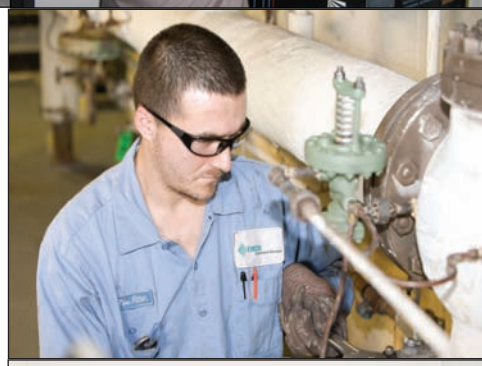
EMCOR Government Services

Safety Plan



SAFETY PLAN

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1. GENERAL SITE SAFETY REQUIREMENTS

This manual has been assembled in order to document the basic elements of our Safety Plan. Its purpose is to:

- Define your personal responsibilities and accountability.
- Define the help available to you from your immediate supervisor and technical support from the Director of Safety.
- Define the elements of this plan.
- Provide standards, procedures, and guidelines.
- Provide information on federally mandated programs and legislation.
- Education into program fundamentals.
- Audit the results of our Safety Plan.

1. DEFINITIONS

SAFETY: **The Art of Working Properly.** The word means many things to many people; however, because the Company's conviction is that it can only exist when proper attention is paid to all aspects of the tasks, the above definition is used.

ACCIDENT: Any undesired event that results in harm to people, property, environment, or process.

INCIDENT: An undesired event that **has** to result in harm to people, property, environment, or process.

CRITICAL INJURY: An injury of serious nature that:

- Is a fatality
- Requires hospitalization for treatment (if paramedic administers drugs)
- Involves permanent disfigurement, loss of a body member
- Involves five or more in one incident

COMPETENT PERSON: One who is capable of identifying existing and predictable hazards in the surroundings or working conditions and who has the authority to take prompt corrective measures to eliminate them.

2. POLICY STATEMENT

The management of EMCOR has dedicated itself to providing the necessary active leadership and support in order to maintain an effective Injury and Illness Prevention Program (hereafter known as the "Safety Plan") to ensure the security, protection and well being of our personnel through the prevention and control of accidents.

As an employee of EMCOR, you are a key factor in providing yourself and those with whom you work with safe conditions. All levels of supervision have a primary responsibility for the safety and well being of all employees within the scope of their authority. In turn, each employee has a primary responsibility, as a condition of employment, to cooperate with supervision and his/her fellow workers in all matters related to safety and health.

The **Zero Accident Program** (ZAP) is our commitment to health and safety of our employees and clients. We will provide training, protective equipment, and the safest work environment possible for our employees to perform their jobs.

Never should safety be sacrificed for production. **SAFETY IS THE ART OF WORKING PROPERLY** and must be considered an integral part of quality assurance and control, cost reduction and job efficiency. A proper safety attitude will be considered to be a condition of employment. Each supervisor at every level of management will be held accountable for the safety and loss control performance demonstrated by the employees under his/her supervision.

We are personally committed to the continued improvement of our safety performance, and will authorize the necessary systems and procedures to achieve this objective. We will expect your fullest cooperation in our safety effort, and are confident we can count on every employee's participation in this important company program.

Jacqueline L. Couillard
Manager, Safety and Risk Services

3. SPECIFIC RESPONSIBILITIES

EMCOR employees are required to make safety their individual responsibility. These specific requirements are coupled with strong organizational policies, procedures, incentives, and disciplinary actions as necessary to ensure employee compliance with safe and healthful work practices.

ALL SENIOR MANAGEMENT: KEY PERSONNEL

- Develop annual loss control goal and objectives with the Safety Manager.
- Cause policy and programs to be implemented and monitored.
- Require immediate notification of all serious accidents and incidents.
- Chair the Company Safety Committee.
- Hold operations, project management, and field supervision staff accountable for their specific responsibilities in safety and loss control.
- Keep involved in safety and loss control activities through the line organization and the Safety Manager.
- Are accountable to Corporate for the implementation, enforcement and monitoring of the operating company's Safety and Loss Control program.
- Are accountable to operations management for the health and safety of all employees in their departments.
- Adopt and administer the safety and loss control program and manuals.
- Identify and assign any other responsibilities required to maintain a safe and healthy work place.
- Are competent in federal, state and local work rules and regulations and in the safety and loss control program.

PROJECT MANAGEMENT

- Personally ensure the follow-up and investigation of all lost time injuries on projects under their control.
- Determine that received tools and equipment are in first class condition. Any tools or equipment that are defective or unsafe (whether received thus or due to usage) shall be removed from the job working area and tagged as "Defective - Do Not Use."
- Satisfy themselves that the necessary safety precautions have been exercised when new job materials or operations are introduced on the job.
- Instruct foremen in the safety plan administrative procedures to be followed and the safety conditions to be maintained throughout the job. Ensure that each foreman instruct his workers in safe practices and has a copy of the new project start-up kit.
- Makes available necessary personal protective equipment, job safety materials, and first aid equipment.
- Conducts documented safety inspections of jobs under their control with the appropriate parties notified, in writing, of deficiencies under their control.
- Coordinates with the foremen for delivery of job site inspection reports and toolbox talks to the safety director.
- Makes verbal reports to the safety director of job site safety and health deficiencies.

- Notifies senior management in the event of a critical injury or fatality.

DIRECTOR OF SAFETY

- Individual(s) designated by the operating company executive management to be responsible for implementation, maintenance, operation and monitoring of the safety program in partnership with the Safety Manager.
- Report directly to the executive management for all activities affecting the safety performance of the operating company, and to Corporate with regard to implementation of policies and procedures set forth in this manual and appendices.
- Communicate with all levels of management on issues directly affecting the health and safety of all employees.
- Perform the necessary employee safety and loss control training, or, conducts "train the trainer" classes for management and supervisory personnel, to ensure that all office and field employees have received the training required by Federal, state, or local legislation.
- Stay abreast of Federal, state and local standards and regulations, and recommends required new programs/elements to senior management.
- Audit Company safety and training programs to ensure all OSHA required programs are in place. Ensures employee-training records are being kept and properly maintained.
- Monitor or participate in all Health and Safety Committees. Ensures records of items discussed at all meetings are maintained. Also, make sure that:
    - All employees/labor, as well as management, are fairly represented.
    - Meeting records are made available to employees.
    - Agendas include:
    - Review investigations of accidents and causes of incidents resulting in injuries, illnesses and exposure to hazardous substances.
    - Review investigations of alleged hazardous conditions.
    - Review results of periodic scheduled inspections.
    - Tracking of corrective action.
    - Review of employee suggestions.
    - Ensure committee suggestions and recommendations are being successfully conveyed and responded to by management and ensure that the action taken by management is completed in a timely manner.
- Ensure company methods and procedures for communicating safety and health matters to employees are effective, and result in employee concerns and suggestions being successfully conveyed and responsive to management. Also, makes sure that:

Safety meetings are being conducted and documented as required.
Bulletin boards are properly posted with required government and company notices, and that promotional/educational materials when used are current and appropriate.
Company suggestion system protects the anonymity of employees.
Employees have no fear of reprisal for expressing their safety suggestions or concerns.

- Make available to all employees the necessary personal protective equipment and the required training in its use.

- Assist with the completion of all accident/incident investigation reports and provide direction in proper completion of the investigation.
- Responsible for insuring that all initial site safety orientation for all workers on all projects is performed.
- Responsible for insuring that documented site inspections of all job sites, noting deficiencies to the general contractor, superintendent/foreman, and senior management of his/her subsidiary, are done.
- Implements, maintains, audits Company Hazard Communication program and conducts Hazard Communication training as required.
- Attends all meetings for professional development as requested by the Corporate Director of Safety and Loss Control.
- Attends all meetings on issues pertaining to safety and health as requested by clients.
- Ensures company procedures for identifying and evaluating workplace hazards and inspection programs are being conducted as required. Also makes sure that:

Periodic scheduled inspections are being conducted.

Evaluation inspections are being conducted whenever new substances, processes or procedures are introduced that represent a new or previously unrecognized hazard.

All evaluations and inspections are documented to include identification of the unsafe conditions and work practices, name of person(s) conducting the inspection/evaluation, and action taken to correct the unsafe conditions and work practices.

- Monitors procedures for correcting unsafe and unhealthy conditions and work practices. Sees that corrective action is completed in a timely manner based on the severity of the hazard.
- When an imminent hazard exists, ensures exposed personnel are removed from the area except those necessary to correct the existing condition and that necessary safeguards are provided to employees who are taking the corrective action.
- Annually conducts an audit of the Injury and Illness Prevention Program to assure full compliance with OSHA regulations.
- Routinely reports any discrepancies to the Safety Committee with recommended corrective action.
- Individual designated by executive management to be responsible for implementation of the loss control program in partnership with the Safety Manager.
- Reports directly to management for all activities affecting the loss control performance of the operating company, and Corporate with regard to implementation of policies and procedures set forth in this manual and appendices.
- Maintains all records as required by legislation and Corporate in areas of safety and loss control and submits this information as required. Distributes the Annual Summary of the OSHA 300 Log for posting at the job site from February 1 through April 30 each year.
- Assist with the completion of all accident/incident investigation reports and provides direction in proper completion of the investigation.

- Review all accident/incident reports to make sure they are thorough, complete and conducted in a timely manner. Ensures that proper corrective action has been implemented and that reports are complete. Reviews accidents at monthly Safety Committee meetings.
- Responsible for injury and accident claims administration.
- Follow up on all significant employee injuries, including those involving non-employees, auto accidents, and property damage.
- Periodically analyzes accidents to determine developing trends or problem areas. Develops frequency and severity rates and compares them to standard industry rates annually.
- Completes all reports as requested by the Safety Manager for review by senior management on all accidents/incidents.
- Notifies the Safety Manager immediately in the event of a fatality or hospitalization of three or more employees as a result of a work-related injury.
- Provides the Safety Manager with copy of investigation reports for all lost time accidents.
- Serve as secretary for the Safety Committee. Ensures records of items discussed at all meetings are maintained. Makes sure that agendas include review of investigations of accidents and causes of incidents resulting in injuries, illnesses and exposure to hazardous substances and alleged hazardous conditions.
- Attends all meetings for professional development as requested by the Safety Manager.
- Communicates with and receives guidance from the Safety Manager on issues affecting the safety and loss control program of the subsidiary.

OPERATIONS MANAGEMENT

- Are accountable to the senior executive of the company.
- Adopts and administers the program and associated manual.
- Requires the setting of safety standards within their areas of responsibility.
- Are members of the Safety Committee
- Requires and approves annual safety and loss control objectives within their areas of responsibility.
- Actively participates in the audit process.
- Holds direct reporting employees accountable for safety and loss control performance, and the safety of all employees under their responsibility.
- Personally ensures the follow-up and investigation of all lost time injuries within the operating company.
- Monitors safety and loss control performance including management systems control, follow up, and documentation of program responsibilities for direct hires and subcontractors.
- Regularly evaluates the attitudes, knowledge and performance of department managers in safety and loss control and uses his assessment in matters of performance evaluation.
- Annually assesses project accident prevention results and participates in the development of objectives and priorities for the next year.

TRAINING PERSONNEL

- Develops and maintains a positive attitude toward safety and loss control with the operations, project management, and field supervisory staff.
- Determines that operations, project management, and field supervisory staff understand their role in the program.
- Makes available and requires direct reporting employees to attend training and education programs on federal, state, or local legislative requirements having a direct effect on the health and safety of their employees.
- Approves training program(s) for employees and ensures written documentation is maintained.
- Develops a positive attitude towards safety and loss control on the part of all employees.
- Makes available, and requires direct reporting employees to attend, training and education programs on federal, state or local legislative requirements having a direct effect on the health and safety of their employees.

CONTROL

- Holds operations, project management, and field supervision staff accountable for safety and loss control performance.
- Maintains daily participation in safety and loss control matters.
- Requires immediate notification of all serious accidents and incidents.
- Assesses the ability of line management in safety and loss control and uses this information in matters of performance evaluation.
- Holds direct reporting employees accountable for safety and loss control performance and the safety of all persons under their responsibility.
- Personally ensures the follow-up and investigation of all lost time injuries within their departments.
- Assesses safety and loss control performance of direct subordinates and uses this assessment in matters of performance evaluation.
- Adopts and administers the safety and loss control program and associated manuals and is thoroughly familiar with it so that he understands his own and other employee's responsibilities.
- Reviews accident reports in order to keep informed of accidents occurring under his control and to ensure that proper action is taken to prevent recurrences.

SUPERVISORY PERSONNEL/LEAD ENGINEERS

- EMCOR will ensure that all field supervisors are aware of their responsibility for safety and loss control and the compliance with Federal and local mandated legislation affecting their subsidiary.
- Adopt and administer the safety and loss control program and associated manuals, ensuring that a copy of the program is maintained on site at all times during the length of the project.
- Issue company safety handbooks to new employees and provide employee orientation to the safety and loss control program safety requirements.

- Be responsible for the posting and maintaining of documents required to be "Site posted."
- Maintain communication with the work force through a structured, nonrestrictive network utilizing weekly "Tool Box" safety meetings involving all employees as well as scheduled supervisory safety meetings. This requires that through their personal example, they obtain the credibility with the work force and the subsequent cooperation in the program.
- The supervisors are responsible for the prompt reporting of job site accidents and incidents immediately after the provision of proper and prompt medical attention. Following the investigation, supervisors shall review and carry out recommendations. Paramount in this process is the responsibility to communicate to all employees the action taken in a reasonable time frame following the event.
- The supervisors are accountable to management for the health and safety of all employees on their project and are responsible for holding employees accountable for safety and loss control performance and the safety of all persons under their responsibility.
- Identifies and assigns any other responsibilities required to maintain a safe and healthy work force.
- Develops a positive attitude towards safety and loss control on the part of all direct reporting employees.
- Makes available, and requires employees to attend, training and education programs on Federal, state or local legislative requirements having a direct effect on the health and safety of their employees.
- Monitors safety and loss control performance including management systems control, follow up, and documentation of program responsibilities for direct hires and subcontractors.
- Adopt and administer the safety and loss control program and associated manuals and be thoroughly familiar with them so that they understand their own and other employees' responsibilities.
- Review accident reports in order to keep informed of accidents occurring under their control and to ensure that proper action is taken to prevent recurrences.
- Personally ensure the follow-up and investigation of all lost time injuries on projects under their control.
- Determine that received tools and equipment are in first class condition. Any tools or equipment that are defective or unsafe (whether received thus or due to usage) shall be removed from the job working area and tagged as "DEFECTIVE - DO NOT USE."
- Satisfy themselves that the necessary safety precautions have been exercised when new job materials or operations are introduced on the job.
- Instruct employees in the safety program administrative procedures to be followed and the safety conditions to be maintained throughout the job. Ensure that each foreman instructs his workers in safe practices and has a copy of the new project start-up kit.
- Make available necessary personal protective equipment, job safety materials, and first aid equipment.

- Require the use of personal protective equipment by all employees as well as the safe condition and usage of tools, equipment, and materials.
- Secure company tools and equipment to prevent theft or damage.
- Conduct documented safety inspections of jobs under their control with the appropriate parties notified, in writing, of deficiencies under their control.
- Coordinate with the employees for delivery of job site inspection reports and toolbox talks to the safety director.
- Notify senior management immediately in the event of a critical injury or fatality.
- Assist management personnel and the loss control coordinator in a prompt and proper investigation of accidents, personally ensuring the follow-up.
- Take an active part in planning safety in the new operations by reviewing potential bottlenecks with supervisory personnel before operations commence.
- Make documented inspections for unsafe practices and conditions, and initiate needed corrective action. If these types of situations are not satisfactorily corrected, they should be reported to the Director of Safety.
- Make sure that required personnel protective equipment is on hand and is being used.
- Ensure that the proper maintenance of tools and equipment is performed.
- Attend safety meetings.
- Establish contact with the local medical facility.
- Maintain first aid supplies.
- Enforce safety rules with appropriate documented disciplinary action.
- Maintain files for Material Safety Data Sheets for all chemical products being used. Make MSDS available as required.
- When correcting any unsafe condition, foremen are to adhere to the "Priority for Correction of Safety" guidelines as listed below: # Class A (Urgent) Isolate or remove from service and repair or replace immediately.
- # Class B (Important) Complete corrections within 30 days. # Class C (Routine) Schedule corrections into routine maintenance schedule.
- When an imminent hazard exists which cannot be immediately abated without endangering employees, the supervisor is responsible for seeing that affected employees are notified and removed from the vicinity of the hazard.
- Ensure that any employees needed to correct the hazard are properly protected.

ALL EMPLOYEES

- All employees must report to work at the start of each shift physically and mentally qualified to perform his/her duties. If not physically and mentally able to perform his/her work, the employee will not be permitted to be on the project.
- Attend a new employee orientation conducted by the immediate supervisor on the safety and loss control program.
- At all times, wear the required personal protective equipment for the task being performed.
- Understand the safe and proper way to perform the work assignment.

- Ask for and receive additional training in the proper discharge of your task, if needed.
- Obtain the proper equipment, tools, and materials to complete the task. Inspect your tools and workplace before beginning your task.
- Abide by all company safety rules and safety related rules that may pertain to a particular project. This includes all Fed OSHA, State OSHA safety rules and regulations.
- Immediately report to your supervisor all accidents and incidents occurring on the job.
- Report all unsafe work conditions or practices to your supervisor.
- Maintain good housekeeping practices.
- Attend the weekly "Tool Box" talk safety meeting as conducted by your supervisor or other designated person.
- Do not operate any equipment unless properly trained.
- Determine that received tools and equipment are in first class condition. Any tools or equipment that are defective or unsafe (whether received thus or due to usage) shall be removed from the job working area and tagged as "DEFECTIVE - DO NOT USE."

