physical agents, infectious agents and the control of hazards through our comprehensive Employee Right-to-Know Program, which includes container labeling, Safety Data Sheets (SDS) and related training.

The following program outlines how this objective will be accomplished:

Container Labeling

It is the policy of NEI Electric that no container of hazardous substances will be released for use until the following label information is verified:

1. Containers are clearly labeled as to contents.
2. Appropriate hazard warnings are noted.
3. The name and address of the manufacturer is listed.

This responsibility has been assigned to the Safety Committee to further ensure that employees are aware of the hazards of materials used in their work areas. It is our policy to label all secondary re-use containers.

The Safety Committee will ensure that all secondary containers are labeled with either 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.

Safety Data Sheets (SDS)

Copies of SDS for all hazardous substances to which employees of this Company may be exposed are accessible via 3E Online through the employee portal on the NEI Electric website. The Safety Committee will be responsible for obtaining and maintaining the data sheet system for NEI Electric.

The Safety Committee will review incoming data sheets for new and significant health/safety information. SDS will be reviewed for completeness. If the SDS is missing or obviously incomplete, a new SDS will be requested from the manufacturer.

SDS are available to all employees on a project for review during each work shift. If a SDS is not available or new hazardous substances in use does not have an SDS, employees should immediately contact the Office.

Employee Information and Training

Employees are to attend a health and safety orientation prior to starting work for information and training on the following:

1. An overview of the requirements contained in the hazard communication regulations, including their rights under the regulations.
2. Operations on their project where hazardous substances may be used/located.
3. Location and availability of the written Employee Right-to-Know Program.
4. Physical and health effects of hazardous substances.
5. Methods and observation techniques used to determine the presence or release of hazardous

substances in the work area.
6. How to lessen or prevent exposure to these hazardous substances through the use of engineering controls, work practices, and/or the use of personal protective equipment.
7. Steps NEI Electric has taken to lessen or prevent exposure to these substances.
8. Emergency and first aid procedures to follow if employees are exposed to any hazardous substance.
9. How to read labels and review SDS to obtain appropriate hazard information.

Note: It is very important that all our employees understand the training. Any questions should be directed to a Safety Committee member. When new hazardous substances are introduced, the Safety Committee will review the above items as they are related to the new material in the work area and communicate the information to the affected employees.

List of Hazardous Substances

Following is a list of some known hazardous substances that may be present at this location or construction site. Specific information on each noted hazardous substance can be obtained by reviewing the SDS. These sheets are provided by the manufacturer and are available upon request.

- PVC Glue
- Fluorescent Lamps
- Mercury Lamps
- Sodium Lamps
- Multi Vapor Lamps
- Ballast with PCB
- Firestop
- Cold Shrink QT Type
- Penetrox
- Propane
- Paint
- Cleaners and Sealants
- Ideal 77

Hazardous Non-Routine Tasks

Periodically, employees may be required to perform hazardous non-routine tasks. Prior to starting work on such projects, each affected employee will be given information by his/her supervisor about hazards to which they may be exposed during such an activity. The information will include:

1. Specific hazards
2. Protective safety measures which must be utilized.
3. Measures NEI Electric has taken to lessen the hazards, including ventilation, respirators, presence of another employee, and emergency procedures.

Hazardous Substances in Unlabeled Pipes

To ensure that our employees working on unlabeled pipes have been informed as to the hazardous substances contained therein, the following policy has been established:

1. The identification of hazardous substances in the pipe systems will be made known.
2. Potential hazards of the substances will be discussed with employees.
3. Safety precautions to be taken in working with and around pipes will be announced to workers.

Informing Customers / Subcontractors

To ensure that subcontractors and other contractors are aware of the hazardous substances known to be on this site, it is the responsibility of the Foreman or the Safety Committee to provide them with the following information:

1. Known hazardous substances to which they may be exposed while on the job site.
2. Precautions the employees may take to avoid harmful exposure by use of appropriate protective measures.

The same person will also obtain this information from subcontractors and contractors about their operations.

Please contact a member of the Safety Committee with questions about this plan. The Safety Committee will monitor the plan to ensure that the policies are carried out and the plan is effective.

Confined Space Program

Purpose

NEI Electric is committed to providing a safe and healthful work environment for our entire staff. In pursuit of this endeavor, the following written program is in place to first identify any Permit-Required Confined Spaces (PRCS) and to eliminate or control hazards associated with PRCS operations. This program is in accordance with the Occupational Safety and Health Administration's (OSHA) Permit-Required Confined Spaces Standard, Title 29, Code of Federal Regulations 1910.146 and construction standard 1926.1201.

