Allen Mechanical Services

Safety Manual 2023

19-Jul-23
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Table of Contents

CORPORATE POLICY STATEMENT

Management, workers, and contractors of Allen Mechanical Services-AMS workers; hereafter referred to as "AMS" must have a common objective to be successful. Our objective is the healthy, safe, environmentally sound, and productive operation of all AMS's activities. We have an obligation to preserve the human, physical, and financial resources of our AMS. In satisfying this obligation, worker safety and health will always be our #1 priority. As such, this basic policy must be considered in every phase of our business including acquisition, job planning, job setup, and performance. Accordingly, our principal objectives are to:

- Provide a work environment that is free of unmitigated recognized hazards
- Comply with all laws that regulate worker safety, health, and our environment
- Recognize the priority of safety and health factors over purely economic considerations
- Hold each worker accountable for the safe execution of all jobs assigned and full compliance with all environmental, safety, and health related procedures and training
- Train our workers in safe and proper job procedures and required compliance with established procedures, policies, and practices
- Provide comprehensive New Employee Safety Training to all new hires
- Hire only those persons who demonstrate the capacity to comprehend and execute all jobs in a safe and healthful manner consistent with the policies and procedures of AMS and the training and job instruction provided
- Promote worker health and safety both on and off the job
- Maintain leadership in safety and accident/incident prevention by continuously improving safety performance and work methods and procedures

First-line supervision has the greatest impact and thus the greatest opportunity to influence and promote safe work practices among our work force in the field. **The prevention of accidents/incidents requires everyone's concerted effort and daily attention. Everyone has equal authority and responsibility to take appropriate action to correct unsafe acts/or conditions.**

A properly planned and executed job will eliminate the chance for losses and return benefits that satisfy needs in each of these areas:

- Health, Safety, & Environment
- Cost
- Quality
- Morale
- Production
- Customer Satisfaction

All workers will contribute to AMS environmental, health, and safety program by following all policies and procedures, bringing unsafe conditions/acts to the attention of management, and recommending actions to improve the effectiveness of the program. Supervisors shall insist that workers observe and follow every rule and regulation necessary for the safe conduct of work and shall take such action necessary to obtain compliance.

Joseph Bryan Allen

Name/Title of Executive

Joseph Bryan Allen/Owner

BLOOD BORNE PATHOGENS

PURPOSE

This Bloodborne Pathogen Exposure Control Plan has been established to ensure a safe and healthful working environment and act as a performance standard for all workers. This program applies to all occupational exposure to blood or other potentially infectious materials pertaining to the service provided by Allen Mechanical Services-AMS; hereafter referred to as “AMS.”

SCOPE

This program addresses all occupational exposure to blood or other potentially infectious materials. Certain Regulatory Agencies and Client Sites requires that all employers that can "reasonably anticipate exposure" of workers to infectious material to prepare and implement a written exposure control plan.

RESPONSIBILITIES

Managers and Supervisors will have an overall responsibility for developing and implementing exposure control procedures for all facilities.
Workers will know what tasks they perform that have an occupational exposure, plan, and conduct all operations in accordance with AMS work practices, and develop good personal hygiene habits.

PROCEDURES

All workers will have access to a copy of the exposure control plan. Access to a copy of the exposure control plan shall be provided in a reasonable time, place, and manner. The procedure is reviewed annually and updated whenever there are establish new functional positions within our facility that may involve exposure to biohazards.

Exposure Determination

- There are no job classifications in which some or all workers have occupational exposure to bloodborne pathogens that may result from the performance of their routine duties
- Designated workers are trained to render first aid and basic life support. Rendering first aid or basic life support will expose workers to bloodborne pathogens and will require them to adhere to this program
- In addition, no medical sharps or similar equipment is provided to, or used by, workers rendering first aid or basic life support
- This exposure determination has been made without regards to the Personal Protective Equipment (PPE) that may be used by workers
- A listing of all first aid and basic life support trained workers in this work group shall be maintained at each work site and at each first aid kit

Methods of Compliance

Universal Precautions

When differential between body fluids is difficult or impossible, all body fluids will be considered potentially infectious.

Engineering Controls

Engineering and work practice controls shall be used to eliminate or minimize worker exposure in accordance with local jurisdiction. Engineering controls should be examined and maintained or replaced on a regular schedule to ensure their effectiveness. Hand washing facilities shall be readily available at all work locations. If provision of hand washing facilities is not feasible, then an appropriate antiseptic hand cleanser in conjunction with cloth/paper towels or antiseptic towelettes shall be provided by AMS. Containers for contaminated reusable sharps that our clients provide have the following characteristics: Puncture-resistant; Color-coded or labeled with a biohazard warning label; Leak-proof on the sides and bottom. Secondary containers which are: Leak-proof; Color-coded or labeled with a biohazard warning label; Puncture-resistant, if necessary.

Work Practice Controls

- Workers shall wash their hands immediately, or when feasible, after removal of potentially contaminated gloves or other PPE
- Following any contact of body areas with blood or any other infectious materials, workers wash their hands and any other exposed skin with soap and water as soon as possible
- Hand washing facilities shall be available. If hand washing facilities are not feasible AMS will provide either an appropriate antiseptic hand cleanser in conjunction with cloth/paper towels or antiseptic towelettes
- Contaminated needles and other contaminated sharps should not be handled if you are not AUTHORIZED or TRAINED to do so. Contaminated needles and other contaminated sharps are not bent or recapped
- Eating, drinking, smoking, applying cosmetics or lip balm and handling contact lenses is prohibited in work areas where there is potential for exposure to biohazardous materials
- Food and drink are not kept in refrigerators, freezers, on countertops or in other storage areas where potentially infectious materials are present
- All equipment or environmental surfaces shall be cleaned and decontaminated after contact with blood or other infectious materials
- Specimens of blood or other potentially infectious materials must be put in leak proof bags for handling, storage, and transport
- If outside contamination of a primary specimen container occurs, that container is placed within a second leak proof container, appropriately labeled, -for handling and storage
- Bloodborne pathogens kits are located on top of first aid kits and are to be used in emergency situations by the caregiver. Once the seal is broken on the kit and any portion has been used it is not to be reused. Pathogen kits shall be ordered and replaced promptly. Biohazard bags are identified by stickers and located in the first aid area. Contaminated supplies are to be disposed at once

Personal Protective Equipment

When the possibility of occupational exposure is present, PPE is to be provided at no cost to the workers such as gloves, gowns, etc. PPE shall be used unless workers temporarily declined to use under rare circumstances. PPE shall be repaired and replaced as needed to maintain its effectiveness. All PPE shall be of the proper size and readily accessible.

Our workers adhere to the following practices when using their personal protective equipment:

- Any garments penetrated by blood or other infectious materials are removed immediately
- All potentially contaminated personal protective equipment is removed prior to leaving a work area
- Gloves are worn whenever workers anticipate hand contact with potentially infectious materials or when handling or touching contaminated items or surfaces
- Disposable gloves are replaced as soon as practical after contamination or if they are torn, punctured or otherwise lose their ability to function as an "exposure barrier"
- Masks and eye protection (such as goggles, face shields, etc.) are used whenever splashes or sprays may generate droplets of infectious materials
- Any PPE exposed to bloodborne pathogens shall be disposed of properly
- PPE shall be used unless workers temporarily declined to use PPE under rare circumstances
- PPE should be cleaned, laundered & properly disposed of if contaminated
- AMS will repair and replace PPE as needed to maintain its effectiveness

Housekeeping

Our staff employs the following practices:

- All equipment and surfaces are cleaned and decontaminated after contact with blood or other potentially infectious materials
- Protective coverings (such as plastic trash bags or wrap, aluminum foil or absorbent paper) are removed and replaced
- All trash containers, pails, bins, and other receptacles intended for use routinely are inspected, cleaned, and decontaminated as soon as possible if visibly contaminated
- Potentially contaminated broken glassware is picked up using mechanical means (such as dustpan and brush, tongs, forceps, etc.)
- Regulated waste must be discarded in proper containers, closed, and disposed of in accordance with applicable federal and state regulations. Regulated waste includes:

    - Liquid or semi-liquid blood or other potentially infectious material (OPIM)
    - Contaminated items that would release blood or OPIM in a liquid or semi-liquid state if compressed
    - Items that are caked with dried blood or OPIM and can release these materials during handling
    - Contaminated sharps
    - Pathological and microbiological wastes containing blood or OPIM

Post-Exposure and Follow Up

If there is an incident where exposure to bloodborne pathogens occurred, we immediately focus our efforts on investigating the circumstances surrounding the exposure incident and making sure that our workers receive medical consultation and immediate treatment. AMS Safety Manager/Supervisor investigates every reported exposure incident and a written summary of the incident, and its causes is prepared, and corrective actions are taken to avoid similar incidents in the future. We provide an exposed worker with the following confidential information:

- Documentation regarding the routes of exposure and circumstances under which the exposure incident occurred
- Identification of the source individual (unless not feasible or prohibited by law)

Once these procedures have been completed, an appointment is arranged for the exposed worker with a qualified healthcare professional to discuss the worker's medical status. This includes an evaluation of any reported illnesses, as well as any recommended treatment. We will forward the following information to the Health Care Professional:

- Description of the incident
- Other pertinent information

After the consultation, the health care professional provides our facility with a written opinion evaluating the exposed worker's situation. We, in turn, furnish a copy of this opinion to the exposed worker. The written opinion will contain only the following information:

- Whether Hepatitis B Vaccination is indicated for the worker
- Whether the worker has received the Hepatitis B Vaccination
- Confirmation that the worker has been informed of the results of the evaluation
- Confirmation that the worker has been told about any medical conditions resulting from the exposure incident which require further evaluation or treatment
- All other findings or diagnoses will remain confidential and will not be included in the written report

Accurate medical records for each worker with occupational exposure must be maintained for at least the duration of employment plus 30 years and shall include at least the following:

- Worker's name, Social Security number and worker identification number
- Worker's Hepatitis B vaccination status, including vaccination dates
- All results from examinations, medical testing, and follow-up procedures, including all health care professional’s written opinions
- Information provided to the health care professional
- Any Hepatitis B Vaccine Declinations

Training records shall be maintained for 3 years from the date on which the training occurred and shall include at least the following:

- Outline of training program contents
- Name of person conducting the training
- Names and job titles of all persons attending the training
- Date of training

Information provided to our workers includes:

- The Biohazards Standard itself
- The epidemiology and symptoms of bloodborne diseases
- The modes of transmission of bloodborne pathogens
- Our facility's Exposure Control Procedure (and where workers can obtain a copy)
- Appropriate methods for recognizing tasks and other activities that may involve exposure
- A review of the use and limitations of methods that will prevent or reduce exposure
- Selection and use of personal protective equipment
- Visual warnings of biohazards within our facility including labels, signs, and "color-coded" containers
- Information on the Hepatitis B Vaccine
- Actions to take and persons to contact in an emergency involving potentially infectious material
- The procedure to follow if an exposure incident occurs, including incident reporting
- Information on the post-exposure evaluation and follow-up, including medical consultation

Training

AMS shall ensure that all workers with occupational exposure participate in a training program in accordance with local jurisdiction. Training is conducted for all workers with occupational exposure before initial assignment and within 1 year of previous training. Training shall include:

- What bloodborne pathogens are; how to protect themselves from exposure
- Methods of warnings (signs, labels, etc.)
- The requirements of bloodborne pathogens
- The Hepatitis B vaccine and vaccine series will be made available to all workers who have an occupational exposure. It must be made available within 10 working days of the initial assignment if there is an occupational exposure. If workers decline the vaccination, they must sign a statement of declination. (See attachment 1)
- The Hepatitis B vaccine shall be made available to all workers that have occupational exposure at no cost to the worker(s)

Attachment 1

Vaccination Declination Form

Date:
Worker Name:

I understand that due to my occupational exposure to blood or other potential infectious materials I may be at risk of acquiring Hepatitis B virus (HBV) infection. I have been given the opportunity to be vaccinated with Hepatitis B vaccine, at no charge to myself. However, I decline the Hepatitis B vaccination at this time. I understand that by declining this vaccine, I continue to be at risk of acquiring Hepatitis B, a serious disease. If, in the future, I continue to have occupational exposure to blood or other potentially infectious materials and I want to be vaccinated with Hepatitis B vaccine, I can receive the vaccination series at no charge to me.

Worker Signature: Date:

Facility Representative Signature: Date:

CONFINED SPACE AWARENESS

PURPOSE

To set forth procedures for the safe entry to confined spaces. This program is intended for "Awareness Level" purposes. Systems shall be used to ensure the safety of workers who are required to enter confined spaces. Only those Allen Mechanical Services-AMS, hereafter referred to as "AMS", workers who have received specifically required training and certification on confined space entry shall be allowed to enter and/or attend a confined space. This program will be reviewed annually and revised as necessary.

This policy covers minimum performance standards applicable to all AMS associates, workers, and locations. Local practices requiring more detailed or stringent rules, or local, state, or other federal requirements regarding this subject can and should be added as an addendum to this procedure as applicable.

SCOPE

Applies to all AMS work sites, i.e., AMS offices, client job sites, etc., involving confined space entry.

DEFINITIONS

Attendant - an individual stationed outside permitted confined spaces that monitors the authorized entrants and who performs all attendants' assigned duties.
Authorized Entrant - an individual who is authorized to enter a confined space.
Blanking or blinding - an absolute closure of a pipe, line, or duct by the fastening of a solid plate (such as a spectacle blind or a skillet blind) that completely covers the bore and that can withstand the maximum pressure of the pipe, line, or duct with no leakage beyond the plate.
Confined space - a space that is large enough and so configured that an individual can enter and perform assigned work; has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry.); and is not designed for continuous occupancy. A permit required confined space has one or more of the following characteristics:

- Contains or has the potential to contain a hazardous atmosphere
- Contains material that has the potential for engulfing an entrant
- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section
- Contains any other recognized serious safety or health hazard

Confined Space Permit - a written or printed document that allows workers to enter a permitted confined space. **Double block and bleed** - the closure of a line, duct, or pipe by closing and locking or tagging two in-line valves and by opening and locking or tagging a drain or vent valve in the line between the two closed valves.
Emergency- any occurrence (including any failure of hazard control or monitoring equipment) or event internal or external to the permitted confined space that could endanger entrants.

Engulfment - the surrounding and effective capture of a person by a liquid or finely divided (flowable) solid substance that can be aspirated to cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.
Entry- the action by which a person passes through an opening into a permit-required confined space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.
Entry supervisor - the person responsible for determining if acceptable entry conditions are present at a permitted confined space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required by this section. An entry supervisor may also be acting as an attendant.
Hazardous atmosphere - an atmosphere that may expose persons to the risk of death, incapacitation, impairment of ability to self-rescue (that is, escape unaided from a permit space), injury, or acute illness.
Line breaking - the intentional opening of a pipe, line, or duct that is or has been carrying flammable, corrosive, or toxic material, an inert gas, or any fluid at a volume, pressure, or temperature capable of causing injury.
Permit-required confined space program (permit space program) -the employer's overall program for controlling, and, where appropriate, for protecting workers from, permit space hazards and for regulating employee entry into permit spaces.
Permit system - a written procedure for preparing and issuing permits for entry and for returning the permit space to service following termination of entry.
Prohibited condition- any condition in a permit space that is not allowed by the permit during the period when entry is authorized.
Oxygen deficient atmosphere - an atmosphere containing less than 19.5 percent oxygen by volume. **Oxygen enriched atmosphere-** an atmosphere containing more than 23.5 percent oxygen by volume. **Rescue service** -the personnel designated to rescue workers from permit spaces.
Retrieval system - the equipment (including a retrieval line, chest or full-body harness, wristlets, if appropriate, and a lifting device or anchor) used for non-entry rescue of persons from permit spaces.
Testing - the process by which the hazards that may confront entrants of a permit space are identified and evaluated. Testing includes specifying the tests that are to be performed in the permit space.

PROCEDURES

General

Workers shall be informed of identified permit required confined spaces for the work site as they are identified. Only authorized workers may be permitted to enter a permit required confined space.

Danger signs or other equivalent means shall be used to warn of existing confined spaces that are accessible by workers and others. The wording shall be “DANGER-PERMIT-REQUIRED CONFINED SPACE, DO NOT ENTER” or other equivalent language.

Required safety equipment shall be at the confined space work area, in working order, and instruments calibrated.

Initial Evaluation of Confined Spaces

Confined spaces shall be considered as permit required confined spaces until a competent person conducts an initial evaluation of the work site to identify permit required confined spaces. Confined spaces shall be classified as follows:

- Non-Hazardous
- Hazardous due to work task
- Hazardous due to internal condition

If the work site contains permit required confined spaces, danger signs stating "DANGER CONFINED SPACE ENTER BY PERMIT ONLY" or equivalent shall be posted to inform workers of the existence and location of the spaces. Bilingual signs shall be posted as necessary.

Reclassification or Canceling of Permit Required Spaces

Permit required confined spaces shall be reclassified as non-permit spaces under the following circumstances:

- The space has no actual or potential atmospheric hazards and if hazards within the space are eliminated without entry into the space
- If testing and inspection during entry demonstrates that the hazards within the space have been eliminated and remain eliminated
- If a hazard returns, workers shall evacuate the space and the space shall be reevaluated
- If new hazards are identified that are not part of the original permit, workers shall immediately evacuate the space and the confined space shall be re-evaluated
- Cancelled permits shall be kept on file for a period of at least 12 months and reviewed to determine problems encountered

Confined Space Entry Form

The supervisor responsible shall ensure that a Confined Space Entry Form is completed prior to the entry of any permit required confined space. Completion of this form involves the following activities:

- Assessing hazards
- Atmospheric testing
- Identification of qualified entrants
- Identification of attendant(s).
- Identification of entry supervisor
- Establishment of Rescue methods and Rescue Service
- De-energizing systems
- Cleaning of confined spaces

- Types of equipment required
- Hazards that may be generated through work activities
- Communication methods
- Entrants are qualified

Confined Space Permits are valid for the work period or work shift and become void and shall be reissued when:

- There is an unplanned interruption in the work process
- The surrounding conditions change that introduce a new hazard
- Workers leave the space to perform other work
- The workspace is left unattended
- The work period (normal time a worker or crew is scheduled to work during that day) ends
- When new crew assumes the work assignments of the existing work crew

Permits are not void during any single work period when crew members are added to the existing crew or when crew members are replaced on a planned rotational basis and the provisions of the permit are met including training and instructions.

Permits become void when the scope of work exceeds the definition of work defined on the permit, and when work is required to be completed that is not covered by the permit.
Confined Space Permits shall be posted at the confined space work area until the work is completed. At the conclusion of work, the permit shall be returned to the issuer (i.e., Entry Supervisor, client, etc.).

Completed confined space permits shall be kept for a minimum of 12 months and until a review of the confined space permit program is completed.

Atmospheric Testing

Atmospheric conditions of a confined space shall be tested with calibrated equipment prior to entry of workers and as identified by the Initial Evaluation of Confined Spaces. Atmospheric testing shall be completed as indicated below and recorded on the Entry Permit:

- Oxygen content shall be tested. The acceptable range is 19.5 to 23.5 percent
- Test for combustible gas and vapors. Acceptable range is 0 to 10 percent of the Lower Flammable Limit (or Lower Explosive Limit). Record readings on the Entry Permit
- Check for toxic gases and airborne combustibles (i.e., dusts) as identified by the initial determination of confined spaces
- Entrants and/or attendants may request additional monitoring at any time See testing equipment requirements under the Industrial Hygiene manual.

Pre-Entry (occurring prior to entry)

Only those workers receiving specifically required training and certification on confined space entry shall be allowed to enter and/or attend a confined space. This training shall be documented at orientation. Annual refresher training shall be conducted for all applicable AMS workers to include

emergency rescue drills. Proficiency in assigned duties will be established after training.

Workers who enter confined space, Attendant(s), and Entry Supervisor shall receive the following minimum instructions concerning the confined space:

- How to recognize symptoms of the specific potential hazards of confined space
- The consequences of exposure to potential hazards
- When to evacuate the confined space
- Adhering to instruction of the Attendant
- Evacuating when alarms sound
- How communications will be maintained
- What to do if an exposure occurs or there is a release of a substance
- Shutting off tools during an emergency

Sources of energy or contaminants shall be controlled, such as:

- Electrical energy
- Pressurized systems such as pipelines and vessels are isolated through double blocking, blinding, bleeding, and depressurization
- Extreme heat and extreme

cold conditions Pre-entry atmospheric

testing shall be completed.

The method of ventilating the confined space shall be established.

The approved tools shall be identified and staged at or near the entry point of the confined space. Tools, electrical tools, and lighting systems shall be approved for use in confined spaces as identified by the Initial Evaluation of confined spaces.

Depending upon the Pre-Job Assessment (lighting and electrical equipment may be either low voltage (50V or less), or conventional 120V portable lamps and tools if powered by approved ground fault circuit interrupter devices and the work is not an electrically hazardous location. Pneumatic equipment may be used instead of electrical equipment.

Required rescue procedures and rescue equipment that shall be staged at the confined space

The safe methods to enter, exit, and escape for workers (including rescue workers during retrieval) working in a permit-required confined space shall be developed during the job planning phase, specified on, and included, as needed, on the entry permit.

Workers have been issued the required personal protective equipment (PPE).

Ventilation of Confined Spaces

Powered ventilation shall occur before entry into permit-required confined space and continue until after the workers have left the space. Layout of ventilation equipment will be made in such a manner that the air is being sent throughout the entire confined space. Forced air ventilation shall come from a clean source and may not increase hazards. Air hoses with diffusers may not be used to provide forced ventilation.

Air sampling shall be conducted prior to worker entry to assure the safety of the space and periodic air sampling shall be continued thereafter in the space when forced ventilation is used.

Forced ventilation may be used to:

- To remove contaminants created by work activities such as welding
- As a method of maintaining controlling the ambient temperature of a confined space when the rise in temperature is caused by atmospheric conditions

Ventilation shall occur only by forcing air into a confined space. If it is necessary to exhaust hazardous gases, such as those produced when welding, the air being forced into the confined space shall be increased by at least the amount that is being exhausted out of the space.

Performance of Work

The confined space attendant shall remain at the entry point of the confined space while workers are inside any permit required confined space.

The confined space attendant shall ensure that only authorized workers enter the confined space.

Confined space attendants shall not perform any other work activities except that they may also serve as the attending supervisor.

Confined space attendants shall only monitor a single confined space unless entry points to subsequent confined space(s) are immediately adjacent and are under the direct control of the attendant.

If an emergency or other unplanned event takes place during work the Confined Space Work

Permit is void. The Attendant and Entry Supervisor have the authority to discontinue work

activities at any time.

Compressed gas cylinders other than a self-contained breathing apparatus should not be taken into a confined space.

The hoses of gas cutting, and welding tools shall be inspected for leaks prior to taking them into any confined space.

Workers who enter confined spaces shall comply with the provisions of this standard and the confined space permit. This includes:

- Supervisors
- Inspectors
- Surveyors
- Observers
- Scaffold Builders
- Engineers
- Vendors
- Contractors, subcontractors, and other workers

Sources of ignition (e.g., flame. arc, or spark) shall not be permitted in any confined space until tests have ensured that the percentage of combustible/flammable gas or vapor is not more than zero (0) % of the Lower Explosive Limit (LEL).

Emergencies

Emergency Notification

It is the responsibility of the Entry Supervisor and/or the Entry Attendant to immediately notify AMS's senior worker on the worksite of a potential emergency by radio or cell phone. AMS's senior worker will assess the situation and contact emergency response services if applicable.

Only those workers trained and certified in confined space entry procedures on the worksite may assist in emergency rescue operations.

Rescue / Retrieval Systems

To facilitate emergency rescue, retrieval systems or methods shall be used whenever an authorized entrant enters a confined space, unless the retrieval equipment increases the overall risk of entry or would not contribute to the rescue of the entrant.
The entry supervisor, prior to the initial entry of workers into a confined space, will ensure:

- Procedures for summoning emergency and rescue services are available and can respond in a timely manner during confined space entries
- Rescue equipment and retrieval systems are functioning properly
- First aid is provided by trained workers
- Prevention of unauthorized workers from attempting a rescue in a

confined space Retrieval systems shall meet the following requirements to

the greatest extent possible.

- Each authorized entrant shall use a full body harness with a retrieval lifeline attached at the center of the entrant's back near shoulder level, or above the entrant's head or

safety coveralls with built-in harness, with a retrieval lifeline attached at the near shoulder level of the entrant's back, or above the entrant's head

- Wristlets may be used in lieu of the full body harness if the entry supervisor can demonstrate that the use of a full body harness is not feasible or creates a greater hazard and that the use of wristlets is the safest and most effective alternative
- The other end of the retrieval line shall be attached to a mechanical device or fixed point outside the confined space in such a manner that rescue can begin as soon as the rescuer becomes aware that rescue is necessary.
- A mechanical device shall be available to retrieve workers from vertical type confined spaces more than 5 feet deep
- The safety harness shall be of the type that permits easy rescue of workers from confined space during emergency conditions and may be either the harness type that suspends a worker in an upright position or the wrist type rescue harness. (A hoisting device or other effective means for lifting workers from confined spaces is preferred)
- Lifelines shall have a minimum breaking strength of 5,400 pounds

Completion of Work

When the work is completed in a confined space the following, as a minimum shall be completed:

- Tools, equipment, and materials shall be removed
- The area surrounding the confined space shall be clean of materials, equipment, scraps, and debris
- The supervisor responsible for the confined space work shall inspect the work location to ensure cleanup of materials, tools, and other items is complete
- (Lockout) locks are removed only when work is completed

CONFINED SPACE ENTRY

POLICY

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Line breaking - the intentional opening of a pipe, line, or duct that is or has been carrying flammable, corrosive, or toxic material, an inert gas, or any fluid at a volume, pressure, or temperature capable of causing injury.
Permit-required confined space program (permit space program) -the employer's overall program for controlling, and, where appropriate, for protecting workers from, permit space hazards and for regulating worker entry into permit spaces.
Permit system - a written procedure for preparing and issuing permits for entry and for returning the permit space to service following termination of entry.
Prohibited condition- any condition in a permit space that is not allowed by the permit during the period when entry is authorized.
Oxygen deficient atmosphere - an atmosphere containing less than 19.5 percent oxygen by volume.
Oxygen enriched atmosphere- an atmosphere containing more than 23.5 percent oxygen by volume.
Rescue service -the personnel designated to rescue workers from permit spaces.
Retrieval system - the equipment (including a retrieval line, chest or full-body harness, wristlets, if appropriate, and a lifting device or anchor) used for non-entry rescue of persons from permit spaces.
Testing - the process by which the hazards that may confront entrants of a permit space are identified and evaluated. Testing includes specifying the tests that are to be performed in the permit space.

PROCEDURES

General

Workers shall be informed of identified permit required confined spaces for the work site before work begins and as they are identified.

Only authorized workers may be permitted to enter a permit required confined space.

Danger signs or other equivalent means shall be used to warn of existing confined spaces that are accessible by workers and others. The wording shall be “DANGER-PERMIT-REQUIRED CONFINED SPACE, DO NOT ENTER” or other equivalent language. Bilingual signs shall be posted as necessary.

Required safety equipment shall be at the confined space work area, in working order, and instruments calibrated.

Initial Evaluation of Confined Spaces

Confined spaces shall be considered as permit required confined spaces until a competent person conducts an initial evaluation of the work site to identify permit required confined spaces. Confined spaces shall be classified as follows:

- Non-Hazardous
- Hazardous due to work task
- Hazardous due to internal condition

Reclassification or Canceling of Permit Required Spaces

Permit required confined spaces shall be reclassified as non-permit spaces under the following circumstances:

- The space has no actual or potential atmospheric hazards and if hazards within the space are eliminated without entry into the space
- If testing and inspection during entry demonstrates that the hazards within the space have been eliminated and remain eliminated
- If a hazard returns, workers shall evacuate the space and the space shall be reevaluated
- If new hazards are identified that are not part of the original permit, workers shall immediately evacuate the space and the confined space shall be re-evaluated
- Cancelled permits shall be kept on file for a period of at least 12 months and reviewed to determine problems encountered

Confined Space Entry Form

The supervisor responsible shall ensure that a Confined Space Entry Form is completed prior to the entry of any permit required confined space. Completion of this form involves the following activities:

- Assessing hazards
- Atmospheric testing
- Identification of qualified entrants
- Identification of attendant(s)
- Identification of entry supervisor
- Establishment of Rescue methods and Rescue Service
- De-energizing systems
- Cleaning of confined spaces
- Types of equipment required
- Hazards that may be generated through work activities
- Communication methods
- Entrants are qualified

Confined Space Permits are valid for the work period or work shift and become void and shall be reissued when:

- There is an unplanned interruption in the work process
- The surrounding conditions change that introduce a new hazard
- Workers leave the space to perform other work
- The workspace is left unattended
- The work period (normal time a worker or crew is scheduled to work during that day) ends
- When new crew assumes the work assignments of the existing work crew

Permits are not void during any single work period when crew members are added to the existing crew or when

crew members are replaced on a planned rotational basis and the provisions of the permit are met including training and instructions. All new crew members will need to be informed of the work being performed and review the job safety analysis.

Permits become void when the scope of work exceeds the definition of work defined on the permit, and when work is required to be completed that is not covered by the permit.
Confined Space Permits shall be posted at the confined space work area until the work is completed. At the conclusion of work, the permit shall be returned to the issuer (i.e., Entry Supervisor, client, etc.).

Completed confined space permits shall be kept for a minimum of 12 months and until a review of the confined space permit program is completed.

Atmospheric Testing

Atmospheric conditions of a confined space shall be tested with calibrated equipment prior to entry of workers and as identified by the Initial Evaluation of Confined Spaces. Atmospheric testing shall be completed as indicated below and recorded on the Entry Permit:

- Oxygen content shall be tested. The acceptable range is 19.5 to 23.5 percent
- Test for combustible gas and vapors. Acceptable range is 0 to 10 percent of the Lower Flammable Limit (or Lower Explosive Limit). Record readings on the Entry Permit
- Check for toxic gases and airborne combustibles (i.e., dusts) as identified by the initial determination of confined spaces
- Entrants and/or attendants may request additional monitoring at any time

See testing equipment requirements under the Industrial Hygiene manual.

Pre-Entry (occurring prior to entry)

Only those workers receiving specifically required training and certification on confined space entry shall be allowed to enter and/or attend a confined space. This training shall be at no cost, in a language and vocabulary the worker can understand, and documented at orientation and before any changes in assigned duties. Annual refresher training shall be conducted for all applicable workers of AMS to include emergency rescue drills. Proficiency in assigned duties will be established after training and before work begins.

Workers who enter confined space, Attendant(s), and Entry Supervisor shall receive the following minimum instructions concerning the confined space:

- How to recognize symptoms of the specific potential hazards of confined space
- The consequences of exposure to potential hazards
- When to evacuate the confined space
- Adhering to instruction of the Attendant
- Evacuating when alarms sound
- How communications will be maintained

- What to do if an exposure occurs or there is a release of a substance
- Shutting off tools during an emergency
- Sources of energy or contaminants shall be controlled, such as:
- Electrical energy
- Pressurized systems such as pipelines and vessels are isolated through double blocking, blinding, bleeding, and depressurization
- Extreme heat and extreme cold conditions

Pre-entry atmospheric testing shall be completed.

The method of ventilating the confined space shall be established.

The approved tools shall be identified and staged at or near the entry point of the confined space. Tools, electrical tools, and lighting systems shall be approved for use in confined spaces as identified by the Initial Evaluation of confined spaces.

Depending upon the Pre-Job Assessment (lighting and electrical equipment may be either low voltage (50V or less), or conventional 120V portable lamps and tools if powered by approved ground fault circuit interrupter devices and the work is not an electrically hazardous location. Pneumatic equipment may be used instead of electrical equipment.

Required rescue procedures and rescue equipment that shall be staged at the confined space.

The safe methods to enter, exit, and escape for workers (including rescue workers during retrieval) working in a permit-required confined space shall be developed during the job planning phase, specified on, and included, as needed, on the entry permit.

Workers have been issued the required personal protective equipment (PPE).

Ventilation of Confined Spaces

Powered ventilation shall occur before entry into permit-required confined space and continue until after the workers have left the space. Layout of ventilation equipment will be made in such a manner that the air is being sent throughout the entire confined space. Forced air ventilation shall come from a clean source and may not increase hazards.

Air hoses with diffusers may not be used to provide forced ventilation.

Air sampling shall be conducted prior to worker entry to assure the safety of the space and periodic air sampling shall be continued thereafter in the space when forced ventilation is used. Forced ventilation may be used to:

- To remove contaminants created by work activities such as welding
- As a method of maintaining controlling the ambient temperature of a confined space when the rise in temperature is caused by atmospheric conditions

Ventilation shall occur only by forcing air into a confined space. If it is necessary to exhaust hazardous gases, such as those produced when welding, the air being forced into the confined space shall be increased by at least the amount that is being exhausted out of the space.

Performance of Work

The confined space attendant shall remain at the entry point of the confined space while workers are inside any permit required confined space.

The confined space attendant shall ensure that only authorized workers enter the confined space.

Confined space attendants shall not perform any other work activities except that they may also serve as the attending supervisor.

Confined space attendants shall only monitor a single confined space unless entry points to subsequent confined space(s) are immediately adjacent and are under the direct control of the attendant.

If an emergency or other unplanned event takes place during work the Confined Space Work Permit is void.

The Attendant and Entry Supervisor have the authority to discontinue work activities at any time.

Compressed gas cylinders other than a self-contained breathing apparatus should not be taken into a confined space.

The hoses of gas cutting, and welding tools shall be inspected for leaks prior to taking them into any confined space.

Workers who enter confined spaces shall comply with the provisions of this standard and the confined space permit. This includes:

- Supervisors
- Inspectors
- Surveyors
- Observers
- Scaffold Builders
- Engineers
- Vendors
- Contractors, subcontractors, and other workers

Sources of ignition (e.g., flame. arc, or spark) shall not be permitted in any confined space until tests have ensured that the percentage of combustible/flammable gas or vapor is not more than zero (0) % of the Lower Explosive Limit (LEL).

Emergencies

Emergency Notification

It is the responsibility of the Entry Supervisor and/or the Entry Attendant to immediately notify the Supervisor the worksite of a potential emergency by radio or cell phone. The Supervisor will assess the situation and contact emergency response services if applicable.

Only those workers trained and certified in confined space entry rescue procedures on the worksite may assist in emergency rescue operations.

Rescue / Retrieval Systems

To facilitate emergency rescue, retrieval systems or methods shall be used whenever an authorized entrant enters a confined space, unless the retrieval equipment increases the overall risk of entry or would not contribute to the rescue of the entrant.

Workers, equipment, and services necessary to perform an effective rescue shall be identified by AMS. They shall be identified in a way that uniquely marks them apart from regular workers and equipment prior to entry into a permit required confined space.

AMS shall also ensure the workers that have been designated to provide permit space rescue and emergency services shall take the following measures:

- Provide affected workers with the PPE needed to conduct permit space rescues safely and train affected workers, so they are proficient in the use of that PPE, at no cost to those workers
- Train affected workers to perform assigned rescue duties. AMS shall ensure that such workers successfully complete the training required to establish proficiency as an authorized entrant
- Train affected workers in basic first aid and cardiopulmonary resuscitation (CPR). AMS shall ensure that at least one member of the rescue team or service holding a current certification in first aid and CPR is available
- Ensure that affected workers practice making permit space rescues at least once every 12 months, by means of simulated rescue operations in which they remove dummies, manikins, or actual persons from the actual permit spaces or from representative permit spaces. Representative permit spaces shall, with respect to opening size, configuration, and accessibility, simulate the types of permit spaces from which rescue is to be performed

Retrieval systems shall meet the following requirements to the greatest extent possible.

- Each authorized entrant shall use a full body harness with a retrieval lifeline attached at the center of the entrant's back near shoulder level, or above the entrant's head or safety coveralls with built-in harness, with a retrieval lifeline attached at the near shoulder level of the entrant's back, or above the entrant's head
- Wristlets may be used in lieu of the full body harness if the entry supervisor can demonstrate that the use of a full body harness is not feasible or creates a greater hazard and that the use of wristlets is the safest and most effective alternative

- The other end of the retrieval line shall be attached to a mechanical device or fixed point outside the confined space in such a manner that rescue can begin as soon as the rescuer becomes aware that rescue is necessary. A mechanical device shall be available to retrieve workers from vertical type confined spaces more than 5 feet deep
- The safety harness shall be of the type that permits easy rescue of workers from confined space during emergency conditions and may be either the harness type that suspends a worker in an upright position or the wrist type rescue harness. (A hoisting device or other effective means for lifting workers from confined spaces is preferred)
- Lifelines shall have a minimum breaking strength of 5,400 pounds

Completion of Work

When the work is completed in a confined space the following, as a minimum shall be completed:

- Tools, equipment, and materials shall be removed
- The area surrounding the confined space shall be clean of materials, equipment, scraps, and debris
- The supervisor responsible for the confined space work shall inspect the work location to ensure cleanup of materials, tools, and other items is complete
- (Lockout) locks are removed only when work is completed

DISCIPLINARY POLICY

PURPOSE & SCOPE

Allen Mechanical Services-AMS, hereafter referred to as “AMS”, progressive discipline policy and procedures are designed to provide a structured corrective action process to improve and prevent a recurrence of undesirable workers behavior and performance issues. It has been designed consistent with AMS organizational values, Human Resource (HR) best practices and employment laws.

Outlined below are the steps of AMS progressive discipline policy and procedure. AMS reserves the right to combine or skip steps depending on the facts of each situation and the nature of the offense. The level of disciplinary intervention may also vary. Some of the factors that will be considered are whether the offense is repeated despite coaching, counseling, training, the worker’s work record, and the impact the conduct and performance issues have on the organization.

PROCEDURES

Step 1: Counseling and Verbal Reprimand

Step 1 creates an opportunity for the immediate supervisor to schedule a meeting with a worker to bring attention to the existing performance, conduct, or attendance issue. The supervisor should discuss with the worker the nature of the problem or the violation of AMS policies and procedures. The supervisor is expected to clearly describe expectations and steps the worker must take to improve performance or resolve the problem.

The supervisor will prepare written documentation of a Step 1 meeting. The worker will be asked to sign this document to demonstrate their understanding of the issues and the corrective action.

Step 2: Written Reprimand

Although AMS hopes that the worker will promptly correct any performance, conduct, or attendance issues that were identified in Step 1, AMS recognizes that this may not always occur. The Step 2 written reprimand involves more formal documentation of the performance, conduct, or attendance issues and consequences.

During Step 2, the immediate supervisor and manager or director will meet with the worker to review any additional incidents or information about the performance, conduct, or attendance issues as well as any prior relevant corrective action plans. Management will outline the consequences for the worker of their continued failure to meet performance or conduct expectations.

The last and most serious step in the progressive discipline procedure is to terminate employment. Generally, AMS will try to exercise the progressive nature of this policy by first providing reprimands and suspension from the workplace before proceeding to terminate employment. However, AMS reserves the right to combine and skip steps depending on the circumstances of each situation and the nature of the offense. Furthermore, workers may be terminated without prior notice or disciplinary action.

Suspensions that are recommended as part of the normal progression of this progressive discipline policy and procedure are subject to approval from a next-level manager and HR.

Depending on the seriousness of the infraction, the worker may be suspended without pay in full-day increments consistent with federal, state, and local wage-and-hour employment laws. Nonexempt/hourly workers may not substitute or use an accrued paid vacation or sick day in lieu of the unpaid suspension. Due to Fair Labor Standards Act (FLSA) compliance issues, unpaid suspension of salaried/exempt workers is reserved for serious workplace safety or conduct issues. HR will provide guidance so that the discipline is administered without jeopardizing the FLSA exemption status.

Appeal Process

Workers will have the opportunity to present information that may challenge information management has used to issue disciplinary action. The purpose of this process is to provide insight into extenuating circumstances that may have contributed to the worker's performance or conduct issues while allowing for an equitable solution.

If the worker does not present this information during any of the step meetings, they will have five business days after that meeting to present such information.

Performance and Conduct Issues Not Subject to Progressive Discipline

Behavior that is illegal is not subject to progressive discipline, and such behavior may be reported to local law enforcement authorities.

Similarly, theft, substance abuse, intoxication, fighting, and other acts of violence at work are not subject to progressive discipline and may be grounds for immediate termination.

Documentation

The worker will be provided copies of all progressive discipline documentation including all PIPs. The worker will be asked to sign copies of this documentation attesting to their receipt and understanding of the corrective action outlined in these documents.

Copies of these documents will be placed in the worker's official personnel file.

Important note: Nothing in this policy provides any contractual rights regarding worker discipline or counseling, nor should anything in this policy be read or construed as modifying or altering the employment relationship between AMS and its workers.

DRUG AND ALCOHOL POLICY

POLICY

ALLEN MECHANICAL SERVICES-AMS, hereafter referred to as “AMS”, is committed to maintaining a safe work environment for all workers and those in the public who may be affected, while ensuring that all workers are treated fairly and with respect. Everyone who works for and with AMS is expected to understand the risks of alcohol and drug use to workplace safety, and to be able to identify and respond to those risks in compliance with this policy. Workers are expected to comply directly with this policy and any supporting programs. Contractors who conduct work on behalf of AMS are expected to develop and enforce comparable policies and programs to manage alcohol and drug risks among their workers.

Work Rules

All workers will be informed regarding this policy at the time of employment. Additionally, it will be discussed periodically at "tailgate" safety meetings.

A worker who has a substance problem is encouraged to seek immediate assistance. AMS Human Resources Department will provide the worker with the name and address of local agencies or facilities that are equipped to provide the rehabilitation assistance needed by the worker.

The following actions are strictly prohibited:

- While on AMS property or at a AMS worksite, to use, consume, possess, distribute, sell or transfer:
    - Alcohol (unless contained in sealed (unopened) packaging, and secured in vehicle for transfer to home or official AMS-sanctioned event)
    - Drugs other than those permitted by this policy as described below
    - Drug paraphernalia
- From reporting to work or performing work while the worker’s ability to safely perform their duties is adversely affected by use of drugs or alcohol.
- From refusing to:
    - Comply with a request to confirm they are following this policy when a supervisor or manager has reasonable grounds to believe the worker may not be complying
    - Comply with a request to submit to an alcohol or drug test
    - When a supervisor or manager has reasonable grounds to believe the worker may not be following the policy and the worker cannot confirm compliance without a test
    - Following an incident or near miss if a supervisor or manager present at the workplace has reasonable grounds to believe that the worker was involved in the incident or near miss and there is no objective evidence to believe that the use of alcohol or drugs did not contribute to the cause of the incident or near miss

- When applying for or transferring into a safety-sensitive position
- As periodically required by AMS throughout the time the worker is working in a safety-sensitive position
- When the worker has previously tested positive and is returning to work after an assessment by a substance abuse expert

- This Work Rule permits the possession or use of prescription and non-prescription drugs under the following conditions:

  - Any prescription drug in the worker's possession or used by the worker is prescribed to the worker, and
  - The worker is using the prescription or non-prescription drug for its intended purpose and in the manner directed by the worker's physician or pharmacist or the manufacturer of the drug, and
  - The use of the prescription or non-prescription drug does not adversely affect the worker's ability to safely perform his or her duties, and
  - The worker has notified his or her supervisor or manager before starting work of any potentially unsafe side effects associated with the use of the prescription or non-prescription drug.

No information collected about a worker under this policy will be disclosed to any person unless the worker has given consent or the supervisor or manager in possession of the information is legally required to disclose it.

Testing Procedures

Laboratory Testing

AMS will designate the laboratories to perform substance testing on blood or urine specimens in accordance with standards set forth by an established industry standard. The substances and detection levels covered by this testing program are set forth below. Workers may be asked by collection site personnel to indicate whether there is the potential that they will test positive for prescription or other substances. A consent form and information sheet will be provided. If the worker fails to provide an acceptable urine specimen AMS may take the following steps:

- Extend the stay of the worker at the designated collection site, if feasible, until an acceptable specimen can be collected
- Reschedule the test due to unusual circumstances, (i.e., post-operative situations)
- Discipline the worker, up to and including termination, on the first offense for failing to cooperate or refusing to provide an acceptable specimen

All positive urine specimen test results for workers on active status will be confirmed by standard laboratory procedures. In case of testing by means other than urine (i.e., breath or other samples), reliable laboratory or instrument testing procedures will be followed.

Testing Substances

As a minimum, the following substances and detection levels shall be tested for:

- Alcohol level equal to or in excess of 0.04 BAL
- Equal to or in excess of the urine concentrations set out in the below table:

Drugs or Classes of Drugs	Screening concentration equal to or in excess of ng/ml
Marijuana metabolites	50
Cocaine metabolites	300
Opiates	2000
6-Acetylmorphone	10
Phencyclidine	25
Amphetamines/Methamphetamines	1000
MDMA	500

Concentrations at or in excess of the above levels shall be conclusive proof of unacceptable levels of unauthorized, prohibited, illegal or controlled substances.

Disciplinary Action for Policy Violation

Applicants

If the final result of a pre-employment drug screen is positive, the applicant will not be employed. No applicant can be reconsidered for employment sooner than six (6) months following the date of the positive drug screen.

Workers

No drug test will be conducted without written consent. However, any worker who refuses to provide such written consent and fully cooperate with this policy will be subject to disciplinary action up to and including discharge from employment.

- Under certain circumstances, disciplinary action may include a mandatory referral to and enrollment in an approved rehabilitation program at the worker's expense. This action may also require an indefinite suspension of regular employment.
- A worker's job is not in jeopardy by reason of his voluntary admission to having a substance problem and request for help and referral to an approved rehabilitation program, provided that such request is made prior to, and well in advance of, any consideration of being tested under the provisions of this policy. Workers participating in this rehabilitation program will be subject to follow-up or "maintenance" testing.

Contractors, Subcontractors, Vendors, Their Workers' Agents, or Representatives

- No drug test will be conducted without written consent. However, anyone who refuses to provide such written consent and does not fully cooperate with this policy will be subject to disciplinary action up to and including removal from the job or job site, as may be appropriate. Preliminary findings of a policy violation may require that the individual involved be suspended from the job pending the results of AMS investigation.
- If the final result of a "reasonable cause" or "post-accident" drug screen is positive, the individual will be permanently barred from the job.

Client Requirements

In the event that a client has an Alcohol and Drug Testing Guideline that is more stringent than those outlined above, the client's guidelines will be followed for all work done with that client. Examples of more stringent guidelines include but are not limited to:

- A greater number of substances (panels) to be tested for
- A lower detection/cut off levels
- Specified number or percent of workers to be tested on the site
- DOT or similar mandated programs

ELECTRICAL SAFETY

PURPOSE

To establish the procedures that shall be followed in the safe performance of work activities involving general electrical hazards.

SCOPE

Applies to all Allen Mechanical Services- AMS, hereafter referred to as "AMS", work sites, i.e., AMS offices, client job sites, etc.

DEFINITIONS

Approved - acceptable to the authorities.
Authorized Person - a person approved or assigned by AMS to perform a specific duty or duties or to be at a specific location or locations at the jobsite.
Cabinet - an enclosure designed either for surface or flush mounting.
Competent Person - one who can identify existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to workers, and who has the authorization to take prompt corrective measures to eliminate them.
Conductor (bare) - a conductor having no covering or electrical insulation whatsoever.
Conductor (insulated) - a conductor encased within material of composition and thickness that is recognized as electrical insulation.
Defect -any characteristic or condition that tends to weaken or reduce the strength of the tool, object, or structure of which it is a part.
Disconnect -a device, or group of devices, or other means by which the conductors of a circuit can be disconnected from their source of supply.
Enclosed - surrounded by a case, housing, fence, or walls which shall prevent persons from accidentally contacting energized parts.
Enclosure - the case or housing of apparatus, or the fence or walls surrounding an installation to prevent personnel from accidentally contacting energized parts, or to protect the equipment from physical damage.
Exposed (as applied to live parts) - capable of being inadvertently touched or approached nearer than a safe distance by a person. It is applied to parts not suitably guarded, isolated, or insulated.
Guarded - covered, shielded, fenced, enclosed, or otherwise protected by means of suitable covers, casings, barriers, rails, screens, mats, or platforms to remove the likelihood of approach to a point of danger or contact by persons or objects.
Isolated - not readily accessible to persons unless special means for access are used.
Labeled - equipment or materials to which has been attached a label, symbol or other identifying mark of a qualified testing laboratory which indicates compliance with appropriate standards or performance in a specified manner.
NEC - stands for National Electric Code.
Qualified - people who are trained and permitted to work on or near energized exposed parts. They are familiar with electrical properties, the proper use of special precautionary techniques, personal protective equipment,

insulating and shielding materials, and insulated tools. Qualified persons have the skills and techniques necessary to distinguish exposed live parts from other parts of electric equipment.
Receptacle - a contact device installed at the outlet for the connection of a single attachment plug. A single receptacle is a single contact device with no other contact device on the same yoke. A multiple receptacle is a single device containing two or more receptacles.
Unqualified - are workers who face a risk of electric shock or may be expected to face comparable risk of injury due to electric shock or other electrical hazards. They shall be trained in and familiar with the safety-related work practices that pertain to their respective job assignments.

PROCEDURES

Training

AMS will ensure that unqualified workers who face a higher-than-normal risk of electrical exposure or accident will be trained in safety-related work practices that pertain to their job scope. In addition, qualified workers will receive specific training relative to working with or near exposed de-energized and/or energized parts. Electrical safety training will provide clear understanding and expectations of safety-related work practices.

General

Feasible engineering and administrative controls shall be applied to mitigate or minimize the risk of injury and illness from exposure to electrical hazards. Where such hazards still exist after application of these controls, 'hot work' procedures shall apply, and Personal Protective Equipment (PPE) shall be used and comply with NFPA 70E.

Where feasible, workers shall not perform live electrical work. Branches that engage in live work are required to provide applicable safe work procedures, PPE, and equipment.

In existing installations, no changes in circuit protection shall be made to increase the load in excess of the load rating of the circuit wiring.