4. ASBESTOS POLICY

Any employee who may expect to be (reasonably) exposed to asbestos fibers must be trained, prior to assignment to the work area, on the detection and hazards of asbestos. The training shall include:

- The physical characteristics of asbestos, including types, fiber size, aerodynamic characteristics and physical appearance;
- Examples of different types of asbestos containing products and materials they may encounter in their specific work assignment (i.e., ceiling tiles, insulation, cement pipes, etc.);
- The health hazards of asbestos;
- The increased risk of lung cancer associated with smoking cigarettes and asbestos exposure;
- Obtaining of building survey from either the general contractor or owner, to show if asbestos exists.
- Insuring employees know of EMCOR's policy - not to work in areas where asbestos is known to exist and is airborne;
- Notifying the general contractor or owner of any suspicious looking material;
- Any testing or monitoring of any material to be done by a qualified person only;
- If any material needs removal, it is to be done by a qualified person only;
- If at any time it is deemed necessary that work be done in an asbestos-related area, only trained people wearing proper protective equipment and clothing will be permitted to do the work.

5. NEW EMPLOYEE ORIENTATION

The purpose of this section is to ensure that every newly assigned EMCOR employee is successfully oriented to the location, its operation, and related work environment.

SCOPE

Program development and implementation documentation.

PERFORMANCE

Program Development and Implementation: The following safety orientation program is to be established and followed in each EMCOR operating location. The responsibilities for orientation activities are as follows:

- The EMCOR Safety Director must establish and ensure the employee orientation program for each new employee
- The immediate supervisor must conduct the new employee safety orientation.
- The immediate supervisor, to whom the new employee is to be assigned, must conduct the “Introduction to the Work Site” portion of the orientation.
- The orientation should be initiated on the first day of employment, and completed within the first week.

A checklist will be used to record the employee’s orientation progress. The items covered in the checklist are influenced by location conditions and local situations. However, sample Safety Orientation Checklists have been provided which might be of assistance to location management in implementing its Safety Orientation Program.

Once completed, the Director of Safety or Project Manager, the immediate supervisor, and the employee shall sign the Safety Orientation Checklist. The checklist is to become a permanent part of the employee’s file.

6. JOB SITE SAFETY ORIENTATION CHECKLIST

The subjects checked below were discussed with me as part of my orientation. My signature states that these topics were discussed with me to my satisfaction and understanding.

_____ EMCOR Safety Plan Statement
_____ Required Personal Protective Equipment
_____ Hazard Communication Training
_____ First Aid/Injury Reporting Procedure
_____ Emergency Procedures (Fire, Injury, etc.)
_____ Evacuation Plan
_____ Safe Work Practices
_____ Safety Responsibilities
_____ Safety Rules and Procedures
_____ Accident Reporting

_____ _____
Employee Signature Date

_____ _____
Supervisor Signature Date

7. ACCIDENT INVESTIGATION AND REPORTING

The purpose of this section is to ensure that accidents are reported in a timely fashion, and investigated in a proficient and expedient manner. This section of the Safety Manual applies to accidents associated with workers' compensation, general liability, and fleet.

SCOPE

Accident reporting and accident investigations include:

Incidents to be investigated

Timeliness

Format

Investigate and review procedures

Recommend follow-up procedures.

Performance Responsibilities

Supervisor:	Take control at the scene
	Get employee medical help
	Control secondary hazards.
	Notify management
	Identify evidence and witnesses
	Preserve evidence at the accident scene
	Investigate
	Complete report
	Take corrective action
	Document corrective action
Department Manager	Review all investigations
	Sign off on cause and corrective action
	Commit to implementing corrective action

ACCIDENT INVESTIGATION

EMCOR employees are to report all injuries and illnesses to direct supervision. Also reported immediately should be vehicular accidents, as well as incidents involving non-employee personnel and/or equipment. "Near miss" incidents that have the potential for serious personal injury and/or property damage must also be reported. The purpose of accident investigation is to:

- fulfill legal requirements, and
- to prevent future accidents by identifying and controlling the cause.

INCIDENTS TO BE INVESTIGATED

Each of the situations to be reported will be investigated by the immediate supervisor of the employee or area involved. At this time, the supervisor is to obtain data from the employee, if possible, regarding:

- What happened (just prior, at the time of, immediately following the accident)?
- What machines/tools/vehicles/materials were involved?
- What was the nature of the work being done?
- How was the work being performed?
- Were there any witnesses? Who were they?

TIMELINESS

The Director of Safety shall be notified by phone as soon as practical after knowledge of an accident. Ideally, the Director of Safety should phone ahead to the medical facility to arrange treatment and discuss our company's policies and procedures for treatment and reporting. Depending on the seriousness of the situation, the supervisor may need to transport the employee to the local clinic or emergency facility.

The immediate supervisor of the injured/ill employee will complete the Supervisor's Accident investigation report. Emphasis will be placed on the identification of accident cause(s), as well as the listing of corrective actions recommended and taken. The report will be completed within a 24-hour period, signed/dated by the supervisor, and faxed to the SAFETY MANAGER.

The supervisor will give the injured employee, the Employee's Claim for Workers' Compensation Benefits form, the day he first knows of the injury. The employee is to complete the top section and the supervisor is to complete the bottom section.

The completed reports will be submitted within 48 hours to the manager directly responsible for the writing supervisor. Following discussion and agreement as to the findings, a manager will sign/date the approval portion of the report. The report should not be approved unless thoroughly completed by the supervisor.

OSHA will be notified within 8 hours when any of the following occur;

1. Fatal injury/illness
2. Three or more persons hospitalized as inpatients as a result of a single occurrence

ACCIDENT REPORTING AND INVESTIGATION

Both original forms are to be sent to the Director of Safety within a 2-day period.

In the event of a "near-miss," the supervisor will discuss the incident with the employee and complete the Near miss or Hazard Report, and submit it in the same manner as an accident investigation report.

When an accident results in a fatality or in hospitalization of three or more employees, the EMCOR Corporate Insurance Department will be notified immediately, and will be provided with copies of the accident investigation report and all subsequent correspondence pertaining to the incident.

FORMAT

The following questions should be helpful in completing the report:

- **Who Was Involved?** Accidents usually affect more than just the injured person, and very often, more than just the injured person contributed to the cause: WHO, therefore, should go beyond who was injured and who was present. Who supervised the injured employee; who failed to report the unsafe condition? All of those people involved are important to the underlying cause of the accident. Get the names of everyone involved!
- **Where Did the Accident Occur?** Again, we must look beyond the obvious answer to this question. The name of the Department or general area is not enough. A detailed description of the accident site should be included. Also, determine if the people involved were where they were supposed to be. Was the equipment in its proper location?
- **What Happened?** This question can be further broken down to uncover the following facts:
  - What was being done? (The answer to this question describes an action or procedure.)
  - What things are involved? (A description of the tool or equipment that was involved answers this question.)
  - What was the result? (This is answered by a description of the actual injury, including the nature of the injury and the part of the body injured.)
- **When?** The answer to this question requires more than just the date. The time of day, the day of the week, and whether the accident occurred at the beginning or end of a shift can also be very important.
- **How Did the Accident Occur?** Actually, the answer to this question brings together all the facts of the accident. The answer to "how" is a description of people, things, places, and time, as they all combine into a complete event. The exact sequence of events that led to the accident should be reported. Refer to the Breakdown of Unsafe Acts and Conditions Guide.
- **Why did the Accident Occur?** In order to determine or recommend what corrective action should be initiated, it must be determined exactly why the accident occurred. Under no circumstances should carelessness be considered the cause of any accident. The word carelessness does not describe the reasons for a person's behavior. What contributed to the accident may have been inattention, inadequate training, failure to report a hazard, etc. To determine root cause(s), the following types of questions need to be answered:
  - WHY was the injured person inattentive?
  - WHY was he poorly trained?
  - WHY did someone fail to report an unsafe condition/procedure?
  - WHY did what happened produce an accident?
  - WHY did the combination of all the factors that made up the event result in an injury?
  - WHY did the event result in anything other than an ordinary, everyday occurrence?

- These questions and others you can think of will help you determine IF and WHY an unsafe act occurred.

Recommend Corrective Action: After evaluating the facts of an accident, you will most likely find that the accident was caused by a combination of unsafe acts and/or unsafe conditions. Recommendations to prevent a recurrence should be directed toward correcting all contributing factors leading to an unsafe condition and/or unsafe act.

NOTE: It is important to remember that an accident investigation is not a trial to find fault or blame. Its purpose is to find accident causes so that similar accidents may be prevented by physical or mechanical improvement or employee training and motivation.

INVESTIGATION REPORT REVIEW PROCEDURE

As already indicated earlier in this section, the manager and the Safety Manager will be actively involved in reviewing the completed investigation reports. The completed investigation reports will also be reviewed as part of the Safety and Health Committee agenda.

RECOMMENDATION FOLLOW-UP PROCEDURES

The Safety Manager will maintain a come-up file to follow-up on the status of recommended corrective actions. The status of the corrective actions will be reviewed at the monthly Safety and Health Committee meetings and the findings attached to the minutes until all recommended corrective actions have been satisfactorily completed.

BREAKDOWN OF UNSAFE ACTS AND CONDITIONS

The table below provides a breakdown of unsafe acts and conditions.

BREAKDOWN OF UNSAFE ACTS AND CONDITIONS	
1	Operating without authority, failure to secure or warn.
2	Starting, stopping, using, operating, firing, moving machinery, vehicles or equipment without authority or without giving proper signal.
3	Failing to lock, block or secure vehicles, switches, valves, press rams, other tools, materials and equipment against unexpected motion, flow of electricity or steam.
4	Failing to shut off equipment not in use.
5	Failing to place warning signs, signals or tags.
6	Failure of crane signalman to give proper signal.
7	Operating or working at unsafe speed.
8	Running or walking backwards; jumping from vehicles, platforms.
9	Feeding, supplying too rapidly or throwing material instead of passing it.
10	Driving too rapidly or too slowly; working too fast or too slow, thereby endangering self and others.
11	Making safety devices inoperative.
12	Removing or disconnecting safety devices.
13	Blocking, plugging, taping or failing to secure safety devices.
14	Replacing safety devices with those of improper capacity, (higher amperage, electric fuses, low capacity safety valves); misadjusting safety devices.
15	Using unsafe equipment, hands instead of equipment or equipment unsafely.
16	Using defective equipment (mushroomed chisel head, chipped grinding wheel).

BREAKDOWN OF UNSAFE ACTS AND CONDITIONS	
17	Unsafe use of equipment (operating pressure valves at unsafe pressures or volume).
18	Gripping objects insecurely, taking wrong hold of objects.
19	Unsafe loading, placing, mixing, combining.
20	Overloading, crowding or carrying a too-heavy load; crowding or unsafe piling.
21	Arranging or placing objects or material unsafely (parking, placing, stopping, or leaving vehicles, elevators, and conveying apparatus in unsafe position for loading and unloading).
22	Injecting, mixing or combining one substance with another so that explosion, fire, or other hazard is created (injecting cold water into hot boiler, pouring water into acid).
23	Introducing objects or materials unsafely (portable electric light extension cord inside of boilers or in areas containing combustibles or explosives); smoking where explosives or combustibles are kept.
24	Placing or leaving on working surfaces unnecessary tools, materials, debris, rope, chain, hose, or electrical leads.
25	Leaving spilled oil, water, grease or paint on working surfaces, floors or stairways.
26	Taking unsafe position or posture.
27	Exposure under suspended loads; unnecessarily putting body or its parts into shaft ways or openings.
28	Not using proper methods of ascending or descending.
29	Entering vessel or enclosure when unsafe because of temperature, gases, wiring, or other exposures.
30	Working on high-tension conductors from above instead of below.
31	Lifting with bent back or while in awkward position.
32	Riding in unsafe position (on platforms, tailboards, and running boards of vehicles): tailing on or stealing rides, riding on apparatus designed only for materials.
33	Passing on grades and curves, cutting in and out, road hogging.
34	Exposure to falling or sliding objects.
35	Working on moving or dangerous equipment.
36	Getting on and off moving equipment (vehicles, conveyors, elevators).
37	Cleaning, oiling, or adjusting moving equipment containing dangerous chemical substances.
38	Distracting, teasing, abusing (horseplay).
39	Calling, talking, or making unnecessary noise; startling by throwing material.
40	Practical joking; quarreling or fighting.
41	Failure to use safe attire or personal protective devices.
42	Failing to wear goggles, gloves, masks, aprons, shoes, leggings or protective hats.
43	Wearing high heels, loose hair, long sleeves, loose clothing or rings.
44	Failure to report defective safety apparel.
45	Inadequately guarded.
46	Weak or defective guard.
47	Improper shoring in mining, construction, excavating.
48	Defective tools, equipment or materials.

BREAKDOWN OF UNSAFE ACTS AND CONDITIONS	
49	Rough, slippery, sharp-edged.
50	Low material strength.
51	Poorly constructed.
52	Inferior composition.
53	Decayed, aged, worn, frayed, cracked.
54	Hazardous arrangement or procedure.
55	Unsafely stored or piled tools or material.
56	Congestion of working space.
57	Inadequate aisle space or exits.
58	Unsafe planning and/or layout of traffic or process operations.
59	Misaligning.
60	Inadequate drainage.
61	Improper Illumination.
62	Insufficient or no light.
63	Glare.
64	Unsuitable location or arrangement (producing shadows or contrasts).
65	Improper ventilation.
66	Insufficient air changes or concentration of toxic fumes, vapors or dust.
67	Unsuitable capacity, location or arrangement of system.
68	Impure air source.
69	Abnormal temperature or humidity.
70	Unsafe dress or apparel.
71	Goggles or face shields defective, unsafe, unsuited for work, or missing.
72	Gloves or mitts defective, unsafe, unsuited for work, or missing.
73	Apron defective, unsafe, unsuited for work, or missing.
74	Shoes defective, unsafe, unsuited for work, or missing.
75	Respirator defective, unsafe, unsuited for work, or missing.
76	Leggings defective, unsafe, unsuited for work, or missing.
77	Protective hardhat defective, unsafe, unsuited for work, or missing.
78	Welders helmet or hand shields defective, unsafe, unsuited for work, or missing.
79	Safety belts defective, unsafe, unsuited for work, or missing.
80	Unguarded.
81	Lack of guard, screen, enclosure, barricade, fence, insulation, railing, rope (as opposed to inadequate guarding).
82	Unsafe design or construction.

BREAKDOWN OF UNSAFE ACTS AND CONDITIONS	
83	Hazard built into new equipment or structures.
84	Faulty architecture, design, or engineering.
85	Faulty assembly, manufacture, or erection (as opposed to “defective through wear and tear or abuse).

8. First Aid Program

The purpose of this section is to ensure that each EMCOR location and work site is arranged and prepared to handle both emergency and non-emergency injuries. Emergency first aid is immediate temporary treatment given to someone injured or suddenly ill before medical services can be obtained.

Non-emergency first aid provides prompt attention to minor cuts, scratches, burns, and the like, for which medical attention is not usually considered necessary.

Scope

- Work Site
- Supplies
- Training
- Documentation
- Notification

Work Site and Fabrication Plant Procedures

Properly trained, certified first aid attendants will be designated at every operable EMCOR location. Written instructions must be posted in strategic locations, naming the person or persons to be notified in an emergency and listing their telephone numbers, along with emergency numbers for the following:

- Servicing physician (include name)
- Ambulance service
- Hospital
- Fire Department
- Police Department
- Ophthalmologist (for eye injuries)
- Any additional in-plant or on-site emergency telephone numbers.

Supplies

The first aid supplies should be approved by the company's consulting physician. A detailed list of suggested supplies is as follows:

- Adhesive bandages, large and small
- Triangular bandage - two (40-inch)
- Soap
- Cotton applicators
- Antiseptic
- Ammonia inhalants
- Gauze roller bandage - 2-inch
- Kerlix gauze (stretch roller gauze)
- Gauze compresses - 2" x 2"; 3"; 4" x 4"
- Large gauze compresses - for pressure dressings 5" x 9"
- Adhesive tape - 1-inch

- Paper towels
- Paper cups
- Eyewash solution
- Tongue depressors
- Safety pins - assorted sizes
- Cleansing tissues

TRAINING

Those individuals selected and assigned to function as work site first aid responders should receive formal certified training in the following subjects:

- Red Cross multi-media first aid.
- Cardiopulmonary resuscitation (CPR).

Although the training should be promoted to all personnel, all supervisors should be trained and certified at a minimum. The size and nature of work site operations may require certified training for persons in addition to the supervisors.

DOCUMENTATION

A First Aid Log will be retained at a central first aid station. Work sites may require more than a single station depending on the size of the operation. The log is to be completed by the first aid attendee in charge whenever treatment is provided.

It is the responsibility of the location/project manager to ensure that the log is properly maintained, and to review the information on a monthly basis for the purpose of identifying trends or problem areas.

NOTIFICATION

When emergency first aid is given, the following information should be given when reporting an illness or injury to the physician, hospital, or ambulance service:

FIRST AID PROGRAM

a. The location of the injured.
b. A detailed description of the accident and injury, with detailed names of any materials contacted, ingested, or inhaled.
c. The first aid care given.

Training and Equipment

First aid is the immediate and temporary care given to the victim of an accident or sudden illness until the services of a physician or EMT can be obtained.
There should be trained first aid personnel and first aid equipment on each job. The number of first aide responders and the types and amounts of equipment necessary will depend on the job factors such as number of employees, nature of the work, and location of the job. A small job of short duration will have different requirements than a large job of long duration or a job in a remote location.

Advice on first aid equipment needs can be obtained from a consulting physician or by checking with other similar organizations to see what they provide.

First aid training courses are available from a number of sources. The American Heart Association offers the CPR basic rescuer and heart saver courses. The American Red Cross offers first aid courses. These training courses, and those courses offered by other groups, are

usually of short duration and usually require periodic refresher training to maintain the skills that are required.

- The occupational first aid course content should include, but not necessarily be limited to the following:
- How, when, and where to transport the injured;
- How to evaluate the injury and the level of care that is needed, as first aid or hospital emergency room;
- Training for a major disaster such as an explosion or tornado;
- Basic anatomy and physiology. Make-up of the human body and functions of major body parts;
- Vital signs. How to assess the extent of injury by checking temperature, color, and condition of skin, blood pressure, and pulse.
- Bleeding, internal and external. How to evaluate and give emergency care for different types of bleeding;
- Shock. What it is; how the body responds; and how to treat;
- Neck, back and spinal injuries. How to determine and how to handle without causing further injury;
- Emergency illnesses such as heart attacks, fainting, epilepsy, and strokes, and how to treat these in an emergency setting;
- Broken bones, exposure to cold, burns, poisons, lacerations, foreign bodies, and what to do for each type of injury.