Responsibilities

The overall responsibility for the program has been delegated to Larry Koenig, NEI Electric Safety Director. Individuals assigned to work where confined space entry is required, will have the responsibilities related to the work they perform. These responsibilities are identified below:

Authorized Entrants

- Know the hazards associated with the permit space and their effects.
- Properly use the equipment required for entry.
- Maintain a continuous means of communication with the attendant.
- Alert the attendant in the event of an emergency.
- Evacuate the space if an emergency occurs.

Attendants

- Know the hazards associated with the permit space and their effects.
- Maintain an accurate account of the authorized entrants.
- Remain at their assigned station until relieved by another or until permit space entry is complete.
- Monitor conditions in and around the permit space.
- Summon rescue and applicable medical services in the event of an emergency.
- Perform non-entry rescue procedures.
- Perform appropriate measures to prevent unauthorized personnel from entering the permit space.

Entry Supervisors

- Know the hazards associated with the permit space and their effects.
- Verify that the safeguards required by the permit have been implemented.
- Verify that rescue services are available and that means for summoning them are operable.
- Cancel the written permit and terminate the permit space entry when required.
- Remove personnel who are not authorized to enter the permit space during entry operations.
- Periodically, determine that entry operation is being performed in a manner consistent with requirements of permit-space entry procedures, and that acceptable entry conditions are maintained.

Confined Space Recognition

Please consult the Confined Space Recognition Form found in this manual to determine if a space should be considered a confined space.

Contract specifications will be reviewed to determine if the potential for confined space situations exists. The host employer will be required to provide information regarding the confined spaces using a Host Work Sheet. A conference will be held to exchange information and to determine the confined space procedures to be used (host or contractor plans).

If confined spaces exist, the spaces will be classified as a Permit-Required Confined Space, Hazardous Atmosphere Only Space, or Reclassified Space. A Hazardous Atmosphere Only Space may be entered without implementing the full Permit-Required Confined Space Program. The Safety Coordinator, however, will ensure that atmosphere testing and continuous ventilation are in place. If hazards can be eliminated before entry into a space, the space is a Reclassified Space. The Safety Coordinator will certify that all hazards are eliminated before entry. All entrants will receive training before entering any classification of confined space.

Permit-Required Confined Space (PRCS)

Notices will be posted at the entrance of all permit-required confined spaces prohibiting entry. Employees will obtain a permit from the host or Safety Coordinator before entering these spaces. An entry supervisor will be assigned to the space. All equipment required by the permit and procedures described in this program and on the permit will be followed.

Training

All employees will be trained to observe confined space signs, warnings and the purpose of permit entry procedures. All individuals involved in confined space permit entry operations will be trained on the following topics (as needed):

- Types of confined space hazards.
- Components of the written PRCS program and entry permit system.
- Components of the hot work permit.
- Need for guarding of entrance opening.
- Atmospheric testing equipment and protocol (use, calibration, and maintenance).
- Oxygen, combustibles, toxics.
- Pre-entry frequent or continuous testing.
- Methods for the control or elimination of any atmospheric hazards.
- Inerting, draining, rinsing, purging, cleaning.
- Continuous forced air ventilation.
- Procedures to follow if a hazard is detected.
- The evaluation process to be used for reentry if hazards are detected.
- The use of entry equipment (e.g., ladders, communication devised, etc.).
- The use of personal protective equipment required: Full body harness, respiratory protection, chemical protective clothing, eye and face protection, etc.
- Procedures to coordinate with rescue team, on-site or off-site rescue, rescue plan, practice rescues.
- Basic first-aid and cardiopulmonary resuscitation certification.
- Procedures for annual review of permits.
- Any other information needed to ensure safety during permit space entry operation.

Prior to entry into a confined space, an authorized entrant, an attendant and an entry supervisor must be designated. A pre-planning meeting will be held and attended by all involved parties.

Rescue and Emergency Services

The precautions and procedures outlined in our written PRCS program are designed to ensure that our employees are safe while working in permit spaces. Under no circumstances do we expect our employees to enter a permit space where hazards have not been eliminated or effectively controlled. Additionally, we recognize that unexpected situations might arise that prevent entrants from self-rescue. Before entry into a confined space, a rescue procedure will be identified and communicated to all involved participants.

Permit-Required Confined Space Program Review

Upon completion of each job involving a permit-required confined space, a debriefing conference will be held to inform the host employer of any hazards confronted or created.

Within one year of any entry operation, the Safety Committee will conduct a review of the program using the canceled entry permits to identify any deficiencies in our program. A review will be conducted sooner if there is reason to believe that the program does not adequately protect our employees. Any corrective measures will be documented by a revision of the program. Employees will be trained on any changes. Additionally, employees who note any inadequacies with the program should contact a Safety Committee member.

If no permit space entry operations are conducted during the year, no review is needed.

FORM - NEI ELECTRIC Confined Space Recognition Form

Part I: Please respond yes or no to each question.