Worn or frayed electric cords or cables shall be removed from work areas for repair or disposal. Plugs equipped with a grounding prong must have the prong in place. Damaged plugs must be repaired. Repairing cords shall be limited to being completed by an authorized qualified person. as determined by the Safety Officer.

Working spaces, walkways, and similar locations must be kept clear of cords to eliminate hazards.

Extension cords shall not be fastened with staples, hung from nails, or suspended by wire. Control equipment, utilization equipment, and busways approved for use in dry locations only shall be protected against damage from the weather during building construction.

Metal raceways, cable armor, boxes, cable sheathing, cabinets, elbows, couplings, fittings, supports, and support hardware shall be of materials appropriate for the environment in which they are to be installed.

Electrical switches shall be labelled to indicate the system, equipment, service, or tool they control. This includes

switch boxes, cabinets, motor control cabinets, stationary equipment, control panels, and other such switches or disconnects.

Workers who perform electrical work shall wear hard hats that are proof tested to 20,000 volts and shall not wear clothing with or without PPE that could increase injury (100% cotton is better than blended materials).

In work areas where the exact location of underground electric power lines is unknown, workers using jackhammers, bars, or other hand tools that may contact a line shall be provided with insulated protective gloves. Gloves must be rated to (or exceed) the voltage for which they may be exposed. The gloves shall be inspected before use and replaced as per the manufacturer's specifications.

Wiring components and equipment in hazardous environments shall be maintained in a condition consistent with NEC requirements (i.e., no loose or missing screws, gaskets, threaded connections, seals, or other impairments to a tight condition).

Hazardous locations are those locations where flammable vapors, liquids or gases, or combustible dusts or fibers may be present. There are six "classifications" for these types of locations, as follows:

- Class I Division 1 and Division 2
- Class II Division 1 and Division 2
- Class III Division 1 and Division 2

Equipment, wiring methods, and installations of electrical equipment in hazardous (classified) locations must be designated as "intrinsically safe" or be approved for the classification location.

Energized Electrical Parts and Systems

This section does not apply to power distribution or transmission lines. Refer to CFR Subpart "R" 1910.269 (servicing) and/or CFR Subpart "V" 1926.950 (Construction) for overhead power transmission and distribution line requirements.

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

Live parts to which a worker may be exposed shall be de-energized before the worker works on or near them, unless it can be demonstrated that de-energizing introduces additional or increased hazards or is infeasible due to equipment design or operational limitations. Live parts that operate at less than 50 volts to ground need not be deenergized if there will be no increased exposure to electrical burns or to explosion due to electric arcs.

If the exposed live parts are not de-energized (i.e., for reasons of increased or additional hazards or infeasibility), other safety-related work practices shall be used to protect workers who may be exposed to the electrical hazards involved. Such work practices shall protect workers against contact with energized circuit parts directly with any part of their body or indirectly through some other conductive object. The work practices that are used

shall be suitable for the conditions under which the work is to be performed and for the voltage level of the exposed electric conductors or circuit parts.

Working on or near exposed de-energized parts

This section applies to working on exposed de-energized parts near enough to expose worker(s) to an electrical hazard.

While a worker is exposed to contact with fixed electrical equipment or circuits which have been de-energized, the circuits energizing the parts shall be locked out in accordance with the Energy Control (lockout) section of this manual.

The circuits and equipment to be worked on shall be disconnected from electrical energy sources (and locked out). Control circuit devices, such as push buttons, selector switches, and interlocks, shall not be used as the sole means for de-energizing circuits or equipment.

Procedures for the release of stored electric energy shall be managed according to this policy.

When capacitors or associated equipment are handled, they shall be treated as energized.

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

Working on or near exposed energized parts

Every effort shall be made to preclude work on energized electrical parts. When this is not possible, the requirements of this section shall apply. Potential contact with live energized parts includes work performed on exposed live parts (involving either direct contact or contact by means of tools or materials) or near enough to them for workers to be exposed to any hazard they present.

Only qualified people shall work on electrical equipment that has not been de-energized.

If work is to be performed near overhead lines, the lines shall be de-energized and grounded, or other protective measures shall be provided before work is started.

If the lines are to be de-energized, arrangements shall be made with the person or organization that operates or controls the electric circuits involved in de-energizing and grounding them. If protective measures, such as guarding, isolating, or insulating are provided, these precautions shall prevent workers from contacting such lines directly with any part of their body or indirectly through conductive materials, tools, or equipment.

Overhead electrical lines

While conducting site activities near overhead lines, field personnel need to be aware of the location of the lines so as not to use conductive equipment (e.g., metal equipment to include drill rigs; hand auger extensions; geoprobe units; excavators, etc.) in close proximity to power lines.

OSHA 29 CFR 1926.550 requires that any vehicle or mechanical equipment (i.e., drill rigs) capable of having parts of its structure elevated near energized overhead lines shall be operated so that a clearance distance of at least 10 feet is maintained.

When calculating clearance distances for a drill rig, consider both the length of the derrick and the length of the rods. Position the rig such that if rods are ever fully extended from the top of the derrick, the rods will still be at least 10 feet away from the power lines. Note that rods can lean or sway when elevated so it may be necessary to maintain more than a 10- foot distance on the ground to ensure that there is a 10-foot horizontal distance between the rods and the power line.

Higher voltages require greater clearance distances. Contact the electrical utility company to verify line voltage. If the voltage is higher than 50kV, the clearance shall be increased 4 in. for every 10kV over that voltage.

Table 12-1	
Voltage	Required Clearance
0-50 kV	10 feet
50-200 kV	15 feet
200-350 kV	20 feet
350-500 kV	25 feet
500-750 kV	35 feet
750-1000 kV	45 feet

Under any of the following conditions, OSHA allows the required clearance to be reduced:

- If a vehicle is in transit with its structure lowered, the clearance shall be reduced to 4 ft. If the voltage is higher than 50kV, the clearance shall be increased 4 in. for every 10kV over that voltage.
- If insulating barriers (boots) are installed to prevent contact with the lines, and if the line being guarded and are not a part of or an attachment to the vehicle or its raised structure, OSHA allows the clearance to be reduced to a distance within the designed working dimensions of the insulating barrier. However, while this is permissible according to OSHA, some utility companies are recommending that safe distances, as described previously, be maintained in addition to the insulating barrier.
- If the equipment is an aerial lift insulated for the voltage involved, and if the work is performed by a qualified person, the clearance (between the uninsulated portion of the aerial lift and the power line) may be reduced to the distance given.

When an unqualified person is working in an elevated position near overhead lines or working on the ground in the vicinity of overhead lines, the location shall be such that the person and the longest conductive object he or she may contact cannot come closer to any unguarded, energized overhead line than the clearance distances indicated in Table 12-1.

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

When a qualified person is working in the vicinity of overhead lines, whether in an elevated position or on the ground, the person shall not approach or take any conductive object without an approved insulating handle closer to exposed energized parts than the clearance distances indicated in Table 12-2, unless:

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

Table 12-2	
Approach Distances for Qualified Workers - Alternating Current	
Voltage range (phase to phase)	Minimum approach distance
300V and less	Avoid contact
Over 300V, not over 750V	1 ft. 0 in.
Over 750V, not over 2kV	l ft. 6 in.
Over 2kV, not over 15kV	2 ft. 0 in.
Over 15kV, not over 37kV	3 ft. 0 in.
Over 37kV, not over 87.5kV	3 ft. 6 in.
Over 87.5kV, not over 121kV	4 ft. 0 in.
Over 121kV, not over 140kV	4 ft. 6 in.

If the equipment is an aerial lift insulated for the voltage involved, and if the work is performed by a qualified person the clearance (between the uninsulated portion of the aerial lift and the power line) may be reduced to the distance indicated in Table 12-2. However, workers standing on the ground shall not contact the vehicle or mechanical equipment or any of its attachments, unless:

- The worker is using protective equipment rated for the voltage or the equipment is located so that no uninsulated part of its structure (that portion of the structure that provides a conductive path to workers on the ground) can come closer to the line than permitted in this section.
- If any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines is intentionally grounded, workers working on the ground near the point of grounding shall not stand at the grounding location whenever there is a possibility of overhead line contact. Additional precautions, such as the use of barricades or insulation, shall be taken to protect workers from hazardous ground potentials, depending on earth resistivity and fault currents, which can develop within the first few feet or more outward from the grounding point.

Illumination

Workers shall not enter spaces containing exposed energized parts unless illumination is provided which enables the workers to perform the work safely. Where lack of illumination or an obstruction precludes observation of the work to be performed, workers shall not perform tasks near exposed energized parts. Workers shall not reach blindly into areas which may contain energized parts.

Confined Space or enclosed space work

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

Conductive materials and equipment

Conductive materials and equipment that are in contact with any part of a worker's body shall be handled in a manner that will prevent them from contacting exposed energized conductors or circuit parts.

For instance, a worker should measure the length of a sledgehammer and the expected radius of his swing prior to using the hammer near an energized circuit. If such a circuit is present, a sign must be posted to warn the workers. The job supervisor must inform the workers of the location of the lines, the hazards involved, and the protective measures to be taken.

Portable ladders

Portable ladders shall have nonconductive siderails if they are used where the worker or the ladder could contact exposed energized parts.

Conductive apparel

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

Housekeeping duties

Where live parts present an electrical contact hazard, workers shall not perform housekeeping duties at such close distances to the parts that there is a possibility of contact, unless adequate safeguards (such as insulating equipment or barriers) are provided.

Electrically conductive cleaning materials (including conductive solids such as steel wool, metalized cloth, and silicon carbide, as well as conductive liquid solutions) shall not be used in proximity to energized parts unless procedures are followed which will prevent electrical contact.

Interlocks

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

Grounding, GFCIs and Assured Grounding Procedures
Equipment, tools, and cord sets shall be provided and used to protect workers from electrical shock and to prevent fire.

Equipment and tools

Note: Portable equipment which is "double insulated" and endorsed by a nationally recognized testing facility need not have a grounding conductor but is subject to the inspection requirements of this section.

Tools and equipment subject to inspection and testing include:

- Portable Electrical Tools such as grinders, drills, and stapling guns
- Stationary tools such as table saws, drill presses, and jig saws
- Portable electrical extension cords
- Portable and Temporary lighting systems and cords

Receptacles shall be of the grounding type and their contacts shall be grounded by connection to the equipment grounding conductor of the circuit supplying that receptacle in accordance with the National Electrical Code (NEC).

Visual inspections

Visual inspection of tools and equipment is required prior to each use and shall include:

- General condition
- Plugs and caps, and presence of ground prong
- Electrical cord sets
- External defects, and missing parts

Defective tools shall be tagged, taken out of service, and placed in a secured location until they are repaired or destroyed.

Testing

The following tests shall be performed on all applicable equipment:

- Equipment grounding conductors shall be tested for continuity and shall be electrically continuous
- Receptacle and attachment cap or plug shall be tested for correct attachment of the equipment-grounding conductor. The equipment-grounding conductor shall be connected to its terminal

Required tests should be performed as indicated below:

- Before first use
- Before being returned to service following any repairs
- Before being used, after any incident that can be reasonably suspected to have caused damage (for example, when a cord set is run over)
- At intervals not to exceed 3 months

Test equipment must be evaluated for proper operation immediately before and after tests are conducted.

Removal from service

Any equipment failing any test shall be taken out of service, shall be tagged with a "Danger, Do Not Use" tag, secured and repaired or destroyed.

Ground Fault Circuit Interrupters (GFCI's)

Ground Fault Circuit Interrupters (GFCI's) shall be used on receptacles >15 amps up to and including 30 amps for tool and equipment used in construction applications and potentially wet environments (either indoors or outdoors). Receptacles of temporary wiring systems and portable generators shall be protected with a GFCI.

The minimum requirements relative to the use of Ground Fault Circuit Interrupters are:

- Prior to use, and periodically thereafter, verify that the GFCI is in good working order. (e.g., Plug the GFCI into an outlet, plug a power tool or light in to the GFCI, hit the "test" button and verify that it interrupts current flow). Periodically re-test the GFCI to ensure continued effectiveness.
- Remove from service any GFCI that has insufficient load capacity, is damaged or is ineffective for any reason. Affix a "Danger, Do Not Use" tag and store the GFCI in a secure location until it can be replaced or repaired. Destroy and discard any GFCI that cannot be repaired or re-used.
- Train workers in the provisions of this section as related to safe us of GFCIs. This training should include:

    - Double insulated tools
    - Defective cords and plugs
    - Heavy moisture, and wet conditions
    - Operation, selection, and use of GFCI's

Assured Grounding Program

When it is not possible to use GFCI's, the Assured Grounding procedures in this section shall apply. If unavoidable, the elements of this program shall include as a minimum:

- Written description of program
- Program coordinator
- Inspections
- Documented Testing

- Availability of Equipment
- Integrity of testing equipment (repairs/testing of test equipment)
- Handling of defective tools and equipment
- Who will perform tests, and repairs
- Recordkeeping
- How receptacles will be provided with GFCI's

Only qualified persons shall perform inspection and "color code" labeling of tools and equipment.

The color code scheme for labeling tools and equipment, as indicated in the following table, shall be used. This color code scheme is consistent with guidance from construction and electrical contractors. Tools and equipment shall be color coded on a quarterly basis when inspected and marked according to the Quarterly Code.

Month	Quarterly Code
January	White
February	White
March	White
April	Green
May	Green
June	Green
July	Red
August	Red
September	Red
October	Orange
November	Orange
December	Orange

Temporary Wiring

This section applies to temporary electrical power and lighting wiring methods that may be of a class less than would be required for a permanent installation.

Temporary wiring shall be removed immediately upon completion of work and when the purpose for which the wiring was installed no longer applies.

General requirements for temporary wiring

Feeders shall originate in a distribution center. The conductors shall be run as multi-conductor cord or cable assemblies or within raceways.

Branch circuits shall originate in a power outlet or panel board. Conductors shall be run as multi-conductor cord or cable assemblies or open conductors or shall be run in raceways. Conductors shall be protected by over-current devices at their ampacity.

Receptacles shall be of the grounding type. Unless installed in a complete metallic raceway, each branch circuit shall contain a separate equipment-grounding conductor, and receptacles shall be connected to the grounding system. Receptacles shall not be connected to the same ungrounded conductor of multi-wire circuits that supply temporary lighting.

Disconnecting switches or plug connectors shall be installed to permit the disconnection of ungrounded conductors of each temporary circuit.

Lamps for general illumination shall be protected from accidental contact or breakage. Metal-case sockets shall be grounded.

The electric cords shall not be used to suspend temporary lights unless cords and lights are designed for this means of suspension. Temporary lighting shall be properly supported.

Portable electric lighting used in wet and/or other conductive locations, such as drums, tanks, and vessels, shall be operated at 12 volts or less. However, 120-volt lights may be used if protected by a ground-fault circuit interrupter.

A mounted box (with a cover) shall be used wherever a change is made to a raceway system or a cable system that is metal clad or metal sheathed. Non-metallic wiring system joints below seven feet (7') shall have mounted boxes and be covered. Exposed temporary joints shall have the wire nuts or other mechanical devices taped with black (electrical) tape to prevent them from falling off. Temporary joints including the ground wire shall have a mechanical connection.

Flexible cords and cables shall be protected from damage. Sharp corners and projections shall be avoided. Flexible cords and cables may pass through doorways or other pinch points if protection is provided to avoid damage. Cords and temporary wiring passing through walls shall be properly protected (e.g., sleeved).

Extension cord sets used with portable electric tools and appliances shall be of three-wire type and shall be designed for hard or extra-hard usage. Flexible cords used with temporary and portable lights shall be designed for hard or extra-hard usage. See the NEC, ANSI/NFPA 70, in Article 400, Table 400-4 that lists various types of flexible cords, some of which are noted as being designed for hard or extra-hard usage. Note: SEU, SER or other similar cables cannot be laid on the floor despite their rating.

For temporary wiring over 600 volts, nominal, fencing, barriers, or other effective means shall be provided to prevent access of other than authorized and qualified personnel.

Clearances in the Workplace

Workers shall not be permitted to work in such proximity to any part of an electric power circuit that the worker could contact the electric power circuit in the course of work unless the worker is protected against electric shock by deenergizing the circuit and grounding it (if appropriate) or by guarding it effectively by insulation or other means.

Supervisors and/or Competent Person(s) shall ascertain by inquiry, direct observation, or by instruments, whether any part of an energized electric power circuit, exposed or concealed, is so located that the performance of the work may bring any person, tool, or machine into physical or electrical contact with the electric power circuit. The supervisor/Competent Person shall post and maintain proper warning signs where such a circuit exists. The supervisor/Competent Person shall advise workers of the location of such lines, the hazards involved, and the protective measures to be taken.

Barriers or other means of guarding shall be provided to ensure that workspace for electrical equipment will not be used as a passageway during periods when energized parts of electrical equipment are exposed.

Fuses

Installing or removing fuses shall be considered as work with live electrical energy and shall be followed according to this policy section for operations conducting such activities.

Persons who perform work on high voltage fuses (over 600 volts) shall wear appropriate head, face, body flash suits, protective footwear, and insulated gloves.

Insulating electrical gloves, sleeves, aprons, and other protective electrical clothing shall be tested for leaks and integrity prior to initial use and periodically.

Protector gloves shall be worn over insulating gloves, except as defined in the above referenced standard.

Only manufacturer-qualified personnel shall inspect and make repairs to electrical insulating protective clothing.

Workspace Clearances - 600 Volts, nominal, or less

Working space about electric equipment

Sufficient access and working space should be provided and maintained for electric equipment to permit ready and safe operation and maintenance of such equipment.

Working clearances

Except as required or permitted elsewhere in this section, the dimension of the working space in the direction of access to live parts operating at 600 volts or less and likely to require examination, adjustment, servicing, or maintenance while live shall not be less than indicated in the table below.

In addition to the dimensions shown in the following table, the workspace shall not be less than 30 inches wide in front of the electric equipment. Distances shall be measured from the live parts if they are exposed or from the enclosure front or opening if the live parts are enclosed. Walls constructed of concrete, brick, or tiles are considered to be grounded.

Working space is not required behind assemblies such as dead-front switchboards or motor control centers where there are no renewable or adjustable parts such as fuses or switches on the back and where connections are accessible from locations other than the back.

Minimum Depth of Clear Working Space in Front of Electric Equipment (feet)			
Nominal voltage to ground conditions*	(a)*	(b)*	(c)*
0-150	3	3	3
151-600	3	3 1/2	4
*Conditions (a), (b), and (c) are as follows: (a) Exposed live parts on one side and no live or grounded parts on the other side of the working space, or exposed live parts on both sides effectively guarded by insulating material. Insulated wire or insulated bus bars operating at not over 300 volts are not considered live parts. (b) Exposed live parts on one side and grounded parts on the other side. (c) Exposed live parts on both sides of the workspace [not guarded as provided in Condition (a)] with the operator between.			
Note: For International System of Units (SI): one foot=0.3048m.			

Working space required in this section shall not be used for storage. When normally enclosed live parts are exposed for inspection or servicing, the working space, if in a passageway or general open space shall be guarded.

At least one entrance should be provided to give access to the working space for electrical equipment.

Where there are live parts normally exposed on the front of switchboards or motor control centers, the working space in front of such equipment shall not be less than 3 feet.

The minimum headroom of working spaces for service equipment, switchboards, panel boards, or motor control centers shall be 6 feet 3 inches.

Guarding of live parts

Except as required or permitted live parts of electrical equipment operating at 50 volts or more shall be guarded against accidental contact by cabinets or other forms of enclosures, or by any of the following means:

- By location in a room, vault, or similar enclosure that is accessible only to qualified persons
- By partitions or screens so arranged that only qualified persons will have access to the space within reach of the live parts. Any openings in such partitions or screens shall be so sized and located that person are not likely to come into accidental contact with the live parts or to bring conducting objects into contact with them.
- By location on a balcony, gallery, or platform so elevated and arranged as to exclude unqualified persons

In locations where electric equipment could be exposed to physical damage, enclosures or guards should be so arranged and of such strength to prevent damage.

Entrances to rooms and other guarded locations containing exposed live parts shall be marked with conspicuous warning signs forbidding unqualified persons to enter.

Workspace Clearances - over 600 volts, nominal

Conductors and equipment used on circuits exceeding 600 volts, nominal, shall comply with all applicable provisions of this section and with the following provisions that supplement or modify those requirements. The provisions of paragraphs listed paragraphs of this section do not apply to equipment on the supply side of the service conductors.

- Installations accessible to qualified persons only
- Installations accessible to unqualified person(s)
- Workspace about equipment

Enclosure for electrical installations

Electrical installations in a vault, room, closet or in an area surrounded by a wall, screen, or fence, access to which is controlled by lock and key or other equivalent means, are accessible to qualified persons only.

A wall, screen, or fence less than 8 feet in height is not considered adequate to prevent access unless it has other features that provide a degree of isolation equivalent to an 8-foot fence. The entrances to buildings, rooms or enclosures containing exposed live parts or exposed conductors operating at over 600 volts, nominal, shall be kept locked or shall be under the observation of a qualified person at all times.

Installations accessible to qualified persons only

Electrical installations having exposed live parts shall be accessible to qualified persons only and shall comply with the requirements of this standard and applicable regulatory standards.

Installations accessible to unqualified worker(s)

Electrical installations that are open to unqualified workers shall be made with metal-enclosed equipment or shall be enclosed in a vault or in an area, access to which is controlled by a lock. Metal-enclosed switchgear, unit substations, transformers, pull boxes, connection boxes, and other similar associated equipment shall be marked with appropriate caution signs. If equipment is exposed to physical damage from vehicular traffic, guards shall be provided to prevent such damage. Ventilating or similar openings in metal-enclosed equipment shall be designed so that foreign objects inserted through these openings will be deflected from energized parts.

Workspace about equipment

Sufficient space shall be provided and maintained for electrical equipment to permit ready and safe operation and maintenance of such equipment. Where energized parts are exposed, the minimum clear workspace shall not be less than 6 feet 6 inches high (measured vertically from the floor or platform), or less than 3 feet wide

(measured parallel to the equipment). The depth shall be as required in the table below. The workspace shall be adequate to permit at least a 90-degree opening of doors or hinged panels.

The minimum clear working space in front of electric equipment such as switchboards, control panels, switches, circuit breakers, motor controllers, relays, and similar equipment shall not be less than specified in the following table, unless otherwise specified. Distances shall be measured from the live parts if they are exposed, or from the enclosure front or opening if the live parts are enclosed.

However, working space is not required behind equipment such as dead front switchboards or control assemblies where there are no renewable or adjustable parts (such as fuses or switches) on the back and where connections are accessible from locations other than the back. Where rear access is required to work on de-energized parts on the back of enclosed equipment, a minimum working space of thirty (30) inches horizontally shall be provided.

Minimum Depth of Clear Working Space in Front of Electric Equipment (feet)			
Nominal voltage to ground conditions*	(a)*	(b)*	(c)*
601 to 2,500	3	4	5
2,501 to 9,000	4	5	6
9,001 to 25,000	5	6	9
25,001 to 75 kV	6	8	10
Above 75kV	8	10	12
*Conditions (a), (b), and (c) are as follows: (a) Exposed live parts on one side and no live or grounded parts on the other side of the working space, or exposed live parts on both sides effectively guarded by insulating materials. Insulated wire or insulated bus bars operating at not over 300 volts are not considered live parts. (b) Exposed live parts on one side and grounded parts on the other side. Walls constructed of concrete, brick, or tiles are considered to be grounded surfaces. (c) Exposed live parts on both sides of the workspace [not guarded as provided in Condition (a)] with the operator between.			
Note: For International System of Units (SI): one foot=0.3048m.			

Lighting outlets and points of control

The lighting outlets shall be so arranged that workers changing lamps or making repairs to the lighting system will not be endangered by live parts or other equipment. The points of control shall be so located that workers are not likely to come in contact with any live part or moving part of the equipment while turning on the lights.

Elevation of unguarded live parts

Unguarded live parts above working spaces shall be maintained at elevations not less than specified in the following table.

Elevation of Unguarded Energized Parts Above Working Space	
Nominal voltage between phases	Minimum elevation
601-7,500	8 feet 6 inches

7,501-35,000	9 feet
Over 35kV	9 feet + 0.37 inches per kV above 35kV
Note: For SI units: one inch=25.4 mm; one foot=0.3048 m.	

Entrance and access to workspace

At least one entrance not less than 24 inches wide and 6 feet 6 inches high shall be provided to give access to the working space for electrical equipment. On switchboard and control panels exceeding 48 inches in width, there shall be one entrance at each end of such board where practicable. Where bare energized parts at any voltage or insulated energized parts above 600 volts are located adjacent to such entrance, they shall be guarded.

EMERGENCY ACTION PLAN

PURPOSE

The purpose of an Emergency Action Plan is to protect workers from serious injury, property loss, or loss of life, in the event of an actual or potential emergency. An emergency may include, but not limited to, any of the following: fire, tornado, earthquake, bomb threat, hazardous chemical spill, or active shooter.

PROCEDURES

Emergency preparedness and response planning is an important factor in ensuring worker safety, protecting the environment, public safety, and AMS assets. Therefore, operations do not require any worker to continue operating critical equipment during an emergency evacuation. Following an emergency evacuation, no worker is permitted to re-enter the building until authorized.

A written copy of the Emergency Action Plan shall be kept in the workplace and available to workers for review.
Training

The Safety Manager has overall responsibility of designating and training workers to assist in a safe and orderly evacuation as well as implementing this plan and updating as needed. Additionally, the Safety Manager will assist any worker who may need more information about the plan or an explanation of their duties under the plan. All workers shall be trained in the following areas:

- The Alarm System
- Various types of emergency scenarios (Fire, Chemical Release, Severe Weather, Lightening, etc.)
- Preferred means of reporting fires and other emergencies
- Emergency escape procedures and route assignments
- Procedures to account for all workers after emergency evacuation has been completed
- Rescue and medical duties for those workers who perform them
- Designated Meeting Areas (Muster Areas)

Refresher training is required; (1) When the plan is developed or the worker is assigned initially to a job, (2) When the worker's responsibilities under the plan change, or (3) When the plan is changed.
Alerting Building Occupants
In case of a fire, call the local Fire Department at 911. In addition, the smoke alarms will alert building occupants of the need for evacuation. Any pertinent fire or rescue information should be conveyed to the Fire Department.

Workers discovering a fire, smoky condition or any other emergency shall activate the fire alarm system and make a verbal announcement immediately.

Evacuation Procedures

When the fire alarm sounds or a verbal announcement is made, all workers should ensure that nearby workers are aware of the emergency, quickly shutdown operating equipment, close doors and exit the building.

All workers should proceed to their Designated Muster Area via their primary or alternate exits and await further instructions from their Safety Monitor.

REMEMBER R.A.C.E.

Rescue: When you discover a fire, rescue people in immediate danger if you can do so without endangering yourself.
Alarm: Sound the alarm by pulling a fire box and call 911 from a safe distance.
Confine: Close all doors, windows, and other openings.
Evacuate: Evacuate the building.

Designated Meeting Area

When an alarm sounds or a verbal announcement is made, all occupants will proceed to the nearest exit and gather at the designated meeting area or "Muster Area" which is pictured on the facilities emergency evacuation maps throughout the facility. The "Muster Area" is designated to be the safe meeting point for all workers. Once the evacuation has been completed, the Safety Monitor shall conduct a head count. The "Supervisor" will have the responsibility of bringing the "Sign-In Roster" to the Muster Area to account for all workers and visitors after the evacuation.

Rescue Plan

- Do not move injured workers
- Always keep injured workers lying down, covered, and warm
- Only trained workers will conduct rescue and medical duties

FALL PROTECTION

POLICY

Work activities where workers may be subject to falls and/or falling objects shall be conducted safely with associated hazards eliminated and/or controlled pertaining to the service provided by Allen Mechanical Services-AMS; hereafter referred to as “AMS”.

This policy covers minimum performance standards applicable to all AMS workers and locations. Local practices requiring more detailed or stringent rules, or local, state, or other federal requirements regarding this subject can and should be added as an addendum to this procedure as applicable.

PURPOSE

To ensure that workers are protected from the hazards associated with falls and falling objects.

SCOPE

Applies to all AMS work sites, (i.e., AMS, client job sites, etc.), where field construction related activities involve exposure to heights greater than or equal to six (6) feet and/or falling objects exist. In general industry (e.g., offices, shops, warehouses, etc.) exposure to heights greater than or equal to four (4) feet shall be in place of all references to the construction six (6) foot reference.

DEFINITIONS

Anchorage a secure point of attachment for lifelines, lanyards, or deceleration devices that is capable of supporting 5,000 lbs. per worker or two times the intended impact load, whichever is greater, or for a positioning system, 3,000 lbs. without failure.
Approved authorized by the Branch Safety Officer, tested and certified by the manufacturer or any recognized national testing laboratory to possess the strength requirements.
Catenary Line – see **Horizontal Lifeline**.
Competent Person an individual knowledgeable (through experience and/or training) of fall protection equipment, including the manufacturer’s recommendations and instructions for the proper use, inspection, and maintenance; who is capable of identifying existing and potential fall hazards; who has the authority to take prompt corrective action to eliminate those hazards; and who is knowledgeable of the rules regarding the erection, use, inspection, and maintenance of fall protection equipment and systems.
Controlled Access Zone 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.
Deceleration Device a device manufactured (fall) shock-absorbing device whereby the forces of the fall are rapidly reduced to meet acceptable levels.
Drop Line a vertical lifeline secured to an upper anchorage for the purpose of attaching a lanyard or device.
Worker every laborer regardless of title or contractual relationship.

Fall Arrest System personal the use of multiple, approved safety equipment components such as body harnesses, shock absorbing lanyards, deceleration devices, droplines, horizontal and/or vertical lifelines and anchorages, interconnected and rigged to ones body as to arrest a free fall.
Fall Protection Work Plan a written planning document in which the employer identifies areas in the work area where a fall hazard of 6 feet or greater exists, whereby conventional Fall Restraint and Fall Arrest Systems cannot be used.
Fall Restraint System an approved device and any necessary components that function together to restrain an worker in such a manner as to prevent that worker from falling to a lower level.
Fall Distance the actual distance from the worker's work platform (area) to the level where a fall would stop (ground level or otherwise).
Full Body Harness a configuration of connection straps to distribute a fall arresting force over at least the thighs, shoulders and pelvis, with provisions for attaching a lanyard, lifeline, positioning rings, or deceleration devices.
Full Body Harness System a Class III full body harness and shock absorbing lanyard attached to an anchorage or attached to a horizontal or vertical lifeline which is properly secured to an anchorage point.
Hardware snap hooks, D-rings, buckles, carabiniers, and adjusters used to attach the components of a fall protection system together.
Holes (floor, roof or walking surface) any opening in the floor greater than two inches whereby falling objects or an worker fall equal to, or greater than six foot is possible.
Holes (wall) – see **Wall Opening**.
Horizontal Lifeline an approved rail, rope, or synthetic cable installed in a horizontal plane between two anchorages and used for attachment of a worker's lanyard or lifeline device while moving horizontally.
Lanyard a flexible line of webbing, rope or cable (usually in two, four or six foot lengths) used to secure a harness to a lifeline or an anchorage point.
Leading Edge the advancing edge of a floor or roof, where a fall of more than six foot is possible to the ground or to another level.
Lifeline (vertical or horizontal) means an approved vertical line from a fixed overhead anchorage or horizontal line between two horizontal anchorages, independent of walking or working surfaces, to which a lanyard or device is secured.
Restraint Line a line from a fixed anchorage or between two anchorages to which an worker is secured in such a way as to restrict the worker from reaching a point where falling to a lower level is possible.
Safety Line – see **Lifeline**.
Shock Absorbing Lanyard a flexible line of webbing or rope used to secure a harness to a lifeline or anchorage point that has an integral shock absorber of either a rip-stitch or retractable configuration.
Snaphook – 'locking' hook at the end of a lanyard or restraining/positioning line that has a double-action locking mechanism intended to eliminate unintentional unhooking from the D-ring of a body harness. Non-locking snaphooks are prohibited.
Standard Guardrail a toprail at 42 inches high (plus or minus three inches), a midrail installed midway the top edge of the guardrail system and the surface.
Static Line – see **Lifeline**.
Toeboard a barrier at the base of the guardrail system to prevent material and objects from falling off the surface. They are at least four (4) inches of nominal height with no less than one (1) inch clearance from the surface.
Unprotected Sides and Edges any side or edge (except at entrances to points of access) of a floor, roof, ramp, or runway where there is no wall or guardrail system.
Walking/Working Surface any area whose dimensions are 45 inches or greater in all directions through which workers pass or conduct work, and can include scaffolding and aerial lifts regardless of surface dimensions.

Wall Opening a gap in a wall where the outside bottom edge is 6 feet or more above lower levels, and the inside bottom edge (e.g. parapet wall) is less than 39 inches above the walking/working surface.
Work Area that portion of a walking/working surface where work activities are being performed.

PROCEDURES

Training

Fall Protection training requirements shall include:

- New workers with work responsibilities requiring the use of fall protection will be oriented to AMS's Fall Protection Program
- At new worksites, AMS offices, client job sites, etc., during the pre-job meeting to describe specific fall protection requirements of the job
- Thereafter, every foreseeably exposed worker will be trained at least annually, and include the following:

    - The nature of fall hazards in the typical work area
    - The correct procedures for erecting, maintaining, disassembling, and inspecting fall protection systems
    - The use and operation of conventional and non-conventional fall protection systems
    - The role of each worker in the safety monitoring system when such a system is in use
    - The limitations on the use of mechanical equipment during the performance of roof work on low-slope roofs
    - The correct procedures for equipment and materials handling and storage, and the erection of overhead protection
    - The correct fit, maintenance and use of personal fall arrest system components, as determined by the manufacturer(s)
    - Rescue procedures in the event an individual falls

Toolbox talks for related issues of this program shall be covered periodically.

Retraining shall also occur whenever deficiencies in the training program are identified, standard requirements change or are modified or new fall protection systems are introduced.

Any worker who has not received orientation or annual training (as previously outlined) shall not be allowed to work at heights.

Training provided shall be documented and maintained in a training file. Training will include dates of training, instructor's name, worker signature, and course name.

Conventional Fall Arrest and Fall Restraints Systems shall be used where the exposure to falls greater than 6 foot and from falling objects as is reasonably foreseen. The following systems shall be used:

Guardrail System (fall restraint and potentially from falling objects)

Toprails and midrails of guardrail systems constructed of wood shall be at least ¼ inch diameter or thickness to prevent cuts and lacerations.

If wire rope is used for toprails, it shall be flagged at not more 6 feet intervals with high-visibility material. Steel and plastic banding are prohibited for use as toprails or midrails.

The top edge height of toprails, or (equivalent) guardrails shall be 42 inches, plus or minus 3 inches, above the walking/working level.

When workers are using ladders in distance proximity equivilent to the maximum use-length of the ladder, the top edge height of the top rail, or equivalent member, shall be increased an amount equal to the maximum use-length height of the ladder.

Screens, midrails, 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 are no walls or parapet walls at least 21 inches high. When midrails are used, they shall be installed at a height midway between the top edge of the guardrail system and the walking/working level. When screens and mesh are used, they shall extend from the top rail to the walking/working level. Intermediate members, such as balusters, when used between posts, will not be more than 19 inches apart.

The guardrail system shall be capable of withstanding a force of at least 200 pounds of force applied within 2 inches of the top edge in any outward or downward direction. When the 200 pounds is applied in a down-ward direction, the top edge of the guardrail shall not deflect to a height less than 39 inches above the walking/working level.

Midrails, screens, mesh, intermediate vertical members, solid panels, and equivalent structural members will be capable of withstanding a force of at least 150 pounds of force applied in any downward or outward direction at any point along the midrail or other member.

Guardrail systems shall be free of sharp edges and burrs to protect against punctures or lacerations and to prevent clothing from snagging.

The ends of top rails and midrails shall not overhang terminal posts, except where such an overhang does not constitute a projection hazard.

When guardrail systems are used at hoisting areas, a chain, gate or removable guardrail section shall be placed across the access opening between guardrail sections when hoisting operations are not taking place. At uncovered holes, guardrail systems shall be set up on unprotected sides or edges. When holes are used for the passage of materials, the hole shall have not more than two sides with removable guardrail sections. When the hole is not in use, it shall be covered or provided with guardrails along unprotected sides/edges.

If guardrail systems are used around uncovered holes that are used as access points (such as ladderways), gates shall be used or the guardrail shall be offset at a 45 degree angle to prevent accidental walking into the hole. Toeboards shall be used around the edges not used as the actual access point.

If guardrails are used at unprotected sides or edges of ramps and runways, they shall be erected on each unprotected side/edge.

When guardrail systems, in combination with netting, is used to prevent materials from falling from one level to another, openings shall be small enough to prevent passage of potential falling objects.

Covers for Holes (fall restraint and from falling objects)

Covers (or a guardrail system with toe boards (Guardrail Systems within this section) shall be installed over holes equal to or greater then 2" in floors, roofs and walkways that are more than 6 feet above lower levels.

Hole covering material shall support at least two times the potential weight that will cross over it. If plywood is chosen as the cover material, it shall be of at least ¾ inch in thickness.

Hole covers shall be secured in place in such a manner as to not easily be displaced. Examples of securing methods include, but are not limited to: nailing, attached cleats, wire, etc.

Such covers shall have the word 'HOLE' or 'COVER' predominately marked on the top surface. Where covers are too small for such marking, they shall be painted or significantly marked in the color orange.

Restraining/Positioning System (fall restraint)

Only full body harness systems with positioning rings are to be used with any restraining/positioning system.

Restraint line (rope) length shall not exceed the distance to fall exposure, and shall be secured to an anchorage capable of supporting at least twice the potential impact load of an worker's fall or 3,000 pounds, whichever is greater.

Requirements for body harness systems, snaphooks, D-rings, and other connectors used with positioning device systems shall meet the same criteria as those for fall arrest systems.

No makeshift fall protection equipment may be used.

Body belts are prohibited.

Personal Fall Arrest System

Personal Fall Arrest Systems shall do all of the following:

- Limit maximum arresting force on an worker to 1,800 pounds. Note: total body weight including tools cannot exceed 310 lbs. to stay under arresting force limit

- Be rigged so that an worker can neither free fall more than 6 feet nor contact any lower level
- Bring an worker to a complete stop and limit maximum deceleration distance an worker travels to 3.5 feet
- Have sufficient strength to withstand 5000 lbs. (excluding horizontal lifelines which require a safety factor of at least two times the potential impact energy)
- All components of the personal fall arrest system (lanyards, body harness and attached hardware, and shock-absorbing devices) shall meet the design specifications of local or federal regulations

The following items/actions are prohibited for use with personal fall arrest systems:

- Body belts
- Non-locking snaphooks
- Lanyards without shock absorbers
- Tying back to the lanyard (once around another object) for a means of an anchorage point, unless the lanyard was designed for this purpose by the manufacturer, the object tied around can support the anticipated fall force and the object does not have sharp edges or burrs

Personal fall arrest systems shall be used in the following manner:

Pre-Use Inspection

All components shall be inspected prior to each use for wear damage, and other deterioration in accordance with manufacturer's requirements (see equipment inspection and maintenance procedures).

General Proper Body Harness Fit Guidelines (two workers are usually required to completely fit each other)

The body harness type and size shall meet the physical needs of its user (male/female or small, medium, large, etc.).

Follow the manufacturer's guidelines on proper fit.

Shoulder, thigh, button and chest straps shall be fit snugly whereas it is slightly difficult to slide the hand underneath.

Loose straps ends shall be folded back under.

D-ring placement should be between the shoulder-blades.

Chest straps should be positioned across the mid-chest area.

Sufficient Anchorage Points Used

Anchorages shall be used under the supervision of a competent person, as part of a complete personal fall arrest system that maintains a safety factor of at least two (i.e., capable of supporting at least twice the weight expected to be imposed upon it).

Anchorages used to attach personal fall arrest systems will be independent of any anchorage being used to support or suspend platforms and shall be capable of supporting at least 5,000 pounds of force per worker attached.

Anchorage points can include:

- Lifelines (horizontal and vertical)
- Designed anchorage points on aerial lifts
- Eye-bolts listed for use by the manufacturer
- Specially designed anchorage tools specifically designed to meet fall force requirements, including:
- Wrap-around lanyards as approved by the manufacturer
- I-beam clamps designed specifically as an anchorage point

Prohibited anchorage points include, but are not limited to:

- Standard guardrails and railing
- Ladders/rungs
- Scaffolding, unless approved by the manufacturer for/with anchorage points
- Light fixtures, ductwork, conduit, pipe vents, wiring/duct/piping harnesses, other roof stacks, vents or fans
- C-clamps
- Piping (unless capable of meeting the criteria of an anchorage point)
- To a lanyard (around a solid object), unless the lanyard and hardware is manufactured for that purpose

Lifeline/Lanyard Applications

Lanyards shall only be attached to anchorage points sufficient to meet the fall force requirements.

Shock-absorbing lanyards are required to limit the fall force to less than 1800 pounds.

Self-retracting lanyards (retractable) capable of withstanding the tensile load of 3,000 lbs. that limit the free fall distance to two (2) feet or less are always recommended and are required when the fall distance is less than nineteen and one-half (19.5) feet.

Lanyards that do not limit free fall distance to 2 feet or less, such as rip stitch lanyards and tearing/deforming lanyards will be capable of sustaining a minimum tensile load of 5,000 pounds applied to the device with the lifeline or lanyard in the fully extended position.

Horizontal lifelines will be designed, installed, and used under the supervision of a Competent Person, as part of a complete personal fall arrest system. Lifelines shall be protected against being cut or abraded. Horizontal lifelines cannot exceed sixty feet in length.

Vertical lifelines shall be used with leading edge work, shall reach the ground, and the method of anchorage attachment shall be of proper design (i.e. no knots).

Safety Net System (fall arrest and potentially from falling objects)

When used, safety nets shall be installed as close as practicable under the walking/working surface on which workers are working and never more than 30 feet below such levels.

Safety nets will be inspected at least once a week for wear, damage, and other deterioration. The maximum size of each safety net mesh opening will not exceed 36 square inches nor be longer than 6 inches on any side, and the openings, measured center-to-center, of mesh ropes or webbing, will not exceed 6 inches.

Defective/unfit nets are not to be used and are to be taken from service and immediately destroyed by cutting into un-useful sizes and properly disposed.

Mesh crossings will be secured to prevent enlargement of the mesh opening. Each safety net or section will have a border rope for webbing with a minimum breaking strength of 5,000 pounds.

Connections between safety net panels will be as strong as integral net components and be spaced no more than 6 inches apart.

Safety nets shall extend outward from the outermost projection of the work surface as follows:

Vertical distance from working level to horizontal plane of net surface.	Minimum required horizontal distance of outer edge of net from edge of working surface.
Up to 5 feet	8 feet
More than 5 feet up to10 feet	10 feet
More than 10 feet	13 feet

Safety nets shall be tested at the beginning of each workday and shall be capable of absorbing an impact force of a drop test consisting of a 400-pound bag of sand 28-32 inches in diameter dropped from the highest walking/working surface at which workers are exposed, but not from less than 42 inches above that level. Workers shall not be allowed in work areas controlled with safety nets until this test is complete.

If safety nets are used for the dual purpose of worker fall protection and the protection of other workers from fall objects, the net webbing opening shall be small enough to prevent passage of potential falling objects.

Items that have fallen into safety nets, such as materials, scrap, equipment, and tools, shall be removed as soon as possible and at least before the next work shift.

Where conventional fall restraint and fall arrest methods cannot be used (or used safely), the following non-conventional methods can be used:

A written work plan shall be developed when a project or task possesses a fall exposure whereby these systems are used.

A Competent Person will develop and implement a written Fall Protection Work Plan including each area of the work place where the workers are assigned and where fall hazards of 6 feet or more will exist. The Risk Assessment for this project/task should be reviewed for this document.

The written Fall Protection Work Plan shall include:

- Identification of fall hazards in the work area
- Describe the non-conventional method (or in combination with conventional method) of fall protection to be provided
- Describe the correct procedures for the assembly, maintenance, inspection, and disassembly of any fall protection system to be used
- Describe the correct procedures for the handling, storage, and securing of tools and materials
- Describe the method of providing overhead protection for workers who may be in or pass through the area below the work site
- Describe the method for prompt, safe removal of injured workers
- Describe the method for destruction of personal fall arrest system equipment subjected to the forces of any fall
- Be available at all times on the jobsite

Controlled Access Zone System

Controlled access zone systems shall be set up as follows:

- Zone shall be established no closer than six (6) feet or further than twenty-five (25) feet from any leading edge
- Control line shall extend parallel along the entire length of the unprotected or leading edge
- Only trained workers are allowed in the Zone
- The Zone shall have signage marking it as a 'Controlled Access Zone'

Warning Line System (pitches of ≤4:12 and flat surfaces only)

Warning line systems consist of ropes, wires, or chains, and supporting stanchions and are set up as follows:

- Flagged at not more than 6-foot intervals with high-visibility material
- Rigged and supported so that the lowest point including sag is no less than 34 inches from the walking/working surface and its highest point is no more than 39 inches from the walking/working surface

- Stanchions, after being rigged with warning lines, will be capable of resisting, without tipping over, a force of at least 16 pounds applied horizontally against the stanchion, 30 inches above the walking/working surface, perpendicular to the warning line and in the direction of the floor, roof, or platform edge
- The rope, wire, or chain will have a minimum tensile strength of 500 pounds, and after being attached to the stanchions, shall support without breaking the load applied to the stanchions as prescribed above
- Line will be attached to each stanchion in such a way that pulling on one section of the line between stanchions will not result in slack being taken up in the adjacent section before the stanchion tips over
- Warning lines will be erected around all sides of roof work areas. When mechanical equipment is being used, the warning line will be erected not less than 6 feet from the roof edge parallel to the direction of mechanical equipment operation, and not less than 10 feet from the roof edge perpendicular to the direction of mechanical equipment operation

When mechanical equipment is not being used, the warning line shall be erected not less than 6 feet from the roof edge.

The warning line system shall be used in conjunction with one of the following:

- Safety monitoring system (most common)
- Personal fall arrest system
- Safety net system
- Guardrails

Safety Monitoring System

A competent person will appoint the 'safety monitor' and will ensure that the safety monitor:

- Is competent in the recognition of fall hazards
- Is capable of warning workers of fall hazard dangers and in detecting unsafe work practices
- Is operating on the same walking/working surfaces of the workers and can see them
- Is close enough to work operations to communicate orally with the workers and has no other duties but the monitoring function
- Has the authority to stop work

Only workers engaged in roof/surface work and the safety monitor shall be allowed in an area where a worker is being protected by a safety monitoring system.

Specific Fall Hazard Procedures

Aerial Personnel Lifts

Workers using aerial personnel lifts (e.g. scissor lifts, genie lifts, cherry-pickers, boom-lifts, etc.) shall use a

restraint/positioning system or personal fall arrest system, even though a guardrail system is in place.

Attachment points for these systems shall be capable of withstanding 5,000 pounds and shall be maintained in the floor of the lift or where designed by the manufacturer.

Rails of such lifts shall not to be used as attachment points unless designed for that purpose by the manufacturer.

Excavations

Workers who work at the edge of an excavation 6 feet or more deep will be protected from falling into the excavation by guardrail systems or covers.

Where walk-ways are provided to permit workers to cross over excavations, guardrails are required on the walkway if the fall would be 6 feet or more to the lower level.

Hoist Areas

Each worker in a hoist area will be protected from falling 6 feet or more by guardrail, restraint/positioning or personal fall arrest systems. If guardrail systems (or chain gate or guardrail), or portions thereof, must be removed to facilitate hoisting operations, as during the landing of materials, and a worker shall lean through the access opening or out over the edge of the access opening to receive or guide equipment and materials, that worker shall be protected by a personal fall arrest system.

Falling Objects (additional protection from)

Except for scaffolding and aerial lifts, no materials or equipment shall be stored within 6 feet of working edges. When canopies are used as protection from falling objects, canopies shall be strong enough to prevent collapse and to prevent penetration by any objects that may fall onto them.

When toeboards are used as protection from falling objects, they shall be erected along the edges of the overhead walking or working surface for a distance sufficient to protect persons working below. Toeboards will be capable of withstanding a force of at least 50 pounds of force applied in any downward or outward direction at any point along the toeboard. Toeboards will be a minimum of four (4) inches tall from their top edge to the level of the walking/working surface, have no more than one (1) inch clearance between its bottom and the surface.

Ladders

If work is performed outside the rails of a ladder equal to, or exceeding 6' ; or if three-point contact on the ladder cannot be maintained, a Personal Fall Arrest Systems shall be used if anchorage points are available. If anchorage points are not available or other traditional fall control systems are not feasible, a non-conventional system can be used.

Leading Edge Work

Workers near a leading edge 6 feet or more above lower levels shall be protected by guardrail, safety net, restraint/positioning, or personal fall arrest systems.

Roofs (work from or on)

Low-sloped (<4:12 pitch)

Workers engaged in roof activities on low-slope roofs with unprotected sides and edges feet or more above lower levels will be protected from falling by guardrail systems, safety net systems, personal fall arrest systems or a combination of a warning line system and guard-rail system, warning line system and safety net system, warning line system and personal fall arrest system, or warning line system and safety monitoring system.

Steep Roofs (>4:12 pitch)

Workers on a steep roof with unprotected sides and edges 6 feet or more above lower levels will be protected by either guardrail systems with toeboards, a safety net system, or a personal fall arrest systems.

Wall Openings

Worker working on, at, above, or near wall openings (including those with chutes attached) shall be protected from falling by the use of either a guardrail system, a safety net system, or a personal fall arrest system.

Equipment Inspection and Maintenance Procedures

Inspection, Replacement and Destruction

All equipment hereafter noted shall be visually inspected before each use, replaced immediately if any of the defective conditions are found, tagged 'out of service' and sent back to the safety coordinator for destruction.

Body Harness Inspection

Beginning at one end, holding the body side of the harness toward you, grasp one area of the harness with your hands six to eight inches apart. Bend the strap in an inverted "U". Follow this procedure the entire length of the belt or harness. Watch for frayed edges, broken fibers, pulled stitches, cuts, burn marks or chemical damage. Special attention should be given to the attachment of buckles and D-rings to strap webbing. Inspect for frayed or broken strands. Broken webbing strands generally appear as tufts on the webbing surface.