Electrical Injuries

The severity of electric shock is determined by the amount of current flow through the victim and the path of that current. Data from authoritative sources indicate that, in general, an alternating current of 100 milliamps at 60 cycles per second may be fatal if it passes through the vital organs. It is estimated that 16 milliamps is the average current at which an individual can still release himself from an object held by the hand. Such current flow may readily be available on contact with ordinary lighting and power circuits. Low voltage alternating current is more dangerous than direct current of the same voltage.

Current flow depends on voltage and resistance. Resistance to current flow is mainly found in the skin surface. Callused or dry skin has a high resistance, but the resistance decreases sharply if the skin is moist or saline. Once the skin resistance is penetrated, the current flows readily through the blood and body tissues.

The protection of the skin decreases rapidly as the voltage increases. High voltage alternating current of 60 cycles per second causes violent muscular contractions often so severe that the victim is thrown clear of the circuit. Low voltage results in less severe muscular contractions so that it may be more difficult for the victim to free himself from the circuit.

Death or injury by electric shock may result from the following effects of current on the body:

- Contracting of chest muscles which may interfere with breathing so that death results from asphyxiation, if exposure continues too long;
- Temporary paralysis of the nerve center, which may result in failure of respiration, a condition which may continue long after the victim is freed from the circuit;

- Interference with the normal rhythm of the heart causing ventricular fibrillation. Blood circulation ceases and unless resuscitation efforts are made, death ensues. The heart cannot recover spontaneously from this condition. It has been estimated that 50 milliamps is sufficient to cause ventricular fibrillation;
- Suspension of heart action by muscular contraction from contact with heavy current. In this case, the heart may resume normal rhythm when victim is freed from the circuit
- Hemorrhages and destruction of tissue, nerves, and muscles from heat due to heavy current along the electrical path through the body.

Usually, the longer the current flows through the body, the more serious the result. Considerable current is likely to flow from high voltage sources and only very short exposure can be tolerated if the victim is to be revived.

Injuries are less severe when the current does not pass through or near nerve centers or vital organs. In most industrial electrical accidents, the current passes from hands to feet and as this path involves the heart and lungs, the results are usually serious.

Another type of injury is burns from electrical flashes. Such burns are often deep and slow to heal and may involve large areas of the body. Persons a good distance from the flash may experience eye burns. When high voltages are involved, flashes of explosive violence may result. This intense arcing is caused by short circuits between bus bars of cables carrying heavy current, failure of knife switches, or their being opened while carrying a heavy load, and pulling fuses in energized circuits.

Mechanical injuries from electrical equipment may be caused by unexpected motion, such as the accidental start-up of motors, which drive machines on which people may be working.

Another type of injury is falling. When a person receives an electric shock, sometimes minor and of short duration, it may cause his muscles to contract and cause him to lose his balance.

Authoritative reference sources indicate that only a small percentage of those who recover from electric shock experience permanent disability. In many cases, the victim may be saved by prompt application of artificial respiration since a common result of electrical accidents is failure of that part of the nervous system that controls breathing.

It is essential that people engaged in electrical work be trained in mouth-to-mouth or other effective means of artificial respiration. It is also desirable that selected people with exceptional exposure receive competent instruction in external cardiac compression - this is used in conjunction with respiratory resuscitation in electrical shock cases involving ventricular fibrillation.

Resuscitative techniques should be immediately applied to a victim of electric shock and should be continued until he revives or until death is diagnosed by a physician.

Emergencies

Emergency situations arise from the use of defective electrical equipment or appliances, or the misuse of such equipment. If the injured is still in contact with the electric source, before beginning first aid, the power cord should be pulled from its electrical connector or the source should be de-energized by turning off the master switch.

Contact with overhead power lines sometimes happens when cranes, derricks, or ladders are used near the lines. Contact with underground lines is sometimes made when excavating in the vicinity. If the equipment is in contact with the lines, no one should touch the equipment or attempt to aid the injured if the injured is in contact with the equipment. The electrical utility company must be contacted to turn off the power source. Protective tools and equipment, such

as gloves, boots, and hot sticks may be used by trained personnel to separate injured people from energized equipment.

Fallen wires may present a hazard. The electric utility company should be contacted for assistance. Someone should stand by to keep people out of the area. When a conductor falls on a car, fence, or other metal object, that too becomes energized. If people are trapped inside vehicles, no attempt should be made to approach the vehicle until the wires are deenergized. Sometimes injured can be advised how to provide medical care for themselves or others trapped in the vehicle. Ordinarily, one does not instruct the injured to jump clear of the vehicle entangled in energized wires, except if the vehicle is on fire. If it is necessary to give a trapped person advice to jump clear of the vehicle, it must be emphasized that there be absolutely no body contact between the vehicle and the ground at the same time.

General Rules

The following rules are applicable to most first aid situations that would be encountered:

- Be calm; size up the situation as completely and quickly as possible before giving first aid;
- Do the simplest things consistent with good first aid;
- Take care of the most important condition first. Severe bleeding, stoppage of breathing, and poisoning must be treated immediately before anything else is done;
- Be gentle in handling an injured person. If the injury is serious, keep the person lying down and make him as comfortable as possible. Do not move him unless you know it can be done without making the person worse;
- Be clean in treating a wound. A basic knowledge of bandaging and familiarity with aseptic technique concerning hands, instruments, and materials is essential;
- Call a doctor immediately if the condition is serious.

9. PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment must be worn when it is impossible or impractical to eliminate workplace hazard. The equipment reduces the chance of injury or illness when the user is exposed to certain hazards.

After the need has been established, the proper type of equipment must be selected. This selection is based on the degree of protection required and the ease of using it. Since personal protective equipment is manufactured by a number of companies, for a given type of equipment, there are usually a number of selection options available.

Often workers are reluctant to wear personal protective equipment because it is uncomfortable or gets in the way, or for other personal reasons. This reluctance may be overcome if they are made aware of the necessity of the equipment; if they are provided with the most comfortable equipment available; and if they are made aware of the consequences of not wearing it. The consequences consist of potential injury or illness and may include a penalty for not wearing the equipment when required.

HEAD PROTECTION

Safety helmets are designed to protect the head from impact, flying particles, and from electric shock, or a combination of the three. They also protect the head, face, and neck from spills of harmful liquids.

Helmets may be full brimmed or brimless with peak. There are three classes:

- Limited voltage resistance for general service;
- High voltage resistance;
- No voltage protection and made of metal.

Helmets that meet American National Standards (ANSI) Z89.1 or Z89.2, are identified on the inside with the manufacturer's name and ANSI standard designator and class of helmet.

Class E helmets are designed to meet voltage tests of 20,000 volts, AC 60 HZ for three minutes and leakage currents not to exceed 9 MA. Other classes of helmets have less strict requirements: 220 volts AC at 60 HZ for one minute and no more than 9 MA leakage. The breakdown voltages for all helmets are 30,000 volts.

ANSI Standard Z89.1 specifies that Class G and C helmets shall not exceed 15 ounces in weight. Class E helmets (electrical) may weigh 15.5 ounces. These weights include suspension, but do not include winter liner or chin straps.

The suspension gives the helmet its impact distributing abilities and this may be adjusted to fit wearer and keep the helmet a minimum distance of 1.25 inches above the wearer's head. Liners are available for cold weather. Chinstraps are available to keep helmet from being knocked off or falling off.

No modification to the shell or suspension is allowed.

Hard hats shall be worn with the bill facing forward.

Protective headgear worn near electric lines and equipment shall be Class E.

No ball caps, knit caps, or other headdress shall be worn under the hard hat that could interfere with the fit or stability of the hard hat.

HEARING PROTECTION

Whenever employees are subject to noise levels above 90 D.B.A. OSHA requires action by employers. Baseline and annual audiograms must be obtained when noise level exceed 85 D.B.A. for an 8 hour time weighted average. Engineering controls to reduce noise levels are the preferred treatment. Administrative controls to reduce exposure time may be acceptable. Periodic audiometric testing may be necessary and personal protective equipment in the form of hearing protection must be used unless the engineering controls have been successful in lowering noise levels to acceptable levels.

There are two types of hearing protection, the plug or insert type and the cup or muff type.

The plug type can be classed as the aural type, which is inserted into the ear canal and the super aural, which is like a cap that fits over the opening to the ear canal.

The aural type that fits in the canal varies in design and material. These may be made from rubber, soft or hard plastic, was, and cotton. Some may be custom molded to provide more comfort and greater effectiveness. Earplugs must be fitted carefully by experienced people as even the slightest leakage may seriously downgrade the effectiveness of the plug.

The super aural type, sometimes called caps, seals the ear canal to achieve sound reduction. These are made of soft rubber-like material that is held in place by spring bands or head suspension.

Muff types cover the entire ear. The noise reduction of these vary widely due to differences in size, shape, mass of the shell, seal material, as well as the size and shape of the wearer's head. Liquid or grease filled, plastic, or foam rubber cushions may be used; each type with certain advantages and disadvantages.

Manufacturers of hearing protection provide attenuation data with their product so that the effectiveness of the product can be evaluated.

Hearing protection devices will be accepted and worn largely on the basis of how comfortable they are and this will vary from user to user. It is well to have both plugs and muffs available for the user to select the type he likes the best.

1910.1995 Appendix B – Methods for estimating the adequacy of hearing protector attenuation.

The employer must remember that calculated attenuation values reflect realistic values only to the extent that the protectors are properly fitted and worn.

OSHA A $L_{prot} = L - (NRR - 7) / 2$

If a second pair of hearing protection is used the value is only + 5 over the NRR of the first pair after the formula has been applied.

EYE PROTECTION

ANSI Standard Z87.1, Practice for Occupational and Educational Eye and Face Protection, sets performance standards for a broad range of hazards. This includes standards for rigid welding helmets, welding hand shields, non-rigid welding helmets, face shields, goggles, and spectacles.

Spectacles, flexible fitting goggles, and cushion fitting goggles, are used to protect eyes from flying particles. These should have impact resistant lenses. In most workplaces, flying particles can be expected form the sides, as well as the front, so that side shields are always necessary. Contact lenses should not be considered as eye protection and their use should be discouraged

in the workplace. Serious eye injuries have resulted when harmful liquids or particles have become lodged between the contact lenses and the eye.

The ANSI Standard Z87.1 includes a guide for the selection of eye and face protection.

All eye and face protection equipment shall meet the requirements of ANSI Z87.1 and bear a legible and permanent “Z87” logo to indicate compliance with the standard.

Employees with prescription eyewear shall notify their supervisors and be offered our corporate purchasing reimbursement program for acquiring prescription safety glasses.

FACE SHIELDS

There are a variety of types of face shields available. These protect the face and neck from flying particles, sprays of hazardous materials, splashes of molten metal, and hot liquids. They may be used to provide anti-glare protection. Face shields are not recommended as eye protection from impact. To get impact protection, face shields are used along with basic eye protection. Face shields are never to be worn without protective eyewear.

Face shields are available with replaceable windows as clear transparent, tinted transparent, wire screen, combination plastic and screen, and fiber window with filter plate mounting.

LASER BEAMS

No one type of glass offers protection from all laser wavelengths. Most firms do not depend on safety glasses to protect themselves from laser exposure, but rely on operating procedures to avoid exposure.

EYE PROTECTION FOR WELDING

During welding, the eyes are subject to physical and chemical agents, along with radiant energy. Welding may emit radiation in three spectral bands depending on the flux used and the size and temperature of the pool of melted metal. Ultraviolet, visible, and infrared bands of the spectrum can produce damage to the eyes. The filtering properties of filter lenses have been established by the National Bureau of Standards. The ANSI Standard Z49.1 Safety in Welding & Cutting provides a guide for the selection of filter lenses for welders and helpers.

RESPIRATORY EQUIPMENT

The National Institute for Occupational Safety & Health and the Mining Enforcement and Safety Administration have established minimum performance requirements for many respiratory protective devices. The NIOSH-MESA certification system does not extend to every type of hazard and whenever there is a choice between certified and uncertified devices, the certified device should be selected. Principles for respirator selection include:

- Nature of hazardous operation or process;
- Type of air containment, concentration, physical and chemical properties, and its effect on the body;
- The length of time that respirator protection will be needed;
- Location of hazard in relation to a source of air that is not contaminated;
- The physical assessment of employees ability to wear assigned respiratory protective equipment and perform work—some people may have health impairments that preclude them from providing the additional effort needed to breathe through certain types of respirator filters;
- The effectiveness of the respiratory device and the ease of using this.

Misuse of respirators may cause problems. Sometimes filter respirators for particulates are incorrectly used and are of no value for solvent vapors, gases, or lack of oxygen. Sometimes chemical filtering respirators are used when atmosphere supporting or self-contained breathing apparatus is required. Some substances require both protection from damage to the respiratory system and systemic injury through the skin.

Excellent health and thorough training in the operation and maintenance of equipment is needed for people who use respiratory protective devices. Air purifying respirators include gas masks, chemical cartridge respirators, particulate filter respirators, and combinations.

The gas mask type consists of a faceplate, a flexible tube, and a canister. The contaminated air is filtered through the canister. The canister is designed for one or more gases or vapors or particulates. This type of device will not give protection in oxygen deficient atmospheres; the oxygen content in the air must be at least 19.5% by volume. The time a gas mask type of respirator is effective, depends on the concentration of the gas or vapor, the type of canister, and the amount of activity by the user. Since this type is often used in emergency situations, there is often strain and excitement. Each mask user must undergo a physical examination with emphasis on the heart and lungs to establish his ability to safely use the device.

The chemical cartridge respirator consists of a half mask face piece connected to one or two small containers of chemicals. These are used in non-emergency situations and atmospheres that are harmful for prolonged or repeated exposures.

The particulate filter respirator is available for most types of particles. The main considerations are the resistance to breathing provided by the filter element, the fineness of the particles that are to be filtered, and the adaptation of the face piece to fit the face. High breathing resistance will not only waste energy, but may damage lungs. High porosity filters are effective against fine dust, but offer high breathing resistance. Breathing resistance is lowered by increasing the porosity of the filter, but then the effectiveness for fine dust is reduced.

AIR SUPPLIED RESPIRATORS

Hose masks and airline respirators are used for emergency situations. This type provides air for breathing in hazardous atmospheres.

Voluntary Use of Dust Masks

The voluntary use of dust masks (filtering face piece respirators) is permissible in atmospheres that are not hazardous. Prior to use of the voluntary respirators (including filtering face pieces), they must be evaluated and approved by the respiratory program administrator to ensure that the respirator use will in itself not create a hazard. If filtering face piece respirators are used, the users shall be provided with the information contained in Appendix D of OSHA Standard 29 CFR 1910.134.

10. ACCIDENT RECORDS AND ANALYSIS

The purpose of this section is to assist each EMCOR location with their maintenance, retention, and use of accident records. It is important to consider that some of the following performance criteria are in accordance with OSHA Standards.

SCOPE

- OSHA 300 log
- Recording Requirements
- Posting
- Retention

OSHA Form 301
Accident File
Accident Analysis

PERFORMANCE

EMCOR will maintain the various accident, injury, and illness records and reports required by both OSHA and the State Workers' Compensation Laws.

A periodic analysis of accident causes will be completed to determine positive and adverse trends, and to advise location management/supervision of progress toward eliminating identified problem areas.

OSHA 300 LOG

Recording Requirements: It is the Safety Manager's responsibility to ensure that the OSHA 300 Log is properly maintained in an up-to-date manner. (Refer to OSHA Recordkeeping Guidelines Summary for Occupational Injuries and Illnesses.)

Injuries and illnesses which must be recorded within seven working days on the OSHA 300 Log include all work related cases, which result in the following:

- Deaths
- Occupational illnesses

ACCIDENT RECORDS AND ANALYSIS

Occupational injuries that involve one or more of the following:

a. Loss of consciousness
b. Restriction of motion
c. Transfer to another job
d. Medical treatment (other than first aid), or
e. Loss of workdays after the day of injury

Posting: The Safety Manager will post, during the months of February 1st to April 30th, the summary portion of the OSHA 300A Log containing entries from the previous year. It is important that the contents of the log be accurately totaled, and that the log be signed and dated by the responsible person.

Retention: The OSHA 300 Log must be retained for five years after the end of the calendar year to which it relates.

OSHA FORM 301

The Employer's Report of Injury (OSHA Form 301) is required by state law to be submitted to our Workers' Compensation Carrier. It should be completed as soon as possible following the Supervisor's Accident Investigation Report, and sent to the closest office of the carrier within five (5) days to comply with the law. The location or work site secretary may be designated to do this.

A copy of this report should be put in the employee's file, and another copy sent to the Corporate Safety Manager.

ACCIDENT FILE

A master accident record file will be established and maintained consisting of the following:

- Employer's Report of Injury (OSHA Form 300)
- Supervisor's Accident Investigation Report
- Physician's Report of Injury and Treatment

This file is considered in addition to any copies maintained in individual employees' files. The Safety Manager will prepare a detailed Accident Review and Analysis at least twice a year. The highest resulting percentages should be highlighted in the findings.

Loss information pertinent to the preparation of the review and analysis will be from the current OSHA 300 Log and Supervisor's Accident Investigation Reports. It will also be important to review and analyze the minor injuries listed on the First Aid Log.

11. OSHA Survey Guidelines

The purpose of this section is to prepare local EMCOR management and safety coordination for a visit by an OSHA Compliance Officer. It is expected that the requests for OSHA inspection of the workplace will be reasonable and conducted within the framework of the Occupational Safety and Health Act.

Scope:

- Management/Alternate Notification
- Authorization
- Procedures

Performance:

Management/Alternate Notification

Each EMCOR location or work site will prepare a roster of management and members who will meet with the Compliance Officer during the opening conference, and who will accompany the officer on the inspection. The roster should include at least one alternate for each member. One person should be designated to immediately notify the Safety Manager.

Written instructions should be prepared for the receptionist or guard as to the person or persons to be notified, and, in the event they are unavailable, their alternates. This must be done promptly as the Compliance Officers must notify the Area Director if they are kept waiting more than 20 minutes. (Waiting may also make their inspection more critical.)