1) Is the space large enough so an employee can enter bodily and perform work? _____
2) Does the space have limited or restricted means for entry and exit? _____
3) Was the space designed for a purpose other than human occupancy? _____

**If the answer is Yes to all items in Part I, continue to Part II. If the answer is No to any of the above items, the space is not considered a confined space, and no further action is needed.

Part II: Please respond yes or no to each question.

1) Does the space contain or potentially contain a hazardous atmosphere? _____
2) Does the space contain any chemicals or chemical residues? _____
3) Does the space contain any flammable/combustible substances? _____
4) Does the space contain or potentially contain any decomposing organic matter? _____
5) Does the space have any pipes that bring chemicals into it? _____
6) Does the space have any materials that can trap or potentially trap, engulf, or drown an entrant? _____
7) Is vision obscured by dust at 5 feet or less? _____
8) Does the space contain any mechanical equipment servicing the space? _____
9) Does the space have converging walls, floors sloped or tapered to smaller cross-sections that could trap or asphyxiate an entrant (Entrapment Hazard)? _____
10) Does the tank or vessel contain rusted interior surfaces? _____
11) Does the space contain thermal hazards (e.g., extreme hot or cold)? _____
12) Does the space contain excessive noise levels that could interfere with communication with an attendant? _____
13) Does the space present any slip, trip or fall hazards? _____
14) Are there any operations conducted near the space opening that could present a hazard to entrants? _____
15) Are there any hazards from falling objects? _____
16) Are there lines under pressure servicing the space? _____
17) Are cleaning solvents or paints going to be used in the space? _____
18) Is welding, cutting, brazing, riveting, scraping, or sanding going to be performed in the space? _____
19) Is electrical equipment located in or required to be used in the space? _____
20) Does the space have poor natural ventilation that would allow an atmospheric hazard to develop? ____
21) Are there any corrosives in the space that could irritate the eyes? _____
22) Are there conditions that could prevent entrants' self rescue from the space? _____
23) Are there substances used in the space that have acute hazards? _____
24) Is mechanical ventilation needed to maintain a safe environment? _____
25) Is air monitoring necessary to ensure the space is safe for entry because of a potential hazardous atmosphere? _____
26) Will entry be made into a dike area where the dike is 5 feet or more in height? _____
27) Are residues going to be scraped off the interior surfaces of the vessel? _____
28) Are non-sparking tools required to remove residues? _____
29) Does the space restrict mobility to the extent that it could trap an entrant? _____
30) Does the space present a hazard other than those noted above which would make it a permit space? ____

If you answered Yes to any of the questions in Part II, a hazard may exist in the confined space. Stop and immediately contact Larry Koenig, Safety Director or Greg Orton, Field Superintendent or Steve Broughton, Superintendent or Andy Karstensen, Superintendent to discuss how to proceed.

LEAD Safety Program

Renovation, Repair and Painting Program (RRP Rule)

NEI Electric has set up a Lead Safety Program to comply with the United States Federal Government, Environmental Protection Agency, 2010 requirements in regards to lead paint exposure. The EPA is the regulating authority for the lead-based paint, renovation, repair and painting program. This program affects contractors working in homes, childcare facilities and schools built before 1978: see Flow Chart 1 to help identify compliance requirements.

Basic Outline of EPA regulations is based on the RRP Rule (Renovation, Repair and Painting Program)

- Renovators to be certified through training.
- Firms must be certified (NEI Electric was certified in 2010, Certification #NAT-73009-1).
- Training provider to be accredited.
- Lead-safe work practices need to be followed during renovations.
- Minnesota is regulated by the EPA; Wisconsin is regulated by the Wisconsin Department of Health Services.
- **If work consists of minor repairs/maintenance that disturbs less than 6 square feet of painted surfaces per room for interior activities or less than 20 square feet of painted surface for exterior activities the program requirements DO NOT APPLY (see Flow Chart 1).**

Lead Safe work Practices

- Provide "Renovate Right" pamphlet to owner and retain signed portion for records.
- Determine if lead is present using EPA-recognized test kit. If no lead is present, proceed as normal; if test is positive, follow lead-safe work practices.
- Contain dust during work. Construct poly walls if applicable and or poly the floor. All dust must be contained. If a vacuum is used it must be HEPA rated.
- Once work is complete all dust/debris must be removed and the work area must be tested by a Certified Renovator to verify no lead is remaining.