Rivets should be tight and unmovable with fingers. Body-side rivet base and outside rivet burr should be flat against the material. Bent rivets will fail under stress. Especially note condition of D-ring rivets and D-ring metal wear pads (if applicable). Discolored, pitted, or cracked rivets indicate chemical corrosion. The tongue or billet of bolts receives heavy wear from repeated buckling and unbuckling. Inspect for loose, distorted, or broken grommets. Harnesses using punched holes without grommets should be checked for torn or elongated holes causing slippage of the tongue buckle.

Hardware (Buckles, D-Rings, Snaps and Thimbles)

Buckle tongues should be free of distortion in shape and motion. They should overlap the buckle frame and move freely back and forth in their socket. Roller should turn freely on frame. Check for distortion or sharp edges.

Inspect the friction buckle for distortion. The outer bars and center bars must be straight. Pay special attention to corners and attachment points of the center bar.

Inspect the sliding bar buckle frame and sliding bar for cracks, distortion, or sharp edges. The sliding bar should move freely. Knurled edge will slip if worn smooth. Pay special attention to corners and ends of sliding bar.

Inspect the forged steel D-ring for cracks or other defects. Inspect the assembly of the D-ring to the body pad or D-saddle. If the D-ring can be moved vertically independent of the body pad or D-saddle, the harness should be replaced. Check D-Rings and D-Ring metal wear pad (if any) for distortion, cracks, breaks, and rough or sharp edges. The D-Ring bar should be at a 90 degree angle with the long axis of the belt and should pivot freely.

Inspect closely for hook and eye distortions, cracks, corrosion, or pitted surfaces. The keeper (latch) should seal into the nose without binding and should not be distorted or obstructed. The keeper spring should exert sufficient force to firmly close the keeper.

The thimble must be unmovable in the eyes of the splice, and the splice should have no loose or cut strands. The edges must be free of sharp edges, distortion, or cracks.

Lanyard (shock-absorbing)

Begin at one end and work to the opposite end. Slowly rotate the lanyard so the entire circumference is checked. Factory spliced ends require particular attention.

Lanyard (Webbing) Retractable

Bend the webbing over a non-lacerating edge, observe each side of the webbed lanyard. This will reveal any cuts or breaks. Swelling, discoloration, cracks, and charring are obvious signs of chemical or heat damage. Closely observe for any breaks in the stitching.

Rope

Rotation of the rope lanyard while inspecting from end to end will bring to light any fuzzy, worn, broken, or cut fibers. Areas weakened by extreme loads will appear as noticeable change in original diameter. The rope diameter should be uniform throughout, following a short break-in period. Strands should be separated and inspected since the rope may wear on the inside if grit or moisture becomes embedded.

Storage/Cleaning

Storage areas shall be maintained as clean, dry and free of exposure to fumes or corrosive elements.

Cleaning methods established by the manufacturer shall be followed for all components. Generally, the following applies for body harnesses:

- Wipe off surface dirt with a sponge dampened in plain water. Squeeze the sponge dry. Dip the sponge in a mild solution of water and commercial soap or detergent. Work up a thick lather with a vigorous back and forth motion
- Wipe the belt dry with a clean cloth. Hang freely to dry but away from excessive heat and UV rays
- Bolts and other equipment should dry thoroughly without close exposure to heat, steam, or long periods of sunlight
- Mildly dirty cotton may be cleaned normally. For heavy dirt or grease, soak belts in a solution of one tablespoon of grease cutter to one gallon of water. DO NOT USE A STRONGER SOLUTION. After soaking, rinse again, then hang to dry
- Fall protection, which is not in the original package, shall be stored in a clean, dry area protected from UV rays

Post-Fall or Near-Miss Incidents

Fall incidents and near-misses shall be thoroughly investigated to determine root causes and facilitate corrective measures to prevent reoccurrences.

Workers involved in a fall equal to, or greater then 6’ shall be required to receive an immediate medical evaluation.

All components of a personal fall arrest system involved in any fall with a fall distance of over six feet shall be immediately and completely replaced. Such equipment shall be tagged ‘out of service’ and sent back to the safety coordinator for destruction.

FIRE PROTECTION

PURPOSE

Fire Prevention/Protection Policy is intended to provide compliance with all related regulations and standard safe work practice. The purpose of the policy is to prevent fires and to provide guidelines for action if a fire does occur. Fire prevention program combines the following policies:

- PPE Policy
- Electrical Safety Policy
- Emergency Action Plan

These policies encompass methods used for incidence avoidance, incident response and specialized training required in the event of a fire. Issues addressed in the above policies include, but are not limited to:

- Evacuation Procedure
- Extinguisher Training
- Basic Process Safety Training (if applicable)
- Hot Work Safety Training (if applicable)
- Confined Space Entry Safety Training (if applicable)
- Emergency Life Support Training
- Respiratory Protective Devices Training (if applicable)
- Assured Grounding Programs

POLICY

Workers shall be informed of the proper actions to take in the event of a fire. This includes, but is not limited to, notification and evacuation procedures. It is STRESSED that at no time does the task of fighting fire supersede an employee's primary duties of:

- Ensuring their own personal safety and the safety of others
- Reporting the incident to the proper authority and ensuring personnel accountability for yourself and all subordinates at the jobsite, in accordance with AMS and client policy

PROCEDURES

- All workers are responsible for good housekeeping practices to enhance fire prevention methods
- Supervisors will be held accountable for the housekeeping of their job sites
- If applicable, welding machine mufflers will be equipped with an approved spark arresting muffler
- Only approved containers will be used during fueling operations. These shall be of the self-closing type
- Combustible and flammable liquids shall be handled and stored in approved containers, cabinets, and areas that are designed for fire prevention. All combustible and flammable materials will be

handled and stored in compliance with applicable regulations and client requirements. The quantity of flammable/combustible material shall be kept to a minimum on the job site

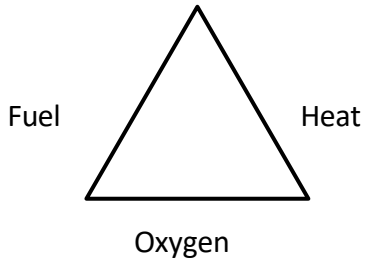
- Welding, cutting, and grinding sparks shall be contained
- Hot work areas shall be kept wetted down, and a fire extinguisher and hose on each jobsite
- Oily rags shall be immediately disposed of in designated hazardous waste containers
- No hot work is to be performed without a Hot Work Permit
- All vehicle entry into process areas requires a permit or permission from the operator
- Use bonding straps to discharge and prevent static charges during transfer of flammable liquids from one container to another
- Report all spills or suspicious odors immediately
- Fire extinguishers are to be kept in areas easily accessible to workers. Only approved fire extinguishers are to be used. They must have an inspection tag attached and be maintained in a fully charged, ready to operate state. Portable fire extinguishers are to be inspected monthly and annually with documentation supporting the inspection and maintenance schedule. Training is provided to all workers who use or may use fire extinguishers. Fire extinguisher training will include general principles of fire and extinguisher use and the hazards involved with incipient stage firefighting.
- **NEVER** put yourself or others at risk while attempting to extinguish an incipient fire
- **DO NOT USE** any fire hoses larger than 1-3/4", unless fully trained as an industrial firefighter
- **NEVER** attempt to extinguish a pressurized fuel fed fire
- **DO NOT** direct a fire nozzle with a straight stream at any type of LPG fire. This action could extinguish the fire, producing an LPG vapor cloud capable of detonation
- **DO NOT USE** fire monitors as the force can damage small equipment and certain high chrome alloy equipment cannot have water applied as cracking could occur
- **DO NOT APPLY** water to any acid or caustic release as it can cause a violent reaction. Additionally, low concentration acids or caustics become extremely corrosive, causing an increasing leak condition.

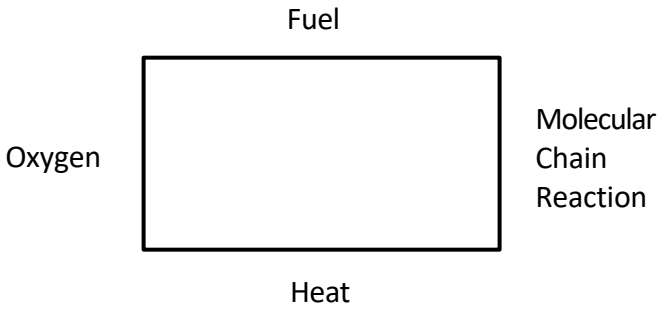
In the Event of a Fire

- Remain calm
- Only extinguish a fire when it is clearly within your abilities and the equipment available
- Know the location of the nearest alarm and how to activate the emergency system
- Know the evacuation routes and collection points
- If the fire cannot be extinguished, leave the area immediately and report to your evacuation area
- Await further instructions from the Incident Commander, or designated responsible personnel

Basic Fire Science

The combination of fuel, heat, oxygen equals the well-known fire triangle. To understand fire better, a fourth factor is added, a molecular chain reaction. This is because fire results from a series of reactions in which complicated molecules "crack" into easily oxidized fragments. Disruption of this chain, along with the removal of fuel, heat, or oxygen, is recognized as a method of fire extinguishment through the use of dry chemical extinguishers.





- **Heat Energy** - Can be produced by building up molecules (composition) or breaking apart (decomposition) by heat or a solution when materials are dissolved in a liquid, or by combustion.
- **Heat Transfer** - A law of physics states that heat tends to flow up from a hot substance or place to a cold substance or place. This is through conduction (transfer of heat through a medium such as metals) or through convection (transfer of heat with a medium-usually circulatory).
- **Fuels** - Those substances that will burn when heat is applied. The most common fuels are not pure elements such as carbon, but compounds and mixtures such as paper and wood.
- **Oxygen** - Makes up a major portion of the oceans and earth's crust and one-fifth of our atmosphere. Atmospheric oxygen is the major source of oxygen that supports combustion. Oxygen itself does not burn, however, without it, combustion is impossible. Normal burning is the combination of fuels with oxygen under the influence of heat.
- **Combustion** - A rapid oxidation or chemical combination accompanied by heat.
- **Oxidation** - The ability of materials to produce oxygen during a chemical reaction.
- **Spontaneous Combustion** - When oxidation is allowed to occur, enough oxygen is available, heat is produced, molecules become more energetic and combine with oxygen at an increasing rate, temperatures rise, and visible heat (flames) are produced.

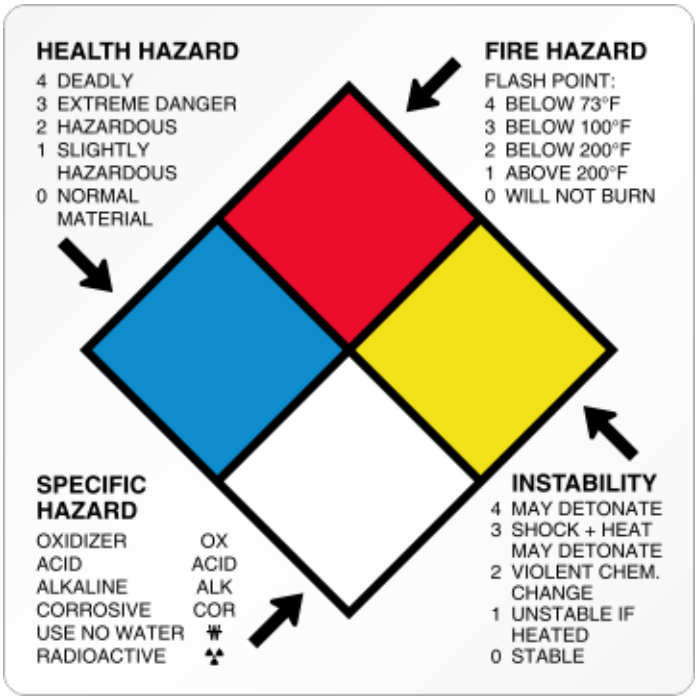
Classes of Fires

- Class A - Ordinary combustibles (wood/paper/textiles)
- Class B - Flammable liquids (gasoline/oils/grease)
- Class C - Live electric (wiring/generators/motors)
- Class D - Combustible metals (finely divided form/chips, turnings)
- Class K – Kitchen (oils/grease)

Types of Fire Extinguishers

- **Water** - extinguisher for ordinary combustible fires
- **Dry Chemical or CO2** - extinguisher for electrical equipment fires and for flammable liquid fires
- **Multipurpose Dry Chemical** - extinguisher for ordinary combustible fires, liquid fires, and electrical equipment fires
- **Foam** - extinguishing agent for hydrocarbon fires

NFPA Diamond:



FIRST AID

PURPOSE

Allen Mechanical Services-AMS, hereafter referred to as “AMS”, is committed to the safety and health of workers and to ensure prompt medical attention for injuries that occurs at work are managed appropriately.

SCOPE

This program applies to all workers, visitors, and contractors under AMS responsibility.

RESPONSIBILITIES

Employer Responsibilities

Ensure every worker receives training that explains first aid procedures.

Determine who must be trained to render first aid with the appropriate practices and techniques, including response to site-specific hazards.

Ensure the first aid response plan, amount of first aid trained personnel, equipment and all other hazard controls reflect workplace hazards as determined in job hazard analyses and worksite inspections.

Ensure first aid kits remain fully stocked and any emergency response equipment is in good condition.

Worker Responsibilities

Follow the first aid program.

If trained in first aid, render care as needed.

PROCEDURES

First Aid Training

First aid and medical facilities will be made available on site. In the absence of medical facilities there shall be a sufficient number (but not less than one) of workers on each shift certified in first aid and CPR to provide adequate first response medical care.

Each designated first aider will receive training and will have a valid certificate in first aid training from an authorized organization.

First Aid Kits

AMS provides a First Aid Kit on the premises. It is there for worker's use in the treatment of minor scratches, burns, headaches, nausea, etc. All workers shall know the location of the First Aid Kit and shall notify their supervisor if they need to use the First Aid Kit. If a worker has a work-related injury or illnesses that requires professional medical assistance, they shall notify their supervisor as soon as possible.

Safety coordinator shall inspect First Aid Kits before the kits are sent out to each job and on a weekly basis to ensure each kit has the required number of supplies.

Medical Treatment

Non-Emergency Medical Treatment

For non-emergency work-related injuries requiring professional medical assistance, management must first authorize treatment. If a worker sustains an injury requiring treatment other than first aid, they shall:

- Inform their supervisor
- Provide details for the completion of the accident investigation report
- Workers shall use the nearest wash facility or eyewash station in the event a worker accidentally spills or splashes injurious chemicals or liquids on their clothing or body

Emergency Medical Treatment

If a worker sustains a severe injury requiring emergency treatment:

- Injured workers should call for help and seek assistance from a co-worker or supervisor immediately.
- A trained first aid provider will render emergency first aid and request assistance for transportation to the local hospital emergency room or other resources as needed.
- Prior to the start of a job, AMS will ensure that arrangements are in place to transport injured workers from the jobsite to the nearest health care facility.
- The phone number of the ambulance service is to be conspicuously posted and provided to all employees for response to an emergency condition.
- If an ambulance is not available, AMS will ensure other transportation is available to accommodate the injured. This transportation will:
    - Be suitable, considering the distance to be travelled and the types of acute illnesses or injuries that may occur at the work site
    - Protect occupants from the weather
    - Have systems that allow the occupants to communicate with the health care facility to which the injured or ill worker is being taken
    - Be able to accommodate a stretcher and an accompanying person if required
- Provide details for the completion of the accident investigation report.

FIT FOR DUTY

PURPOSE

Allen Mechanical Services-AMS, hereafter referred to as “AMS”, is committed to providing a safe working environment and to protecting the health and safety of workers, staff, visitors, and **AMS** property.

DEFINITIONS

Fitness for Duty - physical and mental health status that facilitates the performance of essential job duties in an effective manner and protects the health and safety of oneself, others, and property.
Medical certification - a document from a medically appropriate, licensed provider attesting to a worker's fitness for duty following an extended medical absence. Allowable costs to obtain the certification are paid by Workers Compensation for work-related absences, and by the worker and the worker's health insurance for absences which are not work-related.
Medical evaluation - An examination performed by a designated health professional, including but not limited to a health history, physical and/or psychological examination and any medically indicated diagnostic studies. The cost is paid by the employer.
Reliable report - self-disclosure or third-party opinion about a worker's possible lack of fitness for duty which is assessed as reasonable by the manager/supervisor considering such factors as the relationship of the reporter to the worker, the seriousness of the worker's condition, the possible motivation of the reporter and how the reporter learned the information.
Working hours - beginning with a worker's starting time and ending with the worker's quitting time as well as any time a worker is on call. All work activities are included whether they occur on or outside AMS properties.

RESPONSIBILITIES

Worker responsibilities

Reporting to work, fit for duty.

Notifying the manager/supervisor when not fit for duty.

Notifying the manager/supervisor when observing a co-worker who may not be fit for duty (in cases where the possibly impaired individual is the worker's manager, the worker should make the notification to the next higher-level manager or the Director of Human Resources/Payroll).

Cooperating with a manager/supervisor's directive, and, or referral for a medical evaluation.
Manager/supervisor responsibilities

Observing the attendance, performance, and behavior of workers they supervise.

Interviewing a worker who appears to the manager/supervisor, (or third-party report) unfit for duty and referring a worker for a medical evaluation when appropriate.

Recording the reasons/observations, that triggered a fitness for duty medical evaluation referral.

Utilizing this policy in a fair and consistent manner, respecting the worker's privacy, and the confidentiality of medical information.

PROCEDURES

Return to Work (after an extended medical absence)

- Manager/supervisor receives medical certification from worker prior to their return to work, with suggested accommodations, if applicable.
- Manager/supervisor determines whether worker can perform essential functions of the job with or without accommodation, accepting suggested accommodations or developing alternative accommodations.
- Manager/supervisor provides accommodations if applicable per job description/scope and worker complies with medical direction provided by physician or healthcare professional.

Triggering Event occurs when a manager/supervisor observes or receives a reliable report of a worker's possible lack of fitness for duty. Observations may include, but are not limited to a worker's self-reports, manual dexterity, coordination, alertness, speech, vision acuity, concentration, response to criticism, interactions with co-workers and supervisors, suicidal or threatening statements, change in personal hygiene, presence of condition likely to lead to food borne disease transmission, memory and/or odor of alcohol or marijuana. Management actions include:

- Manager/supervisor interviews workers, when possible.
- Manager/supervisor assesses magnitude of safety risk and are encouraged to contact Human Resources/Payroll for assistance.
- No Risk: keep notes of events.
- Minor Risk: encourage workers to use Worker Assistance Program (see AMS policy) or seek medical treatment; document event.
- Significant Risk: Contact local Police if appropriate, place worker on paid leave of absence (sick leave or paid administrative leave, depending on situation, arrange for worker's safe transportation home if situation warrants. Refer worker to Worker Assistance Program or for medical evaluation, implement discipline, if appropriate.
- Severe risk: Contact local Police, place worker on paid leave of absence, arrange for worker's safe transportation home, and implement appropriate discipline.

Outcomes

Workers voluntarily seeking assistance for physical (including controlled substance, drug, and alcohol abuse/addictions), mental, and/or emotional problems before their work performance or attendance is adversely affected will not have their employment status jeopardized for seeking assistance.

Workers cooperating in a medical evaluation and in compliance with recommendations for medical, psychological and/or chemical dependence treatment may be returned to the job provided appropriate discipline, if warranted, has taken place.

Workers posing a severe risk may be subject to discipline up to and including termination of employment.

Worker Signature _____ Date_____

Printed Name _____

Supervisor/Manager Signature _____

Date _____

HAZARD COMMUNICATION

PURPOSE

The purpose of this plan is to establish a program and procedures for the safe use of hazardous chemical substances pertaining to the service provided by Allen Mechanical Services-AMS; hereafter referred to as "AMS".

The Occupational Safety and Health Administration (OSHA) Hazard Communication Standard (HCS) 29 CFR 1910.1200 (General Industry) and 29 CFR 1926.59 (Construction Industry) call for the development of a hazard communication program when workers may be exposed to any chemical in the workplace under normal conditions of use or in a foreseeable emergency. In 2012, OSHA revised the HCS to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS). As a result, this program has been revised to comply with the requirements of the OSHA HCS 2012. The written hazard communication program will include and address the following criteria to satisfy the minimum requirements of the OSHA HCS 2012:

- List of all hazardous chemicals known to be present in the workplace or individual work area
- Methods used to ensure that all containers, including pipes and holding tanks, are labeled, tagged, or marked properly
- Methods used to obtain and maintain safety data sheets (SDSs)
- Methods used to provide workers with information and training on hazardous chemicals in their work areas
- Methods used to inform workers of the hazards of non-routine work practices
- Methods used to provide the workers of other employers (e.g., consultants, construction contractors and temporary workers) on-site access to SDSs for each hazardous chemical that the other employer's workers may be exposed to while working in the workplace
- Methods used to inform the workers of other employers of precautionary measures that need to be taken to protect themselves during the workplace's normal operating conditions and in foreseeable emergencies
- Methods used to inform the workers of other employers of the labeling system used in the workplace

The hazard communication program will identify the following:

- Key personnel responsible for the program
- Location of chemical inventory list and SDSs
- Workplace labeling system
- Good work practices and procedures to minimize exposures
- How training will be performed
- Procedures to maintain the program and update the required information
- How records will be maintained

RESPONSIBILITIES

The (Safety Coordinator), is responsible for administering the hazard communication program.

This person is also responsible for:

Reviewing the potential hazards and safe use of chemicals

- Maintaining a list of all hazardous chemicals and a master file of SDSs
- Ensuring that all containers are labeled, tagged, or marked properly
- Providing new-hire and annual training for workers
- Maintaining training records
- Monitoring the air concentrations of hazardous chemicals in the work environment
- Properly selecting and caring for personal protective equipment
- Directing the cleanup and disposal operations of the spill control team
- Identifying hazardous chemicals used in nonroutine tasks and assessing their risks
- Informing outside contractors who are performing work on AMS property about potential hazards
- Reviewing the effectiveness of the hazard communication program and making sure that the program satisfies the requirements of all applicable federal, state, or local hazard communication requirements

The purchasing agent or delegate is responsible for:

- Contacting chemical manufacturers and/or distributors to obtain SDSs and secondary labels for hazardous chemicals used or stored in the workplace

The receiving department is responsible for:

- Reviewing incoming hazardous chemicals to verify correct labeling
- Holding hazardous chemicals in the receiving area until receipt of the SDS for the product

Workers are responsible for hazard the following aspects of the communication program:

- Identifying hazards before starting a job
- Reading container labels and SDSs
- Notifying the supervisor of torn, damaged, or illegible labels or of unlabeled containers
- Using controls and/or personal protective equipment provided by AMS to minimize exposure
- Following AMSinstructions and warnings pertaining to chemical handling and usage
- Properly caring for personal protective equipment, including proper use, routine care and cleaning, storage, and replacement
- Knowing and understanding the consequences associated with not following AMS policy concerning the safe handling and use of chemicals
- Participating in training

PROCEDURES

Chemical Inventory List

Attached to this program is a list of hazardous chemicals used, produced and/or stored at AMS.

Copies of the chemical inventory list are available in the file cabinet at site/office.

This list will contain the product identifier that is referenced on the appropriate SDS, the location or work area where the chemical is used, and the personal protective equipment and precautions for each chemical product. This list will be updated annually and whenever a new chemical is introduced to the workplace.

Labels and Other Forms of Warning

Each container of hazardous chemicals received from the chemical manufacturer, importer or distributor will be labeled with the following information:

- Product identifier
- Signal word
- Hazard statement(s)
- Pictogram(s)
- Precautionary statement(s)
- Name, address and telephone number of the chemical manufacturer, importer, or other responsible party

AMS will use the GHS labeling system for secondary containers. When a chemical is transferred from the original container to a portable or secondary container, the container will be labeled, tagged, or marked with a GHS label containing the following information:

- Product identifier
- Signal word
- Hazard statement(s)
- Pictogram(s)
- Precautionary statement(s)

AMS workers will ensure labels are not defaced or removed on containers of hazardous chemicals. Portable containers into which hazardous chemicals are transferred from labeled containers and that are intended for the immediate use of the worker who performs the transfer do not require a label. Food and beverage containers should never be used for chemical storage.

Signs, placards, process sheets, batch tickets, operating procedures or other such written materials may be used in lieu of affixing labels to individual, stationary process containers as long as the alternative method identifies the containers to which it is applicable and conveys the information required for workplace labeling.
Where an area may have a hazardous chemical in the atmosphere (e.g., where extensive welding occurs), the entire area will be labeled with a warning placard.

Pipes that contain hazardous chemicals should be labeled in accordance with ANSI/ASME A13.1 and indicate the direction of flow. (Please note that this not a requirement of the OSHA HCS but a best practice or requirement of local jurisdiction.)

Workplace labels or other forms of warning will be legible, and prominently displayed on the container or readily available in the work area throughout each work shift. If workers speak languages other than English, the information in the other language(s) may be added to the material.

Note: After Dec. 1, 2015, distributors may not ship containers labeled by the chemical manufacturer or importer unless the label on the container meets GHS labeling requirements.

Safety Data Sheets

A SDS will be obtained and maintained for each hazardous chemical in the workplace. SDSs for each hazardous chemical will be readily accessible during each work shift to workers when they are in their work areas.

SDSs will be obtained from the chemical manufacturer, importer, or distributor. The name on the SDS will be the same as that listed on the chemical inventory list. SDSs for chemicals or process streams produced by AMS will be developed and provided by the Safety Coordinator or delegate.

The Safety Coordinator or delegate will maintain the master file of all original SDSs. Hard copies of the master file will be in the file cabinet at office.

SDSs for new products or updated SDSs for existing products will be obtained by the purchasing agent or delegate and forwarded to the safety coordinator. The Safety Coordinator or delegate will then update the master file with new and/or updated SDSs.

If problems arise in obtaining an SDS from the chemical manufacturer, importer or distributor, a phone call will be made to request an SDS and to verify that the SDS has been sent. The phone call will be logged, and a letter will be sent the same day. AMS will maintain a written record of all efforts to obtain SDSs. If these efforts fail to produce an SDS, the local OSHA office will be contacted for assistance.

Worker Information and Training

Workers included in the hazard communication program will receive the following information and training prior to exposure to hazardous chemicals and when new chemical hazards are introduced to their work area:

- Requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200 (General Industry) or 29 CFR 1926.59 (Construction Industry)
- Operations in the work area where hazardous chemicals are present
- Location and availability of the hazard communication program, chemical inventory list and SDSs
- Methods and observations used to detect the presence or release of a hazardous chemical in the work area, such as monitoring devices, visual appearance or odor of hazardous chemicals when being released

- Physical, health, simple asphyxiation, combustible dust, and pyrophoric gas hazards, as well as hazards not otherwise classified of the chemicals in the work area
- Measures workers can take to protect themselves from hazards, such as appropriate controls, work practices, emergency and spill cleanup procedures, and personal protective equipment to
- Explanation of the labels received on shipped containers
- Explanation of the workplace labeling system
- Explanation of the SDS, including order of information and how workers can obtain and use the appropriate hazard information

Note: To facilitate understanding of the new GHS system, the OSHA HCS requires that workers be trained regarding the new label elements and SDS format by Dec. 1, 2013. Employers are required to update the hazard communication program and to provide any additional training for newly identified physical or health hazards no later than June 1, 2016.

Subcontractors

Prior to beginning work, the Safety Coordinator or delegate will inform contractors with workers working on AMS property of any hazardous chemicals that the contractors' workers may be exposed to while performing their work. The Safety Coordinator delegate will also inform contractors of engineering or work practice control measures to be employed by the contractor, personal protective equipment to be worn by the contractors' workers, and any other precautionary measures that need to be taken to protect their workers during the workplace's normal operating conditions and in foreseeable emergencies.

Furthermore, the Safety Coordinator delegate will advise contractors that they must comply with all OSHA standards while working on AMS property. Appropriate controls will be established with the contractor to ensure that AMS workers are not exposed to safety and health hazards from work being performed by the contractor and that AMS operations do not expose contractors' workers to hazards.

The Safety Coordinator or delegate will inform contractors of the workplace labeling system and the availability and location of SDSs for any chemical to which contractors' workers may be exposed while performing their work.

Recordkeeping

Records pertaining to the hazard communication program will be maintained by the Safety Coordinator or delegate. The Safety Coordinator or delegate will keep the following records:

- Chemical inventory list
- Hazardous material reviews
- Copies of phone call logs and letters requesting SDSs
- Worker training records
- Warnings issued to workers for not following the hazard communication program

HAZARD IDENTIFICATION, RISK ASSESSMENT AND CONTROL

PURPOSE

The purpose of this program is Hazard Identification, Risk Assessment Control. The program should be used as a tool to help identify and evaluate both existing and potential hazards on worksites as well as methods to control and eliminate the hazards identified. Allen Mechanical Services-AMS shall hereafter be referred to as "AMS."

RESPONSIBILITIES

Supervisors

The supervisor or competent person shall start the hazard identification process before the job begins by identifying hazards that are known to exist on site and documenting them. By identifying hazards early, the supervisor or competent person may be able to implement controls before any workers arrive on site. Hazards should be identified, classified, and ranked according to a risk matrix or scale.

To ensure the process is thorough, the supervisor or competent person should:

- Look at all aspects of the work
- Include non-routine activities such as maintenance, repair, or cleaning
- Look at accident/incident/near-miss records (including for workers who work "off-site" either at home, on other job sites, drivers, etc.)
- All affected workers be actively involved in the risk identification and assessment process. The program must state at minimum that hazards and risks are reviewed with all affected workers
- Look at the way the work is organized or "done" (include experience and age of people doing the work, systems being used, etc.)
- Look at foreseeable unusual conditions (for example: possible impact on hazard control procedures that may be unavailable in an emergency, power outage, etc.)
- Examine risks to visitors or the public
- Include an assessment of groups that may have a different level of risk such as young or inexperienced workers, etc.
- Look for continuous improvement process for lessons learned to be incorporated into hazard controls such as plan-do-check-act (PDCA) or other similar continuous improvement process

PROCEDURES

General

The hazard identification process is used for routine and non-routine activities as well as new processes, changes in operation, products, or services as applicable. All workers shall be trained on workplace hazards and how to identify, report, and control them. The assessment process must be completed prior to the start of all jobs to identify existing or potential hazards to workers and eliminate or control these hazards using engineering or

administrative controls, proper training, or the use of personal protective equipment (PPE). All AMS workers should be trained on hazard identification and risk assessment.

All workers are required to take a proactive approach to managing and reporting hazards. When they observe a hazard, they are required to take steps to correct that hazard directly (provided they are adequately knowledgeable/trained to safely do so) and eliminate the hazard or get assistance from appropriate workers to do so whenever reasonably possible. Where hazards cannot be eliminated immediately, workers should take necessary steps to warn others of the hazard. Always report hazardous or potentially hazardous conditions and acts to a supervisor or competent person.

Risk Assessment

AMS has a formal process for identifying potential hazards. Processes are in place to identify potential hazards using Job Safety Analysis (JSA), Job Hazard Analysis (JHA) facility wide or area specific analysis/inspections. Information shall be collected, organized, and reviewed with workers to determine which workers may be exposed or potentially exposed. Risk assessments should be done at a minimum, prior to beginning work. A risk assessment must be conducted whenever changes occur to processes, equipment, weather, or facilities.

AMS program provides processes to ensure workers are actively involved in the hazard identification process and hazards are reviewed with all workers concerned.

Information available in the workplace may include, but not be limited to:

- Safety Data Sheets (SDS)
- Inspection reports
- Records of previous injuries and illnesses
- Machinery and Equipment operating manuals

Classification

Hazards are classified and ranked based on severity. The program identifies that hazard are classified/prioritized and addressed based on the risk associated with the task. (See the risk analysis matrix outlining severity and probability). Ranking or prioritizing hazards is one way to help determine which hazard is the most serious and thus which hazard to control first.

Priority is usually established by considering the worker exposure and the potential for accident, injury, or illness. By assigning a priority to the hazards, you are creating a ranking or an action list. Hazards are to be mitigated through a prescribed hierarchy of controls. The hierarchy of controls includes elimination as the preferred control followed by substitution, engineering, administrative, and personal protective equipment (PPE).

All health hazards will be identified by conducting qualitive exposure assessments and reviewing worker medical records. Health hazards include:

- Chemical

- Physical
- Biological
- Ergonomic Risk Factors

The program requires a process for hazard identification such as process hazard analysis, JHA, JSA, daily hazard assessments, pre-task plans, pre-job hazard assessments, or workplace hazard inspections.

The following factors play an important role:

- Percentage of workforce exposed
- Frequency of exposure
- Degree of harm likely to result from the exposure

Probability of Occurrence

There is no single, simple way to determine the level of risk. Ranking hazards requires the knowledge of the workplace activities, urgency of situations, and most importantly, objective judgment. One option is seen in the following examples:

Risk Severity Index:

- Level 1 Fatality OR Property Damage Exceeding $50,000
- Level 2 Employee admitted to hospital or permanently disabled OR property damage between $10,000 and $50,000
- Level 3 Employee not able to perform all their regular duties OR property damage between $1,000 and $10,000
- Level 4 Employee able to perform all their regular duties OR property damage less than $1,000

Probability Index of Occurrence Example:

- Likely to occur immediately Could happen any day
- Probable in time Likely to happen if conditions are repeated
- Possible in time Under the right conditions, the incident might be repeated
- Remotely possible Even under similar conditions, it is unlikely the incident will be repeated

For the activity being examined, determine the most likely reasonable level of severity (levels 1 through 4 in the above example). Then determine how likely (the probability) the injury would be (letters A-D). For example, being hit by a low-speed car is most often a level 2 injury but is barely possible for someone who works a kitchen job (level D). However, put that same worker wearing all black on a roadside at night replacing roadside light bulbs and the probability increases to level A and the severity to 1 (fatality reasonably likely).

Risk Definitions

Risk is the chance or probability that a worker will be harmed or experience an adverse health effect if exposed to a hazard. It may also apply to situations with property or equipment loss.

- 4 - Low Activities in this category contain minimal risk and are unlikely to occur. Organizations can proceed with these activities as planned.
- 3 - Medium Activities in this category contain minor to serious risks that are remotely likely to likely to occur.
- Application of proactive risk management strategies to reduce the risk is advised. Organizations should consider ways to modify or eliminate unacceptable risks.
- 2 - High Activities in this category contain unacceptable levels of risk, including catastrophic and critical injuries that are highly likely to occur. Organizations should consider whether they should eliminate or modify activities that still have a “high” rating after applying all reasonable risk management strategies.
- 1 - Extreme Activities in this category should not be allowed to proceed without very careful planning. AMS needs to evaluate whether the activity is necessary in the first place.

Once the risk has been assessed, the appropriate controls shall be put into place. The following describes how identified hazards/risks are addressed and mitigated.

The main ways to control a hazard include:

- Elimination (including substitution): Remove the hazard from the workplace.
- Engineering Controls: includes designs or modifications to plants, equipment, ventilation systems, and processes that reduce the source of exposure.
- Administrative Controls: controls that alter the way the work is done, including timing of work, policies and other rules, and work practices such as standards and operating procedures (including training, housekeeping, and equipment maintenance, and personal hygiene practices).
- PPE: equipment worn by individuals to reduce exposure such as contact with chemicals or exposure to noise.
- Develop Safe Practices/ Engineering Controls to Mitigate Risk.

These methods are also known as the "hierarchy of control" because they should be considered in the order presented (it is always best to try to eliminate the hazard first, etc.).

Controls are placed:

- At the source (where the hazard "comes from")
- Along the path (where the hazard "travels")
- At the worker

Control at the source and control along the path are also known as engineering controls.

AMS shall make sure investigations go into all workplace incidents (such as injuries, illnesses, near misses, and stop work) to identify the root cause to prevent future occurrences. Administrative controls limit workers' exposure by implementing other "rules," such as training, supervision, shorter shifts in high-risk areas, etc. These control measures have many limitations because the hazard itself is not actually removed or reduced. Administrative controls are not generally favored because they can be difficult to implement and maintain and

are not a reliable way to reduce exposure.

PPE includes items such as respirators; protective clothing such as gloves, face shields, eye protection; and footwear that serves to provide a barrier between the wearer and the chemical or material. It is the final item on the list for a very good reason.

PPE should never be the only method used to reduce exposure except under very specific circumstances because PPE may "fail" (stop protecting the worker) with little or no warning.

For example: "Breakthrough" can occur with gloves, clothing, and respirator cartridges.

Once it has been decided what the best and most practical control for a particular hazard is, this needs to be documented. The safe work procedure for the job needs to be written based on those risks and controls. Using the example from earlier with the car striking a worker, the kitchen work procedure for garbage removal should include something about having the dumpster near the back door to the kitchen and not across the parking lot.

It could also include instruction to the worker to ensure that they report any burnt-out exterior lights. Some may add requirements to put on a reflective vest when taking out the garbage at night. The groundskeeper changing light bulbs needs to have a safe work procedure that includes only working during the day in high visibility clothing and with proper traffic control barriers. Parking a service vehicle in the road ahead of the worker to act as a substantial physical barrier would further reduce the risk.

Communicate the Controls and Train the Workers

All workers will be trained in the hazard identification process, including the use and care of proper PPE.

Once the control has been put into place, AMS shall train workers how to use it. This applies whether it is an engineering control such as a guard or interlock, an administrative control such as a safe work procedure for cold weather, or particular PPE when handling a chemical. Training records are required to show that the workers have been made aware of the hazards and the controls.

Simultaneous Operations (SIMOPS)

This procedure outlines the processes and general plan for conducting SIMOPS to provide for the safety of workers and protection of the environment and equipment. SIMOPs are situations in processes where two or more operations or activities occur at the same time and place. They may interfere or clash with each other and may involve risks that are not identified when each activity is considered by itself. Thus, they can increase the risks of the activities or create new risks.

Work Activities Covered by the SIMOPS Procedure

Any works significant in nature such as large construction jobs, change-out of major rotating equipment, naked flame and hot works in restricted areas, blasting and painting works, radiography, entry into confined space, rigging and lifting works over live equipment or plant, etc. and which occur in the areas under commissioning control. Any works that pose a significant hazard such as working in areas where there is a risk of hydrogen

sulfide gas (H2S), activities where special chemicals are utilized, work in which multiple workers are involved. This work listed is not inclusive and other work activities may also be covered under the SIMOPS Procedure.

SIMOPS often involve work in the same area by companies or multi-disciplinary workers whose work may overlap and/or interact. SIMOPS shall be coordinated through joint planning efforts by the separate operations, such as development, construction, and operations managers/supervisors/engineers who plan and direct activities.

Prior to commencing SIMOPS, there will be a survey of the existing site. The site safety inspection form will contain the site name, signature of the person performing the inspection, and date of inspection. Specific operations must be reviewed on a case-by-case basis with a risk assessment. Activity or works in any given area, where joint activities may be ongoing simultaneously, shall be reviewed and analyzed for potential interference or limitation. AMS shall:

- Establish a mechanism for the review of proposed activities (meetings, toolbox talks, etc.) to identify department and subcontractor participation
- Establish a matrix of responsible workers who shall authorize such simultaneous activities
- Ensure simultaneous activities are controlled and performed in a safe manner by defining the responsibilities of all workers involved in the tasks
- Appointing a Simultaneous Operations Leader (SOL) to coordinate the activities between the different organizations
- Identifying any preventive safety measures, which shall be implemented prior to commencement of the simultaneous activities
- Limit the number of simultaneous activities in any given area
- Establishing communication channels
- Provide training of all workers involved in the tasks

AMS shall restrict workers access to areas where simultaneous activities may be taking place. AMS shall have specific instructions for securing operations and assembling workers in an emergency. All workers involved in the simultaneous tasks must be aware of the specifics of simultaneous operations and emergency procedures.

Communication

Communication shall be established among all workers involved in SIMOPS. A communications system, such as intercom, or radios, shall be set up to facilitate communication. The supervisor or competent person shall communicate with responsible workers from the various operations to discuss the expected activities at the commencement of work, at the beginning of each shift, and at other times during the operation, as conditions require, and to resolve any conflicts due to SIMOPS. The supervisor or competent person shall inform all involved parties of any special problems that might be encountered and the appropriate actions to take if such problems should occur.

Review

Repeat the Hazard Assessment process when site conditions change, when new tasks are added, or when new workers join the crew order to prevent the development of unsafe working condition.

HEARING CONSERVATION

PURPOSE

Allen Mechanical Services-AMS, hereafter referred to as "AMS", has established a Hearing Conservation Program to protect worker(s) from the hazards of noise on the job. AMS requires that each employer implement a hearing conservation program when workers are exposed to noise levels exceeding 85 dB. It is not hard to exceed this level of noise on many of the job's sites. Typically, noise levels exceeding 85 dB are experienced when working with any type of pneumatic chipper or hammer, metal saw, grinders, and heavy machinery. See attachment I for list of some common noise levels.

RESPONSIBILITIES

The Safety Coordinator or delegate is responsible for developing a written Hearing Conservation Procedure and overseeing the training of all workers in AMS. The Safety Coordinator or delegate is responsible for the monitoring and administering this procedure.

SCOPE

The OSHA Standard on Occupational Noise Exposure, 29 CFR 1910.95, established the permissible limit of noise as 85 dB(A) (decibels), expressed as an eight-hour (8-hours), time-weighted average, (TWA). This standard allows short-term unprotected noise exposure up to a maximum of 115dB (A), peak sound.

The noise standard requires the identification by personnel monitoring of workers who may be exposed above the 85 dB (A), 8-hour, TWA. Hearing protection is also required for specific activities or using certain types of equipment.

PROCEDURES

AMS has taken a conservative approach to noise hazards by establishing this program. The following elements establish the program:

- A Worker Education and Training Program
- Monitoring and Analysis of Workplace Noise Levels
- Providing Suitable Engineering Controls
- Providing Hearing Protectors
- Maintain required Records

Worker Education and Training

AMS workers must be trained in the use of personal hearing protection equipment and have access to information and training materials. Each worker must know how to clean and maintain the hearing protection equipment. The training will cover the following:

- Training will be for all workers who are exposed to noise at or above the 8-hour TWA of 85 dB
- The training will be repeated annually for each worker included in the hearing conservation program
- The effects of noise on hearing
- The purpose of hearing protectors, the advantages, disadvantages, and the attenuation of various types and instruction on selection, fitting, use and care
- The purpose of audiometric testing, and an explanation of the test procedures
- Access to information and training materials

Monitoring and Analysis of Workplace Noise Levels

AMS will periodically or as necessary, conduct noise level surveys of the workplace. The results of these surveys will be made available to workers.

Any job area or AMS location found to be in excess of the allowable designated noise levels that cannot be brought into compliance with the noise standard will be designated as an area where hearing protectors are to be worn. When signs are posted workers must wear hearing protection. The signs may read as follows:

NOTICE
EAR PROTECTION
REQUIRED
IN THIS AREA

REMEMBER: A client may determine if a unit or work area is classified as a high noise area. After the decision is made, AMS workers will be instructed to wear the appropriate hearing protection.

Provide Suitable Engineering Controls

Where appropriate, AMS will provide engineering controls to reduce noise exposure. Due to the complexity of most job sites, it is difficult, if possible, to institute effective engineering controls for most noise exposures. Should this be the case, then workers will be required to wear suitable hearing protection.

Provide Hearing Protectors Where Required

AMS will provide the required workers with hearing protectors if their 8-hour TWA is above the 85dB (A). AMS will also make hearing protectors available to all workers exposed to a TWA above 85dB (A) at no cost to the worker. Any worker who may have a significant threshold shift of hearing level will be required to wear hearing protection if they are exposed to noise TWA of 85dB. AMS will ensure all Hearing protectors meet the requirements in CSA Standard Z94.2-02, Hearing Protection Devices – Performance, Selection, Care and Use. AMS will make a concerted effort to find the right protector for each worker, one that offers the right attenuation, is accepted in terms of comfort, and is used by the worker.

Responsibilities

The Client Will:

- Determine all sources of noise at or above 85dD
- Determine if personnel have 8-hour TWA exposures at or above fifty percent (50%) of the OSHA allowable
- Review noise exposures annually for all job classifications with TWA
- Exposure at or above fifty percent (50%)
- Ensure that audiograms are made annually for personnel whose TWA exposures are at or above fifty percent (50%) of the OSHA allowable

Job Site Supervisor Will:

- Require hearing protection in all areas with noise levels at or above the 85dB(A) and for all task which generate such noise level (i.e., grinding, hammering). Ear plug shall be required in an area and/or on tasks with the sound levels exceeding 105dB
- Alert workers to possible hazardous noise exposures, Signs shall be posted in work areas in which the sound levels may exceed 85dB. These signs will be posted by the client
- Evaluate the need for engineering and/or administrative controls to reduce the noise levels below the 85 dB and, where feasible, develop a plan to reduce all personnel exposures to less than fifty-percent (50%) of the OSHA allowable
- Make hearing protection available and enforce its use by all workers with TWA exposures at or above the fifty percent (50%) of the OSHA allowable and/or by those who must enter or work in areas where the noise level is 85dB or above

REMEMBER - The client determines if a unit or work area is classified as a high noise area. After the determination is made, AMS's workers will be instructed to wear the appropriate hearing protection.

Recordkeeping

All record-keeping for this program will be maintained in the office. Records will include:

- Audiometric tests
- Noise surveys
- Worker training
- Engineering controls implemented
- Record of purchase of hearing protector

Work required Hearing Protectors

There are many jobs or types of work that generally produces noise level that intermittently or for short durations exceed the permissible TWA. It is the policy of AMS to require all workers who are engaged in these jobs to wear hearing protectors.

Hearing Protectors

Workers may choose the type of hearing protection that best suits their assignment and personal preference among those listed below. Each worker required to wear hearing protection is responsible for carrying hearing protection on their person. Hearing protection is furnished at no cost to workers.

EAR PLUGS – Most ear plugs, when worn properly, have a noise reduction rating (NRR) on the package. Most ear plugs have NRR of about 30.

EARMUFFS – Adjustable muffs can be worn in three positions:

1. Over the head 24 (this depends on the NRR of the Earmuff)
2. Under the chin 20
3. Behind the head 20

Computing the Hearing Protection Level

To compute the actual hearing protection level under the protector, subtract 7 dB(A) from the Noise Reduction Rating (NRR), then divide the number by 2, and subtract the remainder form the measured noise level dB (A).

For example:

- NRR of 29 -7 = 22 dB(A) 22 dB(A) ÷ 2 = 11 dB(A)
- Noise level of 95 dB(A) – 11 = 84 dB(A)
- Therefore, this device offers a protection level of 11 dB(A)

ATTACHMENT I

The following list represents some work activities and equipment which will require the use of hearing protection:

ACTIVITIES AND/OR EQUIPMENT TYPICALLY RESULTING IN HIGH NOISE LEVEL	**ESTIMATED AVERAGE NOISE LEVEL dB(A)**
1. Air Arc Gouging	115
2. Air compressor	95
3. Chain saw	107
4. Electric Disc Grinder	100
5. Forklift inside a trailer	98
6. Heavy equipment working	100
7. Impact tools	108
8. Pneumatic chipping hammer	110
9. Abrasive blasting	100
10. Welding machines	95

INCIDENT INVESTIGATION POLICY

PURPOSE

The purpose of the Incident Investigation Policy is to make certain that incidents are investigated according to the injury, or injury potential of an event, in accordance with Allen Mechanical Services-AMS, hereafter referred to as "AMS". This will help to control further losses of human and material resources by identifying and correcting unsafe acts and conditions that lead to an incident. This policy applies to all work-related incidents and near misses that affect AMS employees and others who are performing work for AMS.

POLICY

All safety incidents, including work-related injuries, accidents, near misses, and property damage will be reported and investigated to determine root causes, and recommendations will be developed, communicated, and implemented to prevent recurrence of the incident. This policy applies to all workers, contractors, and associates on AMS locations. All entities working with AMS are required to report all incident types to management, supervisors, and/or safety representatives. If the incident requires medical attention, it should be reported as soon as the medical situation has been brought under control.

RESPONSIBILITIES

Management

- Management will participate in the investigation of all incidents to the appropriate level with regards to incident severity.
- Management will review all accidents/injuries of subordinates and implement corrective action and safety modification and/or employee training as recommended by the incident investigation.
- Will ensure proper case management, accident/incident processes, investigation methods, and reporting are carried out according to AMS guidelines.

Supervisor

- The supervisor shall conduct the investigation of the incident in a manner that is timely and appropriate to the circumstances and severity of the incident.
- The supervisor must immediately report accidents and near misses to management and perform an initial investigation, and timely submit an Incident Report within 24 hours of the incident.
- The supervisor must advise new and returning workers of the requirement to report all incidents including near misses. An annual reminder to all employees to report incidents is recommended.

Worker

- Workers are responsible for immediately informing supervisors of accidents, near miss events, unsafe conditions, unsafe equipment, and known unsafe practices.
- Workers are responsible for reporting any incident or near miss immediately.
- Workers shall participate in the incident investigation unless they are unable to do so as a result of injury.
- Workers may choose to report a near miss using AMS's form Incident Near Miss Reporting, or verbally to their supervisor, who will be responsible for completing the document

Safety Representative

- Responsible for assisting in the investigation of an incident and ensuring the case is managed appropriately working with supervisors and other responsible managers.
- Utilizing information collected during investigation of incidents and near misses to help improve and maintain safety overall.
- Monitor corrective actions as appropriate to remedy an unsafe working condition, facility, equipment, location, or practice.

PROCEDURES

Training

All personnel will be trained in their roles and responsibilities for incident response, reporting, and investigating techniques before performing any work. It is the responsibility of the supervisor to ensure all affected workers are properly trained in accident/incident investigation processes and AMS reporting criteria.

Incident Investigating Procedures

All safety incidents are to be investigated in a timely manner (no more than 24 hours) to determine the root cause(s) and contributing factors involved. The extent of the investigation depends on a number of factors including the severity or potential severity of the incidents. All evidence such as people, positions of equipment, parts, and papers must be preserved, secured, and collected through notes, photographs, witness statements, flagging, and impoundment of documents and equipment.