During the opening conference, the Compliance Officer must explain the purpose of the inspection. Site supervision must be prepared to discuss and prove those actions taken to demonstrate EMCOR's commitment to the health and safety of its employees (e.g., work practices, safety standards, safety manuals, tool box talks, and orientation programs for new employees). A site representative is required to accompany the Compliance Officer during the inspection and keep accurate notes or pictures of alleged violations as noted by the Compliance Officer.

If the inspection is precipitated by an employee complaint, the Compliance Officer will present a copy of the complaint to the employer. If the purpose of inspection is not stated, the Compliance Officer should be asked if it is a general inspection or as a result of an employee complaint. The Compliance Officer must withhold the name of the complainant if the complainant so requests.

Procedures

The following steps should be taken to minimize conflicts and protect company interests in the event of an OSHA inspection:

1. The Compliance Officer should be treated courteously at all times. The Compliance Officer may deny the right of accompaniment to any person who interferes with an orderly inspection. If there are any trade secrets to be protected, they should be identified before the inspection begins.
2. The Compliance Officer normally checks the display of the OSHA poster and "Log of Occupational Injuries and Illnesses" (Form 300). Appropriate records should be readily available should the Compliance Officer request them (Form 300 must be posted during the months of February, March and April each year). These records should also include safety programs, safety meeting minutes, inspection reports (both general and specific equipment), etc., which indicate good faith.

3. The Compliance Officer must be warned of any hazards that may be encountered and any special plant rules or regulations that require protective clothing or equipment. The Compliance Officer should be provided with protective equipment employees are required to use when in the facility.
4. A pre-established inspection route may be suggested by management; however, the Compliance Officer is the sole judge of the conduct of the inspection. The Compliance Officer should be escorted throughout the facility. If the Compliance Officer wishes to inspect a complaint area only, he may ask to be escorted there directly. However, a slightly longer route outside or through a better area might be judicious.
5. The site supervisor or management safety representative should be prepared to take copious notes during the walk-around inspection. If the Compliance Officer carries additional equipment such as a camera or other test devices, the management representative should also be equipped with a camera as well as other test devices, if available. If the Compliance Officer takes photographs, similar photographs of the exact scenes should be taken by the management representative. A couple of extra photographs should include the Compliance Officer for authenticity. Note time and subject of each photo.
6. The Compliance Officer is required to conduct a closing conference with the site's senior available officer and review the findings, including possible citations. At this conference, the Compliance Officer should review apparent violations, if any, and discuss abatement dates. Practicality of an item may be discussed, but should not be argued. Copious notes should be taken of each item discussed.
   After the inspection has been completed, a closing conference will be held between the Compliance Officer and the employer. This is the best time, before possible issuance of a citation, to explain and document your position on alleged violations with the compliance office. It is imperative that we question any proposed findings or abatement period which are unreasonable.
7. Taping or recording of this conference must not be done without the knowledge of the Compliance Officer. He may give permission to record the closing conference; however, this may cause him to be extremely careful of what he will say and not speak "off the record."
8. Following the inspection, the Safety Manager shall be notified of the inspection results and the closing conference. Notes pertaining to the inspection and conference should be transcribed and signed as soon as possible. All inspection photographs should be developed as soon as possible. Each photograph should be numbered and dated. A list of the photographs should be made and the following information should be recorded for each photograph.
   - Number of photographs
   - Location of the photograph within the plant facility
   - The date (month, day, year) and time of day
   - Location of photographs (looking toward, etc.)
   - Brief description of what the photograph is identifying
   - Name of the photographer
   - Name of person responsible for retention of negatives or original photographs
   - If photographs invoke a trade secret, name of the person so informing the Compliance Officer of this fact

9. Upon receipt of citations and "Notice of Proposed Penalty, the Safety Manager shall be notified by telephone. Copies shall be forwarded at once. The time and date of receipt shall be recorded on the citations. Management should review each item for the following:
    - Accuracy
    - Abatement period
    - Severity of violation - serious or non-serious

    A review of the citations, abatement periods and "Notice of Proposed Penalty" with the Safety Manager should be conducted as soon as possible.
10. Citations must be posted immediately. The requirement for posting will be attached to the citation. Failure to post the citations promptly may result in a fine.
11. Formal notices to contest citations, abatement periods, or proposed penalties must be filed within 15 working days from "Notice of Proposed Penalty" receipt. If there are any questions concerning the citation, penalty, or abatement periods, an informal conference can be arranged with the OSHA Area Director. The informal conference must be conducted within the 15 working day period. It is imperative that requests for the informal conference be initiated as soon as possible.
12. If it is decided by the Safety Manager and/or company management, after consultation with the Legal Department, not to contest, then the penalty will be paid promptly by the facility and necessary action must be taken to abate the citation within the abatement period. Correction of violation within the abatement period of less than 30 days should be reported promptly to the Area Director. If there is a long abatement period, 30-day status reports on compliance must be forwarded to the local OSHA Area Director.
13. Approval to secure variances, tolerances, or exemptions from any published OSHA Standard must be processed through the Safety Manager. He will coordinate the procedure with the Legal Department. The cost of securing a variance may be higher than the cost of complying. Consideration should also be given to possible unfavorable publicity, since it is required that the requests for variance be published in the Federal Register, which in turn are part of the public record. Also, a variance proposed by the Company must provide the same degree of protection as the protection method contained in the existing OSHA Standard.

12. MEANS FOR ENSURING EMPLOYEES COMPLY WITH SAFE AND HEALTHY WORK PRACTICES

EMCOR project sites will use the following means for ensuring that employees comply with safe and healthy work practices:

Disciplinary Action: Work rules are established, and include, but are not limited to, the following safety related items (taken from the Employee Handbook). These items may be cause for disciplinary action up to and including termination:

- Unsafe work practices or violation of unsafe rules.
- Failure to notify supervisor of any injury when it occurs, whether it requires first aid attention or no care at all.
- Smoking or eating where prohibited.

The following are examples of safety related actions (taken from the Employee Handbook) that may result in immediate termination, without prior warning or disciplinary action:

- Possession of alcoholic beverages or being intoxicated while on company premises.
- Unauthorized possession or use of drugs on company premises.
- Deliberate or negligent abuse of company property.
- Fighting or assault.

Safety violations or horseplay, which causes injury to persons or damage to property.

Note: Disciplinary action is subject to the grievance process covered under the current Union Agreement.

Failure to comply with the safety and work rules may result in the following:

- 1st occurrence -written warning
- 2nd occurrence -written warning
- 3rd occurrence -termination

However, we reserve the right to terminate after the first offense. If terminated, the Union may be notified that you will be "ineligible for re-hire."

Safety Incentive Programs: Safety incentive programs may be used by the company as considered appropriate and approved by the Safety Committee.

Employee Recognition: Individual employee safety recognition programs may be used by the company as considered appropriate and approved by the Safety Committee.

As a general practice while in the course of safety observations, supervisors will be encouraged to use verbal recognition as a means of positive reinforcement of employee safety work practices.

Training/Retraining: The Safety Committee may recommend training or retraining programs as the result of its review of accident investigations, inspections, and hazard evaluations. Such programs will be implemented as directed by the Safety Committee.

GENERAL

Parking is allowed only in specified areas on the project. The foreman will advise employees as to where these areas are. Parking in unauthorized areas may result in the vehicle being towed away.

Project foreman will see that starting time, break and lunch are strictly adhered to. The normal working hours on the project are as follows:

_____Start time at designated gang box/work area
(Supervisor to fill in)

to Meal break

_____Quitting time at designated bang/box work area
(Foreman to fill in)

Thank you for reading these friendly reminders about safety and work rules. We want everyone to work safely.

13. INDIVIDUAL SAFETY AND WORK RULES WARNING

THE FOLLOWING WARNING WAS ISSUED TODAY AND IS TO BE MADE PART OF THE OFFICIAL JOBSITE AND OFFICE PERSONNEL RECORD.

Employee Name _____ Date of Violation _____

Job Number _____ Job Name _____

VIOLATION:

[ ]Not wearing hard hat
[ ] Not wearing eye protection
[ ] Using alcohol or drugs
[ ] Not wearing proper devices
[ ] Throwing material from building
[ ] Horseplay
[ ] Not wearing or using protection safety belt
[ ] Violation of safety rules

[ ] Unsafe use of equipment and/or

[ ] Fighting on company tools unauthorized premises substances during work
[ ] No work gloves on hours
[ ] Disabling or person unhooking safety
[ ] Not abiding by clothes (shoes, etc.) company work rules
[ ] Housekeeping
[ ] Other (please detail reporting under the remarks below)

REMARKS: (Set forth all facts in detail)

_____

_____

_____

_____

_____

Supervisor Signature _____ Employee Signature _____

14. VEHICLE SAFETY

To ensure that employees given the privilege of operating a motor vehicle owned or leased by EMCOR are operating that vehicle in a safe, legal and responsible manner.

SCOPE:

To provide guidance in vehicle safety, including:

- Written Vehicle Safety Program
- Driver selection and training
- Use of occupant restraint systems
- Accident reporting procedures
- Accident investigations
- Vehicle inspections
- Vehicle preventive maintenance

PERFORMANCE:

As a minimum, the following rules and requirements must be strictly adhered to:

- Vehicles operated on public/private property and on public/private streets or roadways that are owned or leased by EMCOR must be operated only by authorized personnel that hold a current and valid vehicle operator driver's license.
- Only authorized personnel may operate an EMCOR owned or leased vehicle.
- Each employee assigned a vehicle owned or leased by EMCOR shall have signed a copy of the rules and regulations on file with the Loss Control Director before he/she is permitted to operate that vehicle.
- If an employee of EMCOR accepts the responsibility of operating a company owned or leased vehicle, he/she agrees to obey all traffic laws. Any violation of these laws that results in a moving traffic citation shall be the sole responsibility of that employee.
- All vehicle operators will wear the approved restraining devices.
- Vehicle operators shall not operate a vehicle while under the influence of drugs, alcohol or any other intoxicating substance that may impair the driver's ability to properly operate the vehicle. This includes off-hour and personal times when the vehicle is operated.
- Any employee stopped by the police or highway patrol and found to be driving any vehicle under the influence of alcohol or drugs will not be allowed to drive company vehicles off site for two years.
- If an employee is involved in a EMCOR owned or leased vehicle accident and it is determined that he/she is responsible for the accident, and that alcohol or any other intoxicating substance caused that employee's involvement with the accident, then that employee shall be held solely responsible for any and all costs and expenses associated with that accident and shall indemnify and hold

harmless EMCOR. Additionally, any expenses incurred by EMCOR may be sought from the involved employee's personal insurance provider.

- All employees are required to lock and/or secure the assigned company vehicle on and off duty, whether the vehicle is parked at the job site or elsewhere.
- Vehicle operators shall not transport, or allow anyone else to transport any illegal or regulated substances in their assigned vehicles.
- Operators shall not alter or intentionally damage or abuse their assigned vehicle.
- Employees assigned a vehicle shall make available to EMCOR a photocopy of their vehicle operator license.
- EMCOR will conduct quarterly requests to the Dept. of Motor Vehicles to ensure that the supplied vehicle operator's license is current and valid, and updates on all personnel driving company vehicles.
- An employee's privilege will be denied based on his/her driving record. Any employee accumulating three or more points will not be allowed to drive company vehicles off site.

DRIVER SELECTION AND TRAINING

Driving a vehicle is often considered an incidental part of an employee's duties and is therefore not emphasized during the hiring process. However, the importance of safe driving should not be overlooked. Driving ability should be included with other job requirements.

Written job applications will include information on prior driving experience, accident history, and driving records. Employee interview procedures shall include questions related to the job application information on driving experience and accident history.

Motor vehicle records will be obtained from the Dept. of Motor Vehicles in the state the applicant is licensed. Subsequently, MVRs (Motor Vehicle Records) shall be reviewed quarterly. Minimum driving record criteria (including motor vehicle citations and accidents) will be established against which each driver's record will be judged. Drivers not meeting the minimum criteria will not be allowed to drive for the company.

A written road test will be given to all employees prior to assigning driving duties. The written test will determine the applicant's knowledge of safe driving procedures, traffic regulations, and signs. Anyone who cannot answer the test questions, in writing, will not be allowed to drive. The test should be used as a guide for initial driver training and instruction.

All employees who will be required to drive will be given an initial road test to determine their ability to drive the type of vehicle they will be driving most frequently, and any specialty vehicles, such as construction equipment or off road vehicles. They will be trained on the specifics of the vehicle they will be driving. Each driver will receive a list of the vehicle operating rules and accident procedures.

Training will be given to any employee who is required to drive but does not pass the written and/or driving tests. The training will be conducted until a satisfactory driving level is achieved, at which time the employee will be allowed to drive.

USE OF OCCUPANT RESTRAINT SYSTEMS

Each EMCOR employee occupying a motor vehicle on company business or a company vehicle on personal time shall have an occupant restraint system properly fastened at all times when the vehicle is in motion. Adherence to this rule is the driver's responsibility.

VEHICLE SAFETY MEETINGS

Vehicle Safety Meetings will be held on a regularly scheduled basis. These meetings may be combined with other safety meetings, and/or supervisor/project manager meetings. Topics can include recent accidents, changes in driving conditions, identified road hazards (such as a sharp turning highway exit with a rollover exposure) and other pertinent information. The topic discussed and the names of the meeting attendees will be documented.

ACCIDENT REPORTING PROCEDURES

All accidents must be reported immediately to the employee's supervisor. In case of serious injury and/or extensive property damage, the insurance company and/or agent should be notified immediately by telephone. In all cases, a written report should be sent to the supervisor within 24 hours after the accident.

Each EMCOR company-owned or leased vehicle should be supplied with an emergency packet, which includes the following:

- Auto/Truck Accident Report Form
- Supervisor's Fleet Accident Investigation Form
- Procedures to follow at an accident site
- Witness Observation Form
- List of insurance company claim offices to contact

Drivers of EMCOR company-owned or leased vehicles are to be informed of their responsibility for the following:

- Auto or Truck Accident Report Form
- Supervisor's Fleet Accident Investigation Form (Items 1 through 9)
- Sending both forms to their immediate supervisor. In case of accident, the driver should:

Help the injured. Provide only whatever first aid you are qualified to give. Don't allow the injured to be moved unless it is necessary for their safety. Call a paramedic or ambulance if injury appears serious.

Protect the accident scene. If the vehicle is in the right of way, protect the scene to prevent further collision. Use cones or other warning devices. Avoid moving the vehicles until the police have arrived, unless it presents a hazard to other traffic or personnel. Call a law officer. File an accident report with the police.

- Gather all information to complete your accident report form.
- Secure names of witnesses.
- Call your supervisor and report the accident.
- Call the Loss Control Director.

Do not discuss the accident with anyone except a properly identified representative of EMCOR or police authorities.

The supervisors of all employees involved in accidents will be informed of their responsibilities. The supervisor will do the following:

- Review the accident report along with the involved drivers' statements and answers on the Supervisor's Fleet Investigation Form.
- See that a copy of the accident report form is sent to the company Safety Director and Loss Control Director.
- Complete Items 10 and 11 on the Supervisor's Fleet Investigation Form and send it to the company Safety Manager/Project Manager.

The company Safety Manager should complete specific items as they relate to fleet accidents, including:

- Review the company accident report form and the Supervisor's Fleet Investigation Report in conjunction with the current MVR on file for the driver.
- Complete Item 12 on the Supervisor's Fleet Accident Investigation Form making comments and/or recommendations.
- Having a meeting with the involved driver, the supervisor, and other responsible company officials, if necessary, to make the final disposition of the case known to all parties.
- Send a copy of the finalized report along with a copy of the driver's MVR to the Safety Director.

ACCIDENT INVESTIGATIONS

All accidents and/or close call incidents should be investigated as soon as possible after they are reported. The purpose of this investigation is not to find fault (that is, to fix responsibility), but rather to find facts, which can then serve as feedback to improve all aspects of your Vehicle Safety Program. The level of investigation, due to the amount of time and cost required, will depend on the severity of the accident or close call. The lowest level of investigation should include the driver's report and a review of that report by the safety officer. In larger operating companies, a Safety Manager may be available to review the driver's report and decide whether or not further investigation is needed. In severe cases, a high level of in-depth investigation should be conducted to collect all pertinent data in the vehicle, human, and environmental areas. Photographs (preferably at the scene) and inspections of all involved vehicles should be employed to collect the needed vehicle data. Driver reports and interviews of all drivers and witnesses should be used. Photographs and measurements at the scene should also be utilized. Refer to Section L of this manual for further information on conducting investigations.

VEHICLE INSPECTIONS

Vehicle inspection is an important part of the fleet program. Inspection of vehicles will reveal defects and/or unsafe conditions before they can cause serious vehicle damage or personal injury. Regardless of the size and type of vehicles, there should be:

- Inspections by the driver.
- Inspections by the supervisor.

- Inspections and audits by the Safety Manager.

Inspection by the Driver

The driver of a fleet vehicle should be responsible for conducting routine inspections of the vehicle he operates. The inspection should include items such as those on the sample forms provided. A protocol should be established for the driver to follow if defects are noted during the vehicle inspection.

Inspection by the Supervisor

Supervisors should spot-check several vehicles at least once a week. The spot-check should include an actual inspection of a vehicle. The results of the inspection should be compared to the Vehicle Condition Report filed by the driver. Any variance or conflicts between the two reports should be discussed with the driver and the Safety Manager. A casual, visual inspection should be made on a random basis.

The Supervisor should also perform periodic fleet observations. The fleet observations should be designed to observe the vehicle and driver during the course of an actual workday. When completing a fleet observation, documentation should be completed and placed in the driver's personnel file.

Inspection and Audit by the Safety Manager

The Safety Manager/Project Manager should inspect fleet vehicles on a random basis. These inspections should be completed during the regular inspections of the physical facilities.

In addition to periodic review of fleet vehicle conditions, the Safety Manager should audit the inspection-correction process used for the fleet vehicles. The purpose of the audit will be to determine whether or not:

- The drivers are inspecting their vehicles.
- The supervisors are periodically verifying the results of driver inspection.
- Maintenance is correcting the defects/unsafe conditions reported.

Identifying in the inspection/correction process will assist the Safety Manager in recognizing areas where additional supervisor/driver training is needed. Also, the Safety Manager will be able to verify that the vehicles are leaving the premises in a reasonably safe condition.