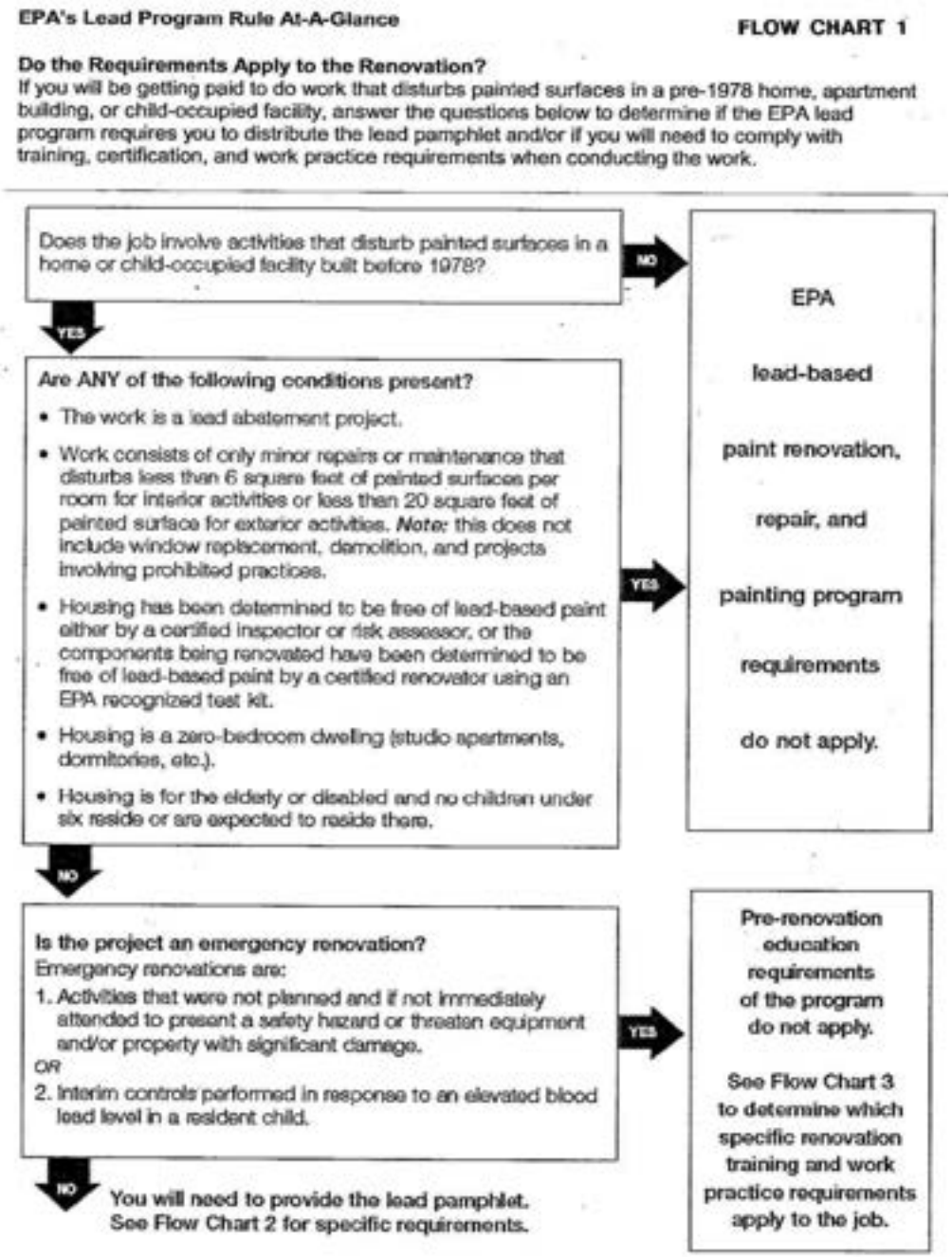
Recordkeeping

- Records must be kept for 3 years and made available to EPA if requested.
- Proof of status is kept on site. (NEI Electric, MN Office)
- The complete Lead Safety Program is available for review at NEI Electric – MN office.

Certified Firm Certificate #NAT-73009-1

- NEI Electric – 4815 White Bear Parkway – White Bear Lake, MN 55110
- 651-771-1000

EPA's Lead Program Rule At-A-Glance Flow Chart I



EMPLOYEE RECEIPT/ACKNOWLEDGMENT FORMS - EMPLOYEE COPY

My signature below acknowledges that I understand and agree it is my responsibility to read the Safety Policy and to follow the policies and rules specified in the pages of the Safety Policy which follow my signature below, together with any further changes, additions or deletions to such pages of the Safety Policy.

Date:_____

_____

Employee Signature

_____

(Print your Name)

EMPLOYEE RECEIPT/ACKNOWLEDGMENT FORMS - NEI ELECTRIC COPY

My signature below acknowledges that I understand and agree it is my responsibility to read the Safety Policy and to follow the policies and rules specified in the pages of the Safety Policy which follow my signature below, together with any further changes, additions, or deletions to such pages of the Safety Policy.

Date:_____ _____

Employee Signature

_____

(Print your Name)