Respond to the Incident Scene Immediately: If the incident results in an employee injury or illness, make sure that the affected employee receives immediate medical attention. Take actions necessary to prevent or minimize the risk of additional injury or illness in the area.

Secure the Incident Scene: The scene of the event should be left intact to the greatest extent possible, with nothing moved or disturbed until the investigation is complete. Use barricades, signs, or other means to isolate the site, warn of hazards, and otherwise restrict access.

Preserve Evidence: Before and during the investigation, make a prompt and careful effort to preserve the evidence that is necessary to answer the key questions about the incident (who, where, what, when how and why). Observe and record perishable or environmental evidence (such as instrument readings, control panel settings, and weather conditions). Use photographs, sketches, and diagrams to record evidence or conditions. Make detailed notes about any photographs, sketches, or diagrams made.

Identify Witnesses: When arriving at the scene, identify the individuals who were either involved in the event or saw it happen. Ask them to identify others who were also in the area and make a list of these names. Separate witnesses. Have each complete a witness statement and sign.

Interview Witnesses: Interview witnesses individually and as soon as possible after the event. Interview the people directly involved first (if Possible), then eyewitnesses and observers.

Complete Investigation Report to include:

- Activity in progress at the time of the event
- Sequence of events leading to the event
- Emergency response to the event
- Medical treatment provided by first responders to the injured/ill employee
- Direct contributing factors
- Corrective actions taken or planned (including estimated completion dates)
- Name(s) of individual(s) responsible for corrective actions

Corrective Actions

Management's initial findings and any immediate corrective actions must be documented and sent to AMS's representative or designee within 24 hours of notifications of the incident. Near miss reports are sent to AMS's representative or designee within 48 hours. AMS's representative or designee will review each incident to ensure the investigation was thorough and all immediate corrective actions are completed, and longer-term follow-up actions are clearly defined with adequate schedule and resources for completion.

Reporting Requirements

Time elements of when incident should be reported

AMS will verbally report fatality and catastrophic incidents to OSHA within 8 hours of discovery. For any in-patient hospitalization, amputation, or eye loss AMS must report the incident within 24 hours of discovery to OSHA. OSHA requires reporting of work-related incidents resulting in death of an employee or the hospitalization of one or more workers within 8 hours.

Involving the Environment

If an environmental incident occurs that must be reported to local, state, and/or federal agencies, the following persons should be notified: LIST TO BE COMPILED.

Investigation Checklist and Plan		
Potential Witnesses (list on separate sheet):	**Identified**	**Interviewed**
Workers involved in the incident		
Workers close to the incident		
Workers involved with events prior to the incident		
Workers involved with events after the incident		
Workers of other contractors		
Client Workers		

Documents:	Relevant	Obtained		Relevant	Obtained
Job Hazard Analysis			Personnel File		
Tailgate/Toolbox Talks			Safety Log		
Other Safety Meetings			Contract(s)		
Audits			Medical Reports		
Inspections			Doctor's First Report		
Work Order/Job Order			Training Records		
Permit			Other		
Time Sheets					

Other Evidence:					
Tools			Photographs		
Equipment			Drawings		
PPE/Clothing			Blueprints		

Incident Report

Attention: This form contains information relating to worker health and must be used in a manner that protects the confidentiality of workers to the extent possible while the information is being used for occupational safety and health purposes.

Worker	Male / Female
Phone #	Date hired
Street Address	Date of incident
City	Time of incident
State / Zip	Time worker began work
Date of birth	Supervisor
Site/Location (facility name) and Unit or Project:	

Name of physician or other health care professional:	
If treatment was given away from the worksite, where was it given?	
Was emp. treated in an emergency room?	Yes or No
Was emp. hospitalized overnight as an in-patient?	Yes or No

First Aid		Medical Non-Disabling		Equipment Damage	
Near Miss		Restricted Work Case		Fire or Release	
Motor Vehicle Accident		Lost Time Case		Non-Occupational	

LOSS Apparent nature and extent of injury, damage, or potential loss?		
INCIDENT Description of the incident (who, what, how, when, why, and what was the worker doing just before the incident occurred)?		
PREVENTION Immediate action and future action to prevent recurrence?		
Prepared By:	Title:	Date:
Report Routed To?		

LADDER SAFETY

PURPOSE

The Ladder Safety Policy is intended to provide workers with safe guidelines for the use of portable ladders, while complying with applicable regulatory compliance standards.

POLICY

Under no circumstances are portable ladders to be used unless conditions are considered safe, secure and in compliance with AMS procedures and safe work practices.

PROCEDURES

The use of ladders with broken or missing rungs or steps, broken or split side rails, or other faulty or defective construction is prohibited. All rungs, cleats, and steps will be parallel, level and uniformly spaced when the ladder is being used. All ladders will be inspected prior to use by a competent person. When ladders with such defects are discovered, they must be immediately removed from service and tagged as such. Inspections will be documented and kept on file along with any service or maintenance records.

Employees will face the ladder and will not carry material or tools in their hands while ascending or descending.

Ladders will not be loaded beyond the maximum intended load for which they were built or beyond the manufacturer's rated capacity.

All ladders shall be placed on secure footing, and the area around the top and bottom will be kept clear of work materials, tools, and debris.

Planks will not be used on the top step of stepladders.

Portable ladders will be placed and used at a pitch that places the horizontal distance, from the top support to the foot of the ladder, at about one-quarter of the working length of the ladder. Ladders will not be used in a horizontal position as a platform, runway, or scaffold.

Ladders shall not be placed in front of doors, unless the door is blocked open, and/or a barricade or guard is provided.

Ladders shall not be placed on scaffold, boxes, boards, barrels, or other unstable bases.

Ladders shall not be spliced together.

Employees will not stand on the top cap or the step below the top cap of a stepladder.

Any ladder splashed with caustic or acid shall not be used until thoroughly cleaned and inspected for possible corrosive damage.

There shall be ample clearance and clear access at the top and bottom of portable ladders. Portable rung ladders shall only be used with metal supports on the underside.

No ladder shall be used to gain access to a roof unless it extends at least 3 feet above the point of highest support with the building. Side rails must extend not less than 36” above any landing. When this is not practical, grab rails will be provided to facilitate employee movement to and from the point of access.

Portable metal ladders will not be used for electrical work or where they may contact electrical conductors.

All ladders shall be equipped with non-slip bases when a hazard of slipping exists.

All ladders will be tied off on top, blocked or otherwise secured to prevent movement before work is performed on them.

All ladders must have a minimum width of 12 inches. All ladders must have a distance of 12" between rungs.

AMS prefers not to use or issue chain ladders, however if a client provides or mandates chain ladder usage, a thorough pre-use inspection of the ladder(s) must be performed. When there is a need for this type of ladder, wire rope ladders are preferred.

Stepladders shall not exceed 20 feet in length.

Extension ladders shall be equipped with positive stops.

Ladders shall be maintained in good condition.

Only one employee is to work on or climb a ladder at the same time.

All work done from a ladder shall be within an individual’s normal reach and with no overextending allowed.

All work done from a ladder that exposes a worker to a fall potential of 6 feet or more requires the worker to wear a harness and be tied off per the Fall Protection Policy. Employees are not permitted to stand or work off the top three rungs or cleats of a ladder unless there are members of the structure that provide a firm handhold, or the employee is protected by personal fall protection.

LOCKOUT TAGOUT

PURPOSE

To establish safe practices associated with equipment or processes that involve hazardous energy sources.

POLICY

Work activities associated with energized equipment or processes shall be controlled prior to initiating by verifying a rendered safe status. This policy covers minimum performance standards applicable to all Allen Mechanical Services-AMS, hereafter referred to as "AMS", workers and locations. Local practices requiring more detailed or stringent rules, or local, state, or other federal requirements regarding this subject can and should be added as an addendum to this procedure as applicable.

SCOPE

Applies to all AMS work sites, i.e., AMS offices, client job sites, etc., that perform activities such as, but not limited to, erecting, installing, constructing, repairing, adjusting, inspecting, cleaning, operating, or maintaining equipment/machines/processes whereby hazardous energy sources are involved such as accessing tanks, air handlers, etc.
Note special exception to policy: equipment/machines that have an electrical plug as the sole hazardous energy source and can reach a zero-energy state by simply being unplugged are exempt from this policy, as long as control of the plug can be maintained at all times.

DEFINITIONS

Affected Worker any worker of AMS whose job requires them to operate or use a machine or equipment on which servicing, or maintenance is being performed under lockout/tagout, or whose job requires them to work in an area in which such servicing or maintenance is being performed.
Authorized Worker any worker of AMS who locks out or tags out machines or equipment to perform servicing or maintenance on that machine or equipment. An affected employee becomes an authorized employee when their duties include performing servicing or maintenance of the machines or equipment.
Control Mechanism any lock or combination of locks, multi-lock hasps and/or other types of special mechanisms (chains, valve covers, breaker covers, etc.) applied to an energy-isolating device to ensure that it cannot be moved/operated.
Energy Isolating Device a mechanical device that physically prevents the transmission or release of hazardous energy, including, but not limited to the following: a manually operated electrical circuit breaker; a disconnect switch; line valve; slide gate; similar device used to block or isolate energy.
Hazardous Energy Source any type of energy that could injure anyone working on or near the equipment/machine/process if released as a result of work activities. Examples of hazardous energy sources include but are not limited to the following: electrical, steam, hydraulic, pneumatic, chemical, radiation, thermal, mechanical, or gravity.
Lockout the placement of a control mechanism on an energy-isolating device that ensures that the equipment/machine/process being worked on cannot be operated/initiated until the control mechanism is removed.

Other Personnel non-company workers or visitors to any work area where AMS authorized workers are using processes outlined in this Policy.
Operation Device any switch, button, leaver, valve, etc. that is expressly intended for the starting or initiation of the equipment/machine/process.
Zero Energy State (Rendered Safe Status) the equipment/machine/process has been purged of and blocked from hazardous energy sources.

PROCEDURES

Identifying Applicable Equipment/Machines/Processes

The following shall be documented:

- Owned and common/typical equipment/machine/processes where this Policy applies
- Owned and known/common/typical energy isolating devices for applicable procedures related to the identified equipment/machine/processes
- Applicable lockout mechanisms necessary for applicable energy control procedures related to the identified equipment/machine/processes
- Applicable energy control procedures related to the identified equipment/machine/processes.

This information shall be developed by the Safety Officer or designee, posted on/near machine, and kept on file, used within the training required for Authorized workers, and updated as equipment/machines/processes and lockout mechanisms are introduced.

Training

Each affected worker shall receive training during orientation on the procedures of this policy for the expressed purpose of ensuring awareness of the prohibition of removing control mechanisms and/or operation/initiation of applicable equipment/machines/processes.
Each authorized worker shall receive special training in the recognition of hazardous energy sources, the specific and/or common equipment/machines/ processes within respective work areas, types of necessary control mechanisms, and the procedures of this policy.

Other Re-training

Any affected or authorized worker shall be immediately re-trained if their actions during related work activities violated any portion of this policy.

Energy Control Procedures - Lockout Application (in order of action)

#	STEP	DESCRIPTION

1	Notify Workers	Notify all affected workers that service or maintenance is required on a machine or equipment, and that the machine or equipment must be shut down and locked out to perform the servicing or maintenance.
2	Review Lockout	The authorized worker shall refer to AMS procedure to identify the type and magnitude of the energy that the machine or equipment utilizes, shall understand the hazards of the energy, and shall know the methods to control the energy.
3	Perform Machine Stop	If the machine or equipment is operating, shut it down by the normal stopping procedure (depress the stop button, open switch, close valve, etc.). Reference machine operating procedure for normal shutdown.
4	Isolate Energy	Follow graphical lockout-tagout procedure from top to bottom to de-activate the energy isolating device(s) so that the machine or equipment is isolated from the energy source(s) such as electrical, steam, hydraulic, pneumatic, chemical, radiation, thermal, mechanical, or gravity.
5	Lockout Energy	Lockout and tagout the energy isolating device(s) with an assigned singularly identified lock(s) and tag(s).
6	Dissipate Energy	Stored or residual energy (such as that in capacitors, springs, elevated machine members, rotating flywheels, hydraulic systems, as well as air, gas, steam, or water pressure, etc.) must be dissipated or restrained by methods such as grounding, repositioning, blocking, bleeding down, etc.
7	Attempt Restart (Verify)	Ensure that the equipment is disconnected from the energy sources by first checking that no personnel are exposed, then verify the isolation of the equipment by operating the push button or other normal operating controls or by testing to make certain the equipment will not operate. Caution: Return operating controls to neutral or "off" position after verifying the isolation of the equipment.

Restore to Service

#	STEP	DESCRIPTION
1	Check Machine	Check the machine or equipment and the immediate area around the machine to ensure that nonessential items have been removed and that the machine or equipment components are operationally intact.
2	Check Area	Check the work area to ensure that all workers have been safely positioned or removed from the area.
3	Verify Machine	Verify that the controls are in neutral.

4	Remove Lockout	Remove the locks, tags and lockout devices and re-energize the machine or equipment. In reverse order, follow all the steps from the visual lockout-tagout procedure found on the previous page. Note: The removal of some forms of blocking may require re-energization of the machine before safe removal.
5	Notify Workers	Notify affected workers that the servicing or maintenance is completed, and the machine or equipment is ready for use.

Emergency Lock Removal Procedures

Every effort shall be made to personally contact authorized worker(s) prior to their lock being removed.

- The direct supervisor of an authorized worker is the first person allowed to remove their lock. If the applicable supervisor is not physically capable, only another authorized worker can be provided with the authority, directly by the applicable supervisor only.
- In either event, the direct supervisor of the authorized worker who originally placed the lockout mechanism(s) to be removed, shall inform that worker of the removal BEFORE that worker returns to that work area. This communication shall be documented. Messages (oral, written, or forwarded) are prohibited.

Lockout Control Mechanisms

Locks & Devices

Each authorized worker shall be issued a lock(s) individually keyed and manufactured of a standard size, shape and/or color. Authorized personnel will use locks and tags that are singularly identified to the person and clearly marked.
Each Safety Officer or designee shall require a list of workers and corresponding lock numbers maintained at the work site. Such lists shall be maintained by the Safety Officer or designee.

Multiple Groups of Workers – Contractors/Subcontractors

Authorized workers shall inform the supervision of other workers in a multi-employer work site of all aspects covered by this manual section. Subcontractors for AMS are required to meet or exceed all aspects covered in this section.
The following steps shall be taken to accommodate multiple authorized workers on a single project:

- A multi-lock hasp shall be used when more than one authorized worker is performing work on the equipment/machine/process.
- AMS's supervisor or authorized worker working on the specific project shall be responsible for assuring that other authorized workers working on the project attach their personal identified lockout device prior to work being performed.
- AMS supervisor or authorized worker working on the specific project shall also be responsible for assuring the continuity of the lockout device during shift changes and/or worker changes unless

formally relieved of that responsibility by the Project Manager. At which time, the Project Manager will obtain the responsibility for the integrity of the lockout device.

- When a traditional multi-lock hasp will not provide enough attachment points for authorized workers, another method shall be established (e.g., adding another multi-lock hasp, lockout box, lockout cabinet, etc.) as per the direction of AMS's senior authorized worker working on the specific project.

Other Specialized Equipment

Tags (when necessary) shall be durable, standardized in type and have areas to indicate the worker's name and contact information.

Policy Review and Certification

Annually, this manual section (and applicable addendums and related training programs) shall be reviewed and documented (certified) by the Safety Officer or designee for updating and verifying the use of these procedures. Inspections verifying that these procedures are being followed shall be a component of this review.

PERSONAL PROTECTIVE EQUIPMENT

PURPOSE

The purpose of the Personal Protective Equipment (PPE) Program is to develop and implement the procedures for the identification, use, care, and maintenance of PPE required to be used by workers for the prevention of illness and injury.

All workers are required to follow the minimum procedures outlined in this program. Any deviations from this program must be immediately brought to the attention of the Program Administrator.

SCOPE

This policy applies to the use of PPE pertaining to the service provided by Allen Mechanical Services-AMS; hereafter referred to as "AMS", and related facilities and operations. This program is integrated into our organization's written safety and health program and is a collaborative effort that includes all workers. The Program Administrator is responsible for the program's implementation, management, training, and recordkeeping requirements.

RESPONSIBILITIES

Management

The management of AMS is committed to the safety and health of its workers. Management supports the efforts of the PPE Program Administrator by pledging financial and leadership support for the identification of hazards and implementation of appropriate PPE for those hazards. Management will regularly communicate with workers about this program.

Program Administrator

The Program Administrator reports directly to upper management and is responsible for the hazard assessments, implementation, training, and administration of the PPE program. The Program Administrator will monitor the results of the program to determine additional areas of focus as needed. The Program Administrator will also:

- Conduct workplace hazard assessments to determine the presence of hazards that require the use of PPE (***Appendix A***)
- Select and purchase PPE
- Review, update, and conduct PPE hazard assessments whenever:
  - A job or process changes
  - New equipment is used or added
  - There has been an accident
  - A supervisor or worker requests it
- Maintain records on hazard assessments
- Maintain records on PPE assignments and training

- Provide training, guidance, and assistance to supervisors and workers on the proper use of PPE
- Periodically re-evaluate the suitability of previously selected PPE
- Review, update, and evaluate the overall effectiveness of PPE use, training, policies, and program

Supervisors: Supervisors have the primary responsibility for implementing and enforcing PPE use in their work area, including, but not limited to:

- Providing appropriate PPE and making it available to workers
- Ensuring that workers are trained on the proper use, care, storage, and cleaning of PPE
- Ensuring that PPE training certification and evaluation forms follow AMS recordkeeping and documentation policy
- Ensuring that PPE is properly inspected, used, and maintained in a sanitary and reliable condition.
- Notifying the Program Administrator when new hazards are introduced or when processes are added or changed
- Ensuring that defective or damaged PPE is immediately disposed of and replaced

Workers: The PPE user is responsible for following the requirements of the PPE program, including, but not limited to:

- Properly wearing PPE as required
- Attending required training sessions
- Properly caring for, cleaning, storing, maintaining, and inspecting PPE as required
- Following program policies and rules
- Informing the supervisor of the need to repair or replace PPE

Workers who repeatedly disregard and do not follow PPE procedures and rules will face disciplinary action up to and including termination.

PROCEDURES

General Requirements

Appropriate PPE is required to be worn at all times when workers are exposed to hazards that cannot be eliminated through the use of preferred elimination, substitution, engineering, or administrative controls.

The workplace will be evaluated per company schedule and all previously unidentified hazards will be addressed based on changes to the workforce and workplace operations. Assessments will include, but are not limited to, the following items:

- Torso and abdominal protection
- Eye and face protection
- Head protection
- Foot protection
- Leg protection

- Hand protection
- Hearing protection (Separate written program)
- Respiratory protection (Separate written program)
- Fall protection (Separate written program)

*NOTE: PPE hazard assessment instructions are located in **Appendix A.** Hazard assessment forms are included in **Appendix B.***

PPE appropriate for the identified hazards will be purchased and provided to all workers exposed to those hazards. All PPE will be properly fit to each worker before relying on it as a protective measure.

Workers will be trained on the types of PPE necessary for the workplace hazards and its limitations. Training will also include the proper way to wear, use and maintain the PPE.

Worker-owned equipment is not allowed.

PPE Program Implementation

The following implementation steps will be used for this program:

- Conduct and document PPE assessment for each work task, assignment, or location (see form in **Appendix B**)
- Select appropriate PPE based on hazard assessment
- Communicate PPE selection decisions to workers
- Provide PPE free of charge to all affected workers
- Train each affected worker
- Verify workers understanding of PPE training
- Document training and worker testing results
- Retrain as necessary
- Enforce PPE requirements

Training

Before any worker is allowed to perform work in areas requiring PPE, they must first receive training in the proper use and care of the PPE they will be using. Retraining will be offered to PPE users as identified by the lack of knowledge or the improper use of PPE, after changes in work tasks or at the supervisor's request, or per regulatory requirements. The training will include, at a minimum, the following subjects:

- Requirement that PPE be worn at all times during identified tasks or in areas requiring PPE
- When it is necessary to wear PPE
- What PPE is necessary
- How to properly put on, take off, adjust, and wear PPE
- The limitations of the PPE
- The proper care, maintenance, useful life, and disposal of the PPE

Eye and Face Protection

Each affected worker will:

- Use appropriate eye and face protection equipment when exposed to hazards from flying objects or particles, molten metal, fumes, chemical liquids, gases, vapors, dusts, acids, caustics, and other potentially injurious chemical or physical hazards.
- Use appropriate eye protection equipment with filter lenses that have a shade number appropriate for the work being performed when exposed to an eye hazard from potentially injurious light radiation.
- When wearing prescription lenses while engaged in operations that involve eye hazards, wear eye protection that incorporates the prescription in its design, or wear eye protection that can be worn over the prescription lenses without disturbing the prescription lenses or the protective lenses.

Foot Protection

Each affected worker will wear protective footwear when working in areas where there is danger of objects falling on or rolling across the foot, piercing the sole, and where the feet are exposed to electrical or chemical hazards. Foot protection will comply with appropriate ANSI standards.

Hand and Body Protection

The Program Administrator will select and require workers to use appropriate hand protection when workers' hands are exposed to hazards from cuts, abrasions, punctures, chemical or thermal burns, harmful temperature extremes, vibration, and skin absorption of harmful substances.

Head Protection

Each affected worker will wear appropriate protective head gear (hard hats, bump caps, etc.) when working in areas where there is a potential for injury to the head from falling objects, impact hazards, extreme temperatures, or high UV levels.

Hearing Protection

The Program Administrator will select and require workers to wear appropriate hearing protection in environments where noise levels equal or exceed the OSHA Occupational Noise Exposure Standard (OSHA 29 CFR 1910.95) 8-hour time weighted average (TWA) of 85 Dba. See Hearing Protection Program for details.

Respiratory Protection

Each affected worker will wear respiratory protective equipment (respirators) when working in areas where

respiratory hazards exist. All respirators will be in compliance with the OSHA 29 CFR 1910.134. See Respiratory Protection Program for details.

After training, workers will demonstrate that they understand how to use PPE properly. If they cannot demonstrate a sufficient understanding, they will be retrained. Training of each worker will be documented using the Worker Training Record (**Appendix D**) and kept on file. The PPE Training Quiz (**Appendix E**) will be used to evaluate workers' understanding and will be kept in the worker training records. The record documents that the worker has received and understands the required training on the specific PPE they will be using.

Retraining

The need for retraining will be indicated when:

- A worker's habits, or knowledge indicate a lack of necessary understanding, motivation or skills required to properly use the PPE
- New equipment is installed that requires new or different PPE
- Changes in the workplace make previous training obsolete
- Changes in the types of PPE to be used make previous training obsolete
- Upon supervisor requests

Periodic Program Review

At least annually, the Program Administrator will conduct a program review to assess the progress and success of the program. The review will consider the following:

- Evaluation of all training programs and records
- The need for retraining of managers, supervisors, and workers
- The jobs, processes or areas that have produced a high incidence rate of injuries or illnesses
- The Program's success will be determined and reported to senior management based upon comparison to previous years, using the following criteria:

    - Cost and frequency of workers' compensation cases
    - Worker and supervisor feedback through direct interviews and

questionnaires Annual reviews will be documented with the form shown in

Appendix C.

Outside Contractors

Whenever outside personnel are contracted to work on-site, the Program Administrator or location management will communicate all necessary PPE safety requirements to the contractor before any work commences.

Record Retention

Written records will be kept which include trainee names, the type of training provided and the dates when

training occurred. The Program Administrator will maintain the written hazard assessment and worker training for the duration of employment for all affected workers exposed to the identified hazards. Program Administrator will also retain worker PPE training records for the duration of employment. The Program Administrator will maintain the Hazard Assessment Form for each work site.

Appendix A
PPE Hazard Assessments

Survey

The Program Administrator will conduct a walk-through survey of the workplace per AMS schedule. The survey is to identify sources of hazards to workers. The following hazard categories will be examined in each area and for each person and their tasks:Impact

- Penetration
- Compression
- Chemical/Gasses
- Heat/Cold
- Harmful dust
- Light (Optical) radiation
- Noise
- Falling objects
- Vibration
- Electrical shock

Hazard Sources

During the walk-through survey, the Program Administrator will observe:

- Sources of motion, i.e., machinery or processes where any movement of tools, machine elements or particles could exist, or movement of personnel that could result in collision with stationary objects
- Sources of high temperatures that could result in burns, eye injury, ignition of protective equipment, etc.
- Types of chemical exposures
- Sources of harmful dust
- Sources of light radiation, i.e., welding, brazing, cutting, furnaces, heat treating, high-intensity lights, etc.
- Sources of falling objects or potential for dropping objects
- Sources of sharp objects which might pierce the feet or cut the hands
- Sources of rolling or pinching objects which could crush the feet
- Layout of workplace and location of coworkers
- Any electrical hazards

Injury and accident data will also be reviewed to help identify problem areas.

Results

Following the walk-through survey, the data and information will be organized by work area and job description.

An estimate of the potential for injuries will be made.

Each of the basic hazards will be reviewed and a determination made as to type, level of risk, and severity of potential injury from each of the hazards identified.

The possibility of exposure to multiple hazards simultaneously will be considered.

Strategies for elimination, substitution, engineering, and administrative controls will be identified and implemented for all possible identified hazards.

After applying all appropriate reduction and elimination technique, the remaining hazards will be analyzed and the proper PPE to reduce the hazards will be selected.

PPE will be identified for hazards that are in the process of being reduced or eliminated and/or when hazard-reduction efforts are not 100% effective in eliminating the hazards.

Appendix B
Hazard Assessment

Building: _____ Date: _____ Location: _____ Prepared By: _____ Job Task: _____

Does the job task present an occupational exposure to?

Eye Hazards	Yes	No	Hazard Description	Recommended PPE
Chemicals				
Dust				
Heat				
Cold				
Impact				
Light/Radiation				

Face Hazards	Yes	No	Hazard Description	Recommended PPE
Chemicals				
Impact				
Heat				
Cold				
Light/Radiation				

Head Hazards	Yes	No	Hazard Description	Recommended PPE
Chemicals				
Impact				
Heat				
Cold				
Light/Radiation				
Electrical Shock				

Hand Hazards	Yes	No	Hazard Description	Recommended PPE
Chemicals				
Impact/ Punctures				
Heat				

Cold				
Vibration				
Electrical Shock				
Cuts/Abrasions				

Foot Hazards	Yes	No	Hazard Description	Recommended PPE
Chemicals				
Impact/ Punctures				
Heat				
Cold				
Vibration				
Electrical Shock				
Compression				
Electrostatic Build-up				

Respiratory Hazards	Yes	No	Hazard Description	Recommended PPE
Fumes				
Mists				
Dusts				
Vapors				
Lack of Oxygen				
Particles				
Heat/Cold				

Noise Hazards	Yes	No	Hazard Description	Recommended PPE
Impact Noise >140 dBA				
Continuous Noise >85 dBA				

Appendix C
Evaluation Report

Date of evaluation:	Evaluated by (list all present):
Written program reviewed: Yes No	
Detailed description of the procedures reviewed:	
Describe any procedure modifications:	
Have any new procedures been added?	
A review of the log of occupational injuries and illnesses (OSHA Form 300 or equivalent) and the associated accident reports and injury and illness reports was made: Yes No	
The following injuries resulted from failure to use the correct PPE:	
Any actions needed or taken to ensure PPE use:	
Comments:	

Appendix D
Worker Training Record

The following individuals received training on AMS Personal Protective Equipment Program:

Print Name	Sign Name	PPE

The undersigned conducted training in accordance with this Personal Protective Equipment Program:

Print Instructor's Name	
Instructor's Signature	
Instructor's Title	
Date of Training	

Appendix E
Training Outline

Hazard Identification/PPE Selection

- Familiarize the workers with the potential hazards and the type of protective equipment that is available, and what it can do, i.e., splash protection, impact protection, etc.
- Compare the hazards associated with the environment, i.e., impact velocities, projectile shape of masses, radiation intensities, with the capabilities of the available protective equipment
- Identify the selected protective equipment which is at a level of protection greater than the minimum required to protect the worker from hazards
- Fit the user with the protective device and give instructions on care and use of the PPE
- Ensure that workers are made aware of all warning labels and limitations of their PPE

Fitting the Device

Each worker will be fitted with appropriate PPE. PPE that fits poorly may not afford the necessary protection. Protective devices are generally available in a variety of sizes. Care should be taken to ensure that the right size is selected. Continued wearing of the device is more likely if it fits the wearer comfortably.

Hazard Changes

It is the responsibility of supervisors and workers to inform the Program Administrator if they identify a change in the workplace hazard situation.

Guidelines

Training will cover AMS requirement of PPE usage. Each type of PPE provided will be reviewed as to its purpose and function in the work environment. As required, the following types of PPE must be covered:

- Eye and face protection
- Head protection
- Foot protection
- Hand protection
- Hearing protection
- Respiratory protection

Cleaning and Maintenance

It is important that all PPE be kept clean and properly maintained. Cleaning is particularly important for eye and face protection where dirty or fogged lenses could impair vision. It is also important to ensure that contaminated PPE, which cannot be decontaminated, is disposed of in a manner that protects workers from exposure to hazards.

RECORDS RETENTIONS

PURPOSE

The purpose of this section is to provide workers and their designated representatives a right of access to relevant exposure and medical records to fulfill responsibilities under the Occupational Safety and Health Act (OSHA). Access by workers and their representatives, is necessary to yield both direct and indirect improvements in the detection, treatment, and prevention of occupational disease.

SCOPE

This section applies to all worker exposure and medical records, and analyses thereof, made, or maintained in any manner, including an in-house or contractual basis. Allen Mechanical Services-AMS, hereafter referred to as "AMS" shall assure that the preservation and access requirements of this section are complied with regardless of the manner in which records are made or maintained.

Notification

Upon initial employment workers will be briefed and at least annually thereafter, informed via a bulletin board or community location posting of the following:

- The existence, location, and availability of worker records for exposure to toxic substances or harmful physical agents.
- The person responsible for maintaining and providing access to the records. Contact your Resources Manager or Safety Representative to initiate this request.
- The worker right of access to those records.
- The entire section pertaining to records retention is available for worker review by contacting the Safety Representative, Human Resources, or delegate.

Record Keeping

The Human Resources Manager is responsible for maintaining and providing access to workers' occupational medical records. These records are kept separately from other worker records. All medical records will be retained following local, AMS and jurisdictional requirements.

The medical records of workers who have worked for less than (1) year for the employer need not be retained beyond the term of employment if they are provided to the worker upon the termination of employment.

Medical records are records concerning the health status of a worker which is made or maintained by a physician, nurse or other health care provide or technician.

Medical records consist of:

- Medical and employment questionnaires or histories (including job description and occupational exposures)

- The results of medical examinations (pre-employment, pre-assignment, periodic, or episodic) and laboratory tests (including chest and other X-ray examinations taken for the purposes of establishing a baseline or detecting occupational illness, and all biological monitoring not defined as an "employee exposure record")
- Medical opinions, diagnoses, progress notes, and recommendations
- First aid records
- Descriptions of treatments and prescriptions
- Employee medical complaints

Worker exposure records shall be maintained for the duration of employment and for 30 years thereafter and should include the following:

- Environmental (workplace) monitoring including personal, area, grab, swipe (wipe over a designated area), etc. type samples
- Biological monitoring—level of chemical in the blood, urine, hair, fingernails, etc.
- Safety data sheets or a chemical inventory or any other record which reveals where and when used and the identity (e.g., chemical, common, or trade name) of a toxic substance or harmful physical agent

Upon written request from an approved requestor such as a local or federal jurisdiction AMS will remove all personal identifiers before releasing the medical/exposure records.
Access

Each worker or designated representative has the right to request access to his/her records. AMS shall assure that access is provided in a reasonable time, place, and manner. AMS will provide a copy of the medical records within fifteen (15) working days.

The worker may access his/her records by making a request to the Human Resources Manager or Safety Representative or delegate. AMS will release a worker's medical records only if the worker has given specific, written consent (see Attachment 6-1).

If AMS cannot reasonably provide access to the record within fifteen (15) working days, AMS shall within the fifteen (15) working days apprise the worker or designated representative requesting the record of the reason for the delay and the earliest date when the record can be made available.

- In the case of an original X-ray, the employer may restrict access to on-site examination or make other suitable arrangements for the temporary loan of the X-ray.
- Records or copies will be provided at no cost to the worker.
    - Whenever a record has been previously provided without cost to a worker or designated representative, AMS may charge reasonable, non-discriminatory administrative costs (i.e., search and copying expenses but not including overhead expenses) for a request by the worker or designated representative for additional copies of the record.

- No charge for an initial request for a copy of new information that has been added to a record which was previously provided.
- No charge for an initial request by a recognized or certified collective bargaining agent for a copy of a worker exposure record or an analysis using exposure or medical records.

Transfer of records

Whenever ceasing to do business, AMS shall transfer all records subject to this section to the successor employer. The successor employer shall receive and maintain these records.

Whenever ceasing to do business and there is no successor employer to receive and maintain the records subject to this standard, AMS shall notify affected workers of their rights of access to records at least three (3) months prior to the cessation of business.

References

Code of Federal Regulation, Title 29, Part 1910.1020

Attachment 6-1
Release of Worker Medical Records

Sample Authorization letter for the release of worker medical record information to a designated representative

I, _____, (full name of worker/patient) hereby authorize _____ (individual or organization holding the medical records) to release to _____ (individual or organization authorized to receive the medical information), the following medical information from my personal medical records:

_____

_____

_____

(Describe generally the information desired to be released).

I give my permission for this medical information to be used for the following purpose:

_____

_____

But I do not give permission for any other use or re-disclosure of this information.

(**Note:** Several extra lines are provided below so that you can place additional restrictions on this authorization letter if you want to. You may, however, leave these lines blank. On the other hand, you may want to (1) specify a particular expiration date for this letter (if less than one year); (2) describe medical information to be created in the future that you intend to be covered by this authorization letter; or (3) describe portions of the medical information in your records which you do not intend to be released as a result of this letter.)

_____

_____

_____

_____

_____

_____

_____

_____

Full name of Worker or Legal Representative

_____

Signature of Worker or Legal Representative & Date

_____

RESPIRATORY PROTECTION

PURPOSE

The purpose of this policy is to establish a respiratory protection program for Allen Mechanical Services-AMS, hereafter referred to as “AMS”, that ensures workers are provided with the necessary information, training, and equipment to protect themselves from harmful vapors and oxygen deficient respiratory hazards in the workplace. The program is designed to comply with OSHA, ANSI, and other applicable standards and regulations.

POLICY

It is management’s responsibility to implement this program at no cost to the workers and it is the worker’s responsibility to comply with all aspects of this program. Any voluntary use of respiratory protection equipment by workers shall be governed by the provisions of this program, also at no expense to the workers.

RESPONSIBILITIES

Management

Management has the responsibility of overseeing the implementation of this policy and assigning program administrators for each site location. These administrators must be suitably trained and have the appropriate accountability and responsibility to fully manage the site respiratory program. The program administrator will report, at least annually, on the effectiveness of the program to management, and be authorized to make appropriate changes to the site program. The administrators will be identified by name in the specific site program.

Supervisor

It is the responsibility of the supervisor to ensure that all workers under their control are completely knowledgeable of the respiratory requirements of this program. Supervisors are to ensure that workers have been trained and are medically fit to use respiratory equipment safely. It is the supervisors’ duty to monitor the workers’ diligence in following procedures and take appropriate action when deficiencies are observed.

Workers

It is the responsibility of the worker to be aware of and practice the information presented in the training. Specifically, worker responsibilities are to report equipment malfunctions, seal check their respirator before every use, and to report medical or physical changes that could affect respirator use.

PROCEDURES

Hazard Assessment

Respiratory hazard determination starts at the planning stage of a job. AMS will identify all known hazards as required by the hazard communication standard. Evaluation of the hazards consists of exposure duration, potential for contact, and known or potential concentrations. When the hazard is a federally controlled substance, that hazard shall be assessed and monitored as dictated by that specific standard. A respiratory hazard may not have an established OSHA permissible exposure limit documented; however, all provisions of this program will be enforced to protect the health of the workers.

Acceptable methods for estimating respiratory hazards include:

- Worker exposure monitoring is the most reliable and accurate method to determine exposure.
- Use of objective data – This is the use of data obtained from industry studies, trade associations or from tests conducted by chemical manufacturers. The objective data shall represent the highest contaminant exposures likely to occur under reasonably foreseeable conditions of processing, use or handling. If objective data is used for assessment, the data must be documented as part of the written program.
- Mathematical Approach – The use of physical and chemical properties of air contaminates, combined with information on room dimensions, air exchange rates, contaminant release rates, and other pertinent data including exposure patterns and work practices to estimate maximum exposure levels in the workplace.
- Where worker exposure cannot be identified or reasonably estimated, the atmosphere will be considered immediately dangerous to life and health (IDLH). Also, atmospheres that are oxygen deficient will be treated as IDLH conditions.
- Accidental release or emergency response must be a consideration when estimating hazard exposure.

Hazard Control

Engineering Controls: This should be the first consideration when evaluating hazard exposure.

- Substitution of a less or non-toxic substance to replace a more harmful one. Example: Sandblasting with black grit instead of silica sand.
- Isolation or encapsulation of the process. Example: To spray asbestos insulation with glue paste to lessen exposure levels.
- Ventilation to remove contamination from the work area before exposure. Example: Mechanical dust collection system installed to capture contaminants and reduce buildup.

Administrative Controls:

- Especially effective for repetitive stress and heat stress control, crew rotation could increase productivity in contaminated atmospheres.
- Adjust the length of the work shift. Instead of two 12-hour shifts, it may be more effective to have three 8-hour shifts.
- Change scheduled work to limit the number of workers exposed.
- The scheduling of other work near the exposure area could be limited until exposure is gone.
- Personal protective devices for the control of respiratory hazards are to be used as a last resort, and only when other means of control are not practical or feasible.

Respiratory equipment will be provided for workers use against harmful vapors & oxygen deficient atmospheres. Respiratory protection may be required while implementing engineering controls, or in conjunction with other control methods. Engineering controls may only lessen the exposure but are required to be implemented along with personal protective devices. Respirators shall be provided where applicable and suitable for the purpose intended.

Respirator Selection

Selecting the proper respirator can be very complex and is critical in having an effective respiratory program. The program administrator must solicit information from all available professional resources concerning exposure controls.

Factors that must be considered include:

- The nature of the hazardous operation or process
- The type of respiratory hazard (including physical properties, oxygen deficiency, physiological effects on the body, concentration of toxic material or airborne radioactivity level, established exposure limits for the toxic materials, established permissible airborne concentration for radioactive material, and established immediately dangerous to life or health concentration for toxic material)
- The location of the hazardous area in relation to the nearest area having respirable air
- The period of time for which respiratory protection must be worn
- The activities of workers in the hazardous area
- The physical characteristics and functional capabilities and limitations of the various types of respirators

Respirator-assigned protection factors listed in Attachment I, Table 1 Respirators for use under IDLH conditions:

The required respiratory protection for IDLH conditions caused by the presence of toxic materials, or a reduced percentage of oxygen, is a combination full face piece pressure demand supplied air respirator (SAR) with auxiliary self-contained air supply. For rescue applications, a full-face piece pressure demand SCBA certified by National Institute for Occupational Safety & Health (NIOSH) for a minimum service life of thirty minutes is acceptable.

When respirators are worn under IDLH conditions, at least one standby person shall be present in a safe area. The standby person shall have the proper equipment available to assist the respirator wearer in case of difficulty. Communications (visual, voice, signal line, radio, or other suitable means) shall be maintained between the standby person and the wearer. While working in the IDLH atmosphere, the wearer shall be equipped with safety harness and safety lines to permit removal to a safe area, if necessary. Provisions for rescue other than safety harness and lines may be used if equivalent.

Breathing Air Quality

Workers using supplied breathing air equipment shall be thoroughly trained in its use.

Breathing air is typically supplied from cylinders or via a compressor. Appropriate measures shall be taken to ensure that all compressed breathing air meets at least the requirements for Grade D breathing air described in ANSI/Compressed Gas Association Commodity Specification for Air, G-7.1-1989, to include:

- Oxygen content (v/v) of 19.5-23.5%
- Hydrocarbon (condensed) content of 5 milligrams per cubic meter of air or less
- Carbon monoxide (CO) content of 10 ppm or less
- Carbon dioxide content of 1,000 ppm or less
- Lack of noticeable odor

Suppliers of breathing air cylinders shall provide AMS with a certificate of analysis with each delivery certifying that the breathing air meets the requirements for Grade D breathing air; and that the moisture content in the cylinder does not exceed a dew point of -50 degrees F (-45.6 degrees C) at 1 atmosphere pressure. The certificate shall have the name of the breathing air supplier, the testing technician and date of test.

Breathing air cylinders shall be tested and maintained as prescribed in the Shipping Container Specification Regulations of the Department of Transportation (49 CFR part 173 and part 178).

Breathing Air Compressors - Compressors used to supply breathing air to respirators shall be constructed and situated so as to:

- Prevent entry of contaminated air into the air-supply system
- Minimize moisture content so that the dew point at 1 atmosphere pressure is 10 degrees F (-5.56 degrees C) below the ambient temperature
- If required to ensure delivery of Grade D air to the user, provide suitable in-line air-purifying sorbent beds and filters. All filters, cartridges and canisters shall be labeled, and color coded with the NIOSH approval label and the label shall remain legible. Sorbent beds and filters shall be maintained and replaced or refurbished periodically following the manufacturer's instructions. A tag containing the most recent change date and the signature of the person authorized by the employer to perform the change shall be attached to the equipment
- For compressors that are not oil lubricated, AMS shall ensure that carbon monoxide

levels in the breathing air do not exceed 10 ppm
    - For oil-lubricated compressors, AMS shall use a high-temperature or carbon monoxide alarm, or both, to monitor carbon monoxide levels. If only high-temperature alarms are used, the air supply shall be monitored at intervals sufficient to prevent carbon monoxide in the breathing air from exceeding 10 ppm
- The air shall be routinely tested to ensure that it meets Grade D requirements In addition, a stand-by attendant shall be on watch anytime workers are using breathing air supplied directly by a compressor.

Breathing air couplings shall be incompatible with outlets for non-respirable worksite air or other gas systems. No asphyxiating substance shall be introduced into breathing airlines.

Training

To protect workers from exposure to respiratory hazards using OSHA and ANSI standards as minimum guidelines, all workers who will wear respiratory protection will be trained on this policy. Training will be provided prior to job assignment where respirator equipment is required, and annually thereafter. Additional training is required when there are deficiencies in the worker's knowledge/skills or when there is a change in the workplace or respiratory equipment that renders previous training obsolete. The training will include the following:

- Responsibilities of workers and supervisors
- How, why and for what jobs we use respirators
- Hazard assessment including limitations of respirators
- Hazard control
- Respirator selection
- Medical evaluation
- Respirator fit test
- Maintenance, care, and storage
- Medical surveillance
- Program evaluation

All training shall be conducted in a way that is understandable to the worker and is documented.

- Why use respiratory protection
    - The nature, extent, and effects of respiratory hazards
    - Consequences of improper fit, usage and maintenance on respirator effectiveness
- Limitations and capabilities of the respirator
    - Air purifying respirators that filter either particles, or absorb vapors and gases
    - Air supplying respirators that supply air from an uncontaminated source
    - Limitations of respirators in IDLH atmospheres and for emergency use only
- How respirators are inspected, donned, removed, seal checked and worn
    - What to do if respirators have defects
    - Who to report problems to during use
    - Proper technique for donning and removing the respirator, and how to store it when not in use
    - How to seal check using the positive and/or negative pressure method

- Methods of maintenance and storage
  - Visual inspection of parts for worn or defective items
  - How to keep the issued respirator clean and sanitary
  - Requirement to disinfect and sanitize before reissue to other workers
  - Proper storage in a cool, clean, and dry location, placing them in a clean, sealed plastic bag after drying
- Medical signs and symptoms that may limit or prevent the effective use of respirators
  - An awareness of physical conditions that may indicate warning signs
  - An obligation to report signs and symptoms and the opportunity for medical reevaluation
  - Changes in weight (gain or loss)
  - Physical changes in facial structure
  - Changes in endurance, stability, or general health
  - Medication for illness

Medical Evaluation

All workers whose job classification may require the use of respiratory protection shall be evaluated and certified by a physician or a licensed health care professional (PLHCP) as being "medically fit" to wear a respirator. For new hires, the medical evaluation shall be made before any use of respiratory equipment. Thereafter, the evaluation shall occur at a minimum annually. The medical evaluation consists of, at a minimum, the administration of a health questionnaire meeting federal guidelines or provisions for a physical examination by a PLHCP that elicits the same information as the questionnaire. The PLHCP shall be provided with supplemental information by the employer on the description of the job classification, possible work conditions and any additional personal protective equipment. that may be required of the worker while using respiratory equipment. Also, a copy of this program will be given to the PLHCP for reference along with the OSHA standard.

The administration of the health questionnaire will be done during work hours and at no cost to the worker. The information on the questionnaire shall remain confidential between the PLHCP and the worker. The worker must have access to the PLHCP for discussion and asking questions concerning their medical evaluation. AMS will only receive a recommendation of the worker's ability to wear respiratory equipment.

If a worker is restricted by the PLHCP from wearing a negative pressure respirator, but otherwise physically able to perform duties with a powered air respirator, then reasonable accommodations will be made by the program administrator not to have this restriction limit the worker's ability to perform his job.

Respirator Fit Test

Respirator fit testing is required of all workers prior to using a positive or negative tight-fitting respirator. The fit test will be specific for respirator manufacturer, model, and size. This test is to be repeated annually, or if there is a change in the respiratory equipment. Some substance specific standards may call for more frequent testing and dictate a specific protocol, which would take precedence over this program. A change in the worker's physical appearance can affect the seal of a respirator and may require re-testing. If the respirator is unacceptable to the worker due to comfort, irritation, or inability to get a seal, the worker will be offered a reasonable selection for an alternate choice of respirators. The worker will be asked to wear the proposed respirator for a period of time to become familiar with the feel and fit. No obstacles can be between their face and the sealing surface of the respirator, including facial hair of 24 hours or more growth, sideburns that extend into the sealing surface or hair that is long enough to prevent proper function of the respirator. Jewelry, caps, hats, scarves, and certain safety gear must be evaluated as part of the fit test if the worker is permitted or required to wear them during work. OSHA did not restrict the use of contact lens with respirators but did mandate that the use of corrective lens shall not interfere with the seal of the respirator. Any adaptive devices for vision correction with respiratory equipment will be supplied at no cost to the worker. The worker will be instructed on how to field check respiratory equipment. The positive and negative seal check methods of verifying a good seal shall be required before every entry into a respiratory hazard area. These seal checks are not to be considered a fit test.

Positive Seal Check

A positive seal check is accomplished by effectively sealing the exhalation valve and slowly exhaling. This should create a slight, positive pressure inside the face piece for a short period of time. The participant must be careful not to exhale too fast or small leaks can be nullified and/or large leaks artificially created.

Negative Seal Check

A negative seal check is accomplished by effectively sealing the inhalation ports of the respirator and inhaling slowly. The participant should be able to create a negative pressure inside the respirator and hold it for a short period of time. Inhaling too fast may nullify small leaks and/or artificially create other leaks.

Fit Test (See Attachment V, Table 2 for "Acceptable Fit-Testing Methods")

- Qualitative fit test – a pass/fail test that relies on the subject to detect a challenge agent and is predicated on an individual's sensory response.
- Quantitative fit test – uses an instrument to measure the challenge agent inside the respirator and gives a numerical value to the test data.

If qualitative testing is used, the worker should be informed of the exposure limitations. A limit of 10 times the permissible exposure level for an 8-hour duration is the maximum exposure for either a half mask, or full-face piece negative pressure respirator.

For OSHA guidelines, refer to Attachment V, Table 2 for Acceptable Fit Test Methods.

Irritant Smoke Protocol

Irritant smoke protocol for qualitative fit testing is very effective, since it is the only challenge agent that does not rely on a voluntary response. This type of test requires that the tester be well trained in the correct and safe use of the irritant smoke tubes. The smoke tubes can be a health hazard if not used properly and in a well- ventilated room. Specific step by step procedures are referenced in Attachment III.Maintenance and Care

AMS will provide for the cleaning and disinfecting, storage, inspection, and repair of respirators that are issued to their workers. There are specific guidelines to follow in Attachment IV to ensure the respirators are clean and disinfected. Respirators designated for the exclusive use of a worker shall be the responsibility of that worker to maintain and keep in a sanitary condition. Respirators issued to more than one worker shall be cleaned and disinfected before being worn by different individuals. Respirators maintained for emergency, training, or fit testing use shall be cleaned and disinfected after every use.

Storage

Respirators shall be stored to protect them from damage, contamination, dust, sunlight, extreme temperatures, excessive moisture, and damaging chemicals. They shall be packed or stored to prevent deformation of the face piece. Emergency respirators shall, in addition, be kept accessible to the work area and stored in easily identifiable coverings. Reference the manufacturer's instructions for other recommendations.

Inspection

Respirators are inspected on a regular basis and workers are instructed on how to inspect their respirator. All respirators used on a routine basis shall be inspected before each use and during cleaning. All emergency respirators shall also be inspected at least monthly. Respirator inspection shall include the tightness of connections and the condition of various parts including, but not limited to, the face piece, head straps, valves, gaskets, connecting tubes, cartridges, canisters, and filters. Also, check all elastic parts for deterioration and pliability. Inspection of self-contained breathing apparatus shall be done only by trained technicians competent with that specific brand, make and model of respiratory equipment. The technician conducting the inspection shall certify the inspection by attaching a signed and dated tag or label to the equipment.

Repairs

Equipment that is defective, broken or otherwise in need of repair shall be identified immediately by attaching a red tag and stating the reason it is out of service. Repairs to respirator equipment shall be made by competent workers and only with the manufacturers' recommended replacement parts. Absolutely no substitution of parts is allowed that is not authorized by the NIOSH approval.