The supervisor should also perform periodic fleet observations. The fleet observations should be designed to observe the vehicle and driver during the course of an actual workday.

When completing a fleet observation, documentation should be completed, and placed in the driver's personnel file.

VEHICLE PREVENTIVE MAINTENANCE

EMCOR fleet vehicles cover a wide spectrum. Because of this fact, a specific fleet preventive maintenance program cannot be developed to include all operations. As such, this section of the fleet guidelines will be designed to include those necessary and basic elements that should be included in every fleet preventive maintenance program.

The depth of the fleet preventive maintenance program should take into consideration whether vehicles are fully or partially maintained and repaired at your facilities, or whether all vehicle maintenance is "farmed out."

Fleets usually develop their own particular systems of maintaining their vehicles. It may be one or a combination of those systems previously mentioned.

The type of fleet, size and scope of operation and other factors will determine the nature of the maintenance procedures. Maintenance should be done on a regularly scheduled basis either by mileage, hours of operation or on a specific time period. At a minimum, manufacturers recommendations will be followed. With any fleet program, maintenance records should be kept. The maintenance records and forms should be designed to serve a three-fold purpose.

- Show vehicle maintenance needs.
- Provide a schedule of work to be done.
- Record completed maintenance and cost. (Maintenance forms may be obtained from truck manufacturers, oil companies, or maintenance form producers)

MAINTENANCE REQUIREMENTS

DOT Requirements: The Department of Transportation safety regulations include certain standards of vehicle inspection and maintenance, which are to be followed by motor carriers under its authority.

State Requirements: States whose traffic laws and ordinances conform to the Uniform Vehicle Code have provisions for the inspection of motor vehicles and components on the road by state highway patrol officers and twice a year at official inspection stations designated by the State Commission of Motor Vehicles.

15. EMPLOYEE COMMUNICATION OVERVIEW

Job sites will use the following means for communicating with employees on matters of safety and health:

1. Periodic scheduled tailgate safety meetings for all employees.
2. Special safety meeting/training sessions, as needed on new hazards or procedures, or equipment for all or specified employees.
3. Posting of notices on established bulletin boards at each job site.

16. EMPLOYEE SAFETY MEETINGS

The purpose of this section is to ensure that each EMCOR job site employee is involved in regularly scheduled safety meetings or toolbox safety talks.

SCOPE

- Program development and implementation
- Frequency
- Documentation

Program Development and Implementation: Each direct supervisor will complete safety talks as part of regularly scheduled toolbox meetings. The meetings will be scheduled in advance with a topic pre-chosen by the supervisor. The supervisor will review the safety talk material at least a day prior to the meeting. The safety talk may even be posted or issued to each employee so they can be more effectively prepared to discuss the subject.

Each meeting need not take much longer than five or ten minutes, but the information should be communicated in the supervisor's own words. To enhance the meeting, actual items of interest should be shown or demonstrated such as mushroomed or damaged tools, personal protective equipment, Polaroid pictures of hazards, etc. Visual aids such as videos may also be used to augment the meeting.

In addition to the safety talk, each supervisor should cover the following additional items to some degree:

- Review any injuries the work group has experienced since the last meeting.
- Review the safety violations noted by the supervisor during day-to-day observations or planned inspections.
- Review the work planned for the week ahead, and discuss higher risk activity and necessary safeguards.

Frequency: The frequency of the toolbox meetings will depend on the nature of each individual operation. By their very nature, work sites are generally in a state of constant change. Normally, this will require that toolbox meetings be conducted on a regular schedule at the work sites.

Documentation: Each safety or toolbox meeting will be fully documented regarding topic, participation, and resource material. Five Minute Safety Talks are available through the Safety Manager to ensure meeting implementation and documentation.

ACCIDENT REVIEW

Name: _____
Title/Supervisor Name_____
Date/Location:_____
Description of Injury:_____
Cause of Injury: _____
Solution to Problem(s):_____

Name: _____
Title/Supervisor Name_____
Date/Location:_____
Description of Injury:_____
Cause of Injury: _____
Solution to Problem(s):_____

Name: _____
Title/Supervisor Name_____
Date/Location:_____
Description of Injury:_____
Cause of Injury: _____
Solution to Problem(s):_____

Name: _____
Title/Supervisor Name_____
Date/Location:_____
Description of Injury:_____
Cause of Injury: _____
Solution to Problem(s):_____

17. SAFETY INSPECTIONS

The purpose of this section is to ensure that comprehensive, documented inspections are being completed at EMCOR work sites.

Scope

- Responsibility
- Inspection
- Procedures
- Documentation
- Corrective Action and Follow-up

Responsibility:

Each supervisor of an EMCOR work area (work site, department, etc.) will be responsible for making a daily informal tour of the area(s) under his/her direct supervisor.

At least weekly, the supervisor of an EMCOR work site will make a formal documented safety and health inspection of his/her area of responsibility. This frequency is due to the ongoing changes in work environment and manpower.

Inspection Procedures

The supervisor should pay close attention to observing work methods as well as work conditions. Prior to the inspection, the supervisor should review past accidents to determine specific causes and high hazard areas of operation. Such areas need to be given special attention during each inspection.

Both unsafe conditions and unsafe acts are contributing factors in most occupational accidents. An unsafe condition, in addition to being a direct cause of accidents, often requires, or at least suggests, an unsafe act.

In addition to the contents of an inspection checklist, the supervisor should watch for the following unsafe acts of employees:

- Using equipment without authority.
- Insecure or disorderly piling or arranging of material.
- Operating equipment at an unsafe speed.
- Using defective tools or equipment.

Safety Inspections

- Unsafe loading or unloading of trucks, skids, racks, etc.
- Lifting improperly, or handling loads that are too heavy.
- Using improper tools, equipment, or vehicles.
- Using tools, equipment, or vehicles improperly.
- Making guards or safety devices inoperative.
- Failure to use personal protective equipment.
- Repairing or adjusting machinery in motion or equipment that is under pressure or energized.
- Horseplay.

Remember unsafe conditions may cause injuries . . . unsafe work practices cause accidents. How do you know it's safe . . . have you really looked?

Documentation:

Safety and Health Inspection checklists will be submitted for each supervisor's inspection. See EMCOR "Site Inspection Report Form". The completed checklists will be handled in the following manner.

Once the checklist is completed by the supervisor, which includes a description of corrective action taken or planned for each deficiency (including work order number and date issued), a copy should be forwarded to the immediate manager. An additional copy will be forwarded to the Safety Director to initiate follow-up assistance.

The completed checklists will be openly discussed as past of the Safety and Health Committee agenda. Location management/supervision will be kept informed of the findings through published minutes.

Corrective Action and Follow-up:

Whenever possible, the supervisor will correct unsafe work methods and conditions immediately upon recognition. Each Safety and Health Inspection Checklist will be updated during the next scheduled tour. Items not yet corrected will be repeated on the new checklist with asterisks (*) indicating a "repeat" item and a notation of the date originally identified.

Hazard conditions or procedures detected during inspections for which no corrective action can be determined by the supervisor will be brought to the attention of the local EMCOR Safety Director. The director will consult with the supervisor, maintenance/engineering, immediate manager, Safety Committee, and outside consultants, as appropriate to determine suitable corrective action. Recommendations submitted by insurance company representatives and/or outside consultants will be handled in the same manner as the Safety and Health Inspection Checklists.

Safety Inspections

A system of prioritization for work orders pertaining to safety/health items will be utilized. Items on the Safety and Health Inspection Checklists will be classified as an "A", "B", or "C" hazard by the inspector(s), and this classification will be indicated on the work order. Priority will then be given to the completion of work orders as follows:

Priority for Correction of Safety Hazards

Hazard Classification	Correction Schedule
Class A (= Urgent)	Isolate or remove from service and repair or replace immediately.
Class B (= Important)	Complete corrections within 30 days.
Class C (= Routine)	Schedule corrections into routine maintenance schedule.

2. GENERAL SAFETY PRACTICES

Working safely is a condition of employment with EMCOR that affects the health and livelihood of the entire operation.

SCOPE

The Safe Work Practice applies to all EMCOR company personnel.

REQUIREMENTS

1. Smoking is only permitted in designated areas. A carelessly thrown match or cigarette could start a fire.
2. Horseplay is dangerous and unacceptable on the work site.
3. Personal protective equipment is provided to ensure employee health and safety. It is required on certain jobs.
4. Observe all safety signs and tags as they are used to warn employees of hazards.
5. Safety devices and guards are not to be removed or made inoperative.
6. Some equipment requires specialized training to operate safely. Do not operate equipment without authorization.
7. Hitching a ride on a Powered Industrial Truck is strictly forbidden.
8. Do not wear loose fitting clothing or jewelry around equipment or machinery.

1. HOUSEKEEPING

A clean, orderly, well-lit work area reduces the potential for slips, trips, falls, and struck by accidents.

All places of employment shall be kept as clean as possible, taking into consideration the nature of the work. Regular cleaning shall be conducted in order to maintain safe and sanitary conditions in the workplace.

The floor of every workroom shall be kept as dry as possible.

To facilitate cleaning, every floor, working place, and passageway shall be kept free from nails, splinters, loose boards, clutter, and unnecessary holes and openings.

SCOPE

The Safe Work Practice applies to all EMCOR work and storage areas. Good housekeeping is everybody's responsibility.

REQUIREMENTS

- The employee shall keep the inside of the structure and surrounding grounds clean and free from trash and debris. Trash containers located throughout the job site shall be used.
- Excess scrap materials and rubbish shall be removed from the work area.
- All surplus materials shall be returned to the stockpile in an orderly fashion at the completion of a job.
- Avoid carelessness in placing tools or materials overhead to prevent them from falling.
- Do not obstruct any portion of an aisle or walkway with tools or material.
- Maintain sufficient illumination by replacing broken lights or bulbs, and keeping storage from obstructing them.
- Tools and materials shall be put in the gang box.
- Oily rags shall be placed in approved metal containers.
- Spilled liquids shall be wiped up immediately. If the problem cannot be handled, the supervisor shall be notified.
- Accumulations of soiled clothes, food scraps, and soft drink bottles are not permitted; drinking cups, sandwich wrappers, paper bags, and other trash should be placed in containers provided.
- Toilets, wash-up facilities and drinking fountains shall be kept clean and sanitary; problems should be reported to the supervisor.
- Inspect the job site daily for good housekeeping.
- Maintain fire extinguishers and keep them visible.

2. LOCKOUT/TAGOUT

To prevent injury to EMCOR employees due to the inadvertent activation of equipment during routine operations, adjustment, or maintenance operations.

SCOPE

- General standards apply to all EMCOR employees and contract employees.
- Specific job standards and the standard operating procedures for specific pieces of equipment apply to the authorized and affected employees.

REQUIREMENTS

Management will prepare a written Hazardous Energy Control Program, which contains the following elements:

- General lockout/tagout procedures.
- A statement of intended use of the procedures.
- Steps for shutting down, isolating, blocking and securing hazardous energy.
- Steps for placement, removal, and transfer of lockout/tagout devices.
- Requirements for testing to verify effectiveness of lockout/tagout devices.
- An outline of employee training requirements.
- Procedures for documenting employee training.
- Procedures for conducting periodic inspections to ensure compliance with established procedures.

Management will train all authorized and qualified employees on the lockout/tagout standard operating procedures as well as the established procedures for specific pieces of equipment.

All training of authorized and qualified personnel will be documented.

When performing Lockout/Tagout all affected personnel in the area shall be notified.

Management will obtain lockout/tagout devices that are standardized, singularly identified, used only for energy control, and not used for other purposes. The devices must be durable, and must identify the authorized employee utilizing the device.

For further compliance with OSHA regulations see 29 CFR 1910.147 and 1926.417.

3. ELECTRICAL

Electrical wiring and equipment shall be free from recognized hazards that are likely to cause death or serious physical harm.

SCOPE

This Safe Work Practice applies to the safety standards for electrical wiring and equipment used by all personnel at EMCOR work sites.

REQUIREMENTS

- Maintain wiring and equipment in accordance with the National Electrical Code, NFPA 70-78 and ANSI C2-81.
- Wires shall be spliced or joined with splicing devices suitable for the use or by brazing, welding, or soldering.
- All splices, joints, and free ends of wire shall be covered with an insulator.
- Electrical equipment must indicate manufacturer's name, voltage, current, wattage, or other ratings.
- Sufficient workspace shall be provided and maintained around electrical equipment to permit safe operations and maintenance of equipment.
- Electric equipment operating over 50v shall be guarded against accidental contact by approved cabinets or enclosures.
- Lighting outlets shall be arranged so that employees making repairs on them will not be endangered by live parts or other equipment.
- Ground wires must be identified and distinguishable from all other wires.
- EMCOR operating companies shall use ground-fault circuit interrupters or implement an "assured equipment grounding conductor program" per OSHA Standard 29 CFR 1910.304 (b)(l)(ii).
- Electrical control panels with open wires shall be guarded to make them accessible only to qualified persons.
- Warning signs and high voltage shall be posted when unqualified personnel might come in contact with live parts.
- Conductors (wires) and equipment shall be protected form over current in accordance with their ability to safely conduct current.
- No wiring system of any kind shall be installed in ducts used to transport dust, loose stock, or flammable vapors.
- Flexible cords must be securely fastened so that there is no direct pull on joints or terminal screws and cannot be substituted for fixed wiring.
- Flexible cords and cables shall be protected from accidental damage.
- Junction boxes, outlet switches, and fittings must be covered and breaker switches must be identified as to their use.

- Whenever possible, all equipment and circuits to be worked on shall be de-energized before work is started and personnel protected by clearance procedures, Lockout/Tagout, and grounding.
- Energized work may never be performed without prior authorization. If it is determined that equipment must be worked in an energized condition, an energized work permit shall be completed. (See SWP # 1 Attachment C – EGS Site Based Energized Electrical Work Permit) (See also NFPA 70E)

4. HAND AND PORTABLE POWER TOOLS

To prevent injury to EMCOR employees from the improper use of power tools and/or from the use of damaged or defective power tools.

SCOPE

The Safe Work Practice applies to the use of all hand and portable power hand tools.

REQUIREMENTS

1 All hand and power tools whether furnished by EMCOR or employees must be in safe working condition. Employees should comply with manufacturer's instructions for use.

2 Tools should be inspected daily to ensure they are working properly. Damaged or defective tools should be placed out of service until repairs are completed.

3 Power saws, grinders, and other power tools should always have proper guards in place.

4 Using damaged, defective, or improperly guarded tools shall be cause for disciplinary action.

5 Power tools should only be hoisted or lowered by a hand line.

6 Cords and hoses should be kept off of walkways, stairs, and ladders. Placement should not create a tripping hazard.

7 Hoses and cords should not be subjected to damage from equipment or materials.

8 All EMCOR employees using hand and power tools must wear the appropriate protective equipment.

9 Recondition or repair mushroomed heads on impact tools such as chisels, punches, etc.

10 Electric power operated tools must be double insulated or grounded.

11 All fuel-powered tools will be stopped during refueling, service, or maintenance.

12 Only employees who have been trained in the safe operation of powder-actuated tools are authorized to use them.

13 Powder-actuated tools shall be tested each day before loading to see that safety devices are in proper working condition.

14 Powder-actuated tools must be treated with the same respect as firearms. They are extremely dangerous when used improperly.

15 Never point a powder-actuated tool at anyone.

16 All employees using hand and powered tools should be properly trained with each type.

17 Loose and frayed clothing, loose long hair, dangling jewelry (including dangling earrings, chains, and wrist watches) shall not be worn while working with any power tool.

18 For further compliance with OSHA regulations, see 29 CFR 1926 Subpart I and 29 CFR 1910 Subpart P.

5. MATERIAL HANDLING, STORAGE, AND DISPOSAL

To prevent employee injury from improper storage, handling, and disposal of materials.

SCOPE

This Safe Work Practice applies to EMCOR employees involved in handling, storing, and disposing of non-hazardous materials.

REQUIREMENTS

- All storage shall be stacked, blocked, interlocked, and limited in height so that it is secure against falling, sliding, or collapse.
- Maximum safe load limits of floors shall not be exceeded.
- Aisles shall be kept clear and in good repair to allow free and safe movement of material handling equipment and employees.
- When a difference in work levels exists, ramps will be provided.
- Material stored inside buildings under construction shall not be placed within six feet of floor openings.
- Incompatible materials shall be separated in storage.
- Only the material needed for immediate operations will be stored on scaffolds.
- Bagged materials shall be stacked by stepping back the layers and cross-keying the bags at least every ten bags high.
- Brick stacks shall not exceed seven feet high. At a height of four feet, the stack shall be tapered back two inches per one foot high.
- Masonry blocks shall be tapered back one-half block per tier above six feet high.
- Used lumber shall have all nails removed before stacking.
- Lumber shall be stacked on level and solidly supported sills.
- Lumber piles shall not exceed 16 feet high.
- Lumber to be handled manually shall not be stacked more than 16 feet high.
- Poles, pipes, conduit, and ductwork shall be stacked and blocked to prevent spreading or tilting.
- All loads shall be secured to prevent displacement during handling operations. A red flag will be secured to the trailing end of the longest item.
- Storage areas must be kept free from accumulations of materials that could cause tripping, fires, explosion, or could harbor pests.
- When manually handling materials:

Do not lift awkward or heavy materials by yourself. Get a fellow worker to help you. Many types of power and mechanical lifting equipment may be used in place of manual lifting.

When two or more persons are lifting an object, only one person should give instructions. Decide the route you plan to take before carrying the object and discuss all possible problems prior to moving the object. Work as a team!
Inspect the object you are going to move or lift for sharp edges, nails, splinters, and other problems that may cause injury prior to lifting.