Medical Surveillance

Workers should be aware of medical conditions that would prevent or limit their use of respiratory equipment. Supervisors shall be informed when workers experience medical difficulties that may affect or be a result of respirator use. Substance specific hazards may require a specific medical monitoring procedure that requires biological testing. Workers will be required to complete a medical questionnaire initially, and then further evaluation at the frequency determined by the medical evaluator.

Program Evaluation

The supervisor will monitor the work site for acceptance of and compliance with the written respiratory program. The supervisor will address issues where workers have had deficient respiratory issues, i.e., cartridge breakthrough and the respirator effectiveness. Workers will be asked questions about the effectiveness of the program and encouraged to offer suggestions for improvement including how the fit test protocol was performed, the maintenance procedures for care and storage of respirators and overall program. Periodic audits will be documented and reviewed by the program administrator. The program administrator will report, at least annually, to the management on the effectiveness of the total program.

Attachment
Table 1: Assigned Protection Factors

Type of respirator	Respiratory inlet covering	
	Half Mask	Full Facepiece
Air purifying	10	100
Atmosphere supplying		
SCBA (demand)	10	100
Airline (demand)	10	100

Type of respirator	Respiratory inlet covering			
	Half mask	Full Face	Helmet/ hood	Loose-fitting facepiece
Powered air purifier	50	1000	1000	25
Atmosphere supplying airline				
Pressure demand	50	1000	-	-
Continuous flow	50	1000	1000	25
Self-contained breathing apparatus				
Pressure demand Open/closed circuit	-		-	-

1) Includes ¼ mask, disposable half masks, and half masks with elastomeric facepieces.
2) Demand SCBA shall not be used for emergency situations such as firefighting.
3) Protection factors listed are for high-efficiency filters and sorbents (cartridges and canisters) With dust filters, an assigned protection factor of 100 is to be used due to the limitations o the filter.
4) Although positive-pressure respirators are currently regarded as providing the highest leve o respiratory protection a limited number of recent simulated workplace studies concluded that all users may not achieve protection factors of 10,000. Based on this limited data, a definitive assigned protection factor could not be listed for positive-pressure SCBA's. Fo emergency planning purposes where, hazardous concentrations can be estimated, ar assigned protection factor of no higher than 10,000 should be used.

NOTE: Assigned protection factors are not applicable for escape respirators. For combinatio respirators, e.g., airline respirators equipped with an air-purifying filter, the mode of operatio in use will dictate the assigned protection factor to be applied.

Attachment
Respirator Selection

Logic Guide: Reference ANSI 288.2 – 1992 7.2.2.

Respirator selection involves reviewing each operation to (a) determine what hazards may be present (hazard determination) and (b) select which type or class of respirators can offer adequate protection.

Hazard Determination Steps

The nature of the hazard shall be determined as follows:

- Determine what contaminant(s) may be present in the workplace.
- Determine whether there is a published Threshold Limit Value, Permissible Exposure Limit, or any other available exposure limit or estimate of toxicity for the contaminant(s). Determine if the IDLH concentration for the contaminant is available.
- Determine if there is a comprehensive health standard (e.g., lead, asbestos) for the contaminant(s). If so, there may be specific respirators required that influence the selection process.
- If the potential for an oxygen-deficient environment exists, measure the oxygen content.
- Measure or estimate the concentration of the contaminant(s).
- Determine the physical state of the contaminant. If an aerosol determines or estimates the particle size. Determine if vapor pressure of the aerosol is significant at the maximum expected temperature of the work environment.
- Determine whether the contaminant(s) present can be absorbed through the skin, produce skin sensitization, or be irritating or corrosive to the eyes or skin.
- Determine for a gas or vapor contaminant(s) if a known odor, taste, or irritation concentration exists.

Selection Steps

The proper respirator shall be selected as follows:

- If unable to determine what potentially hazardous contaminant may be present, the atmosphere shall be considered IDLH.
- If no exposure limit or guideline is available and estimates of the toxicity cannot be made, the atmosphere shall be considered IDLH.
- If a specific standard exists for the contaminant, follow those guidelines/requirements.
- If there is an oxygen-deficient atmosphere, the type of respirator selected depends on the partial pressure and concentration of oxygen and the concentration of the other contaminant(s) that may be present.
- If the measured or estimated concentration of the contaminant(s) is considered IDLH, reference “Respirators for use under IDLH conditions” at the end of this guide.
- Divide the measured or estimated concentration of each contaminant by the exposure limit or guideline to obtain a hazard ratio. When two or more substances are present, consideration

needs to be given if there is a synergistic or combined effect of exposure rather than considering each substance individually. Select a respirator with an assigned protection factor greater than the value of the hazard ratio, as listed in Attachment I, Table 1.

- If the contaminant(s) is a gas or vapor only, select a device with an assigned protection factor that is greater than the hazard ratio. The concentration shall also be less than the maximum use concentration of the cartridge/canister.
- If the contaminant is a paint, lacquer, or enamel, select a respirator approved specifically for paint mists or an atmosphere-supplying respirator. (Approval label or regulatory provision may preclude use for some paints.)
- If the contaminant is a pesticide, select a respirator and filtration system specifically approved for pesticides or an atmosphere-supplying respirator. (Approval label may preclude use for some pesticides.)
- If the contaminant is an aerosol with an unknown particle size, or less than 2 um (MMAD), a high-efficiency filter shall be used.
- If the contaminant is a fume, use a filter approved for fumes or a high-efficiency filter.
- If the contaminant is an aerosol with a particle size greater than 2 um (MMAD), any filter type (dust, fumes, mist, or high efficiency) may be used.
- If the contaminant is a gas or vapor and has poor warning properties, the use of an atmosphere-supplying respirator is generally recommended.
- When atmosphere-supplying respirators cannot be used because of the lack of a feasible air supply, or the need for worker mobility, air-purifying devices should be used only if:
    - The air-purifying respirator has a reliable end-of-service-life indicator that will warn the user prior to contaminant breakthrough or,
    - A cartridge change schedule is implemented based on cartridge service data including desorption studies (unless cartridges are changed daily), expected concentration, pattern of use, duration of exposure, and the chemical does not have a ceiling limit.
- Respirators for use under IDLH atmospheres:
    - The required respiratory protection for IDLH conditions caused by the presence of toxic materials, or a reduced percentage of oxygen, is a combination full face piece pressure demand supplied air respirator (SAR) with auxiliary self-contained air supply. For rescue applications, a full-face piece pressure demand SCBA certified by NIOSH for a minimum service life of thirty minutes is acceptable.
    - When respirators are worn under IDLH conditions, at least one standby person shall be present in a safe area. the standby person shall have the proper equipment available to assist the respirator wearer in case of difficulty. Communications (visual, voice, signal line, intercom, radio, or other suitable means) shall be maintained between the standby person and the wearer. While working in the IDLH atmosphere, the wearer shall be equipped with a safety harness and lifeline to permit removal to a safe area, if necessary. Provisions for rescue other than harness and lifeline may be used if equivalent.
- Special considerations for confined space entry into IDLH conditions are not addressed in this policy.

Use and duration of cartridges:

Contaminant (1)	Maximum Concentration	Maximum Use Time (2) (Hours)
1,3 Butadiene	50	1
Ammonia	100	4
Benzene	10	8
Benzene	50	4
Chemicals not specified (3)	NA	1
Naphtha	100	4
Naphtha	500	2
Particulates (including dust, mists, welding fumes)	NA	8
Sulfur Dioxide	50	8
Total Hydrocarbons (as n-hexane)	100	4
Total Hydrocarbons (as n-hexane)	500	1

- If more than one contaminant is present, use the lowest maximum use time.
- Cartridges should be changed out if the contaminant can be detected inside the respirator mask, regardless of the maximum use time.
- Cartridges for chemicals not listed should be used for only 1 hour. This will err on the side of safety. If specific information is needed on a particular chemical, consult with the SDS or your supervisor.

Attachment III
Fit Testing

If the test subject is not familiar with using a particular respirator, the test subject shall be directed to don the face piece several times and to adjust the straps to become adept at setting the proper tension on the straps.

- Assessment of comfort shall include a review of the following points with the test subject and allowing the test subject adequate time to determine the comfort of the respirator:

    - Position of the mask on the nose
    - Room for eye protection
    - Room to talk
    - Position of mask on face and cheeks

- The following criteria shall be used to help determine the adequacy of the respirator fit:

    - Chin properly placed
    - Adequate strap tension, not overly tightened
    - Fit across nose bridge
    - Respirator of proper size to span distance from nose to chin
    - Tendency of respirator to slip
    - Self-observation in mirror to evaluate fit and respirator position

- The test subject shall conduct a user seal check, utilizing the negative and positive pressure seal check methods. Before conducting the negative and positive pressure checks, the subject shall be told to seat the mask on the face by moving the head from side-to side and up and down slowly while taking a few slow deep breaths. Another face piece shall be selected and retested if the test subject fails the user seal check tests.

- The test shall not be conducted if there is any hair growth between the skin and the face piece sealing surface, such as stubble beard growth, beard, mustache, or sideburns which cross the respirator sealing surface. Any type of apparel, which interferes with a satisfactory fit, shall be altered or removed.

- If the worker finds the fit of the respirator unacceptable, the test subject shall be given the opportunity to select a different respirator and to be retested.

- Exercise regimen: Prior to the commencement of the fit test, the test subject shall be given a description of the fit test and the test subject's responsibilities during the test procedure. The description of the process shall include a description of the test exercise that the subject will be performing. The respirator to be tested shall be worn for at least 5 minutes before the start of the fit test

- The fit test shall be performed while the test subject is wearing any applicable safety equipment that may be worn during actual respirator use, which could interfere with respirator fit.

- Test exercises: The following test exercises are to be performed for all fit testing methods. The test subject shall perform exercises, in the test environment, in the following manner:

    - Normal breathing: In a normal standing position, without talking, the subject shall breathe normally.
    - Deep breathing: In a normal standing position, the subject shall breathe slowly and deeply, taking caution so as not to hyperventilate.
    - Turning head side to side: Standing in place, the subject shall slowly turn his/her head from side to side between the extreme positions on each side. The head shall be held at each extreme momentarily so the subject can inhale at each side.
    - Moving head up and down: Standing in place, the subject shall slowly move his/her head up and down. The subject shall be instructed to inhale in the up position (i.e., when looking toward the ceiling).
    - Talking: The subject shall talk out loud slowly and loud enough to be heard clearly by the test conductor. The subject can be read from a prepared text such as the Rainbow Passage, count backward from 100, or recite a memorized poem or song.

Rainbow Passage

When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a person looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow.

- Bending over: The test subject shall bend at the waist as if he/she were to touch his/her toes. Jogging in place shall be substituted for this exercise in those test environments that do not permit bending over at the waist.
- Normal breathing: Same as exercise (H,1).

Each test exercise shall be performed for one minute. The test subject shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become unacceptable, another model of respirator shall be tried. The respirator shall not be adjusted once the fit test exercises begin. Any adjustment voids the test, and the fit test must be repeated.

Irritant Smoke Protocol

This qualitative fit test uses a person's response to the irritating chemicals released in the "smoke" produced by a stannic chloride ventilation smoke tube to detect leakage into the respirator.

General Requirements and Precautions

- The respirator to be tested shall be equipped with high efficiency particulate air (HEPA) or P100 series filter(s).
- Only stannic chloride smoke tubes shall be used for this protocol.

- No form of test enclosure or hood for the test subject shall be used.
- The smoke can be irritating to the eyes, lungs, and nasal passages. The test conductor shall take precautions to minimize the test subject's exposure to irritant smoke. Sensitivity varies, and certain individuals may respond to a greater degree to irritant smoke. Care shall be taken when performing the sensitivity screening checks that determine whether the test subject can detect irritant smoke to use only the minimum amount of smoke necessary to elicit a response from the test subject.
- The fit test shall be performed in an area with adequate ventilation to prevent exposure of the person conducting the fit test, or the build-up of irritant smoke in the general atmosphere.

Sensitivity Screening Check

- The test operator shall break both ends of a ventilation smoke tube containing stannic chloride and attach one end of the smoke tube to a low flow air pump set to deliver 200 milliliters per minute, or an aspirator squeeze bulb. The test operator shall cover the other end of the smoke tube with a short piece of tubing to prevent potential injury from the jagged end of the smoke tube.
- The test operator shall advise the test subject that the smoke can be irritating to the eyes, lungs, and nasal passages and instruct the subject to keep his/her eyes closed while the test is performed.
- The test subject shall be allowed to smell a weak concentration of the irritant smoke before the respirator is donned to become familiar with its irritating properties, and to determine if he/she can detect the irritating properties of the smoke. The test operator shall carefully direct a small amount of the irritant smoke in the test subject's direction to determine that he/she can detect it.

Irritant Smoke Fit Test Procedure

- The person being fit tested shall don the respirator without assistance and perform the required user seal check(s).
- The test subject shall be instructed to keep his/her eyes closed.
- The test operator shall direct the stream of irritant smoke from the smoke tube toward the face seal area of the test subject, using the low flow pump or the squeeze bulb. The test operator shall begin at least 12 inches from the face piece and move the smoke stream around the whole perimeter of the mask. The operator shall gradually make two more passes around the perimeter of the mask, moving to within six inches of the respirator.
- If the person being tested has not had an involuntary response and/or detected the irritant smoke, proceed with the test exercises.
- The exercises identified in section H of this attachment shall be performed by the test subject while the respirator seal is being continually challenged by the smoke, directed around the perimeter of the respirator at a distance of six inches.
- If the person being fit tested reports detecting the irritant smoke at any time, the test is failed. The person being retested must repeat the entire sensitivity check and fit test procedure.

- Each test subject passing the irritant smoke test without evidence of a response (involuntary cough, irritation) shall be given a second sensitivity screening check with the smoke from the same smoke tube used during the fit test, once the respirator has been removed, to determine whether he/she still reacts to the smoke. Failure to evoke a response shall void the fit test.
- If a response is produced during this second sensitivity check, then the fit test is passed.

Attachment IV
Respirator Cleaning Procedures

These procedures are provided as a guideline when cleaning respirators. They are general in nature, and the administrator as an alternative may use the cleaning recommendations provided by the manufacturer of the respirators used by their workers, provided such procedures are as effective as those listed here. Equivalent effectiveness simply means that the procedures used must accomplish the objectives set forth (i.e., must ensure that the respirator is properly cleaned and disinfected in a manner that prevents damage to the respirator and does not cause harm to the user).

- Remove filters, cartridges, or canisters. Disassemble face pieces by removing speaking diaphragms, demand and pressure-demand valve assemblies, hoses, or any components recommended by the manufacturer. Discard or repair any defective parts.
- Wash components in warm water (110° F maximum), with mild detergent or cleaner recommended by the manufacturer. A stiff bristle (not wire) brush may be used to facilitate the removal of dirt.
- Rinse components thoroughly in clean, warm (110° F maximum), preferably running water. Drain.
- When the cleaner used does not contain a disinfecting agent, respirator components should be immersed for two minutes in one of the following:
    - Hypochlorite solution (50 ppm of chlorine) is made by adding approximately one milliliter of laundry bleach to one liter of water at 110° F, or,
    - Aqueous solution of iodine (50 ppm iodine) made by adding approximately 0.8 milliliters of tincture of iodine (6-8 grams ammonium and/or potassium iodide/100cc of 45% alcohol) to one liter of water at 110°F, or,
    - Other commercially available cleansers of equivalent disinfectant quality when used as directed if their use is recommended or approved by the respirator manufacturer.
- Rinse components thoroughly in clean, warm (110° F maximum), preferably running water. Drain. The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on face pieces may result in dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts if not completely removed.
- Components should be hand-dried with a clean lint-free cloth or air-dried.
- Reassemble face piece, replacing filters, cartridges, and canisters where necessary.
- Test the respirator to ensure that all components work properly.

Attachment V
Table 2: Acceptable Fit-Testing Methods

	QLFT	QNFT
Half-Face, Negative Pressure, APR (<100 fit factor)	Yes	Yes
Full-Face, Negative Pressure, APR (<10 fit factor) Used in atmospheres up to 10 times the PEL	Yes	Yes
Full-Face, Negative Pressure, APR (>100 fit factor)	No	Yes
PAPR	Yes	Yes
Supplied-Air Respirators (SAR), or SCBA used in Negative Pressure (Demand Mode) (>100 fit factor)	No	Yes
Supplied-Air Respirators (SAR), or SCBA used in Positive Pressure (Pressure Demand Mode)	Yes	Yes

TOOL SAFETY AND INSPECTION

PURPOSE

The purpose of this document is to outline safety policy and procedures surrounding the use of Hand and Power Tools for ALLEN MECHANICAL SERVICES-AMS; hereafter referred to as “AMS.” This program covers hand, electrical, pneumatic, powder driven, and hydraulic tool safety.

RESPONSIBILITIES

Management

- Provide correct tools for assigned tasks
- Ensure tools are maintained and stored safely
- Provide worker training
- Provide for equipment repair

Workers

- Follow proper tool safety guidelines
- Report tool deficiencies and malfunctions
- Properly store tools when work is completed

Administrative

- Tool sharpening program
- Use of PPE
- Control of tool issue
- Worker Training
- Controlled access to equipment and tool areas

POLICY

Workers who use hand and power tools and who are exposed to the hazards of falling, flying, abrasive and splashing objects, or exposed to harmful dusts, fumes, mists, vapors, or gases must be provided with the personal equipment necessary to protect them from the hazard. All hazards involved in the use of tools can be prevented by following five basic safety rules:

- Keep all tools in good condition with regular maintenance
- Use the right tool for the job
- Examine each tool for damage before use
- Operate according to the manufacturer's instructions.
- Provide and use the proper protective equipment.

Ergonomic Guidelines

Applying these guidelines in tool design can help maximize human performance on the job by making the job easier for the worker, improving safety, and decreasing injuries. Take-Away Tips for Tool Selection:

- Use the right tool for the job, and the right tool for the user
- "Bend" the tool, not the wrist
- Avoid high contact forces and static loading
- Reduce excessive gripping force or pressure
- Avoid extreme and awkward joint positions
- Avoid twisting hand and wrist motion by using power tools rather than hand tools
- Avoid repetitive finger movements, or at least reduce their number
- Minimize the amount of force needed to activate trigger devices on power tools
- Avoid thumb triggers
- Use two- or three-finger triggers for power tools; use four-finger triggers only when the tool is balanced

Hand Tools

Hand tools are non-powered. They include anything from axes to wrenches. The greatest hazards posed by hand tools result from misuse and improper maintenance. Some examples:

- Using a screwdriver as a chisel may cause the tip of the screwdriver to break and fly, hitting the user or other workers.
- If a wooden handle on a tool such as a hammer or an axe is loose, splintered, or cracked, the head of the tool may fly off and strike the user or another worker.
- A wrench must not be used if its jaws are sprung, because it might slip.
- Impact tools such as chisels, wedges, or drift pins are unsafe if they have mushroomed heads. The heads might shatter on impact, sending sharp fragments flying.

Workers using hand and power tools and exposed to the hazard of falling, flying, abrasive, and splashing objects, or exposed to harmful dust, fumes, mists vapors, or gases shall be provided with PPE necessary to protect them from the hazard.

Appropriate personal protective equipment, e.g., safety goggles, gloves, etc., should be worn due to hazards that may be encountered while using portable power tools and hand tools.

Floors shall be kept as clean and dry as possible to prevent accidental slips with or around dangerous hand tools.

Around flammable substances, sparks produced by iron and steel hand tools can be a dangerous ignition source.

Where this hazard exists, spark-resistant tools made from brass, plastic, aluminum, or wood will provide for safety.

Power Tool Precautions

Power tools can be hazardous when improperly used. There are several types of power tools, based on the power source they use: electric, pneumatic, liquid fuel, hydraulic, and powder actuated. The following general precautions should be observed by power tool users:

- Never carry a tool by the cord or hose.
- Never yank the cord or the hose to disconnect it from the receptacle.
- Keep cords and hoses away from heat, oil, and sharp edges.
- Disconnect tools when not in use, before servicing, and when changing accessories such as blades, bits, and cutters.
- All observers should be kept at a safe distance away from the work area.
- Secure work with clamps or a vise, freeing both hands to operate the tool.
- Avoid accidental starting. The worker should not hold a finger on the switch button while carrying a plugged-in tool.
- Tools should be maintained with care. They should be kept sharp and clean for the best performance. Follow instructions in the user's manual for lubricating and changing accessories.
- Be sure to keep good footing and maintain good balance.
- The proper apparel should be worn. Loose clothing, ties, or jewelry can become caught in moving parts.
- All portable electric tools that are damaged shall be removed from use and tagged "Do Not Use."

Guards

Hazardous moving parts of a power tool need to be safeguarded. For example, belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, chains, or other reciprocating, rotating, or moving parts of equipment must be guarded. Guards, as necessary, should be provided to protect the operator and others from the following:

- Point of operation
- In-running nip points
- Rotating parts
- Flying chips and sparks

Guards shall be always in place and operable while the tool is in use. The guard may not be manipulated in such way that will compromise its integrity or compromise the protection in which intended. Guarding shall meet the requirements set forth in ANSI B15.1.

Safety guards must never be removed when a tool is being used. For example, portable circular saws must be equipped with guards. An upper guard must cover the entire blade of the saw. A retractable lower guard must cover the teeth of the saw, except when it contacts the work material. The lower guard must automatically return to the covering position when the tool is withdrawn from the work.

Safety Switches

The following hand-held powered tools are to be equipped with a momentary contact "on-off" control switch: drills, tappers, fastener drivers, horizontal, vertical and angle grinders with wheels larger than two inches in diameter, disc, and belt sanders, reciprocating saws, saber saws, and other similar tools. These tools also may be equipped with a lock-on control if turnoff can be accomplished by a single motion of the same finger or fingers that turn it on.

The following hand-held powered tools may be equipped with only a positive "on-off" control switch: platen sanders, disc sanders with discs two inches or less in diameter; grinders with wheels two inches or less in diameter; routers, planers, laminate trimmers, nibblers, shears, scroll saws and jigsaws with blade shanks ¼-inch wide or less.

Other hand-held powered tools such as circular saws having a blade diameter greater than two inches, chain saws, and percussion tools without positive accessory holding means must be equipped with a constant pressure switch that will shut off the power when the pressure is released.

Electrical Safety

Among the chief hazards of electric-powered tools are burns and slight shocks which can lead to injuries or even heart failure. Under certain conditions, even a small amount of current can result in severe injury and eventual death. A shock also can cause the user to fall off a ladder or other elevated work surface.

To protect the user from shock, tools must either have a three-wire cord with ground or be grounded, be double insulated, or be powered by a low-voltage isolation transformer. Three-wire cords contain two current-carrying conductors and a grounding conductor. One end of the grounding conductor connects to the tool's metal housing. The other end is grounded through a prong on the plug. Anytime an adapter is used to accommodate a two-hole receptacle, the adapter wire must be attached to a known ground. The third prong should never be removed from the plug.

Double insulation is more convenient. The user and the tools are protected in two ways: by normal insulation on the wires inside, and by a housing that cannot conduct electricity to the operator in the event of a malfunction.

Electric Power Tool General Safety Practices

- Electric tools should be operated within their design limitations.
- Gloves and safety footwear are recommended during use of electric tools.
- When not in use, tools should be stored in a dry place.
- Electric tools should not be used in damp or wet locations.
- Work areas should be well lighted.

Ground Fault Protection

AMS shall use either ground fault circuit interrupters or an assured equipment grounding conductor to protect workers on construction sites. These requirements are in addition to any other requirements for equipment grounding conductors.

Ground-Fault Circuit Interrupters (GFCI)

All 120-volt, single-phase 15- and 20-ampere receptacle outlets on construction sites, which are not a part of the permanent wiring of the building or structure, and which are in use by workers, shall have approved ground-fault circuit interrupters for personnel protection. Receptacles on a two-wire, single-phase portable or vehicle-mounted generator rated not more than 5kW, where the circuit conductors of the generator are insulated from the generator frame and all other grounded surfaces, need not be protected with ground-fault circuit interrupters. 1926.404(b)(1)(ii)

Powered Abrasive Wheel Tools

Powered abrasive grinding, cutting, polishing, and wire buffing wheels create special safety problems because they may throw off flying fragments.

Before an abrasive wheel is mounted, it should be inspected closely and sound- or ring-tested to be sure that it is free from cracks or defects. To test, wheels should be tapped gently with a light non-metallic instrument. If they sound cracked or dead, they could fly apart in operation and so must not be used. A sound and undamaged wheel will give a clear metallic tone or "ring." To prevent the wheel from cracking, the user should be sure it fits freely on the spindle. The spindle nut must be tightened enough to hold the wheel in place, without distorting the flange. Follow the manufacturer's recommendations. Care must be taken to assure that the spindle wheel will not exceed the abrasive wheel specifications.

Due to the possibility of a wheel disintegrating (exploding) during start-up, the worker should never stand directly in front of the wheel as it accelerates to full operating speed.

Portable grinding tools need to be equipped with safety guards to protect workers not only from the moving wheel surface, but also from flying fragments in case of breakage. Powered Grinder Safety Precautions

- Always use eye protection.
- Turn off the power when not in use.
- Never clamp a hand-held grinder in a vise.

Pneumatic Tools

Pneumatic tools are powered by compressed air and include chippers, drills, hammers, and sanders. There are several dangers encountered in the use of pneumatic tools. The main one is the danger of getting hit by one of the tool's attachments or by fastener the worker is using with the tool. Eye protection is required, and face protection is recommended for workers working with pneumatic tools. Working with noisy tools such as jackhammers requires proper, effective use of hearing protection.

When using pneumatic tools, workers are to check to see that they are fastened securely to the hose to prevent them from becoming disconnected. A short wire or positive locking device attaching the air hose to the tool will serve as an added safeguard.

A safety clip or retainer must be installed to prevent attachments, such as chisels on a chipping hammer, from being unintentionally shot from the barrel.

Screens must be set up to protect nearby workers from being struck by flying fragments around chippers, riveting guns, staplers, or air drills.

Compressed air guns should never be pointed toward anyone. Users should never "dead-end" it against themselves or anyone else.

Powder-Actuated Tools

Powder-actuated tools operate like a loaded gun and should be treated with the same respect and precautions. In fact, they are so dangerous that they must be operated only by specially trained workers.

Powder-Actuated Tool Safety

- These tools should not be used in an explosive or flammable atmosphere.
- Before using the tool, the worker should inspect it to determine that it is clean, that all moving parts operate freely, and that the barrel is free from obstructions.
- The tool should never be pointed at anybody.
- The tool should not be loaded unless it is to be used immediately. A loaded tool should not be left unattended, especially where it would be available to unauthorized persons.
- Hands should be kept clear of the barrel end. To prevent the tool from firing accidentally, two separate motions are required for firing: one to bring the tool into position, and another to pull the trigger. The tools must not be able to operate until they are pressed against the work surface with a force of at least five pounds greater than the total weight of the tool.

If a powder-actuated tool misfires, the worker should wait at least 30 seconds, then try firing it again. If it still will not fire, the user should wait another 30 seconds so that the faulty cartridge is less likely to explode, than carefully remove the load. The bad cartridge should be put in water.

Suitable eye and face protection are essential when using a powder-actuated tool.

The muzzle end of the tool must have a protective shield or guard centered perpendicularly on the barrel to confine any flying fragments or particles that might otherwise create a hazard when the tool is fired. The tool must be designed so that it will not fire unless it has this kind of safety device.

All powder-actuated tools must be designed for varying powder charges so that the user can select a powder level necessary to do the work without excessive force.

If the tool develops a defect during use it should be tagged and taken out of service immediately until it is properly repaired.

Powder-Actuated Tool Fasteners

When using powder-actuated tools to apply fasteners, there are some precautions to consider. Fasteners must not be fired into material that would let them pass through to the other side. The fastener must not be driven into materials like brick or concrete any closer than three inches to an edge or corner.

In steel, the fastener must not come any closer than one-half inch from a corner or edge. Fasteners must not be driven into very hard or brittle materials which might chip or splatter or make the fastener ricochet.

An alignment guide must be used when shooting a fastener into an existing hole. A fastener must not be driven into a spalled area caused by an unsatisfactory fastening.

Hydraulic Power Tools

The fluid used in hydraulic power tools must be an approved fire-resistant fluid and must retain its operating characteristics at the most extreme temperatures to which it will be exposed. The manufacturer's recommended safe operating pressure for hoses, valves, pipes, filters, and other fittings must not be exceeded.

Jacks

All jacks - lever and ratchet jacks, screw jacks, and hydraulic jacks - must have a device that stops them from jacking up too high. Also, the manufacturer's load limit must be permanently marked in a prominent place on the jack and should not be exceeded.

A jack should never be used to support a lifted load. Once the load has been lifted, it must immediately be blocked up. Use wooden blocking under the base, if necessary, to make the jack level and secure. If the lift surface is metal, place a 1-inch-thick hardwood block or equivalent between it and the metal jack head to reduce the danger of slippage.

To set up a jack, make certain of the following:

- The base rests on a firm level surface
- The jack is correctly centered
- The jack head bears against a level surface
- The lift force is applied evenly

Proper maintenance of jacks is essential for safety. All jacks must be inspected before each use and lubricated regularly. If a jack is subjected to an abnormal load or shock, it should be thoroughly examined to make sure it has not been damaged. Hydraulic jacks exposed to freezing temperatures must be filled with an adequate antifreeze liquid.

Inspection

Workers shall make sure to inspecting tools before using them to determine that it is clean, that all moving parts operate freely, and that the barrel is free from obstructions and has the proper shield, guard, and attachments recommended by the manufacturer. Tools should be inspected before and after usage by your workers for signs of defects or misuse.

ASBESTOS EXPOSURE PLAN

PURPOSE

This safety guideline is intended to provide safety information regarding asbestos and verify adequate measures can be taken to limit exposures through controls in the workplace pertaining to the service provided by Allen Mechanical Services-AMS; hereafter referred to as “AMS”.

> NOTE: If AMS workers are to work in areas where the contracting company has identified asbestos, these areas will be disclosed to us and rendered safe before work begins. AMS does not knowingly allow workers to work in areas where they will have exposure to asbestos. Any worker who knowingly enters a restricted asbestos area will be disciplined for their unsafe behavior.

SCOPE

Asbestos is a widely used mineral-based material that is resistant to heat and corrosive chemicals. Depending on the chemical composition, fibers may range in texture from coarse to silky. The properties which make asbestos fibers so valuable to industry are its high tensile strength, flexibility, heat and chemical resistance, and good frictional properties.

Although non-asbestos insulation may be used in new work installations, the highest probability for exposure will come during demolition or old insulation removal. However, asbestos-containing material may be encountered in the following forms:

- Valves, vessels, piping insulation, cement insulation, mastic, floor and roof tiling, transit wall siding, caulking, and automobile brake linings.
- All asbestos removal must be done by certified technicians who are licensed to remove asbestos. No worker of AMS is to work on any “asbestos containing materials” unless properly protected and/or the material is encapsulated and will not fragmentize or peel off when working on it.

PROCEDURES

AMS workers are not to work on asbestos containing equipment or materials. If workers become aware of any potential exposure to asbestos, they are to immediately stop work and notify their supervisor/foreman. The supervisor/foreman is then responsible to inform the office for further information, but in no case allow work to proceed until the exposure to asbestos has been abated.

Health hazards

Asbestos fibers are carried into the body as airborne particles. These fibers can become embedded in the tissues of the lung and digestive system. Once the fibers become trapped in the lung’s alveoli (air sacs), they cannot be removed.

Years of exposure to asbestos can cause several disabling and fatal diseases. Among these is asbestosis, an emphysema-like condition, lung cancer; mesothelioma, a cancerous tumor that spreads

rapidly in the cells of membranes covering the lungs and body organs; and gastrointestinal cancer which is caused by ingesting asbestos-contaminated food.

Short term affects (acute)

May cause irritation and itching to the skin, coughing may occur.

Long term effects

Over exposure can result in lung cancer. Common symptoms include difficulty in breathing (e.g., climb a flight of steps and are out of breath), cough, chest pains, clubbing of the fingers, (in advanced stages), risk for lung cancer is or multiplied if the worker exposed to asbestos also smokes.

Work practices

AMS will ensure workers receive awareness training and how to follow safe practices. To help reduce worker exposure to airborne fibers, asbestos must be handled, mixed, applied, removed, cut, scored, or otherwise worked in a wet state. This “wet” method must also be used when products containing asbestos are removed from bags, cartons, or containers. If this is not possible, removal must be done in an enclosed or well- ventilated area.

Compressed air can be used to remove asbestos containing materials only if the compressed air is used in conjunction with an enclosed ventilated system designed to capture the dust cloud created by the compressed air.

Housekeeping

All surfaces must be maintained as free as practicable of accumulations of asbestos containing dust and waste. Floors and other surfaces contaminated with asbestos should only be cleaned by vacuuming and/or wet cleaning methods. Asbestos waste, scrap, debris, bags, containers, and equipment must be disposed of in sealed impermeable bags or containers.

ASBESTOS AWARENESS

PURPOSE

The purpose of this document is to outline safety policy and procedures surrounding operation and maintenance of asbestos containing material (ACM) for ALLEN MECHANICAL SERVICES-AMS; hereafter referred to as “AMS.”

RESPONSIBILITIES

Management

- Ensure all ACM is identified and labeled
- Ensure training is effective for authorized workers
- Conduct medical surveillance of affected workers
- Establish engineering controls for all work with ACM
- Provide adequate and proper equipment and personal protective gear
- Ensure proper disposal of all ACM

Workers

- Qualified workers must follow the exact procedures for repair or removal of ACM, including proper use of containment equipment, clean up equipment and personal protective gear
- Unqualified workers are to stay clear of all asbestos work areas and report any damaged ACM to their supervisor or competent person

DEFINITIONS

Asbestos - a generic term describing a family of naturally occurring fibrous silicate minerals. As a group, the minerals are noncombustible, do not conduct heat or electricity and are resistant to many chemicals. Although there are several other varieties that have been used commercially, the most common asbestos mineral types likely to be encountered in buildings are chrysotile (white asbestos), amosite (brown asbestos), and crocidolite (blue asbestos). Among these, white asbestos is by far the most common asbestos mineral present in buildings.

Friable Asbestos - finely divided asbestos or asbestos-containing material or any ACM that can be crumbled, pulverized, or powdered by hand pressure. Individual fibers in friable ACM can potentially become airborne and can then present a health hazard. Three types of friable material commonly used in buildings are:

1. Sprayed fibrous fireproofing
2. Decorative or acoustic texture coatings
3. Thermal insulation.

Non-friable Asbestos - includes a range of products in which asbestos fiber is effectively bound in a solid matrix from which asbestos fiber cannot normally escape. Non-friable asbestos includes a variety of products including asbestos cement tiles and boards and asbestos reinforced vinyl floor tiles. Cutting, braking, sanding, drilling of similar activities can release asbestos fiber from even non-friable asbestos materials.

POLICY

It is the policy of AMS that only qualified workers shall be involved in any asbestos repairs, maintenance, or removal. All unqualified workers shall be protected from exposure to asbestos fibers by isolating and controlling access to all affected areas during asbestos work. All tasks involving the disturbance of ACM will be conducted only after appropriate work controls have been identified and implemented. A qualified supervisor or competent person shall be available at asbestos-controlled work sites during all activities. Proper personal protective equipment, vacuums and HEPA filters shall be used and properly maintained. If outside contractors are used, AMS shall ensure all contractor workers have been properly trained and have been issued proper equipment and protective gear.

PROCEDURES

Hazards

Asbestos is a common, naturally occurring group of fibrous minerals. Asbestos fibers have been used in a variety of building materials; however, AMS takes an aggressive effort to use non-ACM in new construction and renovation projects. Generally, most asbestos is found in pipe insulation, doors, textured paints and plasters, structural fireproofing, and floor tiles. Friable asbestos (material that contains more than 0.1% asbestos by weight and can be crumbled by hand) is a potential hazard because it can release fibers into the air if damaged. Long term exposure to airborne asbestos is necessary for chronic lung disease. Significant and long- term exposure to asbestos from activities that directly disturb asbestos-containing materials (such as asbestos mining) can lead to a variety of respiratory diseases, including asbestosis and mesothelioma (cancer of the lung lining). Asbestosis is a non-malignant, irreversible disease resulting in fibrosis of the lung. Asbestos-related cancers tend also to result from substantial long-term exposure; however, mesothelioma may result from much smaller exposures to asbestos.

Asbestos materials are used in the manufacture of:

- Heat-resistant clothing
- Automotive brake and clutch linings
- Insulation
- Soundproofing
- Floor tiles
- Roofing felts
- Ceiling tiles
- Asbestos-cement pipe and sheets
- Fire-resistant drywall
- Pipe and boiler insulation materials
- Pipeline wrap and in sprayed-on materials located on beams, in crawlspaces, and between walls.

Exposure to asbestos has been shown to cause lung cancer, asbestosis, mesothelioma, and cancer of the stomach and colon.

Hazard Controls Engineering Controls

Engineering controls include the use of enclosures such as:

- Monitoring equipment
- Glove bags
- Tenting
- Negative pressure work areas
- HEPA filters
- Controlled vacuums
- Water misters and other equipment to ensure containment and clean-up of asbestos work areas.

The air quality (safety) is to be determined from breathing zone air samples. The samples shall be representative of the 8-hour TWA and 30-min. short-term exposure. Measurements are required for documentation. The limit shall comply with that of the TWA and/or excursion limit. The procedures should indicate that access is limited to regulated areas.

Engineering controls and work practices will be established and enforced by AMS to reduce/maintain the exposure below time weighted average (TWA). This shall be done except to the extent that such controls are not feasible. Some of them may be exhaust systems for hand tools, wet methods, clean- up procedures and PPE. Where the TWA and/or excursion limit is exceeded, a written program shall be established and implemented to reduce worker exposure to or below the TWA and to or below the excursion limit.

Administrative Controls

All qualified workers shall be issued proper personal protective equipment, such as respirators, disposable coveralls, gloves, etc. Written procedures and management authorizations are required for all work involving ACM.

Training

All qualified workers, supervisors and managers shall receive the proper level of training, as outlined in this program.

Asbestos awareness training is required for workers whose work activities may contact ACM or presumed asbestos containing material (PACM) but do not disturb the ACM or PACM during their work activities.

The training will be provided prior to, or at the time of initial assignment and at least annually thereafter. The training program shall be done in a manner that the worker is able to understand and should include health effects associated with exposure to asbestos.

Respirators shall be used in the following four circumstances work practice controls, work operations, to reduce exposure, and in emergencies. The respirator shall be provided at no cost to the workers and shall be chosen from those approved by National Institute for Occupational Safety and Health (NIOSH).

Personal Protective Equipment (PPE)

PPE shall include, but not limited to, coveralls, gloves, head coverings, foot coverings, face shields and vented goggles.

Written materials relating to the worker-training program will be readily available to affected workers, the assistant Secretary of Labor for Occupational Safety and Health and the Director of the National Institute for Occupational Safety and Health.

Asbestos Work Categories

Signs and labels shall identify the material which is present, its location, and appropriate work practices which, if followed, will ensure that ACM and/or PACM will not be disturbed.

Workers who perform housekeeping activities during and after construction activities shall be covered by the asbestos construction standard. The program should have requirements for posting signs and labels in regulated works areas. Signs and labels shall meet Occupational Safety and Health Administration (OSHA) requirements.

Category 1

Work includes the installation or removal of non-friable asbestos in which the asbestos fiber is locked in a binder such as cement, vinyl or asphalt which holds the material together.

If workers working immediately adjacent to a Class I asbestos jobs are exposed to asbestos due to the inadequate containment of such job, their employer shall either remove the workers from the area until the enclosure breach is repaired or perform an initial exposure assessment.

Category 2

Work involves work with friable asbestos that is of short duration in situations which create low levels of airborne asbestos. Example of Category 2 work are enclosure of friable asbestos, application of tape or sealant to asbestos containing pipe insulation and minor removal of friable asbestos and minor installation, maintenance, or repair work above false ceilings where sprayed asbestos fireproofing is present on beams.

Category 3

Work involves possible exposure to friable asbestos over long periods of time or work that generates high levels of asbestos. Included in Category 3 work are removal projects where relatively large amounts of asbestos are removed from a building including removal of friable asbestos from structural material, cleaning or removal of heating or air handling equipment that has been insulated with asbestos. Also included in Category 3 work are cutting or grinding of asbestos-containing materials using power tools.

General Rules

When in doubt, treat all material as containing asbestos and comply with all applicable rules and regulations and protective measures. All ACM will be handled by certified and licensed asbestos abatement personnel. The friability of the ACM will dictate the type of removal/maintenance required.

Workers who are uncertified and unlicensed will not handle any ACM >1%. This will include encapsulation projects, renovation/removal and/or demolition of any type of structure. This will prevent the potential for accidental exposure from the mishandling of any ACM.

When an uncertified, unlicensed worker questions whether they may be handling suspect ACM, the

worker will immediately contact their supervisor or competent person. The worker shall not resume working at the site until the area has been checked by a competent person to verify the material is not ACM.

Uncertified, unlicensed workers will not cross over a barrier/containment area where asbestos projects are in progress.

Any worker who discovers ACM or suspect ACM in damaged or poor condition should report it to their supervisor or competent person, so the identified material is repaired.

Medical Examinations

Workers assigned to asbestos removal will be given medical examinations at AMS expense in compliance with 29 CFR 1926.1101 and 40 CFR 763 - Subpart G.

- Within 30 days of first employment or assignment to a job exposing the worker to asbestos containing material.
- Annually.
- Within 30 days of termination of employment.
- Medical examination for workers assigned to asbestos removal will include:

    - Medical and work history with special emphasis directed to symptoms of the respiratory system, cardiovascular system, and digestive tract.
    - Medical questionnaire contained in 29 CFR 1926.1101.
    - A physical examination including a chest roentgenogram and pulmonary function test that includes measurement of the worker's forced vital capacity and expiratory volume.

- No worker shall be assigned to tasks requiring the use of respirators if an examining physician determines the worker will be unable to function normally while using it or that the worker might otherwise be impaired.
- Records of all physical examinations performed for asbestos work-related activities will be maintained permanently by AMS.

Asbestos Inventory

AMS has conducted surveys and prepared a written inventory of the type and locations of asbestos-containing material to:

- Allow for periodic condition inspections
- Allow for maintenance and repair of damaged asbestos
- For each building the inventory contains the following information:

- Type of asbestos-containing material (sprayed fireproofing, texture coating, or thermal insulation)
- The location of the material
- When it has been sampled, the type and percentage of asbestos present.

Also included in the survey information is sampling results showing the absence of asbestos in material which might be mistaken for an asbestos-containing material.

Asbestos Identification

Asbestos identification system is used to alert people to the presence of asbestos. Asbestos is identified by tags, stickers, pipe labels, signs and other high visibility means. Where feasible, stickers indicate the presence of asbestos in thermal insulation, in asbestos board and tiles and in other locations. Warnings may also be placed near the entrances of rooms -particularly mechanical rooms where unusually large amounts of asbestos may be present.

BENZENE AWARENESS

PURPOSE

This safety guideline is intended to provide suitable information to all workers regarding the potential toxic effects of Benzene so that adequate measures can be taken to limit exposure through controls in the workplace pertaining to the service provided by ALLEN MECHANICAL SERVICES-AMS; hereafter referred to as “AMS”.

PROCEDURES

General

Of all the hydrocarbons, Benzene poses the most serious long-term threat. Exposure over time, to even low levels of Benzene, can cause leukemia, blood changes and aplastic anemia. AMS workers are not permitted to work in areas where there may be a potential for Benzene exposure.

Characteristics

Benzene is a colorless to light-yellow liquid with a pleasant, sweet odor.

- Formula (C6H6)
- CAS No.: 71-43-2

Benzene is a flammable liquid that can accumulate static electricity. Benzene vapors are heavier than air and may travel to a source of ignition and flash back. The vapors are readily dispersed by wind movement and/or air currents. Liquid benzene tends to float on water and may travel to a source of ignition and spread fire. Benzene is highly reactive with no oxidizing materials. The maximum time-weighted average (TWA) exposure limit is 1 part of benzene vapor per million parts of air (1 ppm) for an 8-hour workday and the maximum short-term exposure limit (STEL) is 5 ppm for any 15-minute period.

Uses

Benzene is a component of gasoline, both in the manufacturing process and found naturally in crude oil; Benzene is also used as a feedstock for chemical manufacturing.

Health Effects Warning

Benzene is a cancer-causing agent in humans. All contact should be reduced to the lowest possible level. The above exposure limits are for air levels only. Skin contact may also cause overexposure.

Benzene is one of the most hazardous of all petroleum products because of its adverse health hazards and high flammability.

The following adverse health effects are important to remember where there may be potential exposure to Benzene:

- **Acute:** Short-term (acute) overexposure: If you are overexposed to high concentrations of benzene, well above the levels where its odor is first recognizable, you may feel breathless, irritable, euphoric, or giddy; you may experience irritation in eyes, nose, and respiratory tract. You may develop a headache, feel dizzy, nauseated, or intoxicated. Severe exposures may lead to convulsions and loss of consciousness.
- **Chronic:** Long-term (chronic) exposure. Repeated or prolonged exposure to benzene, even at relatively low concentrations, may result in various blood disorders, ranging from anemia to leukemia, an irreversible, fatal disease. Many blood disorders associated with benzene exposure may occur without symptoms.

Chronic exposure can also cause convulsions, liver damage, heart damage, blood diseases (aplastic anemia), and cancer (leukemia). These symptoms can take months or years to surface and can develop without physical or visible indications.

- Repeated skin contact leads to irritant contact dermatitis (rash); as with any petroleum solvent (which Benzene is also classified as), it will leach the natural oils out of the skin. Direct contact with the skin can cause erythema and/or blistering.
- Benzene is irritating to the eyes and mucous membranes.
- Flammable/dangerous fire risk: benzene has a very low flash point making it dangerous to have any open flame, spark, or source of ignition when vapors are present.
- Lower explosive (flammable) limit in air (LEL), 1.2%; upper explosive (flammable) limit in air (UEL), 7.8%

Personal Protective Measures

Workers must wear appropriate protective clothing (such as boots, gloves, sleeves, aprons, etc.) over any parts of your body that could be exposed to liquid benzene.

Workers must wear splash-proof safety goggles if it is possible that benzene may get into your eyes. In addition, you must wear a face shield if your face could be splashed with benzene liquid.

Respirators are required for those operations in which engineering controls or work practice controls are not feasible to reduce exposure to the permissible level. However, where employers can document that benzene is present in the workplace less than 30 days a year, respirators may be used in lieu of engineering controls.

Training

All workers will be provided awareness training in this program to be familiar with the potential hazards and proper safe work procedures to follow if exposed to this health hazard. Training shall occur prior to the initial assignment to work in an area where benzene is present. If exposures are above the action level, the exposure plan will be implemented. Workers will be provided with information and training at least annually thereafter.

CADMIUM EXPOSURE

PURPOSE

Describes the basis by which ALLEN MECHANICAL SERVICES-AMS, hereafter referred to as "AMS," manages cadmium exposure.

POLICY

AMS is committed to limiting worker exposure to cadmium.

SCOPE

This applies to all AMS worksites with the potential for worker exposure to cadmium.

ROLES AND RESPONSIBILITIES

- Ensuring employees have access to cadmium training based on their jurisdictional requirements.
- Ensuring employees have access to required respiratory protective and exposure monitoring equipment.
- Ensuring the Safety Data Sheet (SDS) for cadmium is present at the worksite.

Management

- Ensure employees complete Cadmium training based on their jurisdictional requirements.
- Ensure employees are not exposed to cadmium levels more than jurisdictional requirements.
- Organizing the work scope to limit workers' exposure to cadmium.

Employees

- Participate in training and monitoring programs in the workplace
- Use and maintain all controls and equipment used to reduce exposure properly
- Use respiratory protective and gas monitoring equipment if required.

What is Cadmium/Physical Properties of Cadmium?

Cadmium (Cd) is a soft, malleable, bluish-white metal found in zinc ores, and to a much lesser extent, in the cadmium mineral greenockite. Most of the cadmium produced today is obtained from zinc by-products and recovered from spent nickel-cadmium batteries.

Exposure to Cadmium

Worker exposure to cadmium can occur in all industry sectors but primarily in manufacturing and construction. Workers may be exposed during the smelting and refining of metals, and manufacturing batteries, plastics, coatings, and solar panels. The expanding Ni-Cd battery recycling industry is a concern for cadmium exposure. Electroplating, metal machining, welding, and painting are operations associated with cadmium exposure. Workers involved in landfill operations, the recycling of electronic parts, or the recycling of plastics may be exposed to cadmium. Compost workers and waste collectors are also potentially exposed to dust containing cadmium. The incineration of municipal waste is another source of cadmium exposure.

Worker Health and Cadmium Exposure

Occupational exposure to cadmium can lead to various adverse health effects, including cancer. Acute inhalation exposure (high levels over a short period of time) to cadmium can result in flu-like symptoms (chills, fever, and muscle pain) and can damage the lungs. Chronic exposure (low level over an extended period) can result in kidney, bone, and lung disease. For a comprehensive discussion of cadmium's health effects AMS will ensure that workers are not exposed to levels of cadmium more than specific jurisdictional requirements.

Medical Surveillance Program

AMS, as part of their medical surveillance program, will monitor exposure and organize surveillance of their workers exposed to cadmium by jurisdictional requirements.

Training

AMS workers who have the potential to work in environments where cadmium is present will be provided training on the hazards associated with cadmium sources of cadmium in the workplace and control measures to prevent/limit worker exposure to cadmium by local jurisdictional requirements.

Competent Persons

AMS will ensure a competent person completes all tasks as required by jurisdictional regulations, including:

- Identify potential and existing cadmium hazards in the workplace
- Take prompt corrective measures to address cadmium exposure
- Before the beginning of work:

    - Determine if cadmium is present in the workplace
    - Limit access to areas where cadmium may be present
    - Ensure exposure monitoring is taking place
    - Ensuring workers wear PPE (including respiratory protective equipment) as required

Control Measures and Work Practices to reduce exposure to Cadmium

AMS workers will not be exposed to a concentration of cadmium over jurisdictional regulations.

The following control measures and work practices will be implemented to reduce worker exposure to Cadmium.