- If lifting is part of your job and mechanical lifts are not practical or available, follow these steps:
    - Keep feet apart with one foot alongside the object being lifted and one foot behind it.
    - Keep your back straight (nearly vertical).
    - Tuck your chin in. This will help you keep head, neck, and spine in proper alignment.
    - Grip the object with the whole hand and use a firm grip. Do not lift with your fingers.
    - Tuck your elbows and arms in close to your sides. This will add to your leverage and help keep your body weight centered.
    - Keep your body weight centered over your feet.
    - Start the lift with a thrust of the rear foot, and allow your legs to perform the work.
    - Twisting during a lift is one of the most common causes of back injury. By simply turning the forward foot out and pointing it in the direction of the eventual movement, the greatest danger of injury by twisting is avoided.
    - If you have any questions on the proper way to lift, see your supervisor.
- Ensure that all mechanical lifting equipment is in proper working order before using.
- When material is dropped more than 20 feet to the outside of a building an enclosed chute must be used.
- When material is dropped through holes in the floor, barricades or chutes shall be used. Warning signs must be posted.
- Remove all waste material from the work areas as the work progresses.
- Disposal of all waste material must comply with local, state, and federal regulation.
- For further compliance with OSHA regulations, see 29 CFR 1926.250-252

6. CRANES, HOISTS, ELEVATORS

To prevent employee injury from improper use, care, and/or maintenance of cranes, hoists, and elevators.

SCOPE

This Safe Work Practice applies to EMCOR employees involved in the use and maintenance of cranes, hoists, and elevators.

REQUIREMENTS

1. EMCOR employees shall comply with the manufacturer's specifications and limitations applicable to the operation of any and all cranes and derricks.
2. Rated load capacities, recommended operating speeds, and special hazard warnings or instruction shall be conspicuously posted and shall be clearly visible to the equipment operator.
3. Hand signals to crane and derrick operators shall be those prescribed by the applicable ANSI standard for the type of equipment in use. All illustrations of the signals shall be posted at the job site.
4. EMCOR management shall designate a competent person who shall inspect all machinery and equipment prior to each use, and during use, to ensure it is in safe operating condition. Any defects will be repaired prior to further use.
5. A thorough annual inspection of the hoisting machinery shall be conducted by a competent EMCOR employee, or by a government agency or private agency recognized by the U.S. Department of Labor. The employer shall maintain a record of dates and results of the inspection of each piece of equipment.
6. Wire rope shall be taken out of service when any of the following conditions exist:
   a. In running ropes, six randomly distributed broken wires in one lay of three broken wires in one strand in one lay.
   b. Wear of one-third the original diameter of outside individual wires. Kinking, crushing, bird caging, or any other damage resulting in distortion of the rope structure.
   c. Evidence of heat damage from any cause.
   d. Reductions from nominal diameter of more than one-sixty-fourth inch for diameters up to and including five-sixteenths; one-thirty-second inch for diameters three-eighths inch to and including one-half inch; three-sixty-fourths inch for diameters nine-sixteenths inch to and including three fourths inch, one-sixteenth for diameters seven-eighths inch to 1-1/2 inches inclusive; and three-thirty-seconds inch for diameters 1-1/4 to 1-1/2 inch inclusive.
   e. In standing ropes, more than two broken wires in one lay in sections beyond end connections or more than one broken wire at an end connection.
7. Wire rope safety factors shall be in accordance with America National Standards Institute B30.5-1968 or SAE J959-1966.
8. Belts, gears, shafts, pulleys, sprockets, spindles, drums, flywheels, chains, or other reciprocating, rotating, or other moving parts of equipment shall be guarded if such parts are exposed to contact by employees, or otherwise create a hazard.

9. Machine guarding shall meet the requirements of ANSI Standard B15.5-1958 Rev., Safety Code for Mechanical Power Transmission Apparatus.
10. Accessible areas within the swing radius of the rear of the rotating superstructure of the crane shall be barricaded to prevent access.
11. All exhaust pipes shall be guarded or insulated to prevent contact.
12. Whenever internal combustion engines are used in an enclosed space, tests shall be conducted and recorded to determine if employees are exposed to carbon monoxide.
13. All cab windows shall be of safety glass or equivalent.
14. Where necessary for rigging, a ladder, or steps, shall be provided to give access to a cab roof. Guardrails, handrails, and steps shall be provided conforming to ANSI Standard B30.5. Platforms and walkways shall have anti-skid surfaces.
15. Fuel tank filler pipes shall be located in such a position to prevent spill or overflow to run onto the engine, exhaust, or electrical equipment.
16. An accessible fire extinguisher of minimum 5BC rating shall be available at all operator stations.
17. Equipment or machines shall be operated proximate to power lines only in accordance with the following:
    a. For lines rated 50kV, or below, minimum clearance between the lines and any part of the crane or load shall be 10 feet.
    b. For lines rated over 50kV, minimum clearance between the lines and any part of the crane or load shall be 10 feet plus .4 inch for each 1kV over 50kV, or twice the length of the line insulator, but never less than 10 feet.
    c. In transit with no load and with boom lowered, the equipment clearance shall be minimum of 4 feet for voltages less than 50kV, and 10 feet for voltages over 50kV up to and including 345kV, and 16 feet for voltages up to and including 750kV.
    d. A person shall be designated to observe clearance of the equipment and give timely warning for all operations where it is difficult for the operator to maintain the desired distance by visual means.
18. Any overhead wire shall be considered to be an energized line unless and until the person owning such line or the electrical utility indicates it is not an energized line and it has been visibly grounded.
19. No modifications or additions that affect the capacity of safe operation of the equipment shall be made by EMCOR personnel without the manufacturer's written approval. If such modifications are made, new plates and tags with the new specifications and capacities shall be installed within plain view of the operator.
20. For further compliance with regulations, see 29 CFR 1926.550 and Power Crane and Shovel Association Mobile Hydraulic Crane Standard No. 2.

7. Material Hoists, Personnel Hoists and Elevators

1. EMCOR shall comply with the manufacturer's specifications and limitations applicable to the operation of all hoists and elevators.
2. Rated load capacities shall be posted on cars and platforms.
3. Wire rope shall be removed from service when any of the following conditions exist:
    a. In hoisting ropes, six randomly distributed broken wires in one rope lay or three broken wires in one strand of one rope lay;
    b. Abrasion, scrubbing, flattening, or peening, causing loss of more than one-third of the original diameter to the outside wires;
    c. Evidence of heat damage resulting from a torch or any damage caused by contact with electrical wires.
4. Hoisting ropes shall be installed in accordance with the wire rope manufacturer's recommendations.
5. The installation of the live booms on hoists is prohibited.
6. The use of endless belt-type man lifts on construction sites is prohibited.
7. MATERIAL HOISTS
    a. Operating rules shall be established and posted at the operator's station. Such rules will include a signal system and allowable line speed for various loads.
    b. No person shall be allowed to ride on material hoists except for inspection and maintenance operations.
    c. All entrances of the hoist way shall be guarded by substantial gates or bars, which shall guard the full length of the landing entrance. All hoist way entrances shall be painted with diagonal contrasting colors such as black and yellow stripes.
    d. Gates or bars protecting the entrances to hoist ways shall be equipped with a latching mechanism.
    e. Overhead protective covering of 2-inch planking of ¾-inch plywood or other solid material of equivalent strength shall be provided on top of every material hoist cage.
    f. The operator's station of a hoisting machine shall be provided with overhead protection equivalent to tight planking not less than 2 inches thick.
    g. Car arresting devices shall be installed to function in case of wire rope failure.
    h. All material hoists shall conform to the requirements of ANSI Standard A10.5-1969, Safety Requirements for Material Hoists.

8. PERSONNEL HOISTS

a. Hoist towers outside the structure shall be enclosed for the full height on the side or sides used for entrance and exit to the structure. At the lowest landing, the enclosure on the sides not used entrance shall be enclosed to a height of 10 feet.
b. Towers inside of structure shall be enclosed on all four sides throughout the full height.
c. Towers shall be anchored to the structure at intervals not exceeding 25 feet. In addition to tie-ins, a series of guys shall be installed.
d. Hoist way doors or gates shall be not less than 6 feet, 6 inches high and shall be provided with mechanical locks which cannot be operated from the landing side, and shall be accessible only to persons on the car.
e. Cars shall be permanently enclosed on all sides and the top, except sides used for entrance and exits that have car gates and doors.
f. A door or gate shall be provided at each entrance to the car that shall protect the full width and height of the car entrance opening.
g. Doors or gates shall be provided with electrical interlocks that do not allow movement of the car when the gate is open.
h. Safeties shall be capable of stopping and holding the car and rated load when traveling at governor tripping speed.
i. Cars shall be equipped with a rated capacity and data plate, secured in a conspicuous place on the car.
j. Internal combustion engines shall not be permitted for direct drive.
k. Normal and final terminal stopping devices shall be provided.
l. An emergency stop switch shall be provided in the car and marked “STOP”.
m. Permanent elevators under the care and custody of EMCOR and used by employees shall comply with the requirements of ANSI Standard A17.1-1965 with addenda A17.1a-1967, A17.1b-1968, A17.1c-1969, and A17.1d-1970, and shall be inspected in accordance with ANSI Standard A17.2-1960 with addenda A17.2a-1965 and A17.2b-1967.

8. LADDERS

To prevent injuries to EMCOR employees from improper design, use, and maintenance of ladders.

SCOPE

This Safe Work Practice applies to both portable and fixed ladders.

REQUIREMENTS

1. Use the proper type of ladder. DO NOT use makeshift ladders, such as boxes, barrels, chairs, etc.
2. Purchase only fiberglass ladders. Metal and metal reinforced ladders must NOT be used when working on or near electrical wires.
3. Ladders should be regularly inspected for defects; missing cleats, cracked rungs, broken spreaders, etc. Defective ladders should be tagged and not used for any reason. Use the ladder inspection form provided.
4. Straight ladders should have grippers or cleats. They should be lashed at the top and blocked at the bottom, if possible.
5. Stepladders more than 10 feet high should be held by another person. The two highest steps should not be climbed on.
6. If a straight ladder is used to climb onto a work platform, it should extend at least 3 feet above the working level. When a 3' extension is not possible, a grasping device (such as a grab rail) shall be provided to assist workers in mounting and dismounting the ladder.
7. If a ladder is placed near a door or aisle, a person should hold it at the bottom, and/or warning signs and barricades should be put out.
8. If there are wooden ladders already on site and they are in good condition, do not paint wooden ladders with solid color paints. This may mask cracks in the wood and make them hard to see. Clear wood preservative can be used to protect base wood. Always replace wooden ladders with fiberglass ladders.
9. Maintain "three points of contact" while climbing or descending a ladder.
10. A "competent person" must perform ladder training.
11. Do not overreach. Move the ladder as your work progresses. Do not jump or slide the ladder while you are on it. Go back down and move the ladder over.
12. Always face the ladder and use both hands while ascending or descending the ladder.
13. Only one person is permitted to work from an ordinary straight ladder or stepladder.
14. The length of portable stepladders shall not exceed 20'.
15. For further compliance with OSHA regulations, see 29 CFR 1910.25-26 and 29 CFR 1926.450.

9 SCAFFOLDING

It is important to understand how to erect, use, and dismantle scaffolding safely. Investigation of scaffolding accidents generally reveals a lack of awareness and enforcement in following these procedures. Permanently disabling injuries can occur when “fall-to-below” accidents happen.

SCOPE

This Safe Work Practice applies to all fixed scaffolding under 20 feet high.

REQUIREMENTS

1. Never take chances! If in doubt regarding the safety or use of the scaffold, consult your supervisor.
2. Inspect all equipment before using. Never use any equipment that is damaged or defective in any way. Remove unsafe equipment and tag “DO NOT USE!”
3. Do not erect, dismantle or alter a scaffold unless under the direct supervision of a qualified person.
4. Never use scaffolding equipment for purposes for which it was not intended.
5. Do not work on scaffolds if your physical condition is such that you feel dizzy or unsteady in any way.
6. Do not abuse or misuse the scaffold equipment.
7. Erected scaffolds should be continually inspected by users to be sure they are maintained in a safe condition. Report any unsafe equipment to your supervisor.
8. Scaffolds should be erected in accordance with design and/or manufacturer’s recommendations.
9. A survey shall be made for hazardous conditions in the area where the scaffolding is to be erected.
10. Scaffolds and their components shall be capable of supporting without failure, at least four times the maximum intended load.
11. The design-working load of all scaffolds shall be calculated on the basis of:
    a. LIGHT - Designed and constructed to carry a working load of 25 lbs per square foot.
    b. MEDIUM - Designed and constructed to carry a working load of 50 lbs per square foot.
    c. HEAVY - Designed and constructed to carry a working load of 75 lbs per square foot.
12. Use a personal fall arrest system where fall distances are over 6 feet.

REQUIREMENTS FOR THE ERECTION AND USE OF SCAFFOLDS

1. The scaffold base must be set on an adequate sill or pad to prevent slipping.
2. Use adjusting screws or other approved methods instead of blocking when adjusting or making the scaffold even.
3. Bracing, leveling, and plumbing of scaffolds.
   a. Plumb and level all scaffolds as the erection proceeds.
   b. Do not force frames or braces to fit; level the scaffold until proper fit can easily be made.
   c. Each frame or panel shall be braced by horizontal bracing, cross bracing, diagonal bracing or any combination thereof for securing vertical members together.
   d. All brace connections shall be made secure.
   e. Fasten all couplers and/or connections securely before assembly of the next level.
4. Do not erect scaffolds near electrical power lines unless proper precautions are taken.
5. All scaffold and ladder stand platform work levels 10 feet or higher above the ground or floor shall have a standard toe board.
6. All scaffold and ladder stand platform work levels with platform height of 4 feet or greater shall be provided with guardrails and midrails on exposed sides and ends wherever the horizontal dimension of the platform in either direction is less than 45 inches.
7. All scaffold and ladder stand platform work levels 10 feet or higher above the ground or floor shall have guardrails and midrails.
8. Guardrails shall have a vertical height of 36 inches +/-1 inch including a midrail approximately midway between the top rail and the working surface.
9. Do not use ladders or makeshift devices on top of scaffolds to increase height.
10. A means of access to all platforms shall be provided.
11. Where persons are required to work under the scaffold, scaffold shall be provided with a screen between the toe board and the guardrail, extending along the entire opening, consisting of No. 18 gauge ½-inch mesh, or the equivalent.
12. Scaffold accessories such as braces, brackets, trusses, screw legs, etc., damaged or weakened for any cause shall be immediately repaired or replaced.
13. Slippery conditions on scaffolds shall be eliminated as soon as possible after they occur.
14. The minimum scaffold width shall be at least 2 feet of acceptable grade number.
15. Overhead protection shall be provided for persons working on a scaffold exposed to overhead hazards.
16. Scaffold frames and their components manufactured by different companies shall not be intermixed, unless the component parts readily fit together and the resulting scaffold's structural integrity is maintained by the user.
17. Scaffold planking

a. Check each plank prior to use to be sure plank is not warped, damaged, or otherwise unsafe.
b. Planking shall have at least 12 inches overlap and extend 6 inches beyond center of support, or be restrained at both ends to prevent sliding off supports.
c. Working platforms shall cover scaffold bearer as completely as possible. Only scaffold grade wood planking, or fabricated planking and decking meeting scaffold use requirements shall be used.
d. Do not jump onto planks or platforms.
e. The maximum permissible span for a 1-1/4 x 9 inch or wider plank shall be 4 feet with medium duty loading.
f. The work level platform of scaffolds shall be made of approved wood, aluminum, or plywood planking, steel, or expanded metal, for full width of the scaffold, except for necessary openings.
g. Work platforms shall be secured in place by appropriate means.

18. Do not ride on a rolling scaffold. This practice is very hazardous and is not permitted.
19. Scaffold wheels or casters shall be provided with locking means to prevent caster rotation and scaffold movement and kept locked while in use.
20. Do not attempt to move a scaffold without sufficient help.
21. Do not overload or clutter the platform working area.

REQUIREMENTS FOR THE DISMANTLING OF SCAFFOLDS

1. Check to make sure that the scaffolding has not been structurally altered in a way that would make it unsafe and, if it has, reconstruct where necessary before commencing with dismantling procedures. This includes all scaffold ties.
2. Visually inspect planks prior to dismantling to be sure they are safe.
3. Consideration must be given as to the effect removal of a component will have on the rest of the scaffold prior to the component's removal.
4. Do not accumulate excess components or equipment on the level being dismantled.
5. Do not remove ties until the scaffold above has been removed or dismantled.
6. Lower dismantled components in an orderly manner. Do not throw off of scaffold.
7. Dismantled equipment should be stockpiled in an orderly manner.
8. Follow any erection and or dismantling procedures and use manuals supplied by the scaffolding manufacturer.

10. WELDING AND BURNING OPERATIONS

To prevent fire and explosion by controlling the use of flame heat producing devices in the work area.

SCOPE

This Safe Work Practices applies to all EMCOR personnel using welding and burning equipment in areas not specifically designed for welding and burning operations. (i.e., designated areas in a maintenance shop.)

REQUIREMENTS

1. Verify that sprinkler system is activated in area of welding or burning operation.
2. All combustible and flammable materials are to be moved 30 feet from the site or covered with flameproof material if removal is not practical.
3. All holes, latch ways, stairwells, and other floor openings shall be sealed with wetted burlap and/or other flameproof material.
4. No hot work is allowed in the presence of flammable vapors/liquids, dust, or dust producing products (i.e., starch, sugar).
5. The required personal protective equipment shall always be used during welding and burning operations.
6. Wherever practical, use shields around the operation to protect other persons in the area.
7. Cables must be properly insulated. If damaged you must get different cables. OSHA does not allow repaired cables to be used.
8. Cables running along walkways, access ways, or in general work areas shall be grouped together and placed to one side.
9. Cylinders shall always be handled with care and secured in an upright position.
10. Cylinders shall not be taken into confined spaces.
11. Welding and burning operations in confined spaces may require general mechanical or local exhaust ventilation to reduce the concentrations of smoke and fumes to acceptable levels prescribed by OSHA.
12. A fire extinguisher must be located at the welding site.
13. A Fire Watch will be used during all welding and burning operations.
14. The Fire Watch must be trained to operate the alarm system and use the fire extinguisher.
15. The Fire Watch must observe for 30 minutes after the operation is complete.
16. Employees shall not perform welding or burning operations until they have been properly trained in the safe practices that apply to this type of operation.
17. The EMCOR supervisor/foreman is responsible for ensuring that the work site is prepared.
18. A Hot Work Permit shall be completed and approved. See EMCOR SWP # 5 Hot Work and Fire Prevention.
19. For further compliance with OSHA regulations, see 29 CFR 1910.251-254 (Subpart Q) and 29 CFR 1926.350-354 (Subpart J).