Administrative

AMS will use the following administrative controls to address worker cadmium exposure.

- Limiting the amount of time a worker performs work involving potential exposure to cadmium

Exposure Monitoring

- AMS will determine the concentration of airborne cadmium through personal sampling/jurisdictional requirements at the frequency required by that specific jurisdiction.

Respiratory Protection

If working in an area where cadmium exposure is greater than jurisdictional regulations, AMS workers will use respiratory protective equipment as per jurisdictional requirements.

Engineering Controls

Where required, AMS will consider isolating the source and using ventilation systems or other engineering controls (torch-cutting extensions) to minimize exposure to cadmium.

CONCRETE AND MASONRY SAFETY

PURPOSE

The objective of this procedure is to provide safety guidelines and prevent incidents related to masonry and concrete construction performed by workers of ALLEN MECHANICAL SERVICES-AMS, hereafter referred to as “AMS”.

Site Preparation

Before erecting formwork or shoring the surface area in which the formwork or shoring will be placed will be prepared to receive the load that will be imposed on its surface. The existing ground will be level and thoroughly compacted before erecting formwork and shoring to prevent settlement.

The site layout will simplify the assembly and disassembly of formwork and shoring, moving equipment (e.g., ready-mix trucks, concrete pumps, cranes), and the storage of reinforcement steel, formwork, and shoring.

Electrical hazards (e.g., overhead power lines and temporary power) in the work area will be identified and the local power company consulted to set up safe clearance distances or to move the utilities.

Whenever possible, formwork and shoring will be roped off from other work (e.g., excavation or pile driving).

Reinforcing Steel

Reinforcing steel for walls, piers, columns, and similar structures will be laterally supported to resist overturning. The lateral supports for reinforcing steel will be capable of withstanding the force that will be applied to them during construction.

Bundles of reinforced steel moved by crane will be securely tied together to prevent slipping. Steel over 20 feet long will be handled by two-part slings.

Exposed rebar onto or into which workers could fall, will be covered to remove the hazard of impalement. Reinforced plastic cap coverings will be used during construction on exposed rebar to remove the hazard of impalement.

When working more than 6 feet above any close working surfaces, placing, and tying reinforcing steel in walls, piers, columns, etc., workers must use a personal fall arrest system as set forth in AMS safety procedure (Fall Prevention & Protection). Position devices for rebar work will be rigged so a worker cannot free fall more than 2 feet. The positioning device will be secured to an anchorage capable of supporting at least twice the potential impact load of the worker’s fall or 3,000 pounds, whichever is greater.
Reinforcing mats used as walkways will be provided with planking to provide safe footing.

Reinforcing steel will not be used as guy attachments at dead men or other anchorage points and will not be used for scaffolding hooks, stirrups, or as a load-bearing member of any lifting device.

Wire mesh reinforcing mats will be secured at each end or the roll turned over to prevent recoiling action. Unrolled wire mesh will be secured on each side of a proposed cut before cutting the mesh.

No workers, except those essential to post-tensioning operations, will be allowed to be behind the jack during tensioning. Signs and barricades will be erected to limit workers access to post-tensioning areas during tensioning.

Vertical Shoring

Before erection, shoring equipment will be inspected by the concrete contractor to verify that it conforms to the equipment named in the shoring layout. Unauthorized changes or substitution of equipment will not be made unless the designer has approved the change or substitution.

The manufacturer's specification for fabricated shoring will be available at the job site during the planning and execution.

Erecting shoring will be under the supervision of an experienced and competent person.

Shoring equipment will be inspected following the manufacturer's procedures. Metal frame shoring equipment and accessories will not be used if excessively rusted, bent, dented, re-welded beyond the original factory weld locations, or if they have broken welds or other defects. Each part will be in good working order and in a condition similar to that of original manufacture. Damaged shoring equipment will not be used for shoring. Any part which cannot be brought into proper alignment or contact with the part, into or onto which it is intended to fit, will be "Red-Tagged", removed and replaced.

Erected shoring equipment will be inspected by the worker immediately before, during, and immediately after the placement of concrete to decide the shoring equipment meets the needs named on the formwork drawings. Acceptable shoring will be "Green-Tagged". Any shoring found to be damaged or weakened must be immediately reinforced or re-shored.

Re-shoring will be provided when necessary to safely support slabs and beams after stripping or whenever the concrete is required to support loads in excess of its capacity.

Temporary storage of reinforcing rods, materials, or equipment on top of formwork is banned unless these temporary structures have been designed or strengthened to support the added load. Eccentric loads on shore heads and similar members will be restricted unless these members are designed for such loads.

Frame Shoring

Frame shoring (tubular welding and tube and coupler) will not be loaded beyond the safe working load recommended by the manufacturer. Frame shoring will be designed with a minimum safety factor of 2.5.

Locking devices on frames and braces will be in good working order; coupling pins will align the frame or panel legs; pivoted cross braces will have their center pivot in place and parts will be in good serviceable condition. Couplers (tube and couple shoring) will be of a type of metal such as drop- forged steel, malleable iron, or structural grade aluminum; gray cast iron will not be used. Couplers that are deformed, broken, or have defective or missing threads or bolts will not be used. Frames and braces found to be defective or damaged will be "Red-Tagged" and removed from service.

Following erection, a thorough inspection will be made to verify that:

- The shoring has been erected as shown on the layout drawing
- Spacing between towers and cross brace spacing does not exceed that shown on the layout, and that all-locking devices are in the closed position
- The devices for attaching the external lateral stability bracing are securely fastened to the legs of the shoring frame
- Interlocking tubular members and coupling are properly installed and tightened
- Base plates, shore heads, extension devices, or adjustment screws are in firm contact with the footing sill and the form
- Acceptable shoring will be "Green-Tagged"

The following general safety precautions will apply to frame shoring:

- Follow the shoring layout drawing and do not omit needed parts
- Do not exceed the shore frame spacing or tower heights as shown on the shoring layout
- The shoring load must be carried on all legs
- Plumb and level shoring frames as the erection continues and check plumb and level of shoring towers just before pour.
- Do not force braces on frames to fit level the shoring towers until proper fit can be made easily
- Tie high towers of shoring frames together with sufficient braces to make a rigid, solid unit. Shoring must always be secured when the height of the shoring towers exceeds four times the minimum base width. California (and other states) requires a height-to-minimum base width ratio of three to one (3:1). Refer to the governing codes for your job location
- Exercise caution in erecting or taking apart freestanding shoring towers to prevent tipping
- Do not climb cross braces
- Use screw jacks to adjust for uneven grade conditions, to level and accurately position the falsework, and to aid stripping
- Do not exceed the manufacturer's recommended maximum extension of screw jacks. Keep screw jack extensions to a minimum for maximum load carrying capacity

- Make certain that screw jacks are firmly in contact with the foundation and frame legs
- Screw jacks will not be used to raise formwork during concrete placement

Single-Post Shores

Single-post shoring layout will provide for the maximum intended loading with a minimum safety factor of three. When single-post shores are to be used in more than one tier, they will be designed and inspected by a registered structural engineer.

Single-post shores will be horizontally braced in both the longitudinal and transverse directions and will also be braced diagonally. The bracing will be installed as the shores are being erected.

Single-post shoring layouts will be horizontally braced in both the longitudinal and transverse directions and will also be braced diagonally. The bracing will be installed as the shores are being erected.

Single-post shores and adjusting devices will be inspected before use. Fabricated shores and adjusting devices will not be used if heavily rusted, bent, dented, re-welded, damaged, or deficient in any manner. Timber shores and timber components of fabricated shores will not be used if split, knotted, broken, or otherwise structurally deficient.

Base plates and shore heads of single-post shores will be in firm contact with the footing sill and the form material.

Adjustment of single-post shores will not be made after the concrete is in place.

Releasing and Moving Forms

Forms will be securely attached to wire rope slings (lifting equipment should have a minimum safety factor between 8-9), when raised or moved by crane or other mechanical lifting devices. Panels and form sections will be equipped with hoisting brackets or attachments for slings.

Loose tools and materials will be removed before moving the forms. Taglines for controlling forms will be used whenever necessary to protect workers or structures.

Workers are not allowed to ride forms or form scaffolding being raised or moved.

Vertical and overhead forms will not be released until adequately braced or secured. Workers at lower levels exposed to falling materials will be removed to a safe area before release or moving forms.

Forms, shores, and bracing (except those used for slab on grade and slipforms) will not be removed until the concrete has gained enough strength as listed in the contract specifications or shown on the form drawings.

Concrete Tools and Conveyance Systems

Concrete buckets will have positive safety latches or similar safety devices installed to prevent premature or accidental dumping. Manually operated gates will be of the self-closing type. Riding the concrete bucket is restricted. Raised concrete buckets will be routed so no worker, or the fewest number possible, are exposed to the hazard of falling concrete buckets. An appointed qualified signal person will provide direction to the crane operator using the standard hand signals or radio communications that are common to the industry. Cranes and rigging must comply with AMS policies outlined in AMS safety procedure (Cranes) as well as local or federal regulations.

Handles on bull floats used where they can contact energized electrical conductors must be made of nonconductive material or insulated with a nonconductive sheath that will protect the operation from electrical shock.

Powered and rotating type concrete troweling machines that are manually guided must be equipped with a control switch that has a positive mechanical release (dead-man switch) that automatically stops trowel rotation when the operator removes their hand from the equipment handle.

Handles of concrete buggies must not extend beyond the wheels on either side of the buggy. Motorized concrete buggies will be equipped with a dead-man control switch and knuckle guards. Stop- checks will be used at all places where buggies dump.

Runways will be of sturdy construction, evenly supported and will have a smooth-running surface and curbs (2" x 2" or 4" x 4"). Where necessary, runways will have a railing high enough on the open side to protect workers. If a single runway is used, turnarounds will be provided. Buggies will be routed in a continuous loop to lessen the danger of collision.

Sections of tremies and similar concrete conveyances will be secured with wire rope or equivalent material as well as the regular coupling. Concrete trucks must not travel through the job site with the chute extended. When unloading on a slope, the wheels of the concrete truck will be blocked, and the brakes set to prevent movement.

Concrete mixers with one cubic yard or larger loading skips will be equipped with a mechanical device to clear the skip of material. Skip clearing will not be performed by a worker standing under or near a raised skip while striking it with a handheld tool. Guardrails will be provided on each side of the dangerous area under the raised skip

Grid-guards will be installed on all motor, plaster, or fireproof mixers of one-yard capacity or smaller. Any guards will be in place before the mixer is ran. The mixer will be locked out when work (i.e., clean out) is performed on the mixer.

Bulk cement storage structures will be equipped with conical or tapered bottoms, and mechanical or pneumatic means of starting the flow of material. No worker will be allowed to enter storage facilities unless the ejection system has been shut down, locked out and tagged to suggest the ejection system is not to be worked.

Masonry saws will be guarded with a semicircular enclosure over the blade.

No worker will be allowed to perform maintenance or repair activities on equipment (i.e., mixers, screens or pumps used for concrete and masonry construction) where the unplanned operation of the equipment could occur and cause injury, unless all known potentially hazardous energy sources have been locked out and tagged.

Concrete Pump Trucks

Concrete pump trucks and parts (pump, boom, piping) will be inspected by the manufacturer's instructions and found to be in safe working condition. Concrete pumps will be equipped with an emergency shut off.

Trucks will be positioned so any obstacles (power lines, ditches, walls, and columns) do not interfere with safe operation. Whenever possible, at least 17 feet clearance will be kept from power lines. Never less than 10 feet of clearance will ever occur.

Visual communication between the pump operator and the placement area will be kept, or a signalperson will be used to assume safe placement of concrete.

Outriggers must be extended and locked into place and kept away from un-supportive surfaces. Pads or dunnage will be used as necessary to stabilize the crane. Raised tires will be blocked to prevent unnecessary bouncing or rolling.

The boom must never be allowed to contact deck forming or near structures.

Clamps, pipes, safety straps, and restraining devices on hoses suspended from booms will be inspected.

Concrete pumps will not be worked unless the hopper is guarded. Workers will not place hands or objects in the hopper unless it is locked out.

Pumping line clean out operation must conform to the manufacturer's and will be conducted in a named area. The use of the compressed air procedure for cleaning pumping lines is restricted.

Masonry Construction

A limited-access zone will be set up whenever a masonry wall is being built. The limited-access zone will be set up before building the wall and will be equal to the height of the wall being built, plus four feet, and will run the entire length of the wall.

The limited-access zone will be set up on the side of the wall opposite the scaffolding.

Employees who are building the wall may enter the limited access zone but will not allow other employees to enter. The limited-access zone will remain in place until the wall is adequately supported to prevent overturning or collapse.

Masonry walls over eight feet in height will be adequately braced and supported so they will not overturn or collapse. Limited-access zones and bracing will remain in intact until permanent supporting elements of the structure are in place.

Scaffolding for masonry construction will meet or exceed local or federal jurisdictions and AMS safety procedure (Scaffolds).

Health Hazard

The cutting, grinding, drilling, and finishing of concrete and masonry poses a potential silica dust hazard. Each employer must warn employees about the hazards posed by silica dust. Where concrete tools (jackhammers, masonry saws, grinders, etc.) disturb masonry and concrete products, engineering or work practice controls must be implemented to reduce (silica) dust. When engineering or work practice controls are not possible, employees exposed to dust will use respiratory protection. Suggested engineering controls and work practice controls for preventing silica dust is as follows:

- Post Warning Signs
- Employ wet methods
- Connect the tool to a point-of-operation dust collection system
- Limit the number of workers in the work area (workers who are in the area must use respiratory protection)
- Contain the work area with barricades and similar devices
- Use a ventilation system that removes and collects dust (workers in containment must use respiratory protection). Point exhaust away from other workers

Concrete and masonry cement are irritating to the eyes and skin. Protective equipment such as gloves, rubber boots, kneepads, and protective eyewear must be used when handling concrete. Washing with soap and water is important to prevent skin irritation. Hands will not be washed in a bucket of water used for moistening and washing concrete tools.

Safety data sheets (SDS) will be available for concrete and masonry products that will be used or disturbed. SDSs are needed for form-release agents, concrete additives, or cure agents. All containers will be labeled.

Training

Workers working with or near concrete and masonry operations may not work until the following training has been completed and documented.

- Concrete Operation and Safety Procedures
- Proper tool use, inspection, and maintenance
- Health Hazards associated with concrete and masonry
- Required PPE and clothing
- Sanitation and Decontamination Procedures
- Hazard Communication
- Fall Protection
- Vehicle Safety
- Access Zones and Traffic Control

PURPOSE

This program is intended to provide ALLEN MECHANICAL SERVICES-AMS, hereafter referred to as "AMS", and/or Subcontracted Companies performing this type of work with guidelines for the safe operation, use, and inspection of mobile cranes and hoists. This policy applies to wheel mounted cranes of both truck and self- propelled wheel type, and any variations thereof that retain the same fundamental characteristics used at AMS controlled work locations where AMS workers are performing work.

Functional Description: Can hoist, lower, and horizontally move a suspended load.

Examples:

- Articulating cranes (such as knuckle-boom cranes)
- Crawler cranes
- Floating cranes
- Cranes on barges
- Locomotive cranes
- Mobile cranes (such as wheel-mounted, rough-terrain, all-terrain, commercial truck- mounted, and boom truck cranes)
- Multi-purpose machines when configured to hoist and lower (by means of a winch or hook) and horizontally move a suspended load
- Industrial cranes (such as carry-deck cranes)
- Dedicated pile drivers
- Service/mechanic trucks with a hoisting device
- Crane on a monorail
- Tower cranes (such as fixed jib ("hammerhead boom"), luffing boom and self-erecting)
- Pedestal cranes
- Portal cranes
- Overhead and gantry cranes
- Straddle cranes
- Side boom cranes
- Derricks

DEFINITIONS

Accessory - A secondary part or assembly of parts which contributes to the overall function and usefulness of a machine.
Axis of Rotation - The vertical axis around which the crane superstructure rotates.
Base - The traveling base or carrier on which the rotating superstructure is mounted such as a car, truck, crawlers, or wheel platform.
Boom Angle - The angle between the horizontal and longitudinal centerline of the boom. The boom longitudinal centerline is a straight line between the boom foot pin (heel pin) centerline

and boom point sheave pin centerline.
Boom crane - Member hinged to the front of the rotating superstructure with the outer end supported by ropes leading to a gantry or A-frame and used for supporting the hoisting tackle.
Boom Hoist - A hoist drum and rope reeving system used to raise and lower the boom. The rope system may be all live reeving or a combination of live reeving and pendants.
Boom Stop - A device used to limit the angle of the boom at the highest position.
Brake - A device used for retarding or stopping motion by friction or power means.
Cab - A housing which covers the rotating superstructure machinery and/or operator's station. On truck-crane trucks a separate cab covers the driver's station.
Clutch - A friction, electromagnetic, hydraulic, pneumatic, or positive mechanical device for engagement or disengagement of power.
Counterweight - A weight used to supplement the weight of the machine in providing stability for lifting working loads.
Crane Safe Work Permit - The permit issued by the Site Supervisor or Crane Competent Person at the job site to the crane operator before any mobile hoisting work is performed. **Critical Lift** - A lift where:

- The load exceeds 75% of the crane's capacity.
- Two booms are required.
- Personnel are being lifted.
- Any lift in a Critical Lift Area.

Designated - selected or assigned by AMS or a representative of AMS as being qualified to perform specific duties.
Drum - Cylindrical members around which ropes are wound for raising and lowering the load or boom. **Dynamic** - loads introduced into the machine or its components by forces in motion for hoisting and lowering loads.
Gantry - Structural frame, extending above the superstructure, to which the boom support ropes are reeved. **Jib** - An extension attached to the boom point to provide added boom length for lifting specified loads. The Jib may be in line with the boom or offset to various angles.
Load (working) - the external load, in pounds, applied to the crane, including the weight of load- attaching equipment such as load blocks, shackles, and slings.
Load block [lower] - the assembly of hook or shackle, swivel, sheaves, pins, and frame suspended by the hoisting ropes.
Load block [upper] - the assembly of hook or shackle, swivel, sheaves, pins, and frame suspended from the boom point.
Load hoist - A hoist drum and rope reeving system.
Load Ratings - Crane ratings in pounds established by the manufacturer.
Locomotive Crane - Consists of a rotating superstructure with power-plant, operating machinery, and boom, mounted on a base or car equipped for travel on railroad track. It may be self-propelled or propelled by an outside source.
Mobile Hoisting Equipment - Conventional rigid boom cranes, hydraulic cranes, and flex lifts. **Outriggers** - Extendable or fixed metal arms, attached to the mounting base, which rest on supports at the outer ends.
Reeving - A rope system in which the rope travels around drums and sheaves.

Rigging - Any cables, chokes, slings, hooks, beams, spreaders, or other device used to attach or lift the load.
Rope - a wire rope unless otherwise specified.
Side Loading - A load applied at an angle to the vertical plane of the boom.
Superstructure - The rotating upper frame structure of the machine and the operating machinery mounted thereon.
Swing - the rotation of the superstructure for movement of loads in a horizontal direction about the axis of rotation.
Swing Mechanism - The machinery involved in providing rotation of the superstructure.
Tackle - Assembly of ropes and sheaves arranged for hoisting and pulling.
Truck Crane - Consists of a rotating superstructure with power plant, operating machinery, and boom, mounted on an automotive truck equipped with a power plant for travel.
Wheel Mounted Crane - Consists of a rotating superstructure with power plant, operating machinery, and boom, mounted on a base or platform equipped with axles and rubber-tired wheels for travel. The base is usually propelled by the engine in the superstructure, but it may be equipped with a separate engine controlled from the superstructure.
Whip line - A separate hoist rope system of lighter load capacity and higher speed than provided by the main hoist.
Winch Head - A power driven spool for handling loads by means of friction between fiber or wire rope and spool.

RESPONSIBILITIES

Site Supervisor

The Site Supervisor or their designate is responsible for assuring that:

- Workers know, understand, and comply with the requirements of this policy.
- Workers are trained in the procedures and use of equipment they are to use to complete the job.
- Audit and inspect for compliance with this policy.
- Each crane is on a regular (daily, monthly, annual) inspection schedule.
- Proof of regular inspections using the checklist in this policy is available.
- Rental or leased cranes have a valid annual certification sticker or other documents prior to the use of the cranes.
- Competent, qualified operators are used when lifting.
- A Crane Safe Work Permit is issued for the following:
    - All lifts with cranes have a capacity greater than 10 tons.
    - All critical lifts.
- Joint responsibility with the crane operator for the safe operation of the crane(s) and the safety of the lift is maintained.
- Failure to comply with this policy will result in disciplinary action, up to and including discharge.

Crane Operators

The crane operator will be designated by AMS and is responsible for:

- Knowing, understanding, and complying with this policy.
- Inspecting cranes daily and reporting defects noted during these inspections.
- Reporting any unsafe conditions to supervision.
- Knowing the weight of loads PRIOR to lifting.
- Knowing the wind speed PRIOR to lifting.
- Performing a daily inspection using the Daily Operators Inspection Report at the beginning of each day's work PRIOR to the crane use. Any deficiencies that affect the safe operations of the crane shall be repaired PRIOR to use. Each daily inspection report shall remain with the operator during the operation of the crane and will be turned in at the end of the workday.
- Perform a lifting job specific pre-task assessment using Operators Lift Pre-Task Safety Assessment for each lift.
- Ensure the load, rigging, procedures, and lifts are safe to use. The operator is responsible for the load and lift when the crane is connected to the load.
- Assume joint responsibility with the Site Supervisor for the safe operation of the crane(s) and the safety of the lift.
- Understand that failure to comply with this policy will result in disciplinary action, up to and including discharge.

PROCEDURES

Pre-Lift

- The manufacturer's lifting procedures and methods shall always be observed.
- No modifications or additions which affect the capacity or safe operation of the equipment shall be made by AMS or its workers without the manufacturer's written approval. If such modifications or changes are made, the capacity, operation, and maintenance instruction plates, tags, or decals, shall be changed accordingly. In no case shall the original safety factor of the equipment be reduced.
- All cranes shall have a qualified competent operator.
- Inspect cranes when they arrive on site for mechanical integrity, load chart, operating manual, and annual certification decal/sticker.
- The crane operator must complete an Operator's Lift Pre-Task Assessment and Mobile Hoisting Safe Work Procedure PRIOR to lifting.
- Rated load capacities recommended operating speeds, special hazard warnings, or instructions shall be in a conspicuous place on all equipment, as required, and shall be visible to the operator while at the control station.
- Inspect all rigging devices before use. Follow manufacturer's capacities and recommendations.
- Obtain a Crane Safe Work Permit for all cranes with capacities of 10 tons or more and critical lifts.
- Work with lifts, cranes, or any hoisting equipment must always be supervised.
- The rear of the rotating superstructure of a crane will be barricaded to warn of the pinch point hazard.
- The area where an overhead lift is made will be barricaded if personnel can have access and walk under the load.
- Load block, headache ball, hooks, boom tip, and anti-2 block devices shall be marked

with highly visible fluorescent orange paint.

- All jibs shall have positive stops to prevent their movement of more than 5 degrees above the straight line of the jib and boom on conventional type crane booms. The use of cable type belly slings does not constitute compliance with this rule.

Lifting

- Hand signals to crane operators shall be those prescribed by the applicable ANSI standard for the type of crane in use. An illustration of the signals shall be posted at the job site.
- All workers shall be kept clear of loads about to be lifted and of suspended loads.
- There shall be no sudden acceleration or deceleration of the moving load.
- Side loading of booms shall be limited to freely suspended loads. Cranes shall not be used for dragging loads sideways.
- No hoisting, lowering, swinging, or traveling shall be done while anyone is on the load or hook.
- On truck-mounted cranes, no loads shall be lifted over the front area except as approved by the crane manufacturer.
- The operator shall test the brakes each time a load approaching the rated load is handled by raising it a few inches and applying the brakes.
- Outriggers shall be used when the load to be handled at that particular radius exceeds the rated load without outriggers as given by the manufacturer for that crane. Where floats are used, they shall be securely attached to the outriggers.
- Wood blocks used to support outriggers shall:
  - Be strong enough to prevent crushing.
  - Be free from defects.
  - Be of sufficient width and length to prevent shifting or toppling under load.
- Neither the load nor the boom shall be lowered below the point where less than 2 full wraps of rope remain on their respective drums.
- When two or more cranes are used to lift one load, one designated person shall be responsible for the operation. They shall be required to analyze the operation and instruct all personnel involved in the proper positioning, rigging of the load, and the movements to be made.
- In transit the following additional precautions shall be exercised:

  - The boom shall be carried in line with the direction of motion.
  - The superstructure shall be secured against rotation, except when negotiating turns when there is an operator in the cab or
  - The boom is supported on a dolly.

The empty hook shall be lashed or otherwise restrained so that it cannot swing freely.

- Before traveling a crane with load, a designated person shall be responsible for determining and controlling safety. Decisions such as position of load, boom location, ground support, travel route, and speed of movement shall be in accord with their

determinations.

- A crane with or without load shall not be traveled with the boom so high that it may bounce back over the cab.
- When rotating the crane, sudden starts and stops shall be avoided. Rotational speed shall be such that the load does not swing out beyond the radii at which it can be controlled. A tag or restraint line shall be used when rotation of the load is hazardous.
- When a crane is to be operated at a fixed radius, the boom-hoist pawl or other positive locking device shall be engaged.
- Ropes shall not be handled on a winch head without the knowledge of the operator.
- While a winch head is being used, the operator shall be within convenient reach of the power unit control lever.
- The operator shall not be permitted to leave his position at the controls while the load is suspended.
- No person should be permitted to stand or pass under a load on the hook.
- If the load must remain suspended for any considerable length of time, the operator shall hold the drum from rotating in the lowering direction by activating the positive controllable means of the operator's station.

Other Requirements

- Cranes shall not be operated without the full amount of any ballast or counterweight in place as specified by the manufacturer, but truck cranes that have dropped the ballast or counterweight may be operated temporarily with special care and only for light loads without full ballast or counterweight in place. The ballast or counterweight in place specified by the manufacturer shall not be exceeded.
- Necessary clothing and personal belongings shall be stored in such a manner as to not interfere with access or operation.
- Tools, oil cans, waste, extra fuses, and other necessary articles shall be stored in the toolbox and shall not be permitted to lie loose in or about the cab.
- Refueling with small portable containers shall be done with an approved safety type can equipped with an automatic closing cap and flame arrester.
- Machines shall not be refueled with the engine running.
- A carbon dioxide, dry chemical, or equivalent fire extinguisher shall be kept in the cab or vicinity of the crane.
- Operations and maintenance personnel shall be familiar with the use and care of the fire extinguishers provided.

Crane Maintenance, Repairs and “Out of Service” Procedures

Prior to making repairs or adjustments to a crane, specific procedures shall be followed, and precautions taken:

- Move the crane to be repaired to a place where it will cause the least interference with other cranes and operations in the area.
- Set all controllers to the off position.
- Open the main or emergency switch and lock it in the open position.

- Place prominent warning or "out of order" signs on the crane so that they are in plain sight of workers in the area.
- After repairs and adjustments are completed, replace all guards, reactivate all safety devices, and remove maintenance equipment before operating the crane.
- All maintenance and repair workers will be competent and qualified to perform essential duties and tasks.

Operations Near Overhead Electrical Lines

Except where electrical distribution and transmission lines have been de-energized and visibly grounded at point of work or where insulating barriers, not a part of or an attachment to the equipment or machinery, have been erected to prevent physical contact with the lines, equipment or machines shall be operated proximate to power lines only in accordance with the following:

Could you get within 20 feet of ANY power line? If the answer is NO, there is no further action required. If the answer is YES, then you have 3 options:

1. De-energize & Ground
2. Maintain 20-foot clearance
3. Ask Utility for Voltage and use Table A (with minimum clearance distances)

If you chose option 2 or 3 then Encroachment Prevention Measures need to be implemented including, a planning meeting, if tag lines are used then non-conductive, elevated warning lines, barricade, or line of signs, plus choose one: Proximity alarm, spotter, warning device, range limiter, or insulating link

Table A – Minimum Clearance Distances

Voltage (nominal, kV, alternating current)	Minimum clearance distance (feet)
up to 50	10
over 50 to 200	15
over 200 to 350	20
over 350 to 500	25
over 500 to 750	35
over 750 to 1000	45
over 1000	(As established by the power line owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution)

- If you intentionally work closer than the Table A Zone, you must show that:
  - Staying outside the zone is infeasible
  - It is infeasible to de-energize and ground and the following is required:

    - Power line owner – **sets minimum approach distance**
    - Planning meeting – minimum procedures
    - Dedicated spotter
    - Elevated warning line or barricade
    - Insulating link/device
    - Nonconductive rigging
    - Range limiter (if equipped)
    - Nonconductive tag line (if used)
    - Barricades - 10 feet from equipment
    - Limit access to essential workers
    - Prohibit non-operator workers from touching above insulating link
    - Properly ground crane
    - Deactivate automatic re-energizer
    - Insulating line cover-up installed

- Electric Utilities – employers whose workers are qualified to perform power distribution and transmission work are considered to be in compliance with §§ 1926.1407-1926.1411 of subpart CC (power lines sections) when performing subpart V work in accordance with § 1910.269. (§ 1926.1400(g)).
- A worker shall be designated to observe clearance of the equipment and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means.
- Cage-type boom guards, insulating links, or proximity warning devices may be used on cranes, but the use of such devices shall not alter the requirements of any other regulation of this part even if such device is required by law or regulation.
- Any overhead line shall be considered to be an energized line unless and until the person owning such line or the electrical utility authorities indicate that it is not an energized line, and it has been visibly grounded.
- Prior to work near transmitter towers where an electrical charge can be induced in the equipment or materials being handled, the transmitter shall be de-energized, or tests shall be made to determine if electrical charge is induced on the crane.

The following precautions shall be taken when necessary to dissipate induced voltages:

- The equipment shall be provided with an electrical ground directly to the upper rotating structure supporting the boom.
- Ground jumper cables shall be attached to materials being handled by boom equipment when electrical charge is induced while working near energized transmitters.
- Crews shall be provided with nonconductive poles having large alligator clips or other similar protection to attach the ground cable to the load.

- Combustible and flammable materials shall be removed from the immediate area prior to operations.
- Identify work zone by marking boundaries or ensure that clearance of 360 degrees around the crane up to the maximum working address.

Inspection Requirements

The Crane Operator and the Crane Competent Person are responsible for performing inspections using Daily Operators Inspection Report - Mobile Crane Operation, Monthly Hydraulic Crane Inspection Report, and Monthly Inspection of Truck Cranes.

Inspection of critical components of the crane shall be performed at least monthly.

Assessment of ground conditions must be conducted prior to set-up and operation. A competent person on site will ensure that the flooring on which equipment may be placed is substantial enough to safely hold the weight of the load per the manufacturer's specifications. If the strength of the floor is unknown and/or cannot be determined, a professional engineer will determine the pounds per square foot required and, if necessary, the appropriate shoring to be installed to sustain the weight. Cranes will not be used unless grounding conditions can support the equipment and all supporting material and all conditions meet manufactures' requirements.
Components inspected shall include crane hooks and safety latches, brakes and braking components, and ropes.

Inspection records shall be filed and maintained by the INSERT TITLE at AMS's main office. Crane certification records shall include the inspection date, signature of the inspector, and identification of the component by serial number or another identifier. This certification record shall be maintained so that it is readily available for inspection and confirmation.

A written record also shall be maintained of reports showing rated load test procedures and confirming the adequacy of repairs or alterations.

Test loads shall not exceed 110 percent of the rated load at any selected working radius.

If re-rating is required, crawler, truck, and wheel-mounted cranes shall be tested in accordance with SAE Recommended Practice, Crane Load Stability Test Code J765 (2017). Re-rating test report shall be readily available.

No re-rating in excess of a crane's original load rating shall be performed unless the manufacturer or designated technician who is in charge of final assembly gives their approval in writing. Such written approval shall be maintained in a file by the INSERT TITLE.

A thorough annual inspection of the hoisting machinery shall be made by a competent person, or by a government or private agency recognized by the U.S. Department of Labor.

AMS shall maintain a record of the dates and results of inspections and rated load tests for each

hoisting machine and piece of equipment.

Any defects found will be repaired by a qualified person before the crane is used.
Before a crane is placed in service for use, rope components shall be inspected by a qualified person for defects, damage, and deformities and at least monthly thereafter.

Certification of this inspection shall be in writing and document the date of inspection; inspector's name and signature, and identification number of the rope component inspected.

Inspection of Wire Rope

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

- In running ropes, 6 randomly distributed broken wires in 1 lay or 3 broken wires in one strand in one lay.
- Wear of 1/3 the original diameter of outside individual wires.
- Kinking, crushing, bird caging, or any other damage resulting in distortion of the rope structure.
- Evidence of any heat damage from any cause.
- Reductions from nominal diameter of more than 1/64 inch for diameters up to and including 5/16-inch, 1/32 inch for diameters 3/8 inch to and including 1/2-inch, 3/64 inch for diameters 9/16 inch to and including 3/4-inch, 1/16 inch for diameters 7/8 inch to 1 1/8 inches inclusive, 3/32 inch for diameters 1 1/4 to 1 1/2 inches inclusive.
- In standing ropes, more than 2 broken wires in 1 lay in sections beyond end connections or more than 1 broken wire at an end connection.
- Wire rope safety factors shall be in accordance with American National Standards Institute ASME B 30.5-2018 or SAE J959-2012.

Heavy wear and/or broken wires may occur in sections that have contact with equalizer sheaves or other sheaves (where rope travel is limited) or with saddles. Specific care shall be taken to inspect ropes at these locations.

If rope has not been used for a month or longer (i.e., due to shut down or storage of a crane on which it is installed) this rope shall be given a thorough inspection before it is used.

This inspection shall be made by a designated worker who is authorized by AMS.

This inspector shall examine rope for any kind of damage, deterioration or defect that might compromise the safety and specifications of the rope. Specific attention and care shall be given to the inspection of non-rotating rope.

Only this designated and authorized inspector shall give approval for use of this rope following satisfactory safety inspection as described above.

A written record of the inspector's certification shall be maintained by the Safety Coordinator in a file and be readily available for review and confirmation. This certification shall include the inspection date, name, and signature of the inspector, and the identification number of the rope component that was inspected.

Inspection of Hoist Chains

Hoist chains and end connections shall be inspected daily for damage, deterioration, excessive wear, twist, distorted links interfering with proper function, or stretch beyond manufacturer's recommendations.

Chains shall be inspected visually by the operator each day or before use.

Chains also shall be inspected monthly for safety certification. The written certification shall include the date of inspection, name, and signature of the inspector, and the identification number of the chain that was inspected. Written certification records shall be maintained by the Safety Coordinator in a file.

Inspection of Hooks and Hook Components

Crane hooks and safety latches shall be visually inspected each day or at the beginning of a shift prior to use for damage, cracks, or deformation.

Hooks and safety latches also shall be inspected monthly for safety certification. The written certification shall include the date of inspection, name, signature of the inspector, and the identification number of the hook that was inspected. Written certification records shall be maintained by the Safety Coordinator.

Hooks that have cracks or a throat opening that is greater than 15 percent in excess of normal or more than 10- degree twist from the plane of the unbent hook shall be discarded.

Preventive maintenance

AMS has implemented a preventive maintenance program to help ensure the safety of cranes, hoists, rigging, and related equipment. Preventive maintenance shall be performed in accordance with the manufacturer's recommendations. Each crane shall have a written record of preventive maintenance that is maintained by the Safety Coordinator.

Type of Inspection	Who?
Modified or repaired/adjusted	Qualified person
Post-assembly	Qualified person
Shift	Competent person
Monthly	Competent person
Annual	Qualified person

- Inspections – all documentation required by the inspection provisions must be available to all inspectors performing required inspections (including wire rope inspections).

- Pre-Erection Inspection for Tower Cranes – inspection of crane components shall be performed after transportation to the work site and prior to erection of the crane.
- Operations procedures must be developed by a qualified person when the manufacturer's procedures are unavailable.
- Procedures related to the capacity of the equipment must be developed by a registered professional engineer (familiar with the equipment) when the manufacturer's procedures are unavailable.
- This information must be readily available in the crane cab.
- Operators cannot be engaged in activities that distract their attention while operating the equipment (for example, no cellular phone use unless used for signaling).

Training Requirements for Crane Operators

All Crane Operators must be trained to recognize and avoid hazards. Training must be provided to the worker in a manner where they can understand it whether it be oral/written training. Training must also be provided in a language that the worker understands. Training will be conducted on the requirements of this policy annually, whenever this policy is revised, and for new crane operators or newly hired operators.

If the job has multiple lifts this policy will be reviewed once prior to starting the job. All new crane operators and rigging crew members will review this policy prior to starting work.

Acceptable types of training to verify crane operators are qualified to perform their tasks:

- Accredited Testing
- Audited Employer Program
- US Military
- State/Local License

	PORTABLE	VALIDITY PERIOD
Accredited testing Organization	YES *	5 years
Audited Employer Program	NO	5 years
U.S. Military license	NO *	Set by issuing entity
State/local license	NO * Valid only in jurisdiction	Set by issuing entity, not > 5 years

* Subject to State & Local requirements and whether the military/state training meets accredited requirements.

Assembly/Dis-Assembly

(INSERT NAME OF COMPETENT/QUALIFIED PERSONS HERE), must be competent and qualified and must:

- Understand procedures
- Review procedures
- Check that crew members understand their tasks/hazards
- Follow manufacturer's prohibitions
- All rigging work is done by a Qualified Rigger
- When using outriggers, fully extend OR deploy as per the load chart

Qualified Riggers

All riggers of AMS or riggers supplied by a contractor will be qualified person for the performance of specified hoisting activities such as during assembly/disassembly work and those that require workers to be in the fall zone to handle a load. The rigger would be considered qualified through possession of a recognized degree, certificate, or professional standing; or by extensive knowledge, training, and experience, successfully demonstrating the ability to solve/resolve problems related to rigging work and related activities.

Signal Persons

- Qualification Requirements:
  - Know & understand signals
  - Competent in using signals
  - Basic understanding of crane operation
  - Verbal or written test plus practical test

Qualified How	Documentation	Portable
Third party qualified evaluator	Yes	Yes
Employer qualified evaluator	Yes	No

Safety Devices

- Safety devices are required and must always be operational, including:

  - Crane level indicator
  - Boom/Jib stops (except derricks)
  - Integral holding device/check valve for outrigger and stabilizer jack

Operational aids are required but temporary alternative measures are also allowed while operational aids are being repaired.

- **Category I Devices**
  - Boom hoist limiting device, luffing jib limiting device, and anti-two- blocking device. Replacement of parts**:** Must be repaired within 7 calendar days of discovery of deficiency unless AMS documents parts are ordered within 7 calendar days.
- **Category II Devices**
  - Boom angle or radius indicator, boom length indicator, load weighing devices, jib angle indicator, outrigger/stabilizer position sensor/monitor, and hoist drum rotation indicator.
  - Replacement of parts**:** Must be repaired within 30 days of discovery of deficiency.
  - Exception: employer has documented that it ordered the part and then repaired the equipment within 7 days of receipt of the replacement part.

- When any necessary repairs or adjustments are needed for the equipment and alternative methods are being implemented, the employer must communicate this information to all affected workers at the beginning of each shift. (§ 1926.1417(j))

Tower Cranes

Some supplemental requirements for Tower Cranes:

- Foundations & structural supports
  - Design & Inspection
- Plumb tolerance
  - Specification & verification
- Climbing procedures
  - Host structure strength verification
  - Wind
- Post-erection load test
- Monthly Inspection: tower mast bolts, upper-most tie-in, braces, floor supports, floor wedges

Required Documentation Includes:

- Monthly & annual inspection reports for the equipment and wire rope
- Modifications that affect the safe use of the equipment
- Operator and signal person qualifications
- Tower crane foundation/support design
- When repairs or adjustments of the equipment are needed
- Employer-developed procedures (i.e., assembly/disassembly, operational, and other procedures related to the safe operation of the equipment)
- Power line encroachment procedures/plan

DEMOLITION AND BLASTING SAFETY

PURPOSE and SCOPE

Construction workers performing demolition work are exposed to many hazardous conditions and materials. Although a contractor may be concerned about safety, there should also be heightened awareness for the safety of the general public and the property of others.

PROCEDURES

Before the start of every demolition job, ALLEN MECHANICAL SERVICES-AMS, hereafter referred to as "AMS", shall take a number of steps to safeguard the health and safety of workers at the job site. These preparatory operations involve the overall planning of the demolition job, including the methods to be used to bring the structure down, the equipment necessary to do the job, and the measures to be taken to perform the work safely. Planning for a demolition job is as important as actually doing the work. Therefore, a competent (or qualified in some jurisdictions) person experienced in all phases of the demolition work to be performed shall perform all planning work.

Pre-Demolition/Engineering Survey

Prior to starting a demolition operation, a written pre-demolition survey or engineering survey of the structure must be performed. The purpose of this survey is to determine the condition of the framing, floors, and walls so that measures can be taken, if necessary, to prevent the premature collapse of any portion of the structure. In addition, the survey will identify designated/hazardous substances, physical hazards, and health hazards, etc. When indicated, any adjacent structure(s) or improvements shall also be similarly checked. AMS will maintain a written copy of this survey. Photographing existing damage in neighboring structures will also take place by the competent/qualified person designated.

The pre-demolition survey or engineering survey provides AMS with the opportunity to evaluate the job in its entirety. AMS shall plan for the demolition of the structure, the equipment to do the work, manpower requirements, and the protection of the public. The safety of all workers on the job site will be a prime consideration. During the preparation of the pre-demolition survey or engineering survey, AMS shall plan for potential hazards such as fires, cave-ins, and injuries. If the structure to be demolished has been damaged by fire, flood, explosion, or some other cause, appropriate measures, including bracing and shoring of walls and floors, shall be taken to protect workers and any adjacent structures. It shall also be determined if any type of hazardous chemicals, gases, explosives, flammable material, or similar dangerous substances have been used or stored on the site. If the nature of a substance cannot be easily determined, samples shall be taken and analyzed by a qualified person prior to demolition.

Prior to starting work, a qualified person will identify health hazards associated with all demolition and blasting activities. A hazard assessment will be conducted with appropriate control plans implemented to protect workers from identified or potential hazards. Personal Protective Equipment (PPE) will be provided and worn as identified in the assessment. This may include proper hearing protection for excess noise during demolition or blasting operations. Communication of potential health hazards will be shared with all affected workers prior to beginning work.

Utility Location

One of the most important elements of the pre-job planning is the location of all utility services. All electric, gas, water, steam, sewer, and other service lines shall be shut off, capped, or otherwise controlled, at or outside the building before demolition work is started. In each case, any utility company that is involved shall be notified in advance, and its approval or services, if necessary, shall be obtained.

If it is necessary to maintain any power, water, or other utilities during demolition, such lines shall be temporarily relocated as necessary and/or protected. The location of all overhead power sources shall also be determined, as they can prove especially hazardous during any machine demolition. All workers shall be informed of the location of any existing or relocated utility service. The telephone numbers of the local police, ambulance, and fire departments shall be available at each job site. This information can prove useful to the job supervisor in the event of any traffic problems, such as the movement of equipment to or from the job site.

Medical Services and First Aid

Prior to starting work, provisions shall be made for prompt medical attention in case of serious injury. The nearest hospital, infirmary, clinic, or physician shall be located as part of the pre-demolition survey or engineering survey. The supervisor shall be provided with instructions for the most direct route to these facilities. Proper equipment for prompt transportation of an injured worker, as well as a communication system to contact any necessary ambulance service, will be available at the job site. The telephone numbers of the hospitals, physicians, or ambulances shall be conspicuously posted.

A properly stocked first aid kit will be available at the job site. The first aid kit shall contain approved supplies in a weatherproof container with individual sealed packages for each type of item. The contents of the kit shall be checked before being sent out on each job and at least weekly to ensure the expended items are replaced.

Fire Prevention and Protection

A **"fire plan"** shall be set up prior to beginning a demolition job. This plan shall outline the assignments of key personnel in the event of a fire and provide an evacuation plan for workers on the site.

Preparatory Operations

When workers are required to work within a structure to be demolished which has been damaged by fire, flood, explosion, or other cause, the walls or floor shall be shored or braced.

All electric, gas, water, steam, sewer, and other service lines shall be shut off, capped, or otherwise controlled, outside the building line before demolition work is started. In each case, any utility AMS that is involved shall be notified in advance.

If it is necessary to maintain any power, water or other utilities during demolition, such lines shall be temporarily relocated, as necessary, and protected.

It shall also be determined if any type of hazardous chemicals, gases, explosives, flammable materials, or similarly dangerous substances have been used in any pipes, tanks, or other equipment on the property. When the presence of any such substances is apparent or suspected, testing and purging shall be performed, and the hazard eliminated before demolition is started.

Where a hazard exists from fragmentation of glass, such hazards shall be removed.

Where a hazard exists to workers falling through wall openings, the opening shall be protected to a height of approximately 42 inches.

When debris is dropped through holes in the floor without the use of chutes, the area onto which the material is dropped shall be completely enclosed with barricades not less than 42 inches high and not less than 6 feet back from the projected edge of the opening above. Signs, warning of the hazard of falling materials, shall be posted at each level. Removal shall not be permitted in this lower area until debris handling ceases above.

All floor openings, not used as material drops, shall be covered over with material substantial enough to support the weight of any load that may be imposed. Such material shall be properly secured to prevent its accidental movement.

Except for the cutting of holes in floors for chutes, holes through which to drop materials, preparation of storage space, and similar necessary preparatory work, the demolition of exterior walls and floor construction shall begin at the top of the structure and proceed downward. Each story of exterior wall and floor construction shall be removed and dropped into the storage space before commencing the removal of exterior walls and floors in the story next below.

Worker entrances to multi-story structures being demolished shall be completely protected by sidewalk sheds or canopies, or both, providing protection from the face of the building for a minimum of 8 feet. All such canopies shall be at least 2 feet wider than the building entrances or openings (1 foot wider on each side thereof) and shall be capable of sustaining a load of 150 pounds per square foot.

During the planning stage of the job, all safety equipment needs shall be determined. The required number and type of respirators, lifelines, warning signs, safety nets, special face and eye protection, hearing protection, and other worker protection

In the absence of an infirmary, clinic, hospital, or physician that is reasonably accessible in terms of time and distance to the work site, a worker who has a valid certificate in first aid training shall be available at the work site to render first aid.

A comprehensive first aid plan is necessary for any confined space entry.

Pre-Demolition Considerations

- All potential sources of ignition shall be evaluated, and the necessary corrective measures taken.
- When storing debris or combustible material inside a structure, such storage shall not obstruct or adversely affect the means of exit.
- Electrical wiring and equipment for providing light, heat, or power should be installed by a competent person and inspected regularly.
- Electrical wiring and equipment for providing light, heat, or power shall be installed by a competent person and inspected regularly.
- A suitable location at the job site shall be designated and provided with plans, emergency information, and equipment, as needed.
- Access to heavy fire-fighting equipment shall be provided on the immediate job site at the start of the job and well maintained until the job is completed.
- Equipment powered by an internal combustion engine shall be located so that the exhausts discharge away from combustible materials and away from workers.
- When the exhausts are piped outside the building, clearance of at least six inches shall be maintained between such piping and combustible material.
- Free access from the street to fire hydrants and to outside connections for standpipes, sprinklers, or other fire extinguishing equipment, whether permanent or temporary, should be provided and maintained at all times.
- All internal combustion equipment shall be shut down prior to refueling. Fuel for this equipment shall be stored in a safe location.
- Pedestrian walkways should not be constructed so as to impede access to hydrants.
- Sufficient firefighting equipment shall be located near any flammable or combustible liquid storage area.
- Only approved containers and portable tanks shall be used for the storage and handling of flammable combustible liquids.
- No material or construction should interfere with access to hydrants, splitter connections, or fire- extinguishing equipment.
- A temporary or permanent water supply of volume, duration, and pressure sufficient to operate the fire-fighting equipment properly shall be made available.
- Standpipes with outlets should be provided on large multistory buildings to provide fire protection on upper levels. If the water pressure is insufficient, a pump shall also be provided.
- Heating devices shall be situated so they are not likely to overturn and shall be installed in accordance with their listing, including clearance to combustible material or equipment
- Temporary heating equipment, when utilized, shall be maintained by competent personnel.
- An ample number of fully charged portable fire extinguishers should be provided throughout the operation. All motor-driven mobile equipment shall be equipped with an approved fire extinguisher.
- Roadways between and around combustible storage piles shall be at least 15 feet wide and maintained free from accumulation of rubbish, equipment, or other materials.
- Smoking shall be prohibited at or in the vicinity of hazardous operations or materials. Where smoking is permitted, safe receptacles shall be provided for smoking materials.

- An alarm system, (e.g., telephone system, siren, two-way radio, etc.) shall be established in such a way that workers on the site and the local fire department can be alerted in case of an emergency. The alarm code and reporting instructions shall be conspicuously posted, and the alarm system shall be serviceable at the job site during the demolition. Fire cutoffs shall be retained in the buildings undergoing alterations or demolition until operations necessitate their removal.

Procedures

Stairs, Passageways, and Ladders:

- Only those stairways, passageways, and ladders, designated as means of access to the structure of a building, shall be used. Other accessways shall be entirely closed at all times.
- All stairs, passageways, ladders, and incidental equipment thereto, which are covered by this section, shall be inspected as required and maintained in a clean safe condition.
- In a multistory building, when a stairwell is being used, it shall be properly illuminated by either natural or artificial means, and completely and substantially covered over at a point not less than two floors below the floor on which work is being performed, and access to the floor where the work is in progress shall be through a properly lighted, protected, and separate passageway.

Chutes

- No material shall be dropped to any point lying outside the exterior walls of the structure unless the area is effectively protected.
- All materials chutes or sections thereof, at an angle of more than 45° from the horizontal, shall be entirely enclosed, except for openings equipped with closures at or about floor level for the insertion of materials. The openings shall not exceed 48 inches in height measured along the wall of the chute. At all stories below the top floor, such openings shall be kept closed when not in use.
- A substantial gate shall be installed in each chute at or near the discharge end. A competent worker shall be assigned to control the operation of the gate, and the backing and loading of trucks.
- When operations are not in progress, the area surrounding the discharge end of a chute shall be securely closed off.
- Any chute opening, into which workers dump debris, shall be protected by a substantial guardrail approximately 42 inches above the floor or other surface on which the workers stand to dump the material. Any space between the chute and the edge of openings in the floors through which it passes shall be solidly covered over.
- Where the material is dumped from mechanical equipment or wheelbarrows, a securely attached toe board or bumper, not less than 4 inches thick and 6 inches high, shall be provided at each chute opening.
- Chutes shall be designed and constructed of such strength as to eliminate failure due to impact of materials or debris loaded therein.

Removal of Materials through Floor Openings

- Any openings cut in a floor for the disposal of materials shall be no larger in size than 25 percent of the aggregate of the total floor area, unless the lateral supports of the removed flooring remain in place.
- Floors weakened or otherwise made unsafe by demolition operations shall be shored to carry safely the intended imposed load from demolition operations.

Removal of Walls, Masonry Sections and Chimneys

- Masonry walls, or other sections of masonry, shall not be permitted to fall upon the floors of the building in such masses as to exceed the safe carrying capacities of the floors.
- No wall section, which is more than one story in height, shall be permitted to stand alone without lateral bracing, unless such wall was originally designed and constructed to stand without such lateral support, and is in a condition safe enough to be self- supporting. All walls shall be left in a stable condition at the end of each shift.
- Workers shall not be permitted to work on the top of a wall when weather conditions constitute a hazard.
- Structural or load-supporting members on any floor shall not be cut or removed until all stories above such a floor have been demolished and removed. This provision shall not prohibit the cutting of floor beams for the disposal of materials or for the installation of equipment, provided that the jurisdictional requirements (Local, State, Federal, or Provincial) are met.
- Floor openings within 10 feet of any wall being demolished shall be planked solid, except when workers are kept out of the area below.
- In buildings of "skeleton-steel" construction, the steel framing may be left in place during the demolition of masonry. Where this is done, all steel beams, girders, and similar structural supports shall be cleared of all loose material as the masonry demolition progresses downward.
- Walkways or ladders shall be provided to enable workers to safely reach or leave any scaffold or wall.
- Walls, which serve as retaining walls to support earth or adjoining structures, shall not be demolished until such earth has been properly braced or adjoining structures have been properly underpinned.
- Walls, which are to serve as retaining walls against which debris will be piled, shall not be so used unless capable of safely supporting the imposed load.

Manual Removal of Floors

- Openings cut in a floor shall extend the full span of the arch between supports.
- Before demolishing any floor arch, debris and other material shall be removed from such arch and other adjacent floor area. Planks not less than 2 inches by 10 inches in cross section, full size undressed, shall be provided for, and shall be used by workers to stand on while breaking

down floor arches between beams. Such planks shall be so located as to provide a safe support for the workmen shall the arch between the beams collapse. The open space between planks shall not exceed 16 inches.

- Safe walkways, not less than 18 inches wide, formed of planks not less than 2 inches thick if wood, or of equivalent strength if metal, shall be provided and used by workmen when necessary to enable them to reach any point without walking upon exposed beams.
- Stringers of ample strength shall be installed to support the flooring planks, and the ends of such stringers shall be supported by floor beams or girders, and not by floor arches alone.
- Planks shall be laid together over solid bearings with the ends overlapping at least 1 foot.
- When floor arches are being removed, workers shall not be allowed in the area directly underneath, and such an area shall be barricaded to prevent access to it.
- Demolition of floor arches shall not be started until they, and the surrounding floor area for 20 feet, have been cleared of debris and any other unnecessary materials.

Removal of Walls, Floors, and Material with Equipment

- Mechanical equipment shall not be used on floors or working surfaces unless such floors or surfaces are of sufficient strength to support the imposed load.
- Floor openings shall have curbs or stop-logs to prevent equipment from running over the edge.

Storage

- The storage of waste material and debris on any floor shall not exceed the allowable floor loads.
- In buildings having wooden floor construction, the flooring boards may be removed from not more than one floor above grade to provide storage space for debris, provided falling material is not permitted to endanger the stability of the structure.
- When wood floor beams serve to brace interior walls or freestanding exterior walls, such beams shall be left in place until other equivalent support can be installed to replace them.
- Storage area for debris: Provided that such removal does not endanger the stability of the structure.
- Storage space into which material is dumped shall be blocked off, except for openings necessary for the removal of material. Such openings shall be kept closed at all times when material is not being removed.

Removal of Steel Construction

- When floor arches have been removed, planking in accordance with jurisdictional requirements (Local, State, Federal, or Provincial) shall be provided for the workers engaged in razing the steel framing.
- Cranes, derricks, and other hoisting equipment used shall meet the requirements specified in other chapters of this Program.
- Steel construction shall be dismantled column length by column length, and tier by tier (columns may be in two-story lengths).
- Any structural member being dismembered shall not be overstressed.

Mechanical Demolition

- No workers shall be permitted in any area which can be adversely affected by demolition operations when balling or clamming is being performed. Only those workers necessary for the performance of the operations shall be permitted in this area at any other time.
- The crane boom and load line shall be as short as possible.
- The weight of the demolition ball shall not exceed 50 percent of the crane's rated load, based on the length of the boom and the maximum angle of operation at which the demolition ball will be used, or it shall not exceed 25 percent of the nominal breaking strength of the line by which it is suspended, whichever results in a lesser value.
- The ball shall be attached to the load line with a swivel-type connection to prevent twisting of the load line and shall be attached by positive means in such manner that the weight cannot become accidentally disconnected.
- When pulling over walls or portions thereof, all steel members affected shall have been previously cut free.
- All roof cornices or other such ornamental stonework shall be removed prior to pulling walls over.
- During demolition, continuing inspections by a competent person shall be made as the work progresses to detect hazards resulting from weakened or deteriorated floors, or walls, or loosened material. No worker shall be permitted to work where such hazards exist until they are corrected by shoring, bracing, or other effective means.

Special Structures Demolition

Safe work practices when demolishing a chimney, stack, silo, or cooling tower

Inspection and Planning

When preparing to demolish any chimney, stack, silo, or cooling tower, the first step will be a careful, detailed inspection of the structure by a competent person. If possible, architectural/engineering drawings shall be consulted. Particular attention shall be paid to the condition of the chimney or stack. Workers shall be on the lookout for any structural defects such as weak or acid-laden mortar joints, and any cracks or openings. The interior brickwork in some sections of industrial chimney shafts can be extremely weak. If the stack has been banded with steel straps, these bands shall be removed only as the work progresses from the top down. Sectioning of the chimney by water, etc., shall be considered.

Safe Work Practice

When hand demolition is required, it shall be carried out from a working platform.

- Experienced workers will install a self-supporting tubular scaffold, suspended platform, or knee- braced scaffolding around the chimney.
- Particular attention shall be paid to the design, support, and tie-in (braces) of the scaffold.
- A competent person shall be present at all times during the erection of the scaffold.

- It is essential that there be adequate working clearance between the chimney and the work platform.
- Access to the top of the scaffold shall be provided by means of portable walkways.
- The platforms shall be decked solidly and the area from the work platform to wall bridged with a minimum of two-inch thick lumber.
- A top rail 42 inches above the platform, with a mid-rail covered with canvas or mesh, shall be installed around the perimeter of the platform to prevent injury to workers below. Debris netting may be installed below the platform.
- Excess canvas or plywood attachments can form a windsail that could collapse the scaffold.
- When working on the work platform, all workers shall wear hard hats, long-sleeved shirts, eye and face protection, such as goggles and face shields, respirators, and safety belts, as required.
- Care shall be taken to assign the proper number of workers to the task.
- Too many workers on a small work platform can lead to accidents.

An alternative to the erection of a self-supporting tubular steel scaffold to "climb" the structure with a creeping bracket scaffold. Careful inspection of the masonry and a decision as to the safety of this alternative will be made by a competent person. It is essential that the masonry of the chimney be in good enough condition to support the bracket scaffold.

The area around the chimney shall be roped off or barricaded and secured with appropriate warning signs posted. No unauthorized entry shall be permitted to this area. It is also good practice to keep a worker, (i.e., a supervisor, operating engineer, another worker, or a "safety person,") on the ground with a form of communication to the workers above.

Special attention shall be paid to weather conditions when working on a chimney. No work shall be done during inclement weather such as during lightning or high wind situations. The work site shall be wet down, as needed, to control dust.

Debris Clearance

If debris is dropped inside the shaft, it can be removed through an opening in the chimney at grade level.

- The opening at grade will be kept relatively small in order not to weaken the structure.
- If a larger opening is desired, a professional engineer shall be consulted.
- When removing debris by hand, an overhead canopy of adequate strength shall be provided.
- If machines are used for removal of debris, proper overhead protection for the operator shall be used.
- Excessive debris shall not be allowed to accumulate inside or outside the shaft of the chimney as the excess weight of the debris can impose pressure on the wall of the structure and might cause the shaft to collapse.
- The foreman shall determine when debris is to be removed, halt all demolition during debris removal, and make sure the area is clear of cleanup workers before continuing demolition.
- All tools and equipment used during demolition projects will be kept in good working

order. Prior to beginning work, tools and equipment will be inspected. Damaged or defective tools or equipment will be removed from service and tagged “Do Not Use.”

Demolition By Deliberate Collapse

Another method of demolishing a chimney or stack is by deliberate collapse. Deliberate collapse requires extensive planning and experienced worker and shall be used only when conditions are favorable.

There will be a clear space for the fall of the structure of at least 45^0 on each side of the intended fall line and 1½ times the total height of the chimney. Considerable vibration may be set up when the chimney falls, so there should be no sewers or underground services on the line of the fall. Lookouts must be posted on the site and warning signals must be arranged. The public and other workers at the job site must be kept well back from the fall area.

The use of explosives is one way of setting off deliberate collapse. **This type of demolition shall be undertaken only by qualified workers.** The entire work area shall be cleared of nonessential workers before any explosives are placed. Though the use of explosives is a convenient method of bringing down a chimney or stack, there is a considerable amount of vibration produced, and caution shall be taken if there is any likelihood of damage.

Demolition Of Prestressed Concrete Structures

The different forms of construction used in a number of more or less conventional structures built during the last few decades will give rise to a variety of problems when the time comes for them to be demolished. Prestressed concrete structures fall in this general category. The most important aspect of demolishing a prestressed concrete structure takes place during the pre-demolition survey or engineering survey. During the survey, a qualified person shall determine if the structure to be demolished contains any prestressed members.

It is the responsibility of AMS to inform all workers on the demolition job site of the presence of prestressed concrete members within the structure. AMS shall also instruct them in the safe work practice that will be followed to safely perform the demolition. Workers shall be informed of the hazards of deviating from the prescribed procedures and the importance of following their supervisor's instruction.

Categories of Prestressed Construction

There are four main categories of prestressed members. The category or categories shall be determined before attempting demolition, bearing in mind that any prestressed structure may contain elements of more than one category.

Category 1- Members are prestressed before the application of the superimposed loads, and all cables or tendons are fully bonded in the concrete or grouted within ducts.

Category 2- Like Category 1, but the tendons are left un-grouted. This type of construction can sometimes be recognized from the access points that may have been provided for inspection of the cables and anchors. More recently, unbonded tendons have been used in the construction of beams, slabs, and other members; these tendons are protected by grease and surrounded by plastic sheathing, instead of the usual metal duct.

Category 3- Members are prestressed progressively as building construction proceeds and the dead load increases, using bonded tendons as in Category 1.

Category 4 Like Category 3 but using unbonded tendons as in Category 2.

Examples of construction using members of Categories 3 or 4 are relatively rare. However, they may be found, for example, in the podium of a tall building or some types of bridges. They require particular care in demolition.

Pretensioned Members

These usually do not have any end anchors, the wires being embedded or bonded within the length of the member. Simple pretensioned beams and slabs of spans up to about 7 meters (23 feet) can be demolished in a manner similar to ordinary reinforced concrete. Pretensioned beams and slabs may be lifted and lowered to the ground as complete units after the removal of any composite concrete covering to tops and ends of the units. To facilitate breaking up, the members shall be turned on their sides. Lifting from the structure shall generally be done from points near the ends of the units or from lifting point positions. Reuse of lifting eyes, if in good condition, is recommended whenever possible. When units are too large to be removed, consideration shall be given to temporary supporting arrangements.

Precast units stressed separately from the main frames of the structure with end anchors grouted and un- grouted

Ducts

Before breaking up, units of this type shall be lowered to the ground, if possible. It is advisable to seek the counsel of a professional engineer before carrying out this work, especially where there are un-grouted tendons. In general, this is true because grouting is not always 100% efficient. After lowering the units can be turned on their side with the ends up on blocks after any composite concrete is removed. This may suffice to break the unit and release the prestress; if not, a sandbag screen, timbers, or a blast mat as a screen shall be erected around the ends and demolition commenced, taking care to clear the area of any worker. It shall be borne in mind that the end blocks may be heavily reinforced and difficult to break up.

Monolithic Structures

The advice of the professional engineer experienced in prestressed work shall be sought before any attempt is made to expose the tendons or anchorages of structures in which two or more members have been stressed together. It will usually be necessary for temporary support to be provided so the tendons and the anchorage can be cautiously exposed. In these circumstances it is essential that indiscriminate attempts to expose and de- stress the tendons and anchorages are not made.

Progressively Prestressed Structures

In the case of progressively prestressed structures, it is essential to obtain the advice of a professional engineer, and to demolish the structure in strict accordance with the engineer's method of demolition. The stored energy in this type of structure is large. In some cases, the inherent properties of the stressed section may delay failure for some time, but the presence of these large prestressing forces may cause sudden and complete collapse with little warning.

Safe Work Practices When Working in Confined Spaces

AMS often comes in contact with confined spaces when demolishing structure at industrial sites. These confined spaces can be generally categorized into two major groups: those with open tops and a depth that restricts the natural movement of air, and enclosed spaces with very limited openings for entry. Examples of these spaces include storage tanks, vessels, degreasers, pit vaults, casing, and silos. The hazards encountered when entering and working in confined spaces are capable of causing bodily injury, illness, and death. Accidents occur among workers because of failure to recognize that a confined space is a potential hazard. It shall therefore be considered that the most unfavorable situation exists in every case and that the danger of explosion, poisoning, and asphyxiation will be present at the onset of entry.

Safe Blasting Procedures

Blasting Survey and Site Preparation

Prior to the blasting of any structure or portion thereof, a complete written survey will be made by a qualified person of all adjacent improvements and underground utilities. When there is a possibility of excessive vibration due to blasting operations, seismic or vibration tests shall be taken to determine proper safety limits to prevent damage to adjacent or nearby buildings, utilities, or other property.
The preparation of a structure for demolition by explosives may require the removal of structural columns, beams, or other building components. This work shall be directed by a structural engineer, or a competent person qualified to direct the removal of these structural elements. Extreme caution will be taken during this preparatory work to prevent the weakening and premature collapse of the structure.

The use of explosives to demolish smokestacks, silos, cooling towers, or similar structures shall be permitted only if there is a minimum of 90^0 of open space extended for at least 150% of the height of the structure or if the explosives specialist can demonstrate consistent previous performance with tighter constraints at the site.

Fire Precautions

The presence of fire near explosives presents a severe danger. Every effort shall be made to ensure that fires or sparks do not occur near explosive materials. Smoking, matches, firearms, open flame lamps, and other fires, flames, or heat-producing devices will be prohibited in or near explosive magazines or in areas where explosives are being handled, transported, or used. In fact, workers working near explosives shall not even carry matches, lighters, or other sources of sparks or flames. Open fires or flames shall be prohibited within 100 feet of any explosive materials. In the event of a fire which is in imminent danger of contact with explosives, all workers will be removed to a safe area.

Electrical detonators can be inadvertently triggered by stray radio frequency (RF) signals from two- way radios. RF signal sources shall be restricted from or near to the demolition site if electrical detonators are used.

Personnel Selection

A blaster is a competent person who uses explosives. A blaster will be qualified by reason of training, knowledge, or experience in the field of transporting, storing, handling, and using explosives. In addition, the blaster shall have a working knowledge of state and local regulations that pertain to explosives. Training courses are often available from manufacturers of explosives and blasting safety manuals are offered by the Institute of Makers of Explosives (IME) as well as other organizations.

Blasters shall be required to furnish satisfactory evidence of competency in handling explosives and in safely performing the type of blasting required. A competent person shall always be in charge of explosives and shall be held responsible for enforcing all recommended safety precautions in connection with them.

Transportation Of Explosives Vehicle Safety

Vehicles used for transporting explosives shall be strong enough to carry the load without difficulty and shall be in good mechanical condition. All vehicles used for the transportation of explosives shall have tight floors, and any exposed spark-producing metal on the inside of the body shall be covered with wood or some other non- sparking material.

Vehicles or conveyances transporting explosives shall only be driven by, and shall be under the supervision of, a licensed driver familiar with the local, state, and federal regulations governing the transportation of explosives. No passengers shall be allowed in any vehicle transporting explosives.

Explosives, blasting agents, and blasting supplies shall not be transported with other materials or cargoes. Blasting caps shall not be transported with other materials or cargoes.

Blasting caps shall not be transported in the same vehicle with other explosives. If an open-bodied truck is used, the entire load shall be completely covered with a fire and water-resistant tarpaulin to protect it from the elements. Vehicles carrying explosives shall not be loaded beyond the manufacturer's safe capacity rating, and in no case shall the explosives be piled higher than the closed sides and ends of the body.

Every motor vehicle or conveyance used for transporting explosives shall be marked or placarded with warning signs required by OSHA and the DOT.

Each vehicle used for transportation of explosives shall be equipped minimally with at least 10 pound rated serviceable ABC fire extinguisher. All drivers shall be trained in the use of extinguishers in their vehicle.

In transporting explosives, congested traffic and high-density population areas shall be avoided, where possible, and no unnecessary stops shall be made. Vehicles carrying explosives, blasting agents, or blasting supplies shall not be taken inside a garage or shop for repairs or servicing. No motor vehicle transporting explosives shall be left unattended.

Storage Of Explosives

Inventory Handling and Safe Handling

All explosives will be accounted for at all times, and all not being used will be kept in a locked magazine. A complete detailed inventory of all explosives received and placed in, removed from, and returned to the magazine shall be maintained at all times. Appropriate authorities will be notified of any loss, theft, or unauthorized entry into a magazine.

Manufacturers' instructions for the safe handling and storage of explosives are ordinarily enclosed in each case of explosives. The specifics of storage and handling are best referred to in these instructions and the IME manuals. They shall be carefully followed. Packages of explosives shall not be handled roughly. Sparking metal tools shall not be used to open wooden cases. Metallic slitters may be used for opening fiberboard cases, provided the metallic slitter does not come in contact with the metallic fasteners of the case.

The oldest stock shall always be used first to minimize the chance of deterioration from long storage. Loose explosives or broken, defective, or leaking packages can be hazardous and shall be segregated and properly disposed of in accordance with the specific instructions of the manufacturer. If the explosives are in good condition, it may be advisable to repack them. In this case, the explosives supplier shall be contacted. Explosives shall not be opened, or explosives packed or repacked while in a magazine.

Storage Conditions

Providing a dry, well-ventilated place for the storage of taken to make sure mats and other protection do not disturb the explosives is one of the most important and effective safety measures. Exposure to weather damages most kinds of explosives, especially dynamite and caps. Every precaution shall be taken to keep them dry and relatively cool. Dampness or excess humidity may be the cause of misfires resulting in injury or loss of life. Explosives shall be stored in properly constructed fire and bullet-resistant structures, located according to the IME American Table of Distances, and kept locked at all times except when opened for use by an authorized worker. Explosives shall not be left, kept, or stored where children, unauthorized persons, or animals have access to them, nor shall they be stored in or near a residence.

Detonators shall be stored in a separate magazine located according to the IME American Table of Distances. Detonators shall never be stores in the same magazine with any other kind of explosive.

Ideally, arrangements shall be made whereby the supplier delivers the explosives to the job site in quantities which will be used up during the workday. An alternative would be for the supplier to return to pick up unused quantities of explosives. If it is necessary for AMS to store his explosives, he shall be familiar with all local requirements for such storage.

Proper Use of Explosives

Blasting operations shall be conducted between sunup and sundown, whenever possible. Adequate signs shall be sounded to alert to the hazard presented by blasting. Blasting mats or other containment shall be used where there is danger of rocks or other debris being thrown into the air or where there are buildings or transportation systems nearby. Care shall be taken to make sure mats and other protection do not disturb the connections to electrical blasting caps.

Radio, television, and radar transmitters create fields of electrical energy that can, under exceptional circumstances, detonate electric blasting caps. Certain precautions will be taken to prevent accidental discharge of electric blasting caps from current induced by radar, radio transmitters, lightning, adjacent power lines, dust storms, or other sources of extraneous or static electricity. These precautions shall include:

- Ensuring that mobile radio transmitters on the job site which are less than 100 feet away from electric blasting caps, in other than original containers, shall be de-energized and effectively locked.
- The prominent display of adequate signs, warning against the use of mobile radio transmitters, on all roads within 1,000 feet of the blasting operations.
- Maintaining the minimum distances recommended by the IMES between the nearest transmitter and electric blasting caps.
- The suspension of all blasting operations and removal of persons from the blasting area during the approach and progress of an electric storm.
- After loading is completed, there shall be as little delay as possible before firing. Each blast shall be fired under the direct supervision of the blaster, who shall inspect all connections before firing and who shall personally see that all workers are in the clear before giving the order to fire. Standard signals, which indicate that a blast is about to be fired and a later all clear signals have been adopted. It is important that everyone working in the area be familiar with these signals and that they be strictly obeyed.

Procedures After Blasting Inspection After the Blast

Immediately after the blast has been fired, the firing line shall be disconnected from the blasting machine and short-circuited. Where power switches are used, they shall be locked open or in the off position. Sufficient time shall be allowed for dust, smoke, and fumes to leave the blasted area before returning to the spot.

An inspection of the area and the surrounding rubble shall be made by the blaster to determine if all charges have been exploded before workers are allowed to return to the operation. All wires shall be traced and the search for unexploded cartridges made by the blaster.

Disposal Of Explosives

Explosives, blasting agents, and blasting supplies that are obviously deteriorated or damaged shall not be used; they shall be properly disposed of. Explosive's distributors will usually take back old stock. Local fire marshals or representatives of the United States Bureau of Mines may also arrange for its disposal. Under no circumstances shall any explosives be abandoned.

Wood, paper, fiber, or other materials that have contained high explosives shall not be used again for any purpose but shall be destroyed by burning. These materials shall not be burned in a stove, fireplace, or other confined space. Rather, they shall be burned at an isolated outdoor location, at a safe distance from thoroughfares, magazines, and other structures. It is important to check that the containers are entirely empty

before burning. During burning the area shall be adequately protected from intruders and all workers kept at least 100 feet from the fire.

EXPLOSIVE ATMOSPHERE SAFETY

PURPOSE

The purpose of this section is to provide workers with a safety policy and procedure surrounding the operation and maintenance of dangerous substances and explosive atmospheres for ALLEN MECHANICAL SERVICES-AMS; hereafter referred to as "AMS."

SCOPE

Dangerous substances and explosive atmospheres are any substances used or present at work that could, if not properly controlled, cause harm to the worker, environment, asset, or public as a result of a fire or explosion or corrosion of metal. They can be found in nearly all workplaces and include such things as solvents, paints, varnishes, fertilizers, refineries, flammable gases, such as liquid petroleum gas (LPG), dusts from machining and sanding operations, pressurized gases, and substances corrosive to metal.

RESPONSIBILITIES

Management

Supervisors or their delegate are responsible to ensure the following:

- what dangerous substances are in their workplace and what the risks are
- put control measures in place to either remove those risks or, where this is not possible, control them
- put controls in place to reduce the effects of any incidents involving dangerous substances
- prepare plans and procedures to deal with accidents, incidents and emergencies involving dangerous substances
- ensure workers are properly informed about and trained to control or deal with the risks from the dangerous substances
- identify and classify areas of the workplace where explosive atmospheres may occur and avoid ignition sources (from unprotected equipment, for example) in those areas

Workers

Qualified workers must follow the safe work procedures when working in an explosive atmosphere environment, including proper use of equipment and tools, clean up equipment and personal protective equipment (PPE).

Unqualified works are restricted to performing tasks unless under the direct supervision of a qualified worker or supervisor.

PROCEDURES

Risks

AMS will assess the risks of fires and explosions that may be caused by dangerous substances and

explosive atmospheres in the workplace, including risks caused by gases under pressure, organic materials, and substances that are corrosive to metals. All identified risks must be eliminated or reduced as far as reasonably practicable to protect the worker, environment, public, and assets.

Fires and explosions create harmful physical effects - thermal radiation, overpressure effects and oxygen depletion. These effects can also be caused by other energetic events such as runaway exothermic reactions involving chemicals or decomposition of unstable substances such as peroxides. Gases under pressure can also cause explosions creating harmful effects. Substances that are corrosive to metal may cause damage to metal/metal containing structures which could result in reduced structural integrity.

The following examples illustrate the type of activities that could create an explosive atmosphere:

- storage of fuel for cars, boats, or horticultural machinery
- use of flammable gases, such as acetylene, for welding
- handling and storage of waste dusts in a range of manufacturing industries
- handling and storage of flammable wastes such as fuel oils
- welding or other 'hot work' on tanks and drums that have contained flammable material
- work that could release naturally occurring flammable substances such as methane in coalmines or at landfill sites
- use of flammable solvents in laboratories
- storage and display of flammable goods, such as paints
- filling, storing, and handling aerosols with flammable propellants such as LPG
- transporting flammable substances in containers around a workplace
- deliveries from road transporters, such as fuel and bulk powders
- chemical manufacturing, processing, and warehousing
- the petrochemical industry, both onshore and offshore
- handling, storage, and use of gases under pressure
- handling, storage, and use of substances corrosive to metal.

Assessing Risk

Before work is carried out, workers must assess the risks that may be caused by dangerous substances and explosive atmospheres. This should be an identification and careful examination of:

- the dangerous substances and explosive atmospheres in the workplace
- the work activities involving those substances
- the ways in which those substances and work activities could harm workers, the environment, assets, or the public

All risks will be identified by their hazardous classification. The purpose is to determine what is needed to eliminate or reduce the risks from dangerous substances or explosive atmospheres.

If there is no risk to safety, or the risk is reduced to as low as practical, no further action is needed. If there are risks, then the competent person must consider what else needs to be done to comply fully with the local jurisdictions or industry best practices.

Preventing or Controlling Risks

AMS will put control measures in place to eliminate risks from dangerous substances or explosive atmospheres or reduce them as far as is reasonably practicable. Where it is not possible to eliminate the risk completely AMS will take measures to control risks and reduce the severity (mitigate) the effects of any harmful event.

The best solution is to eliminate the risk completely by replacing the dangerous substance with another less dangerous substance or using a different work process.

Control Measures

Where the risk cannot be eliminated, AMS requires control measures to be applied in the following priority order:

- reduce the quantity of dangerous substances to a minimum
- avoid or minimize releases of dangerous substances
- control releases of dangerous substances at source
- prevent the formation of an explosive atmosphere
- collect, contain, and remove any releases to a safe place (for example, through ventilation)
- avoid ignition sources
- avoid adverse conditions (for example, exceeding the limits of temperature or control settings) that could lead to danger
- keep incompatible substances apart

These control measures should be consistent with the risk assessment and appropriate to the nature of the activity or operation. The contents of pipes, containers, etc. must be identifiable to alert workers and others to the presence of dangerous substances.

5Mitigation

In addition to control measures AMS requires mitigation measures are in place. These measures should be consistent with the risk assessment and appropriate to the nature of the activity or operation and include:

- reducing the number of workers exposed to the risk
- providing workplace that is explosion resistant
- providing workplace that is corrosion resistant
- providing explosion suppression or explosion relief equipment
- taking measures to control or minimize the spread of fires or explosions
- providing appropriate personal protective equipment

Preparing Emergency Plans and Procedures

Arrangements must be in place prior to the start of work to respond to accidents, incidents and emergencies involving dangerous substances and explosive atmospheres. These plans and procedures should cover safety drills and suitable communication and warning systems and should be in proportion

to the risks. If an emergency occurs, workers tasked with carrying out repairs or other necessary work must be provided with the appropriate equipment to allow them to carry out this work safely.

The information in the emergency plans and procedures must be made available to the emergency services to allow them to develop their own plans if necessary.

Providing Information, Instruction, and Training for Workers

Workers must be provided with relevant information, instructions, and training. This includes:

- the dangerous substances or explosive atmospheres present in the workplace and the risks they present including access to any relevant safety data sheets and information on any other legislation that applies to the dangerous substance
- the findings of the risk assessment and the control measures put in place as a result (including their purpose and how to follow and use them)
- emergency procedures

Information, instruction, and training need only be provided to other people (non-workers) where it is required to ensure their safety. It should be in proportion to the level and type of risk.

FORKLIFT SAFETY

PURPOSE

To define the procedures and standards that apply to the care, control, maintenance, inspection, and operation of Forklifts also known as Powered Industrial Trucks (PIT) pertaining to the service provided by ALLEN MECHANICAL SERVICES-AMS; hereafter referred to as “AMS”.

Forklifts shall be operated, maintained, and controlled in a safe manner.

This policy covers minimum performance standards applicable to all AMS associates, workers and locations. Local practices requiring more detailed or stringent rules, or local, state, or other federal requirements regarding this subject can and should be added as an addendum to this procedure as applicable.

SCOPE

AMS work sites, i.e., client job sites, etc. requiring the use of Forklifts.

DEFINITIONS

Forklift - a mobile, power-propelled truck used to carry, push, pull, lift, stack, or tier materials. PIT (Forklifts) are commonly known as pallet trucks, rider trucks, fork trucks, or lift trucks.

PROCEDURES

Training

Only trained and authorized persons are permitted to operate a forklift or other PIT. The Safety Officer or designee will administer the forklift operator certification program and maintain training records.

Training shall occur prior to worker operation of any forklift, and at least every three years thereafter unless observed performance by the operator dictates the need for more frequent retraining. Classroom and Practical Training in addition to Operator Evaluation are required. Each trainee, who satisfactorily completes the qualifications as outlined above, shall be issued a written document as evidence of being a Qualified Forklift Operator.

Each manufacturer or un-similar model of PIT shall require individual Practical Training and Operator Evaluation prior to receiving authorization to operate.

Inspection and Maintenance

Prior to placing a forklift truck into service, the truck operator shall inspect their vehicle and document this inspection. All inspection records will follow AMS document control program.

Any noted condition that affects the safe operation of the lift truck shall be reported to the operator's supervisor for corrective action and shall keep the lift truck from being operated until the unsafe condition is corrected.

Forklifts that are defective, in need of repair or are unsafe shall be tagged "Danger Do Not Operate" and taken out of service until restored to safe operating condition.

A maintenance log shall be maintained for each forklift to determine when required maintenance is due. Only qualified personnel shall perform maintenance and repair. Maintenance records for each forklift shall be kept on file by the assigned department manager.

General Safe Operating Rules

The following safe operating rules apply to workers who operate a forklift. Violations of safe operating rules can and will result in retraining and/or disciplinary action.

- Only workers trained as per the requirements of this manual section and authorized by the department manager shall be allowed to operate Forklifts
- Forklifts shall not be loaned or rented to others for use.
- Stunt driving and horseplay shall not be permitted
- Forklifts equipped with seat belts will be used by the operator when in use.
- Personnel are not permitted to ride on Forklifts except in designated seats that are part of the equipment design.
- Forklifts shall be equipped with a portable fire extinguisher.
- Under travel conditions, the forklift shall be operated at a speed that will permit it to be brought to a stop in a safe manner.
- Traffic regulations shall be observed, including authorized work site speed limits. A safe distance shall be maintained approximately three forklift lengths from the forklift truck ahead.
- The driver shall be required to slow down and sound the horn at cross aisles and other areas where vision is obstructed. If the load being carried obstructs forward view, the driver shall be required to travel with the load trailing.
- The driver shall be required to look in the direction of and keep a clear view of the path of travel.
- Forklifts shall have a functional horn and back-up alarm with a distinctive sound, loud enough to be heard clearly above background noises. There are other scenarios where a flashing yellow/amber light would be installed.
- Copies of the manufacturer's operating instructions for each type of forklift shall be readily available for review by operators and supervisory personnel.
- Lift trucks, stackers, etc., shall have the rated capacity clearly posted on the vehicle to be clearly visible to the operator. When the manufacturer provides auxiliary removable counterweights, corresponding alternate rated capacities also shall be clearly shown on the vehicle. These ratings shall not be exceeded.
- No modifications or additions, which affect the capacity or safe operation of the equipment, shall be made without the manufacturer's written approval. If such modifications or changes are made, the capacity, operation, and maintenance

instruction plates, tags, or decals shall be changed accordingly. In no case shall the original safety factor of the equipment be reduced.

- Steering or spinner knobs shall not be attached to the steering wheel unless the steering mechanism is of a type that prevents road reactions from causing the steering hand wheel to spin. The steering knob shall be mounted within the periphery of the wheel.
- Forklifts shall have the manufacturer's nameplate showing its weight with attachments, lifting capacity, lift height maximum and other pertinent data. Nameplates or markings shall be maintained in a legible condition and remain in place.
- Railroad tracks shall be crossed diagonally wherever possible. Parking closer than 8 feet from the center of railroad tracks is prohibited.
- Grades shall be ascended or descended slowly.
- When ascending or descending grades in excess of 10 percent, loaded Forklifts shall be driven with the load upgrade.
- Unloaded Forklifts should be operated on all grades with the load engaging means downgrade.
- On grades, the load and load engaging means shall be tilted back if applicable and raised only as far as necessary tee clear the road surface.
- No person shall be allowed to stand or pass under the elevated portion of any forklift, whether loaded or empty.
- There shall be sufficient headroom under overhead installations, lights, pipes, sprinkler system, etc.
- Arms or legs are prohibited from being placed between the uprights of the mast or outside the running lines of the forklift.
- When a forklift is left unattended, load engaging means shall be fully lowered, controls shall be neutralized, power shall be shut off, brakes set and remove the key.
- Wheels shall be blocked if parked on an incline.
- A safe distance shall be maintained from the edge of ramps or platforms while on any elevated dock, or platform, or freight car. Forklifts shall not be used for opening or closing freight doors.
- Brakes shall be set, and wheel blocks shall be in place to prevent movement of trucks, trailers, or railroad cars while loading or unloading. Fixed jacks may be necessary to support a semi-trailer during loading or unloading when the trailer is not coupled to a tractor. Prior to forklift entry, the flooring and frames of trucks, trailers and railroad cars shall be checked for breaks and weakness

  before they are driven into and to determine if it will bear the intended weight of the forklift and intended load.
- Dock board or bridge plates shall be properly secured before they are driven over. Dock board or bridge plates shall be driven over carefully and slowly, and their rated capacity never exceeded. Portable dock boards shall be secured in position, by being anchored or equipped with devices that will prevent their slipping.
- An overhead guard shall be used as protection against falling objects. It should be noted that an overhead guard is intended to offer protection from the impact of small packages, boxes, bagged material. etc. representative of the job application, but not to withstand the impact of a falling capacity load.
- Additional counter weighting of Forklifts shall not be allowed unless approved by the

manufacturer.

- Workers shall not jump off a forklift.
- Forklift operators shall yield to pedestrians.
- Loads carried shall be secured on the forks to prevent upset / overturn.

GAS MONITOR SAFETY

PURPOSE

To ensure proper use and accuracy of gas monitors, which will be used where hazardous gases may exist.

SCOPE

This section applies to all workers who will be either using a personal gas monitor or performing work on a job site where continuous air monitoring is required pertaining to the service provided by ALLEN MECHANICAL SERVICES-AMS; hereafter referred to as “AMS”.

DEFINITIONS

Zero (fresh air) Calibration – This is done in a clean atmosphere of 20.9% oxygen and no detectable VOC, toxic, or combustible gases. It is used to set the zero point for each sensor.
Span Calibration – is the set of operations that establish, under specified conditions, the relationship between the values of quantities indicated by a measuring instrument and the corresponding values realized by given standards. Note: Refer to the gas bottle label for specific values.
Bump Testing – Ensures that all sensors are reading accurately according to the set values of the gas being applied. Note: Refer to the gas bottle label for specific values.
STEL – Short Term
Exposure Limit **TWA** –
Time Weighted Average
LEL – Lower Explosive
Limit

PROCEDURES

Zero Calibration

After the gas monitor is turned on in a safe, well ventilated, clean air environment, and is in operation mode, the oxygen sensor should read 20.9%. All other sensors should read 0. If this not the case, zero calibration should be performed. Refer to the manufacturer’s reference guide for proper procedure. A calibration log shall be maintained in accordance with manufacturers recommendations and when applicable for use.

Span Calibration

All monitors shall be calibrated per manufactures recommendations. Refer to the manufacturer’s reference guide for proper calibration procedure. A calibration log shall be maintained in accordance with manufacturers recommendations and when applicable for use.

Bump Testing

All gas detection monitors shall be bump tested daily or prior to each use. Refer to the manufacturer's reference guide for proper bump testing procedure. Each Bump Tests will be documented and recorded on AMS logs.

Alarm Values

Peak, STEL, and TWA values shall be set to meet or exceed the OHS regulations for the specific gases that are being monitored. Alarm levels for LEL's shall not exceed 10%.
Alarm values shall meet site specific requirements that exceed OHS regulations.

Servicing and Maintenance

Service and maintenance should be performed by competent and trained personnel. Documentation will be kept for all gas detection monitors and maintained in specified locations of AMS.

PURPOSE

ALLEN MECHANICAL SERVICES-AMS, hereafter referred to as "AMS", has developed this policy to address the hazards associated with heat and cold-related illness.

PREVENTING HEAT-RELATED ILLNESSES (HEAT STRESS)

Heat Stress

Heat stress takes place when your body's cooling system is overwhelmed. It can happen when heat combines with other factors such as:

- hard physical work
- fatigue (not enough sleep
- dehydration (loss of fluids)
- certain medical conditions

Heat stress can lead to illness or even death. AMS has a duty to take every precaution reasonable in the circumstances to protect their workers.

Heat Stress Symptoms

Heat rash: itchy red skin.
Heat cramps: painful muscle cramps.
Heat exhaustion: high body temperature; weakness or feeling faint; headache, confusion or irrational behavior; nausea or vomiting.
Heat stroke: no sweating (hot, dry skin), high body temperature, confusion, or convulsions. Get immediate medical help.

Precautions When Working in Hot, Humid Conditions

- Increase the frequency and length of rest breaks.
- Provide **cool drinking water** near workers and remind them to drink often.
- Caution workers about working in direct sunlight.
- Train workers to recognize the signs and symptoms of heat stress. Start a "buddy system" because it's unlikely people will notice their own symptoms.
- Tell workers to wear light summer clothing to allow air to move freely and sweat to evaporate. They should always wear shirts to protect themselves from direct sunlight.

PREVENTING COLD-RELATED ILLNESSES (COLD STRESS)

Cold Stress

When you're cold, blood vessels in your skin, arms, and legs constrict, decreasing the blood flow to your extremities. This helps your critical organs stay warm, but your extremities are at risk for

frostbite.

Frostbite means that your flesh freezes. Blood vessels are damaged, and the reduced blood flow can lead to gangrene.
The first sign of frostbite is skin that looks waxy and feels numb. Once tissues become hard, it's a severe medical emergency.

Wind chill accelerates heat loss—sometimes to a dramatic extent. For example, when the air temperature is – 30°C

- with no wind, there is little danger of skin freezing
- with 16 km/h wind (a flag will be fully extended), your skin can freeze in about a minute
- with 32 km/h wind (capable of blowing snow), your skin can freeze in 30 seconds

When your core temperature drops, you're at risk for hypothermia. Early signs of hypothermia are shivering, blue lips and fingers, and poor coordination. Breathing and heart rate will slow down, and you become disoriented and confused. Hypothermia requires medical help.

Precautions to Prevent Cold Stress

- Train workers to recognize the signs and symptoms of cold stress. Start a "buddy system" because it's unlikely people will notice their own symptoms.
- Wear several layers of clothing rather than one thick layer.
- Wear gloves if the temperature is below 16°C for sedentary work, below 4°C for light work, and below –7°C for moderate work.
- Take warm, high-calorie drinks and food.
- If your clothing gets wet at 2°C or less, change into dry clothes immediately to prevent hypothermia.
- If you feel hot, open your jacket but keep your hat and gloves on.
- Give workers warm-up and rest breaks in a heated shelter. Ensure work is not conducted only within allowable exposure limits, as per provincial OHS Regulations.

HEAVY MOBILE EQUIPMENT SAFETY

PURPOSE

The use of heavy equipment/mobile equipment is a common part of many jobs conducted by ALLEN MECHANICAL SERVICES-AMS; hereafter referred to as "AMS." AMS recognizes the hazards associated with the operation of heavy equipment/mobile equipment, and has developed this policy to establish guidelines in an attempt to eliminate injuries or fatalities related to this type of equipment.

AMS is dedicated to assuring that every job is conducted safely, and that operational expediency, including the use of short cuts, does not compromise the safety and well being of workers and the public.

This policy applies to all free moving mobile equipment that may be propelled by gasoline, propane, diesel or electricity, however the policy is not intended for operators of licensed and registered (by the Department of Motor Vehicles) automobiles and similar motor vehicles intended for use by licensed motor vehicle operators on public roads and highways.

Examples of Heavy Equipment/Mobile Equipment covered by this policy include but are not limited to:

- Backhoes Sweepers Graders
- Loaders Excavators Mini-Excavator
- Dump Trucks Skid-Steers Boom Trucks
- Dozers Mini-Skid Steer Forklifts
- Tractors Compact Tractor Golf Carts
- Bucket Truck Mower Sand/salt spreader
- Rollers All Terrain Vehicles Snow Plow

Only competent workers may operate heavy equipment/mobile equipment. An workers competency must be demonstrated by successful completion of the training and evaluation process specified in this policy. This policy establishes requirements to work in or around all types of mobile equipment. The requirements defined in this policy describe the minimum required by AMS. In addition, the operation of some equipment may require the operator to possess other licenses (i.e., Commercial Drivers License, Forklift License) or specialty training required by the State or other regulatory agency.

DEFINITIONS

Competent Person – Person who by possession of a recognized degree in an applicable field or a certificate of professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter and work.
Free Moving Mobile Equipment – Operator controlled mobile equipment not constrained by Fixed Rails and can include Industrial Fork Trucks, Aerial Lifts, Buggies, Sweepers and Backhoes.

Mobile Equipment – Free moving equipment propelled/powered by gasoline, propane, natural gas, diesel or electricity used to haul, transport, excavate, move, maneuver, or hoist materials, equipment, products or workers.
Pre-use Inspection – Required inspection of a piece of mobile equipment completed when the facility has not operated the mobile equipment for each shift.

RESPONSIBILITIES

The following identifies some of the responsibilities for various parties affected by this policy.

Company Management

- Ensuring that Federal, State and Local laws, regulations, codes and ordinances are followed.
- Developing policies, accident prevention methods, procedures and programs.
- Conducting periodic safety inspections of all work locations.
- Assuring that accidents and hazardous conditions are investigated and corrective actions are implemented.
- Provide/Arrange for assistance with the policy to requesting departments.

Supervisors

Supervisors are responsible for:

- Identifying the specific jobs or individuals to whom this policy applies.
- Identifying all heavy equipment/mobile equipment in their department.
- Ensuring that a competent person is available for heavy equipment/mobile equipment training and evaluations.
- Ensure that operators of heavy equipment/mobile equipment are trained, evaluated, observed and given skills needed to operate the equipment safely.
- Assuring that Operator's manuals and manufacturer's safety information is available for all equipment and vehicles identified in the department.
- Ensuring that safety procedures presented in this and other A MS policies, as well as in Manufacturer's Operator's and Safety Manuals are implemented and enforced.
- Maintaining training and certification records for all operators of heavy equipment/mobile equipment.

Supervisors/Mangers/Leads

Due to their constant contact with workers, supervisors, managers and leads must take a primary role in the prevention of accidents and the safety of workers under their supervision.

Responsibilities include:

- Observing and evaluating the use of heavy equipment/mobile equipment by workers and correcting any unsafe conditions or practices and reporting or correcting any found.
- Checking and ensuring that heavy equipment/mobile equipment is properly maintained and in safe operating condition.
- Remove from service, any heavy equipment/mobile equipment that is not safe.
- Promptly investigating all accidents and completing required reports.
- Encouraging workers to report all unsafe conditions and practices.
- Being familiar with and enforcing all safety procedures and practices applicable to work done by their workers.

Workers/Heavy Equipment/Mobile Equipment Operators

Worker responsibilities include:

- Reading, understanding and following the procedures and practices outlined in this policy.
- Reading, understanding and complying with owner's manuals and manufacturer-provided safety information before using heavy equipment/mobile equipment.
- Completing the Daily Heavy/Mobile Equipment Checklist before use.
- Report any inspection deficiencies with equipment to their immediate supervisor for maintenance or further action prior to operation of the equipment.
- Using all appropriate safety equipment and devices, including but not limited to seatbelts.
- Immediately reporting all work related accidents, fuel spills, fires, and injuries to their supervisors.
- Obey traffic signs and signals and audible or visual warning devices.
- Immediately reporting all unsafe conditions and practices to their supervisors and/or Department Head and/or AMS Administrator.
- Attending appropriate training as recommended by their supervisors.

Competent Person (Equipment Trainer):

- Train and evaluate equipment operators in classroom, hands-on training process and refreshers.
- Be knowledgeable and experienced in the particular equipment operation and how-to train.
- Document evaluations and training.

Heavy Equipment/Mobile Equipment Operations

General Requirements

All vehicles must have a service brake system, an emergency brake system, and a parking brake system. These systems may use common components, and must be maintained in operable condition. Whenever visibility conditions warrant additional light, all vehicles in use must be equipped with at least two headlights and two taillights in operable condition. All vehicles, or combination of vehicles, must have brake lights in operable condition regardless of light conditions. All vehicles must be equipped with an adequate audible warning device at the operator's station (horn) in an operable condition.

- The vehicle has a reverse signal audible above surrounding noise level.
- The vehicle backs up only when an observer signals it is safe to do so.
- All vehicles with cabs must be equipped with windshields and powered wipers.
- Cracked and broken glass must be replaced.
- Vehicles operating in areas or under conditions that cause fogging or frosting of the windshields must be equipped with operable defrosting devices.
- All haulage vehicles, whose pay load is loaded by means of cranes, power shovels, loaders, or similar equipment, must have a cab shield and/or canopy adequate to protect the operator from shifting or falling materials.
- Tools and material will be secured to prevent movement when transported in the same compartment with workers.
- Vehicles used to transport workers must have seats firmly secured and adequate for the number of workers to be carried.
- Seat belts and anchorages meeting the requirements of 49 CFR Part 571 (Department of Transportation, Federal Motor Vehicle Safety Standards) must be installed in all motor vehicles, and used by the operator.
- Trucks with dump bodies must be equipped with positive means of support, permanently attached, and capable of being locked in position to prevent accidental lowering of the body while maintenance or inspection work is being done.
- Operating levers controlling hoisting or dumping devices on haulage bodies must be equipped with a latch or other device which will prevent accidental starting or tripping of the mechanism.
- Trip handles for tailgates of dump trucks will be so arranged that, in dumping, the operator will be in the clear.
- All rubber-tired motor vehicle equipment manufactured on or after May 1, 1972, must be equipped with fenders.
- Mud flaps may be used in lieu of fenders whenever motor vehicle equipment is not designed for fenders (such as dump trucks where the dump bed forms an effective fender).
- All vehicles in use must be checked at the beginning of each shift to assure that the following parts, equipment, and accessories are in safe operating condition and free of apparent damage that could cause failure while in use:

    - Service Brakes (including any trailer brake connections)

- Horn
- Parking System (hand brake)
- Steering Mechanism
- Emergency Stopping System
- (Brakes)
- Tires
- Coupling Devices
- Seat Belts
- Safety Devices
- Operating Controls

Operators will complete the Daily Heavy/Mobile Equipment Checklist (Appendix A) every day that a piece of equipment is used, prior to using that equipment.

All defects will be corrected before the vehicle is placed in service. These requirements also apply to equipment such as lights, reflectors, windshield wipers, defrosters, fire extinguishers, etc., where such equipment is necessary.

General Safety Requirements for Earthmoving Equipment

These rules apply to the following types of earthmoving equipment: scrapers, loaders, crawler (track) or wheel tractors, bulldozers, off-highway trucks, graders, agricultural and industrial tractors, and similar equipment. Following are general requirements for earth moving equipment:

Seat Belts

Seat belts must be provided on all equipment listed above, and must meet the requirements of the Society of Automotive Engineers (SAE).

Tractors listed above must have seat belts as required for the operators when seated in the normal seating arrangement for tractor operation, even though back-hoes, breakers, or other similar attachments are used on these machines for excavating or other work.

Access Roadways and Grades

No AMS may move or cause to be moved construction equipment or vehicles upon any access roadway or grade unless the access roadway or grade is constructed and maintained to accommodate safely the movement of the equipment and vehicles involved.

Every emergency access ramp and berm used by an employer will be constructed to restrain and control runaway vehicles.

Brakes

All earthmoving equipment must have a service braking system capable of stopping and holding the equipment fully loaded.

Fenders

Pneumatic-tired earth-moving haulage equipment (trucks, scrapers, tractors, and trailing units) whose maximum speed exceeds 15 miles per hour must be equipped with fenders on all wheels.

Rollover Protective Structures (ROPS)

Rollover protective structures must meet the requirements of 29 CFR 1926.1001 Minimum performance criteria for rollover protective structures for designated scrapers, loaders, dozers, graders, and crawler tractors.

Audible Alarms

All bidirectional machines, such as rollers, compacters, front-end loaders, bulldozers, and similar equipment, must be equipped with a horn, distinguishable from the surrounding noise level, which can be operated as needed when the machine is moving in either direction. The horn must be maintained in an operating condition. Earthmoving equipment with an obstructed view to the rear will not be used in reverse gear unless:

1) the equipment has in operation a reverse signal alarm distinguishable from the surrounding noise level, or
2) a ground guide signals that it is safe to do so.