11 EXCAVATIONS AND TRENCHES

To protect EMCOR employees involved in excavation and trenching operations from injury, as well as employees working in the immediate vicinity.

SCOPE

All EMCOR employees involved in excavation and trenching operations.

REQUIREMENTS

1. Walkways, runways, and sidewalks shall be kept clear of excavated material or other obstructions. No sidewalk will be undermined unless shored to carry a minimum live load of one hundred and twenty-five pounds per square foot.
2. If planks are used for raised walkways, runways, or sidewalks, they shall be laid parallel to the length of the walk and fastened together against displacement.
3. Planks shall be uniform in thickness and all exposed ends will be provided with beveled cleats to prevent tripping.
4. Raised walkways, runways, and sidewalks shall be provided with plank steps on strong stringers. Ramps used in lieu of steps will be provided with cleats to ensure a safe walking surface.
5. All EMCOR employees shall be protected with personal protective equipment for the protection of the head, eyes, respiratory tract, hands, feet, and other parts of the body.
6. EMCOR employees exposed to vehicular traffic will be provided with warning vests made of reflectorized, or high visibility, material.
7. No person shall be permitted under loads handled by power shovels, derricks, or hoists.
8. Daily inspections of excavations will be conducted by a competent person. If evidence of possible cave-ins or slides is apparent, all work in the excavation shall cease until the necessary repairs and precautions have been taken.

SPECIFIC EXCAVATION AND TRENCHING REQUIREMENTS

1. Prior to opening an excavation, efforts shall be made to determine whether underground installations (i.e., sewer, telephone, water, fuel, electric lines, etc.), will be encountered, and, if so, where such installations are located.
2. Trees, boulders, and other surface encumbrances, located so as to create a hazard to employees, shall be removed.
3. The walls and faces of all excavations in which employees are exposed to danger from moving ground shall be guarded by a shoring system, sloping of the ground, or some other means.
4. Excavations shall be inspected by a competent person after every rainstorm or other hazard-increasing occurrence, and the protection against slides and cave-ins shall be increased if necessary.
5. The determination of the angle of repose and design of the supporting system shall be based on careful evaluation of pertinent factors such as: Depth of cut; possible variation in water content of the material while the excavation is open; anticipated changes in materials from exposure to sun, air, water, or freezing; loading imposed by structures, equipment, overlying material, etc.

6. Supporting systems (i.e., shoring, cribbing, etc.), shall be designed by a qualified person and meet accepted engineering requirements.
7. All slopes shall be excavated to at least the angle of repose except for areas where solid rock allows for line drilling or pre-splitting.
8. The angle of repose shall be flattened when an excavation has water conditions, silty materials, loose boulders, and areas where erosion, deep frost action and slide planes appear.
9. In excavations which employees may be required to enter, excavated or other material shall be effectively stored and retained at least 2 feet or more from the edge of the excavation.
10. Slides, slopes, and faces of all excavations shall meet accepted engineering requirements by scaling, benching, barricading, rock bolting, wire meshing, or other equally effective means.
11. Support system shall be planned and designed by a qualified person when excavation depth is in excess of 20 feet, adjacent to structures or improvements, or subject to vibration or ground water.
12. Materials used for sheeting, sheet piling, cribbing, bracing, shoring and underpinning shall be in good serviceable condition, and timbers shall be free from large knots, and of proper dimensions.
13. Special precautions shall be taken in sloping or shoring the sides of excavations adjacent to a previously backfilled excavation or a fill, particularly when the separation is less than the depth of the excavation.
14. Except in hard rock, excavations below the level of the base of footing of any foundation or retaining wall shall not be permitted, unless the wall is underpinned and all other precautions taken to insure the stability of the adjacent walls.
15. Diversion ditches, dikes, or other suitable means shall be used to prevent surface water from entering an excavation and to provide adequate drainage of the area adjacent to the excavation. Water shall not be allowed to accumulate in an excavation.
16. If it is necessary to place or operate power shovels, derricks, trucks, etc., on a level above and near an excavation, the side of the excavation shall be sheet-piled, shored, and braced.
17. Adequate barrier physical protection shall be provided at all remotely located excavations. All wells, pits, shafts, etc., shall be barricaded or covered. Upon completion of exploration, temporary wells, pits, shafts, etc., shall be backfilled.
18. Where an employee or equipment is required or permitted to cross over excavations, walkways or bridges with standard, guardrails will be provided.
19. Where ramps are used for employees or equipment, they shall be designed and constructed by qualified persons in accordance with accepted engineering requirements.
20. In locations where oxygen deficiency or gaseous conditions are possible, or where engulfment or entrapment is possible, employees entering the excavation will be subject to the procedures outlined in Section 15 of this manual, “Confined Space Entry.”
21. For further compliance, regarding specific excavation and trenching requirements, such as “Trench Shoring Requirements”, consult 29 CFR 1926.650-652.

12. GRINDING WHEELS

Grinding wheels can be dangerous when improperly used and guards are not in place.

SCOPE

This Safe Work Practice applies to all EMCOR employees using grinding (abrasive wheel grinders) during their job.

REQUIREMENTS

1. Work rests must be no more than 1/8 inch from the wheel to prevent fingers from getting caught between the work rest and wheel.
2. Eye protection must be worn when operating a grinding wheel. A transparent eye shield should also be permanently mounted to the machine.
3. The tongue guard must be no more than ¼ inch from the wheel to prevent flying pieces of the wheel from striking the operator if it shatters.
4. The exhaust system on the grinder should be working properly.
5. Bench and pedestal grinders must be permanently mounted.
6. Side guards must cover the spindle, nut flange and 75% of the wheel diameter.
7. For further compliance with OSHA regulations, see 29 CFR 1910.215 and 29 CFR 1926.303.

13. FLOOR AND WALL OPENINGS, AND STAIRWAYS

To protect all employees from potential fall hazards due to openings in floors, walls, and stairways.

SCOPE

This procedure applies to all EMCOR employees and contractors.

REQUIREMENTS

1. Floor openings shall be guarded by a standard railing and toe boards or cover. The railing will be provided on all sides of the opening, except at the entrance to stairways.
2. Ladderway floor openings or platforms shall be guarded by standard railings with standard toeboards on all exposed sides, except at the entrance to the opening, with passage through the railing either provided with a gate or so offset that a person cannot walk directly into the opening.
3. Hatchways and chute floor openings will be guarded by hinged covers of standard strength and construction, and a standard railing with only one exposed side. When the opening is not in use, the cover shall be closed.
4. Where there is a danger of falling through a skylight opening (See EMCOR SWP # 15 Rooftop Area Access), it shall be guarded by a fixed standard railing on all exposed sides.
5. Pits and trapdoor openings will be guarded by floor opening covers of standard strength and construction.
6. Manhole floor openings shall be guarded by standard manhole covers. While the cover is not in place, the manhole opening shall be protected by standard railings.
7. Temporary floor openings shall have standard railings.
8. Where doors or gates open directly on a stairway, a platform will be provided.

GUARDING OF WALL OPENINGS

1. Wall openings, from which there is a drop of more than 4 feet shall be guarded with a standard or intermediate rail that will effectively reduce the danger of falling.
2. The bottom of a wall opening, which is less than 4 feet above the working surface, shall be protected by a standard toe board.
3. An extension platform outside a wall opening onto which materials can be hoisted for handling shall have side rails or equivalent guards of standard specification. One side of the platform may have removable rails.

OPEN-SIDED RAILS

1. Every open sided floor or platform 6 feet or more above adjacent floor or ground level shall be guarded by a standard railing on all open sides. The railing will be provided with a standard toe board.
2. Where employees entering upon runways become thereby exposed to machinery, electrical equipment, or other danger not a falling hazard, additional guarding shall be provided.

STAIRWAY RAILINGS AND GUARDS

1. Every flight of stairs having 4 or more risers shall be equipped with standard stair railings or standard handrails.

2. For further information regarding specific guarding requirements for floor and wall openings and stairway guarding, such as a description of the “Standard Handrail,” please consult 29 CFR 1926.500.

14. CONFINED SPACE ENTRY

Confined spaces pose special dangers for those who enter them. Oxygen depletion, explosion of combustible gas or vapor, exposure to toxic contaminants and engulfment are often causes of fatalities in confined spaces.

SCOPE

Provide practices and procedures to protect EMCOR employees from hazards unique to confined spaces.

REQUIREMENTS

1. Determine if the job site has permit-confined spaces.
2. A Confined Space Entry Permit (See EMCOR SWP # 3 Confined Space Entry Attachments A and B) must be used before entering a permit-confined space.
3. An individual must be stationed outside the permit area at all times when an employee is in the permit confined space.
4. Warning signs must be posted near the permit space.
5. Only employees trained in Confined Space Entry as Authorized Entrants are permitted in the confined space.
6. Identify the hazards of the permit-confined space.
7. Isolate (put out of service) the permit space and remove or control the hazards.
8. Maintain acceptable environmental conditions during entry.
9. Ensure that all testing and monitoring equipment and procedures are maintained in acceptable condition.
10. All employees that are authorized to enter the permit-confined space shall be trained in hazard recognition, maintaining constant communication with the individual stationed outside the permit area, use of the necessary personal equipment and self-rescue.
11. All employees that will be stationed outside that permit area (attendants) shall be trained in items listed in #10.
12. Attendants must maintain an accurate count of those authorized employees in the confined space.
13. The supervisor in charge of entry shall also be trained as in #10 above.
14. The supervisor in charge of entry shall make sure that all practices, procedures, and equipment are sufficient for safe entry.
15. The supervisor shall monitor the operation to ensure proper entry is still in effect, and cancel entry when acceptable conditions are not met.
16. A rescue team and equipment must be in place before entry into a permit-confined space entry.
17. Proper ventilation shall be provided when welding or cutting in a confined space.
18. The Confined Space Entry Permit must boldly indicate welding operations.
20. For further compliance, see proposed OSHA regulation 29 CFR 1910.146.

15. Use of Radioactive Materials in Radiography

To prevent injuries or illness from improper use, control, and/or storage of radioactive materials.

Scope

This Safe Work Practice applies to use of radioactive materials by EMCOR employees and independent contractors hired by EMCOR.

Requirements

1. Any activity that involves the use of radioactive materials or X-rays, whether or not under license from the Atomic Energy Commission, shall be performed by competent persons specially trained in the proper and safe operation of such equipment.
2. In the case of materials used under license from the Atomic Energy Commission, only persons actually licensed, or competent persons under direction and supervision of the licensee, shall perform such work.
3. All radiographic work should be performed within the requirements prescribed by applicable regulations.
4. Where applicable, EMCOR employees should be trained to recognize radiation-emitting equipment and should be warned of its presence by the posting of approved signs.
5. Radiation identification signs and labels should use conventional radiation colors (magenta or purple on yellow background) and bear a conventional radiation symbol. An adequate number of signs should be provided by the user to identify the radioactive source and equipment while in storage, transit, and use.
6. Workers should be protected against external body exposure to gamma radiation.
7. Areas where radioactive sources are being used should be isolated as required by law.
8. Signs should be removed when the hazard no longer exists.
9. Operations involving radiation should be monitored by a competent technician with a radiation meter to determine the danger area.
10. Only the technician in charge of the radioactive source should touch, handle, move, or transport it.
11. All radioactive sources and equipment should be kept under lock and key while being stored and transported.
12. Radioactive sources should be kept in properly shielded containers while being stored and transported.
13. Radioactive sources in use should be under the surveillance of a trained technician to prevent accidental exposure to radiation.
14. The pertinent provisions of the Atomic Energy Commission’s Standards for Protection Against Radiation (10 CFR Part 20), relating to protection against occupational radiation exposure, shall apply.

16. AIR HOSES

Proper protective equipment is essential to EMCOR employees when using air hoses to prevent injuries from airborne chips and small particulate. In addition, maintaining required air pressure could prevent air from permeating the skin, which can be fatal to the heart.

SCOPE

This Safe Work Practice applies to the use of air hoses for cleaning.

REQUIREMENTS

1. Never use compressed air for personal cleaning of any type. This shall be grounds for termination.
2. Never aim or spray compressed air at a fellow employee for any reason. This shall be grounds for termination.
3. Only approved safety nozzles are allowed on air hoses. OSHA Standards limit air output to 30 pounds per square inch (psi) for cleaning purposes. Air hoses missing safety nozzles must not be used until the nozzle has been replaced.
4. Air hoses should only be used for cleaning machinery or equipment when brooms, brushes, or vacuum cleaners won't do the job.
5. When using compressed air for cleaning, be sure everyone is clear and proper personal protective equipment is being used.
6. Report defective nozzles, gauges, and regulators to your supervisor at once.
7. All flexible airlines and hoses shall be fastened down to prevent whipping in the case of a broken line.
8. Always return air hose to its proper storage place after use to prevent tripping hazards.
9. Hoses used for operating pneumatic power tools shall be designed for the pressure to which they will be subject. Remove defective hoses from service.
10. For further compliance with OSHA Standards, see 29 CFR 1926.302 (b).

17. OFFICE SAFETY

To reduce the exposure to employee injuries resulting from an attitude of indifference toward safety in the office due to the relatively few serious injuries which occur in offices.

SCOPE

The Safety Work Practice applies to all EMCOR employees that work in fixed or mobile offices.

REQUIREMENTS

1. Floors and carpet must be kept in good repair to prevent tripping hazards. Spills should be cleaned up immediately.
2. Building entrances should be provided with special storm mats when there is a chance of floors becoming slippery.
3. Stairways should be kept clean, well lighted, and equipped with non-slip treads and suitable handrails.
4. Electrical and telephone outlets should be installed so as not to be tripping hazards. Cords should be kept off the floor.
5. Replace or repair broken chairs.
6. Employees involved in handling of heavy materials should be trained in proper methods of lifting.
7. Office machine repairs should only be made by competent service personnel.
8. Loose razor blades should not be stored in drawers.
9. Do not block aisles with boxes or equipment.
10. The drawers of file cabinets should be kept closed when not in use.
11. Do not overload file cabinets or shelves. They should be properly anchored.
12. Specific employees should be trained in emergency procedures and all employees should be involved in periodic evacuation drills.

3. FALL PROTECTION PROGRAM (CONSTRUCTION SITE)

The purpose of the EMCOR Fall Protection Program is to protect employees from fall hazards. All EMCOR employees and subcontractors to EMCOR operating companies shall adhere to the requirements of the EMCOR Fall Protection Program.

DEFINITIONS

Anchorage: A secure point of attachment for lifelines, lanyards, or deceleration devices that is capable of withstanding the forces specified.

Body Belt: A Type I safety belt used in conjunction with lanyard or lifeline for fall restraint only.

Body Harness: Straps which may be secured about the employee in a manner that will distribute the fall arrest forces over at least the thighs, pelvis, waist, chest and shoulders with means for attaching it to other components of a personal fall arrest system. A full body harness system consists of a full body harness, which is attached to an anchorage or to a lifeline that is properly secured to an anchorage.

Buckle: Any device for holding the body harness closed around the employee's body.

Competent Person: An individual who by experience and training has the ability to recognize the hazards associated with the work being performed, and, had the authority to take action to correct the hazards.

Connector: A device that is used to couple (connect) parts of the personal fall arrest system and positioning device systems together. It may be an independent component of the system, such as a carabiner, or it may be an integral component of part of the system (such as a buckle, or D-ring sewn into a body belt or body harness, or a snap-hook spliced or sewn to a lanyard or self-retracting lanyard).

Controlled Access Zone (CAZ): An area in which certain work may take place without the use of guardrail systems, personal fall arrest systems, or safety net systems and access to the zone is controlled.

Dangerous Equipment: Equipment (such as galvanizing tanks, decreasing units, machinery, electrical equipment, and other units) that as a result of form or function may be hazardous to employees who fall onto or into such equipment.

Deceleration Device: Any mechanism, such as a rope grab, rip-stitch lanyard, specially-woven lanyard, tearing or deforming lanyards, automatic self-retracting lifelines/lanyards, etc., which serves to dissipate a substantial amount of energy during a fall arrest or otherwise limit the energy imposed on an employee during fall arrest.

Deceleration Distance: The additional vertical distance a falling employee travels, excluding lifeline elongating and free fall distance, before stopping, from the point at which the deceleration device begins to operate.

Fall Arrest: Fall arrest system means the use of multiple approved safety equipment components such as: body harness, lanyards, deceleration devices, drop-lines, horizontal and/or vertical lifelines and anchorages interconnected and rigged as to arrest a free fall.

Fall Restraint: Any approved safety equipment components that function together to restrain an employee in such a manner as to prevent that employee from falling from the work surface such

as: a standard guard rail system or a body harness and lanyard that does not allow movement beyond the surface edge.

Free Fall: The act of falling before a personal fall arrest system begins to apply force to arrest the fall.

Free Fall Distance: The vertical displacement of the fall arrest attachment point on the employees body harness between onset of the fall and just before the system begins to apply force to arrest the fall.

Guardrail System: A barrier erected to prevent employees from falling to lower levels.

Hole: A gap or void 1 inch or more in its least dimension, in a floor, roof, or other walking working surface.

Lanyard: A flexible line of rope, wire rope, or strap, which generally has a connector at each end for connecting the body harness to a deceleration device, lifeline, or anchorage.

Leading Edge: The edge of a floor roof, or formwork for a floor or other walking/working surface (such as the deck), which changes location as additional floor, roof, decking, or form work sections are placed, formed, or constructed. A leading edge is considered to be an **"Unprotected Side and Edge"** during periods when it is not actively and continuously under construction.

Lifeline: A component consisting of a flexible line for connection to an anchorage at one end to hang vertically (vertical lifeline), or for connection to anchorages at both ends to stretch horizontally (horizontal lifeline), and which serves as a means for connecting other components of a personal fall arrest system to the anchorage.

Low Slope Roof: A roof having a slope less than or equal to 4 in 12 (vertical to horizontal).
Personal Fall Arrest System: A system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, a body harness and may include a lanyard, deceleration device, lifeline or suitable combinations of these.

Positioning Device System: A body harness system rigged to allow an employee to be supported on an elevated vertical surface such as a wall, and work with both hands free while leaning.

Rope Grab: A deceleration device which havels on a lifeline and automatically, by friction, engages the lifeline and locks so as to arrest the fall of an employee. A rope grab usually employs the principle of inertial locking, cad level locking or both.

Roof: The exterior surface of the top of a building. This does not include floors or floor work which, because a building has not been completed, temporarily become the top surface of a building.

Safety Monitoring System: A safety system in which a competent person is responsible for recognizing and warning employees of fall hazards.

Steep Roof: A roof having a slope greater than 4 in 12 (vertical to horizontal).

Toe Board: A low protective barrier that will prevent the fall of materials and equipment to lower levels and provide protection from falls for personnel.

Unprotected Sides and Edges: Any side or edge (except at enhances to points of access) of a walk working surface, e.g., floor, roof, ramp, or runway where there is no wall or guardrail system at least 39 inches high.

Walking Working Surface: Any surface, whether horizontal or vertical on which an employee walks or works, including, but not limited to, floors, roofs, ramps, bridges, runways, formwork and concrete re-enforcing steel but not including ladders, vehicles, or trailers on which employees must be located in order to perform their job duties.

Warning Line System: A banner erected on a roof to warn employees that they are approaching an unprotected roof side or edge.

Work Area: That portion of a walking/working surface where job duties are being performed.

Fall Protection Requirement

This program sets forth requirements for EMCOR to provide fall protection. All fall protection required by this program shall conform to the criteria set forth in CFR 29 1926.502. The Job Site Supervisor shall be responsible for determining if the walking/working surfaces on which its employees are to work have the strength and structural integrity to support employees safely. Employees shall be allowed to work on those surfaces only when the surfaces have the requisite strength and structural integrity.

Each employee on a walking/working surface (horizontal and vertical surface) with an unprotected side or edge which is 6 foot or more above a lower level shall be protected from falling by the use of guardrail systems, safety net systems, or personal fall arrest systems.

Each employee who is constructing a leading edge 6 foot or more above lower levels shall be protected from falling by guardrail systems, safety net systems, or personal fall arrest systems.

Each employee on a walking/working surface 6 foot or more above a lower level where leading edges are under construction, but who is not engaged in the leading edge work, shall be protected from falling by a guardrail system, safety net system, or personal fall arrest system. If a guardrail system is chosen to provide the fall protection, and a controlled access zone has already been established for leading edge work, the control line may be used in lieu of guardrail along the edge that parallels the leading edge.

Walking/Working Surfaces Not Otherwise Addressed

Except as provided in 1926.500(a) (2) or in 1926.501(b) (I) through (b) (14), each employee on a walking/working surface 6 feet or more above lower levels shall be protected from falling by a guardrail system, safety net system, or personal fall arrest system. When an employee is exposed to falling objects, the company shall have each employee wear a hard hat and shall implement one of the following measures:

1. Erect toe boards, screens, or guardrail systems to prevent objects from falling from higher levels; or,
2. Erect a canopy structure and keep potential fall objects far enough from the edge of the higher level so that those objects would not go over the edge if they were accidentally displaced; or,
3. Barricade the area to which objects could fall, prohibit employees from entering the barricaded area, and keep objects that may fall far enough away from the edge of the higher level so that those objects would not go over the edge if they were accidentally displaced.

4. All extension and/or straight ladders shall be tied off at the top when used as a transition point. Any ladder protruding a landing area shall extend a minimum of 36 inches above the landing.
5. All temporary stairs must have a handrail system installed and temporary risers installed before being used.
6. Any elevation changing more than 19 inches must have a stair or stairs erected to eliminate the fall exposure.
7. All holes with a gap or void 2 inches or more in its least dimension shall meet the following requirements:
    a. All covers shall be capable of supporting, without failure, at least twice the weight of employees, equipment, and materials that may be imposed on tile cover at any one time.
    b. All covers shall be secured when installed so as to prevent accidental displacement by the wind, equipment, or employees.
    c. All covers shall be color-coded or they shall be marked with the word "HOLE" or "COVER" to provide warning of the hazard.

EMCOR Fall Protection Assessment

The site safety director/coordinator or competent personal will identify all fall hazards at each project site prior to the commencement of work activities, during the project as work conditions change to determine the extent of the fall exposure. Upon completion of the fall exposure hazard evaluation, all employees must be notified of the exposures on the site, and a determination must be made as to the fall protection system(s) and/or devices that will be used to prevent employee injuries. Three systems are available to all EMCOR operating companies including:

a. Guardrail systems

b. Safety net systems

c. Personal fall arrest systems

Guardrail Systems

Each employee in a hoist area shall be protected from falling 6 feet or more to lower levels by guardrail systems or personal fall arrest systems. If guardrail systems, (or chain, gate, or guardrail) or portions thereof, are removed to facilitate the hoisting operation (e.g. during landing of materials) and an employee must lean through the access opening or out over the edge of the access opening (to receive or guide equipment and materials, for example), that employee shall be protected from fall hazards by a personal fall arrest system.

1. Each employee on walking/working surfaces shall be protected from falling through holes (including skylights) more than 6 feet above lower levels by personal fall arrest systems, covers, or guardrail systems erected around such holes. Each employee on a walking/working surface shall be protected from tripping in or stepping into or through holes (including skylights) by covers.
2. Each employee on a walking/working surface shall be protected from objects falling through holes (including skylights) by covers.
3. Each employee on the face of formwork or re-enforcing steel shall be protected from falling 6 feet or more to lower levels by personal fall arrest systems, safety net systems, or positioning device systems. Each employee on ramps, runways and

outlier walkways shall be protected from falling 6 feet or more to lower levels by guardrail systems.

4. Each employee at the edge of an excavation 6 feet or more in depth shall be protected from falling by guardrail systems, fences, or barricades when the excavations are not readily seen because of plant growth or other visual barrier; each employee t the edge of a well, pit, shaft and similar excavation 6 feet or more in depth shall be protected from falling by guardrail systems, fences, barricades or covers.
5. Each employee less than 6 feet above dangerous equipment shall be protected from falling into or onto the dangerous equipment by guardrail systems or by equipment guards.
6. Each employee 6 feet or more above dangerous equipment shall be protected from fall hazards by guardrail systems, personal fall arrest systems, or safety net systems.
7. Each employee working on, at, above, or near wall openings (including those with chutes attached) where the outside bottom edge of the wall opening is 6 feet or more above lower levels and the inside bottom edge of the wall opening is less than 39 inches above the walking/working surface shall be protected from falling by the use of guardrail system, a safety net system, or a personal fall arrest system.
8. Top edge height of top rails, or equivalent guardrail system members, shall be 42 inches plus or minus 3 inches above the walking/working level.
9. Midrails, screens, mesh, intermediate vertical members, or equivalent intermediate structural members shall be installed between the top edge of the guardrail system and the walking/working surface when there is no wall or parapet wall at least 21 inches high.
10. Midrails, when used, shall be installed at a height midway between the top edge of the guardrail system and the walking/working level. Screens and mesh, when used shall extend from the top rail to the walking/working level and along the entire opening between top rail and supports.
    a. Intermediate members (such as balusters) when used between posts, shall be not more than 19 inches apart. Other structural members such as additional midrails and architectural panels shall be installed so that there are no openings in the guardrail systems that are more than 19 inches wide.
    b. Guardrail systems shall be capable of withstanding without failure, a force of at least 200 pounds applied within 2 inches of the top edge, in any outward or downward direction at any point along the top edge. When the 200-pound test load specified above is applied in a downward direction, the top edge of the guardrail shall not deflect to a height less than 39 inches above the walking/working level. Guardrail system components selected and constructed in accordance with the attached appendix will be deemed to meet this requirement.
    c. Midrails, screens, mesh, intermediate vertical members, solid panels, and equivalent structural members shall be capable of withstanding, without failure, a force of at least 150 pounds applied at any downward or outward direction at any point along the midrail or other member. Guardrail systems shall be so surfaced as to prevent injury from punctures or lacerations, and to prevent snagging of clothing

d. The ends of all top rails and midrails shall not over hang the terminal post except where such overhang does not constitute a projection hazard.
e. Steel banding and plastic banding shall not be used as top rails or midrails. Top rails and midrails shall be at least one-quarter inch nominal diameter or thickness to prevent cuts and lacerations.
f. If wire rope is used for top rails, it shall be flagged at not more than 6 feet intervals with high-visibility material.
g. When guardrail systems are used at hoisting areas, a chain, gate or removable guardrail section shall be placed along the access opening between the guardrail sections when hoisting operations are not taking place.
h. When guardrail systems are used at holes, they shall be erected on all unprotected sides or edges of the hole. When guardrail systems are used around holes for the passage of materials, the hole shall have not more than two sides provided with removable guardrail sections to allow the passage of materials. When the hole is not in use, it shall be closed with a cover, or a guardrail system shall be provided along all unprotected sides or edges.
i. When guardrail systems are used around holes, which are used as points of access (such as ladder ways), they shall be provided with a gate or be so offset that a person cannot walk directly into the hole.
j. Guardrail systems used on ramps and runways shall be erected along each unprotected side or edge. Manila, plastic or synthetic rope being used for top rails or midrails shall be inspected as frequently as necessary to ensure that it continues to meet the strength requirements of this section.

SAFETY NET SYSTEMS

Safety net systems and their use shall comply with the following provisions:

1. Safety nets shall be installed as close as practical under the walking/working surface on which employees are working but in no case more than 30 feet below such level. When nets are used on bridges, the potential fall area from the walking/working surface to the net shall be unobstructed.
2. Safety nets shall extend outward from the outer most projection of the work surfaces follows:
3. Vertical distance from working level to Minimum required horizontal distance horizontal plane of net of outer edge of net from the edge of the working surface
   - Up to 5 feet. . 8 feet
   - More than 5 feet up to 10 feet 10 feet
   - More than 10 feet. . 13 feet
4. Safety nets shall be installed with sufficient clearance under them to prevent contact with the surface of structures below and subjected to an impact force equal to the drop test specified below. Safety nets and their installation shall be capable of absorbing an impact force equal to that produced by the drop test listed below.
   - Except as provided below, safety nets and safety net installations shall be drop tested at the job site after initial installation and before being used as a fall protection system, whenever relocated after major repair, and at 6 month intervals if left in one place.

The drop test shall consist o f a 400 pound bag of sand 30 plus or minus two inches in diameter dropped into the net from the highest walking/working surface at which employees are exposed to fall hazards but not from less than 42 inches above that level.

When we can demonstrate that it is unreasonable to perform the drop test required above, we shall certify that the net and net installation complies with the drop test requirements. This must e done prior to the net being used as a fall protection system. The certification must include an identification of the net and net installation for which the certification record is being prepared; the date that it was determined that the identified net and net installation were in compliance and the signature of the person making the determination and certification. The most recent certification record for each net and net installation shall be available at the job site for inspection from a representative of the Department of Labor.

Defective nets shall not be used. Safety nets shall be inspected at least once a week for wear, damage, and other deterioration. Defective components shall be removed from service. Safety nets shall also be inspected after any occurrence that could affect the integrity of the system. Materials, scrap pieces, equipment, and tools which have fallen into the safety net shall be removed as soon as possible from the net and at least before the next work shift.

The maximum size of each safety net mesh opening shall not exceed 36 square inches nor be longer than 6 inches on any side, and the opening, measure center to center of mesh ropes or webbing, shall not be longer than 6 inches. All mesh crossings shall be secured to prevent enlargement of the mesh opening. Each safety net shall have a border rope for webbing with a minimum breaking strength of 5,000 pounds. Connections between safety net panels shall be as strong as integral components and shall be spaced not more than 6 inches apart.

Personal Fall Arrest Systems

Personal fall arrest systems and their use shall comply with the provisions set forth below.

Body belts are not allowed for use as part of any fall arrest. They may however be used in conjunction with fall arrest systems for positioning purposes.

Connectors shall be drop forged, pressed or formed steel, or made of equivalent materials. Connectors shall have a corrosion resistant finish and all surfaces and edges shall be smooth to prevent damage to interfacing parts of the system. D-rings and snap hooks shall have a minimum tensile strength of 5,000 pounds. D-rings and snap hooks shall be proof-tested to a minimum tensile load of 3,600 pounds without cracking, breaking, or taking permanent deformation.

Snap hooks shall be compatible with the member to which they are connected to prevent unintentional disengagement of the snap hook by depression of the snap hook keeper by the connected member, or shall be a locking type snap hook designed and used to prevent disengagement of the snap hook by the contact of the snap hook keeper by the connected member. Note: only locking snap hooks shall be used.

On suspended scaffolds or similar work platforms with horizontal lifelines which may become vertical lifelines, the devices used to connect to a horizontal lifeline shall be capable of locking in both directions on the lifeline.

Horizontal lifelines shall be designed, installed, and used under the supervision of a competent person, as part of a complete personal fall arrest system, which maintains a safety factor of at least two.

Lanyards and vertical lifelines shall have a minimum breaking strength of 5,000 pounds. When vertical lifelines are used, each employee shall be attached to a separate lifeline.

Lifelines shall be protected against being cut or abraded.

Self-retracting lifelines and lanyards which automatically limit free fall distance to two feet or less shall be capable of sustaining a minimum tensile load of 3,000 pounds applied to the device with the lifeline or lanyard in the fully extended position.

Self-retracting lifelines and lanyards which do not limit free fall distance to two feet or less, rip stitch lanyards, and tearing and deforming lanyards shall be capable of sustaining a minimum tensile load of 5,000 pounds applied to the device with the lifeline or lanyard in a fully extended position. Ropes and straps (webbing) used in lanyards, lifelines, and strength components of body harnesses shall be made from synthetic fibers. Anchorages used for attachment of personal fall arrest equipment shall be independent of any anchorage being used to support or suspend platforms and capable of supporting at least 5,000 pounds per employee attached, or shall be designed, installed, and used as follows:

1. As part of a complete personal fall arrest system which maintains a safety factor of at least two; and
2. Under the supervision of a qualified person

Personal fall arrest systems when stopping a fall, shall:

1. limit maximum arresting force on an employee to 1,800 pounds when used as a body harness;
2. be rigged such that an employee can neither free fall more than 6 feet, nor contact any lower level;
3. bring an employee to a complete stop and limit maximum deceleration distance an employee travels to three and a half feet, and have sufficient strength to withstand twice the potential impact energy of an employee free falling a distance of 6 feet, or the free fall distance permitted by the system, which ever is less.

The attachment point of the body harness shall be located in the center of the wearer's back near shoulder level, or above the wearer's head. Body harnesses and components shall be used only for employee protection (as part of personal fall arrest system or positioning device system) and not to hoist materials.

Personal fall arrest systems and components subject to impact loading shall be immediately removed from service and shall not be used again for employee protection until inspected and determined by a competent person to be undamaged and suitable for re-use.

The EMCOR operating company shall provide for prompt rescue of employees in the event of a fall or shall assure that employees are able to rescue themselves. Personal fall arrest systems shall be inspected prior to each use for wear, damage and other deterioration, and defective components shall be removed from service.

Personal fall arrest systems shall not be attached to guardrail systems, nor shall they be attached to hoist.

When a personal fall arrest system is used at hoist areas, it shall be rigged to allow the movement of the employee only as far as the edge of the walking/working surface.

Maintenance and Inspection of Fall Protection Equipment

1. Guard rails will be inspected daily to ensure completeness and will be retentioned as needed. Any deficiencies must be noted in writing and reported to the general contractor or other responsible party for immediate correction.

Harnesses

2. Each employee using fall arrest or fall restraint systems under this plan shall daily inspect his body harness webbing, " D rings, lanyard and hook assemblies prior to use.
   a. Harness webbing shall be free from nicks or frayed material
   b. "D" rings and lanyard hardware shall not be deformed or cracked
   c. All body harness and lanyard assemblies shall have a legible tag attached that will identify the manufacturer. Equipment that does not have a legible manufacturer tag shall not be used.
   d. All equipment that does not meet the requirements of the above items shall be returned to the foreman for replacement.
   e. If for any reason the employee feels that his fall protection equipment needs to be replaced, the EMCOR operating company shall do so.

Safety Nets

3. Documented weekly inspection for evidence of wear, damage, and other deterioration.
   a. Inspected after any occurrence, which could affect the integrity of the system.
   b. Ensure that there are no tools, equipment, materials, or debris in the nets

Method of Safe Removal of Injured Workers

Prior to commencing work activities, a determination should be made as to the extent of emergency medical and rescue services that are available to the project on which work is being performed.

If the fallen worker can easily be reached and there is no serious exposure to falls and to those employees who are assisting in the retrieval of the injured employee, then this retrieval can be made by job site personnel who have been trained in rescue practices.

In the event that there are no certified individuals on site for the removal and/or retrieval of workers who may have fallen from heights, then the local emergency medical and rescue service shall be contacted immediately.

Employee Training

It is EMCOR's responsibility to ensure that all sub-contractors are providing the necessary training under the fall protection statutes to their employees There are times when EMCOR operating companies act as a prime, general, or sub-contractors to others. Regardless, the EMCOR operating company is required by OSHA statute to ensure that all training is done in accordance with 1926.21 and 1926.500. Documentation of this training is required from all of our sub-contractors in writing on the sub-contractors letterhead. Additionally, each EMCOR operating company will document its own training accordingly.

It will be required under this program that the EMCOR operating company provide a training program for each employee who may be exposed to fall hazards. The program shall enable each employee to recognize the hazards of falling and shall train each employee in the procedures to be followed in order to minimize these fall hazards. This training should be conducted during a "tool box" talk training session. Additionally, a "personal fall arrest systems" training examination must be given to employees to document their understanding of their fall arrest system

The EMCOR operating company shall verify that training has in fact been provided to employees by preparing a written certification letter. The written certification shall contain the name of, or other identity, the employee trained, the date(s) of the training, and the signature of the person who conducted the training, or the signature of the employer. If after you have completed the training, you have reason to believe that any affected employee does not have the understanding and skill required, the competent person shall retrain each such employee. Circumstances where retraining is required include, but are not limited to:

- changes in the workplace render previous training obsolete
- changes in the types of fall protection systems or equipment to be used render previous training obsolete
- inadequacies in an affected employees knowledge or use of fall protection systems or equipment indicate that the employee has not retrained the requisite understanding or skill.