Scissor Points

Scissor points on all front-end loaders or articulating equipment, which constitute a hazard to the operator during normal operation, must be guarded.

Lift trucks, Stackers, etc.

Equipment of this type must have the rated capacity clearly posted on the vehicle so as to be clearly visible to the operator. When auxiliary removable counterweights are provided by the manufacturer, corresponding alternate rated capacities also must be clearly shown on the vehicle. These ratings will not be exceeded.

Modifications or Additions

No modifications or additions which affect the capacity or safe operation of the equipment may be made without the manufacturer's written approval. If such modifications or changes are made, the capacity, operation, and maintenance instruction plates, tags, or decals will be changed accordingly. In no case will the original safety factor of the equipment be reduced.

Steering or Spinner Knobs

Steering or spinner knobs must not be attached to the steering wheel unless the steering mechanism is of a type that prevents road reactions from causing the steering wheel to spin. The steering knob must be mounted within the periphery of the wheel.

Operator Training

The employer must ensure that each heavy equipment/mobile equipment operator is competent to operate the equipment safely, as demonstrated by the successful completion of the training and evaluation specified in this section. Prior to permitting an worker to operate heavy equipment/mobile equipment (except for training purposes), the employer must ensure that each operator has successfully completed the training required by this section.

Training Program Implementation

Trainees may operate heavy equipment/mobile equipment only:

- Under the direct supervision of workers who have the knowledge, training, and experience to train operators and evaluate their competence.
- Where such operation does not endanger the trainee or other workers.

Training will consist of a combination of formal instruction (e.g., lecture, discussion, interactive computer learning, video tape, written material), practical training (demonstrations performed by the trainer and practical exercises performed by the trainee), and evaluation of the operator's performance on the job-site.

All operator training and evaluation will be conducted by workers who have the knowledge, training, and experience to train heavy equipment/mobile equipment operators and evaluate their competence.

Training Program Content

Heavy equipment/mobile equipment operators must receive initial training in the following topics, except in topics which the employer can demonstrate are not applicable to safe operation of the equipment in the employer's workplace. Training will be documented on the Heavy Equipment/Mobile Equipment Operator Training. Certification Form presented as Appendix B. All training documentation will be maintained in accordance with the recordkeeping and documentation policy.

Certification

AMS will certify that each operator has been trained and evaluated as required by this section. The certification will include the name of the operator, the date of the training, the date of the evaluation, and the identity of the worker(s) performing the training or evaluation. Appendix C presents a Heavy Equipment Operator Evaluation/Employer Certification Form that will be completed upon initial or refresher training of the operator, and at a minimum frequency of every three years thereafter.

Traveling (Roading) Heavy/Mobile Equipment

All traffic regulations must be observed, including authorized site speed limits. A safe distance must be maintained approximately three vehicle lengths from the vehicle ahead, and the equipment must be kept under control at all times. The right of way will be yielded to ambulances, fire trucks, or other vehicles in
emergency situations. Other vehicles traveling in the same direction at intersections, blind spots, or other dangerous locations may not be passed. The operator will be required to slow down and sound the horn at cross intersections of roadways, paths, and other locations where vision is obstructed. If the load being carried obstructs forward view, the operator will be required to travel with the load trailing (to the rear). Railroad tracks must be crossed diagonally wherever possible. Parking closer than 8 feet from the center of railroad tracks is prohibited.

Class I locations Class II locations Class III locations

Locations in which flammable gasses or vapors are, or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures Locations which are hazardous because of the presence of combustible dust. Locations where easily ignitable fibers are present but not likely to be in suspension in quantities sufficient to produce ignitable mixtures.

General Requirements for Heavy Equipment Use

All equipment left unattended at night, adjacent to a highway in normal use, or adjacent to construction areas where work is in progress, will have appropriate lights or reflectors, or barricades equipped with appropriate lights or reflectors, to identify the location of the equipment.

A safety tire rack, cage, or equivalent protection will be provided and used when inflating, mounting, or dismounting tires installed on split rims, or rims equipped with locking rings or similar devices.

Heavy machinery, equipment, or parts thereof, which are suspended or held aloft by use of slings, hoists, or jacks will be substantially blocked or cribbed to prevent falling or shifting before workers are permitted to work under or between them.

Bulldozer and scraper blades, end-loader buckets, dump bodies, etc., will be either fully lowered or blocked when being repaired or when not in use. All controls will be in a neutral position, with motors stopped, and brakes set unless work being performed requires otherwise.

Whenever the equipment is parked, the parking brake will be set. Equipment parked on inclines will have the wheels chocked and the parking brake set. The use, care and charging of all batteries will conform to the following:

- Ventilation will be provided to ensure diffusion of the gases from the battery and to prevent the accumulation of an explosive mixture.
- Face shields, aprons, and rubber gloves will be provided for workers handling acids or batteries.
- Facilities for quick drenching of the eyes and body will be provided within 25 feet of battery handling areas.
- Facilities will be provided for flushing and neutralizing spilled electrolyte and for fire protection.

All cab glass will be safety glass, or equivalent, that introduces no visible distortion affecting the safe operation of any machine covered by this section. All equipment will comply with AMS requirements when working or being moved in the vicinity of power lines or energized transmitters.

General Requirements for Site Clearing

Workers engaged in site clearing will be protected from hazards of irritant and toxic plants and suitably instructed in the first aid treatment available.

All equipment used in site clearing operations must be equipped with rollover guards. In addition, rider-operated equipment will be equipped with an overhead and rear canopy guard meeting the following requirements:

- The overhead covering on this canopy structure will be of not less than 1/8-inch steel plate or ¼- inch woven wire mesh with openings no greater than 1 inch, or equivalent.
- The opening in the rear of the canopy structure will be covered with not less than ¼- inch woven wire mesh with openings no greater than 1 inch.

Additional Heavy/Mobile Equipment Safety Guidelines

Many injuries involving heavy/mobile equipment do not occur to the operator, but are inflicted on ground personnel working in or around the vicinity of moving machines. Always be aware of the location of personnel working near your machine. Heavy/mobile equipment operations frequently require the aid of ground personnel who should be thoroughly familiar with the procedures of your operation and the capabilities of the machine; usual operating procedures should not be changed without first notifying ground personnel. Never assume that your assigned ground workers will watch out for themselves. Always know your ground personnel's

location, if they are not visible to you, DO NOT MOVE THE MACHINE OR ANY IMPLEMENTS! When working in conjunction with ground personnel, never operate equipment at speeds which would necessitate ground personnel to work in a careless manner. REMEMBER, they are depending on your skill and judgment, as are all workers in your immediate work area.

- Read the operators manual and operate the machine only if trained and considered competent to do so.
- Wear appropriate clothing and personal protective equipment for the job.
- Hearing protection is recommended for operating many types of heavy/mobile equipment.
- Do a walk around to make sure the area is clear before moving the machine.
- Do not climb on the machine where hand and foot holds have not been provided.
- Use a three point climbing technique whenever entering, exiting, or servicing the machine.
- Start machine only while sitting in the operator's seat and all workers are clear.
- Ensure all controls are in the neutral position before starting the machine.
- Keep tires properly inflated. Improper inflation may cause the machine to tip over under load.
- Heavy/mobile equipment machines are required to have a seat belt and rollover protection (ROPS).
- Always use the seat belt. AMS takes the position that seat belts are personal protective equipment, and failure to use them is grounds for discipline.
- Keep the load as low as possible while traveling; always reduce speed when making a turn. Keep speeds low on rough terrain. Bouncing, bucking, or side hopping because of excessive speed may cause loss of control of the machine.
- Check for overhead lines or obstructions before raising any overhead implement. Ensure the proper clearance requirements are being met when the equipment is being worked on or moved in the vicinity of overhead power lines or transmitters.
- Do not allow the tires to spin when picking up or pushing a load.
- Do not walk, work, or allow workers under any raised part of heavy/mobile equipment.
- Do not use heavy/mobile equipment for demolition of structures which are taller than the machine without overhead protection sufficient to withstand the debris likely to impact the cab.
- Do not under-cut a bank which is higher than the machine.
- Use extreme caution when approaching or operating near excavations, the weight of the machine or vibration may cause the edges to collapse.
- Dust suppression and control is required where dust seriously limits visibility. Wear respiratory protection when needed.
- Pre-wet soil to make loading easier and to aid in dust control.
- Rip tight soil before scraping or excavating to improve speed and efficiency.
- Always load buckets or hoppers down grade to increase the speed of operation, lessen wear on equipment, and reduce the need for a push tractor.
- Do not use heavy/mobile equipment as a battering ram.

- In tight turns, make sure the machine has clearance in front and rear if equipped with rear implements.
- Do not place any part of your body under any raised implement at any time unless it is properly blocked.
- Keep operator's compartment free of clutter and all controls free of oil and grease. Personal tools or equipment must be secured.
- All underground utilities in the work area must be located prior to digging. Utility companies must be notified of your intention to excavate within established, or customary, response times. (Check local codes).
- When excavations approach the estimated location of underground utilities, the exact location must be determined and marked.
- Wherever equipment operations encroach on a public thoroughfare, a system of traffic controls must be used.
- Flaggers are required at all locations where barricades or warning signs cannot control moving traffic.
- Never use an elevating part of heavy equipment as a man-lift.

The productivity and safety of heavy equipment operations are increased by using well trained workers, along with properly maintained and serviced equipment. A well laid out worksite and work- plan always improves efficiency and safety on the jobsite.

APPENDIX A

DAILY HEAVY/MOBILE EQUIPMENT CHECKLIST

Operator: _____ Vehicle: _____

_____ Date:

Check: (S) each safe item, (D) each defect, NA for non applicable

	S	D	NA
(1) Seat-Belt			
(2) Gauge and Instruments			
(3) Light (front and rear)			
(4) Horn/Warning Device			
(5) Back-Up Signal			
6) Brakes (hand and foot)			
(7) Steering and Hydraulic controls			
(8) Tires and Wheels			
(9) Fluid Leaks			
(10) Physical Damage?			
Recent? (Y/N)			
Does it affect safe operation? (Y/N)			
(11) Equipment Kill Switch			
(12) Window Defrost			
(13) Reflectors			
(14) Windshield Wipers			
(15) Fire Extinguishers			

Service Required? (Y/N)

Technician Called? (Y/N)

By Whom?

Date:

Service Performed? (Y/N)

By Whom?

Date:

Lockout/Tagout Required? (Y/N)

Vehicle Back in Service? (Y/N)

Date:

APPENDIX B

HEAVY EQUIPMENT/MOBILE EQUIPMENT OPERATOR TRAINING CERTIFICATION FORM

Worker Name: _____

Department: _ Locati

Training included the following topics. Instructor should indicate and initial the dates that a particular topic was completed.

Equipment-Related Topics

Date	Topic	Trainers Initials
	Operating instructions, warnings, and precautions for the types of equipment the operator will be authorized to operate	
	Differences between the equipment and an automobile (e.g., turn radius, braking ability, visibility of surroundings, blind spots, etc.)	
	Equipment controls and instrumentation; where they are located, what they do, and how they work	
	Engine or motor operation	
	Steering and maneuvering	
	Visibility (including restrictions due to loading).	
	Implement and attachment adaptation, operation, and use limitations	
	Equipment capacity	
	Vehicle stability	
	Equipment Inspection and Maintenance Requirements (See Daily Heavy Equipment Inspection Form)	
	Refueling and/or charging and recharging of batteries	
	Operating limitations	
	Any other operating instructions, warnings, or precautions listed in the operator's manual for the types of equipment that the worker is being trained to operate	

Workplace-Related Topics

Date	Topic	Trainers Initials
	Surface conditions where the equipment will be operated	
	Composition of loads to be carried and load stability	
	Load maneuvering, loading, and unloading (includes trucks, hoppers, etc.)	
	Pedestrian traffic in areas where the equipment will be operated	
	Confined areas and other restricted places where equipment will be operated	
	Hazardous (classified) locations where the equipment will be operated	
	Ramps and other sloped surfaces that could affect the vehicle's stability	
	Closed environments and other areas where insufficient ventilation or poor vehicle maintenance could cause buildup of carbon monoxide or diesel exhaust	
	Other unique or potentially hazardous environmental conditions in the workplace that could affect safe operation	

I have been instructed in the safe operation of the equipment identified at the top of this form. Training included the topics identified above. I have read, understand and agree to abide by AMS's Heavy Equipment Policy as well as the manufacturer's User's Manual/Safety Guidelines for the equipment.

Signature of Worker/Operator _____Date;_____

The individual identified above has been instructed in and evaluated on the safe operation of the equipment identified at the top of this form. Instruction included the topics identified in the tables presented above.

Signature of Trainer_____Date:_____

APPENDIX C

HEAVY/MOBILE EQUIPMENT OPERATOREVALUATION/EMPLOYER CERTIFICATION FORM

Name of Operator:_____ Equipment: _ Depart

This evaluation is to be completed upon completion of initial or refresher training of the heavy equipment operator, and at a minimum frequency of every three years thereafter.

EMPLOYER CERTIFICATION

I certify that the individual identified above has been instructed and evaluated in the safe operation of the equipment identified at the top of this form. Training and evaluation were conducted in accordance with AMS's Heavy Equipment Policy. The operator has been evaluated and been deemed competent in his performance of the following:

- Safely operates and does not abuse the equipment.
- Completion of daily equipment inspections
- Keeping equipment clean and serviceable
- Practices good driving habits
- Identifying and reporting equipment wear, malfunctions and damage

Evaluator_____ Date:_____
Department Head _____Date:_____

HOT WORK POLICY

PURPOSE

The purpose of ALLEN MECHANICAL SERVICES-AMS's, hereafter referred to as "AMS", policy is to establish cutting and welding safety procedures and to ensure that all cutting, and welding operations are performed in the safest manner possible, and in compliance with applicable regulations.

POLICY

All cutting and welding operations shall be performed in compliance with OSHA standards and all other applicable state, local and client regulations, policies, procedures, and standard safe work practices. Welding is restricted to areas or situations where adequate fire prevention, welder protection and passerby protection can be assured.

PROCEDURES

This safety standard is intended as a guide to safe practices in welding, burning, brazing and related operations. The precautions and protective measures outlined are recommended minimum requirements. Welders should exercise judgment in applying these precautionary measures in such matters as length of work periods, poor ventilation, unusual work locations, and specialized operations. Additional protective measures may be required in certain instances.

Training

"Fire Watch" is a worker specifically trained and assigned to warn others of hazards associated with flammable materials and when capable of preventing incipient stage fires. At a minimum the Fire Watch will be trained in the following:

- Ensure proper "Hot Work" permit is on site
- Ensure permit is signed by all appropriate personnel
- Ensure adequate means of access and egress are provided to the work site
- Read and understand all permit provisions, and maintain the conditions of the permit at all times
- Wear an identification vest (made of flame-retardant material)
- Maintain appropriate sewer drain coverage (if applicable)
- Maintain a charged fire hose to the end nozzle, and/or a charged dry chemical fire extinguisher with current inspection tags
- Maintain spark containment by using approved fire blankets
- Prevent the taking of samples, venting, or opening of piping or equipment in the immediate area of the hot work

- Must be able to communicate in English so that you can inform others in the event of emergency conditions
- Determine the exact location of firefighting equipment in the immediate area
- Ensure proper barricading and warning signs are used
- Continuously monitor the work area during and for 30 minutes after hot work has finished to ensure no smoldering embers or slag exist
- During actual hot work, keep area wet when possible
- Continuously monitor the work area and surrounding area for any unsafe conditions, or potentially hazardous conditions
- In the event of a hazardous condition, emergency, or changing environment, the fire watch will stop all work until it is safe to resume
- Never leave the work site unless the work has stopped, or until you are relieved by another worker with equal or greater training and knowledge
- Ensure surrounding conditions are inspected and precautions are taken with consideration given to wind direction
- Ensure equipment such as welding machines, hoses, tools, etc., are located so as not to impede access or egress, or access to firefighting equipment
- In the event of a fire - Remain calm
- Only extinguish a fire when it is clearly within your abilities and the equipment available
- Know the location of the nearest alarm and how to activate the emergency system
- Know the evacuation routes and collection points
- If the fire cannot be extinguished, leave the area immediately and report to your evacuation area
- Await further instructions from the Incident Commander, or designated responsible personnel

Only trained and qualified workers may operate or maintain welding, cutting or brazing equipment Welders/Cutters will be trained per this policy and will possess the appropriate certifications for their work scope.

Craft who perform any of the functions covered by this policy will be required to complete training including:

- A test or other method to determine competency
- All training records shall be documented and kept on file with Human Resources

General Rules

Initial Assessment – Fire is a primary focus and the assessment for fire protection guide should be used:

A dedicated fire watch is required for all hot work. If the object to be cut, burned, or brazed cannot be moved and if all fire hazards cannot be removed, then guards shall be used to confine the heat sparks and slag and to protect the immovable fire hazards.

Fire watchers shall be required whenever welding or cutting is performed in locations where other than a minor fire might develop, or any of the following conditions exist:

- Appreciable combustible material, in building construction or contents, closer than 35 feet (10.7 m) to the point of operation.
- Appreciable combustibles are more than 35 feet (10.7 m) away but are easily ignited by sparks.

If these steps cannot be taken to prevent fire, then the hot work will be stopped until a safer alternative is available to perform the work safely.

Supervisor/qualified personnel will inspect the area prior to work beginning and authorize the work. The competent person will be trained to perform his/her job functions and to identify substandard conditions/acts. The competent person shall ensure all oxygen-fuel gas supply equipment is suitable, safe to use, and in good working condition for the hot work.

Inspections and certification records will be kept for recordkeeping.

If	And	Then
The object to be welded, cut, or heated can be moved	A fire-resistant, safe workspace is available	Welding, cutting, or heating shall be done in that space.
The object to be welded, cut, or heated cannot be moved	All fire hazards can be moved to a safe distance	Welding, cutting, or heating can be done once fire hazards are taken to a safe place.
The object to be welded, cut, or heated cannot be moved	All the fire hazards cannot be removed	Guards shall be used to confine the heat, sparks, and slag, and to protect the immovable fire hazards.

Before doing any welding or burning, outside of an area approved for routine hot work, be certain the necessary Hot Work Permit has been issued. All hot work will be approved by the client and the site supervisor. The crew responsible for the equipment will ensue all is suitable and in good working order. All equipment is inspected prior to beginning work and all crew members using the equipment will be familiar with “American Welding Society Standard A6-1-1966”. Any equipment that is not ready for service or needs repair shall be red-tagged and repaired by qualified personnel.

Whenever it is necessary for hoses, lines or cords to cross walkways or work areas, they must be strung overhead or protected by planks laid on both sides of the hose. All hoses, cord and leads and other welding equipment must be maintained in a safe and serviceable condition, with no fraying or exposed copper permitted. They should be deployed in a manner that does not create tripping hazards.

Contain all sparks with fire blanketing.

Before each use, hose must be inspected for leaks, burns, worn places, loose connections, or other defects which may render the hose unfit for service. Hose burned by a flash back must be discarded.

Welding machine ground connections must be made on or as close as possible to the object being worked upon to assure a good ground and prevent damage to valves, pump bearings, etc.

Welding machine grounds shall not be made to handrails, stairs, or to projections from steel power or lighting towers, or on any active oil, gas, steam, air, or chemical line.

Temporary power lines to portable arc welding machines should be carried overhead whenever practical or laid on the floor or ground suitably protected so that they cannot be damaged or interfere with safe passage.

Necessary precautions must be taken to protect against electrical shocks when working in wet or damp places.

In electric welding, all parts of the body should be covered to prevent skin burns from ultra-violet rays or molten metal. The feet and ankles are particularly vulnerable to burns, and care should be taken to see that they are properly protected.

Do not use ear cotton when welding. Sparks or slag may ignite the cotton.

Welding rod shall not be stored in its original container once the container has been opened. When an original container is opened, the rod shall be immediately transferred to either a rod oven or an approved container, such as the plastic “rod guard” container. The original container shall then be crushed and properly disposed of.

Full spark containment is required, and any exposed equipment or small-bore piping must be protected from damage. A trained fire watch must be present at all times when hot work is in progress.

Two sets of Flash Back arrestors must be installed on oxyacetylene system; one set installed at regulators and one set at torch handle (unless torch is equipped with arrestors).

Welders must wear Z-87 Safety Glasses with side shields under their welder’s hoods.

Grinders are required to have OSHA approved guards in place at all times. Exceptions must be approved by the Safety Department.

Only pipe stands that are designed to prevent pinch points at the center tube locking washer, and a stop at the base of the center tube to prevent crushing type injuries shall be used.

All welding rigs must be in safe operating condition and be properly identified.

Welding rigs must have emergency brake set and transmission in park or low gear when parked. If there is any slope the wheels must be chocked. When exiting a welding rig, welders must wear all required PPE.

The work area must be kept clean and materials including used weld rod removed when job is

complete. All welding rigs shall have a fire extinguisher.

Approved spark arrestors are required on all welding machines.

Always inspect grinders before each use. Grinders must have ground fault circuit interrupters (GFCI's)

Welding hoods must be equipped with the proper shaded lens for protection against radiant energy. (According to chart)

Make sure all sewers, drains, pits, pipe trenches, confined spaces; enclosed spaces have been tested for flammable vapors and/or hydrocarbons. Cover all openings per client policy.

Filter Lens Shade Numbers for Protection against Radiant Energy

Shade Number	Welding Operation
10	Shielded metal arc welding 1/16, 3/32, 1/8, 5/32-in. diameter electrodes
11	Gas-shielded arc welding (nonferrous) 1/16, 3/32, 1/8, 5/32-in. diameter
12	electrodes
12	Gas-shielded arc welding (ferrous) 1/16, 3/32, 1/8, 5/32-in. diameter electrodes
14	Shielded metal-arc welding 3/16, 7/32, 1/4-in. diameter electrodes
10 to 14	Shielded metal-arc welding 5/16, 3/8-in. diameter electrodes.
14	Atomic hydrogen welding
2	Carbon arc Welding
3 or 4	Soldering
3 or 4	Torch Brazing
4 or 5	Light cutting, up to 1 in.
5 or 6	Medium cutting, 1 in. to 6 in.
4 or 5	Heavy cutting, over 6 in.
5 or 6	Gas welding (light), up to 1/8-in.
6 or 8	Gas welding (medium), 1/8-in. to 1/2-in.
	Gas welding (heavy), over 1/2-in.

Gas Cylinders

Compressed gas cylinders are to be shut-off at the bottle when not in use or unattended for short periods of time. At the end of the shift the bottles are to be shut off and gauges and hoses detached, and properly stored and protective caps installed.

Compressed gas cylinders shall have gauges removed and be capped prior to transportation. Cylinders shall only be transported or stored in the up position.

Use approved storage racks or dollies to store compressed gas cylinders. Chain or #9 wire may also be used. Never use rope for this purpose.

On welding rigs compressed gas cylinders shall be securely stored in vertical racks.

Oxygen and acetylene cylinders must be stored at a distance of 20 feet apart or be separated by a fire wall that is 5 feet or higher and has a fire rating of 60 minutes or more. These cylinders must be kept at least 20 feet away from combustibles or separated by a fire wall.

Do not use a choker or chokers to haul cylinders.

Keep cylinders away from work so sparks, slag, or flame cannot reach them. If cylinders cannot be isolated, fire- resistant shields must be provided for them.

Cylinders shall always have the gauges removed and cylinder caps installed prior to being moved.

Acetylene shall never be exposed to unalloyed copper except in a torch.

Compressed gas cylinders shall be equipped with connections that conform to ANSI B57.1-1965.

Cylinders shall be marked to identify contents.

No more than 15 psi of acetylene shall be used at any time.

Bottles shall be slightly opened then closed just prior to attachment of the regulator.

Torches shall be lighted by friction lighters, not matches or other hot work.

Welders must ensure that lines have been adequately purged prior to working on them.

Equipment shall be inspected for leaks daily.

Unserviceable/non-approved equipment may not be used.

All welders shall possess current certifications.

Hot work area shall be kept damp at all times.

Unattended/unused welding machines shall be turned off.

Fire Watches shall remain on site for 1/2 hour after job.

MOST IMPORTANTLY: NO HOT WORK PERMIT = NO WELDING.

Ventilation

The following are ventilation requirements for welding:

- Ensure that adequate ventilation is provided for workers working with welding and cutting equipment. Confined space work will have a plan to address securing of cylinders, lifelines, and warning systems that will be utilized by the safety attendant (Fire Watch/Confined Space Attendant).
- Ensure that contaminated air exhausted from a working space is discharged into the open air or otherwise clear of the source or intake air.
- Do not use oxygen for ventilation, comfort cooling, blowing dust from clothing, or for cleaning a work area.
- Ensure that all necessary precautions are taken to prevent the accumulation of gases when cutting torches are used.
- Do not take compressed gas cylinders into confined areas.
- Ventilation equipment consists of air siphons (air movers), and/or exhaust blower (coppus air mover).
- When using blowers or siphons to exhaust fumes, exhaust inlet must be kept as close as possible to the work. Air siphons use large amounts of compressed air. The following safety procedures shall be followed:

    - Keep connecting air hoses as short as possible.
    - Do not attempt to operate more than one siphon off a single air hose or outlet.
    - If used to exhaust a vessel, be sure to seal the bell of the inlet side around the manhole or vessel opening.
    - A daily inspection of the safety screens' condition should be accomplished on the blowers. Repair or replace if broken. The use of a blower hinge is also recommended.

Planning Hot Work Welding

In planning or carrying out hot work, certain factors should be considered besides the obviously important hot work permit, gas test and hazard analysis. Those factors include, but are not limited to:

- The base metal and its health effects. The SDS on the metal is available and will address this issue.
- The welding or burning process to be used and its special health problems, if any.
- The location of the work: Is the work to be done in the open or in a confined space?
- Ventilation required: Is special ventilation equipment needed?
- Position of the work: Is the work overhead or below? Can it be positioned to allow fumes to be carried away without entering the welder's breathing zone?
- Presence of other workers near the job: Is eye protection needed against ultraviolet radiation? Are other workers in the path of the welding fumes?
- Cleanliness of the metal surface: Are harmful or flammable materials present beneath patches or in seams?
- Respiratory protection: Are fume respirators adequate, or are air-supplied respirators needed? Protection must be appropriate to the circumstances and must meet the minimum requirement of the permit, but also may be upgraded.
- Ensure adequate first aid supplies are available before beginning work. All injuries will be reported immediately.

Welding and Burning Safe Practices

The following information is the recommended minimum precautionary measure to be followed in performing the types of hot work listed in Table 13-1. If, in the opinion of the supervisor, additional protection is required for a particular welding or burning job, such added protective measures should be used.
Open Area includes most outside work, the mechanical shop (except vessels or partitioned areas inside the building) and well-ventilated large rooms, buildings, or tanks. Confined Spaces include work areas such as inside small tanks, drums, towers, or other vessels, whether indoors or out, as well as small rooms, deep excavations, and manholes.

Table 13-1 - Welding and Burning Stick Electrode Welding

Electrode	Basic Elements	Byproducts	Precautions
AWS E-6010	Iron		A
AWS E-6011	Iron		A
AWS E-6012	Iron		A
AWS E-6013	Iron		A
AWS E-6020	Iron		A
E-316 Stainless 18-12	Chromium, Nickel, Iron	Chromium, Nickel	B
E-310 Stainless 25-20	Chromium, Nickel, Iron	Chromium, Nickel	B
e-308 Stainless 18-8	Chromium, Nickel, Iron	Chromium, Nickel	B
E-610 12% Cr	Chromium, Iron	Chromium	B
E-502 5% Cr	Chromium, Iron		A
E-605 9% Cr	Chromium, Iron	Chromium	B

E-7018 Low Hydrogen	Iron	Fluorides	C
E-8018 B-2 (1-1/4% Cr)	Chromium, Iron		A
E-9018 B-3 (2-1/4% Cr)	Chromium, Iron		A
E-8108 C-2 (3-1/2% Ni)	Nickel, Iron		
Stoody 6	65% Cobalt, 45% Tungsten, 28% Chromium Cobalt	Chromium	B
Eutectic 680	High Chromium, Nickel	Chromium, Nickel	B
Inco-A	68% Nickel	Nickel	B
Inconel 182	65% Nickel	Nickel	B
Monel 190	60% Nickel, 23% Copper	Nickel, Copper	B
Ni-Rod 55	60% Nickel	Nickel	B
Carpenter 20	36% Nickel, 20% Chromium		B

Precautions:

A. No special precautions are needed in open or well-ventilated areas. Work in poorly ventilated areas will require respiratory protection. Work in confined spaces may require fume filter-type respirators or supplied air. Adhere to or upgrade permit requirements. Consult the Welding Supervisor.

B. Moderate amounts of fumes generated:

1. Use exhaust blowers or air siphons to remove fumes from breathing zone in open areas.
2. Work in confined spaces will require high efficiency particulate respirators.

C. Fumes and gases generated:

1. Use exhaust blowers or air siphons to remove gases and fumes from breathing zone in open areas.
2. Work in confined spaces will require air-supplied respirator.

D. Intense arc. Large amounts of metal fumes and gases generated:

1. Provide adequate ventilation of work. Use fume exhausters to remove fumes and gases from breathing zone in open areas. Do not direct exhaust air toward other workers. Use fume filter-type respirators in open areas.
2. In confined areas, adequate ventilation must be provided, and air-supplied respirator must be worn.

E. Use only in metalizing hood. If necessary to metalize in other locations, use air-supplied respirator and protect other workers in the vicinity. Do not use any lead alloys in open shop area.

Table 13-1
Tungsten Arc Welding, Gas Shielded (Heli arc)* (TIG)

Rod	Basic Elements	Harmful Byproducts	Precautions
Evedur 1010	05.6% Copper Silicon	Copper, Ozone	C
Oxweld 372 Copper	98% Copper	Copper, Ozone	C
AWS ER 4043	Aluminum, Silicon	Ozone	C
AWS ER 5356	Magnesium, Aluminum	Ozone	C
Oxweld 28	18% Chromium, 8% Nickel, Iron	Chromium, Nickel Ozone	C

Steel	Steel	Ozone	C
1-1/4% Chromium	Chromium, Iron	Ozone	C
2-1/4% Chromium	Chromium, Iron	Ozone	C

*High levels of ultraviolet light produced. Avoid eye flash with side shield goggles. Avoid skin burns with proper clothing.

C. Fumes and gases generated:

1. Use exhaust blowers or air siphons to remove gases and fumes from breathing zone in open areas.
2. Work in poorly ventilated areas will require respiratory protection.
3. Work in confined spaces will require air-supplied respirator.

Short Arc Consumable Electrode Gas Shield* (MIG)

Wire	Basic Elements	Harmful Byproducts	Precautions*
18-8 Stainless	18% Chromium, 8 % Nickel, Steel	Chromium,Nickel,Ozone	B
25-20 Stainless	25% Chromium, 20% Nickel, Steel	Chromium,Nickel,Ozone	B
Oxweld 63	98% Copper	Copper, Ozone	B
Airco 110	98% Copper	Copper, Ozone	B
Oxweld 62	91.5% Copper, Aluminum	Copper, Ozone	B
Type 316 Stainless	18% Chromium, 13% Nickel, Steel	Copper, Nickel, Ozone	B
Aluminum	Aluminum	Ozone	B
Hastelloy B	Nickel, Molybdenum	Nickel, Ozone	B
Inconel 62	Chromium, Nickel	Nickel, Ozone	B
Oxweld 65	Iron		B

*High levels of ultraviolet light produced. Avoid eye flash with side shield goggles. Avoid skin burns with proper clothing.

B. Moderate amounts of fumes generated:

1. Use exhaust blowers or air siphons to remove fumes from breathing zone in open areas.
2. Work in confined spaces or poorly ventilated areas will require high efficiency particulate respirators.

Acetylene Welding and Brazing

Wire	**Basic Elements**	**Harmful Byproducts**	**Precautions**
Hastelloy D	Silicon, 90% Nickel	Nickel	A
Oxweld 5M	Copper, Zinc, Tin	Copper, Zinc	B
1 Oxweld	Steel		A
Aluminum	Aluminum		A

Everdur 1010	Copper, Silicon	Copper	A
Arcosil J	56% Silver, 22% Copper 17% zinc, 5% Tin	Copper, Zinc	B
Oxweld 28	18% Chromium, 8% Nickel, Steel	Chromium, Nickel	B
18-8 Stainless	18% Chromium, 8% Nickel, Steel	Chromium, Nickel	B
Easy-Flo	45% Silver, 15% Copper 25% Cadmium, 16% Zinc	Copper, Cadmium Zinc	B
Sil-Fos	15% silver, 80% Copper 5% Phosphorus	Copper	B
Oxweld 372	98% Copper	Copper	B
Colmonoy 6	65% Cobalt, 28% Chromium	Cobalt, Chromium	B
Chromium	Tungsten		
Stoodite	Iron, 30% Chromium	Chromium	B
Borod	Tungsten Carbide, Iron		

A. No special precautions are needed in open or well-ventilated areas. Work in confined spaces or poorly ventilated areas may require fume filter-type respirators. Consult the mechanical welding and metals supervisor.

B. Moderate amounts of fumes generated:

1. Use exhaust blowers or air siphons to remove fumes from breathing zone in open areas.
2. Work in confined spaces will require high efficiency particulate respirators.

Silver Soldering and Soldering

Rod, Wire	Basic Elements	Harmful Byproducts	Precautions*
1801 Super	Silver, Copper, Cadmium, Zinc	Copper, Cadmium, Zinc	B
1602	Silver, Copper, Tin	Copper	B
18 FC	Copper, Tin Zinc	Copper, Zinc	B
16 FC	Silver Copper, Nickel	Copper, Nickel	B
15 Phoson	Silver Copper Phosphorous	Copper	B
11 Allstate	Copper, Zinc, Nickel	Copper, Zinc, Nickel	B

B. Moderate amounts of fumes generated:

1. Use exhaust blowers or air siphons to remove fumes from breathing zone in open areas.
2. Work in confined spaces will require high efficiency particulate respirators.

Air Arc Cutting and Gouging (Carbon Rod) *

Material Worker	Basic Elements	Harmful Byproducts	Precautions*
Steel	Iron	Iron Oxides	D

Cast Iron	Iron	Iron Oxides	D
Monel	Copper, Nickel	Copper, Nickel	D
Stainless Steels	Chromium Nickel, Iron	Chromium, Nickel	D
Chrome Steels	Chromium, Iron	Chromium	D
Brass	Copper, Zinc	Copper, Zinc	D
Copper	Copper	Copper	D
Aluminum	Aluminum	Nickel Oxides	D
High Nickel	Nickel	Nickel Oxides	D

CADMIUM AWARENESS

While AMS does not expect any exposure to cadmium, if the job or project that we are working is determined to contain or potentially expose our workers, then we will work with the client to first determine if the hazard can be engineered out or if we will need to establish a protocol using this policy to safely perform the work. The equipment and processes that typically contain cadmium will be identified by the work permit and or job hazard analysis systems. Procedures for elimination or minimization of exposure will be the 1st line of defense. Special precautions will be exercised when maintenance of ventilation systems and changing of filters is performed.

Appearance

Cadmium metal-soft, blue-white, malleable, lustrous metal or grayish white powder. Some cadmium compounds may also appear as a brown, yellow, or red powdery substance. Cadmium can cause local skin or eye irritation. Cadmium can affect your health if you inhale or if you swallow it. Cadmium that may be immediately dangerous to life or health occur in jobs where workers handle large quantities of cadmium dust or fume; heat cadmium-containing compounds or cadmium-coated surfaces; weld with cadmium solders or cut cadmium-containing materials such as bolts.

The program will be evaluated and updated as needed on an annual basis.

Exposure Limit

TWA PEL 8-Hour (time weighted average, permissible exposure limit) is Five (5) micrograms of cadmium per cubic meter of air 5 ug/m (3), time weighted average for an 8- hour workday. If the PEL is exceeded, this policy will be implemented.

Training

Only trained and qualified workers may operate or maintain welding, cutting or brazing equipment. Welders/Cutters who may be exposed or have the potential to be exposed will be trained per this policy and will possess the appropriate certifications for their work scope.

Any Craft or Trade required to perform any of the functions covered by this policy will be required to complete training per AMS's Training policy including:

- A test or other method to determine competency.
- Training initial to assignment and at least annually thereafter.
- All training records shall be documented and kept on file with Human Resources for at least one year or for the duration of the covered worker's employment.

Documentation will include outline or class name, the names and worker numbers of the workers who participated in the training, names, and signatures of those who trained the class and a class date.

Medical Surveillance/Written Exposure Plan

While AMS should not expose workers to, at or above the action level, if those levels are reached, then a written exposure plan including annual reviews and updates will be required. Should worker(s) become exposed to, at or above action levels related to work exposures and cadmium, then workers will receive a medical evaluation, which will include tests to determine exposure and a medical history. This is provided at no cost to the worker. As with all medical records, these are kept strictly confidential. The worker or representative is entitled to see the records of measurements of the exposure. The worker can also request that medical records for exposure be furnished to the worker's personal physician or designated representative. The written program will be provided for examination and copying upon request of affected workers and their representatives.

Respiratory Protection Program

If respiratory protection is required, see AMS's Respiratory Protection Program for complete guidelines to respiratory protection.

Emergency Procedures

First Aid for Eye Exposure

Direct contact may cause redness or pain. Wash eyes immediately with large amounts of water and seek medical attention immediately.

First Aid for Skin Exposure

Direct contact may result in irritation. Remove contaminated clothing and shoes immediately. Wash affected area with soap or mild detergent and large amounts of water. Get medical attention immediately.

Ingestion

May result in vomiting, abdominal pain, nausea, diarrhea, headache, and sore throat. Treatment for symptoms must be administered by medical personnel. Get medical attention immediately.

Inhalation

If large amounts of cadmium are inhaled, the exposed person must be moved to fresh air at once. Get medical attention immediately.

Rescue

Move affected person from the hazardous exposure. If the exposed person has been overcome, attempt rescue only after notifying at least one other person and put into effect established emergency procedures.

Respirators

You may be required to wear a respirator for work related to this type of exposure or for emergency response. Only use respirators approved by MSHA and NIOSH. Cadmium does not have a detectable odor except at levels well above the PEL. If you can smell cadmium while wearing a respirator, proceed immediately to fresh air.

PPE

You may be required to wear impermeable clothing, gloves, splash-proof or dust resistant goggles, face shield or other appropriate PPE to prevent skin contact with cadmium.

HEXAVALENT CHROMIUM AWARENESS

While AMS does not expect any exposure to Hexavalent Chromium, if the job or project that we are working is determined to contain or potentially expose our workers, then we will work with the client to first determine if the hazard can be engineered out or if we will need to establish a protocol using this policy to safely perform the work. The equipment and processes that typically contain hexavalent chromium will be identified by the work permit and or job hazard analysis systems. Procedures for elimination or minimization of exposure will be the 1st line of defense. Special precautions will be exercised when maintenance of ventilation systems and changing of filters is performed.

DEFINITIONS

Action Level = a concentration of airborne chromium (VI) of 2.5 micrograms per cubic meter of air (2.5 µg/m³) calculated as an 8-hour time-weighted average (TWA)
Chromium (VI) [hexavalent chromium or Cr (VI)] means chromium with a valence of positive six, in any form and in any compound
Emergency means any occurrence that results, or is likely to result, in an uncontrolled release of chromium
(VI). If an incidental release of chromium (VI) can be controlled at the time of release by workers in the immediate release area, or by maintenance personnel, it is not an emergency
Worker Exposure means the exposure to airborne chromium (VI) that would occur if the worker were not using a respirator
Regulated Area means an area, demarcated by the employer, where a worker's exposure to airborne concentrations of chromium (VI) exceeds, or can reasonably be expected to exceed the PEL. Access to Regulated Area shall be limited to:

- Persons authorized by the employer
- Persons with required work duties in the regulated area
- Workers are not permitted to eat, drink, smoke, chew tobacco or gum, or apply cosmetics in the regulated area where skin and eye contact with Chromium VI may occur

Permissible Exposure Limit (PEL). AMS shall ensure that no worker is exposed to an airborne concentration of chromium (VI) in excess of 5 micrograms per cubic meter of air (5 µg/m³), calculated as an 8- hour time-weighted average (TWA)

- Below 0.5 µg/m³ under any condition – Exempt
- Between 0.51 and 2.5 µg/m³
    - Housekeeping – no dust
    - Clean eating and drinking areas
- Above action level 2.5 µg/m³ for more than 30 days per year
    - All of the above
    - Install engineering controls
    - Personal respiratory protection

    - Monitoring every 6 months
    - Medical Surveillance, at least annually
    - Recordkeeping, Hazard Communication Training
- Above the PEL 5.0 µg/m³
    - All of the above
    - Establish regulated areas – roped off, limited access, Personal Protective Equipment (PPE), washing facilities
    - Monitoring every 3 months

Respiratory Protection

Fresh air will be the only method currently that will prevent airborne exposure and eye exposure when being exposed to the PEL.

Skin Protection

If exposure or likely exposure is there, then appropriate skin protection such as Tyvek and gloves (i.e., disposable type PPE).

No PPE that is contaminated shall be removed from the job site, except by those workers whose job it is to launder, clean, maintain, or dispose of such clothing and equipment (all clothing/equipment being removed for laundering, cleaning, maintenance, or disposal shall be transported in sealed, impermeable bags or other closed, impermeable containers).

Removal of chromium (VI) from protective clothing and equipment by way of blowing, shaking, or any other means that disperses chromium (VI) into the air or onto a worker's body is prohibited.

Access to regulated areas will be limited to those workers with the authority to be there. Regulated areas will be marked as such.

A medical surveillance program including notifications and medical follow-ups will be required for any worker who is exposed at no cost to the worker (medical examination to include: medical work history, with emphasis on: past, present, and anticipated future exposure to chromium (VI); any history of respiratory system dysfunction; any history of asthma, dermatitis, skin ulceration, or nasal septum perforation; and smoking status and history; physical examination of the skin and respiratory tract; and any additional tests deemed appropriate by the examining physician).

If any worker exposure exceeds the PEL, AMS will notify the worker within 15 days in writing of the exposure.

When protective clothing is required, a change room facility must be provided, and the room will include separate areas for protective clothing and street clothes to prevent cross-contamination.
Where skin contact with chromium (VI) occurs, washing facilities must be provided and workers must wash their hands and faces at the end of the shift and prior to eating, drinking, smoking, chewing tobacco or gum, applying cosmetics, or using the toilet (none of these activities can be done in the regulated area).

Housekeeping

All areas contaminated with chromium (VI) will be cleaned by HEPA-filter vacuuming or other methods that minimize the likelihood of exposure. All surfaces must be kept as free as practical of Chromium VI. Waste, scrap, debris, and other materials with Chromium VI must be placed in impermeable bags and labeled according to the Hazard Communication Standard prior to disposal.

Training

- Only trained and qualified workers may operate or maintain welding, cutting or brazing equipment. Welders/Cutters who may be exposed or have the potential to be exposed will be trained per this policy and will possess the appropriate certifications for their work scope.
- Craft who perform any of the functions covered by this policy will be required to complete training per AMS's Training policy including:

    - A test or other method to determine competency
    - Training initial to assignment and at least annually thereafter
    - All training records shall be documented and kept on file for the duration of the covered worker's employment.
        - Documentation will include an outline or class name, the names and worker numbers of the workers who participated in the training, names, and signatures of those who trained the class and a class date.

Medical Surveillance/Written Exposure Plan

While AMS's work should not expose workers to work at or above the action level, if those levels are reached, then a written exposure plan including annual reviews and updates will be required. Should worker(s) become exposed to at or above action levels related to work exposures and Hexavalent Chromium VI, then workers will receive a medical evaluation, which will include tests to determine exposure and a medical history. This is provided at no cost to the worker. As with all medical records, these are kept strictly confidential. The worker or representative is entitled to see the records of measurements of the exposure. The worker can also request that medical records for exposure be furnished to the worker's personal physician or designated representative.

HOUSEKEEPING POLICY

PURPOSE

The purpose of this document is to provide definitions and procedures that should be used by all facilities in defining and managing housekeeping and walking-working surfaces within ALLEN MECHANICAL SERVICES-AMS, hereafter referred to as “AMS”, sites. Where local regulations are more stringent than this requirement, those regulations supersede this requirement.

SCOPE

This requirement applies to all AMS facilities.

DEFINITIONS

Standard railing – A vertical barrier erected along exposed edges of a floor opening, wall opening, ramp, platform, or runway to prevent falls of workers.
Stairs, stairway – A series of steps leading from one level or floor to another, or leading to platforms, pits, boiler rooms, crossovers, or around machinery, tanks, and other equipment that are used continuously or routinely by workers, or only occasionally by specific workers.
Platform – A working space for persons, elevated above the surrounding floor or ground, such as a balcony or platform for the operation of machinery and equipment.

REQUIREMENTS

- The workplace must be kept in a suitable clean and tidy state.
- Aisle-ways must be kept free of hoses, cords, stored materials, and other trip hazards.
- Floors must be even and free of holes or other trip hazards.
- Elevated surfaces (platforms, mezzanines) must be provided with guard rails (standard railing).
- Staircases must be safe.
- Ladders and other equipment should be secured and not left leaning.
- Housekeeping inspections should be conducted at each location at least monthly and documented.
- Health and safety inspections should be conducted at each work site at least monthly.
- Training must be provided to all workers at all work sites to maintain orderliness and housekeeping.

HYDROGEN SULFIDE GAS (H2S) POLICY

PURPOSE

The purpose of this document is to outline safety policy and procedures surrounding the exposure to Hydrogen Sulfide Gas (H2S).

RESPONSIBILITIES

ALLEN MECHANICAL SERVICES-AMS, hereafter referred to as "AMS", shall ensure that all workers follow this program and are trained annually or as needed in H2S Awareness. Workers shall always adhere to this policy.

PROCEDURES

Characteristics of H2S

H2S or sour gas is a flammable, colorless gas that is toxic at extremely low concentrations. It is heavier than air and may accumulate in low-lying areas. It smells like 'rotten eggs' at low concentrations and causes you to quickly lose your sense of smell and a significant property of the gas is its density and temporary paralytic effect on the olfactory nerve. H2S is toxic, colorless, with the odor of rotten eggs at low concentrations, is soluble in water and it is flammable.

Potential Exposure

H2S is a nearly ubiquitous, acute acting toxic substance. It is one of the leading causes of death in the workplace. Occupational exposures to H2S may be found in all places of employment. Workers with the potential to be exposed to H2S above the stated occupational exposure limit (OEL) or permissible exposure limit (PEL) must be trained in H2S awareness.

Some of the area/activities in which AMS workers might be potentially exposure to H2S are as follows:

- Drilling Operations
  - Recycled drilling mud
  - Water portion from the sour crude wells
  - Blow outs (infrequent)
- Tank Gauging (the opening of the tank hatch to measure the liquid level in the tank can result in the release of build-up H2S)
  - Run-down tanks
  - Storage tanks at pipeline stations
  - Crude oil storage tanks in refineries
  - Storage tanks for intermediate and finished products
  - Field maintenance of wells

- Tank batteries and wells

- Entry into closed spaces including trenches, Pits, Process vessels, and tanks
- Leaks in pumps or lines
- Stripping of H2S and carbon dioxide from crude oil at the oil field and at the refinery
- Injection of sour gas back into formation to stimulate oil production
- Asphalt storage and associated operations

Byproducts

Iron sulfide is a byproduct of many production operations and may spontaneously combust with air. Flaring operations associated with H2S production will generate Sulfur Dioxide (S02), another toxic gas.

Health Effects of H2S

H2S is an extremely toxic and irritating gas. Symptoms of acute exposure include nausea, headaches, delirium, disturbed equilibrium, tremors, convulsions, blistering, and eye irritation. Inhalation of high concentrations of H2S can produce extremely rapid unconsciousness and instant death by blocking the oxidative processes of tissue cells and by reducing the oxygen-carrying capacity of the blood. Free H2S in the blood depresses the nervous system and larger amounts can paralyze the nervous system so that in acute poisoning death is due to respiratory failure and asphyxiation.

H2S is irritating to the eyes and respiratory tract. The eye irritations--conjunctivitis, pain, lacrimation, and photophobia--may persist for several days.

Respiratory tract symptoms include coughing, pain in breathing, and pain in the nose and throat. Repeated exposures to H2S can result in chronic poisoning that can include:

- Eye irritation
- Respiratory tract irritation
- Slow pulse rate
- Lassitude, digestive disturbances, and
- Cold sweats occur

The temporary paralytic effect on the olfactory nerve is probably its most significant property because high concentrations can cause collapse and death before the odor is detected.

Controls & Work Practices

Detection and Exposure/Air Monitoring

In areas where H2S may be present monitors should be used. Monitors must be bump tested at a minimum as required by manufacturer, if monitor fails a bump test a full calibration is required. Monitors must be calibrated according to manufacturer's recommendations.

Personal alarm monitors must be set to alarm initially at 10ppm H2S, and each contractor should wear an H2S personal alarm monitor when working in all potential H2S areas. AMS will make sure workers are trained annually or as needed in exposure detection/air monitoring. Before entering areas where H2S may be present air must be tested for the presence and concentration of H2S by a qualified person using air monitoring equipment, such as H2S detector tubes or a multi-gas meter that detects the gas. Testing should also determine if fire/explosion precautions are necessary.

- If the gas is present, the space/area must be ventilated continually to remove the gas.
- If the gas cannot be removed, the person entering the space/area must use appropriate respiratory protection and any other necessary personal protective equipment, rescue, and communication equipment.

Entering Dangerous H2S Atmosphere

A level of H2S gas at or above 10 ppm is Immediately Dangerous to Life and Health (IDLH). Entry into IDLH atmospheres can only be made using:

- A full facepiece pressure demand self-contained breathing apparatus (SCBA) with a minimum service life of thirty minutes, or
- A combination full facepiece pressure demand supplied-air respirator with an auxiliary self- contained air supply

If H2S levels are above 10 ppm, an air-purifying respirator may be used, assuming the filter cartridge/canister is appropriate for H2S. A full facepiece respirator will prevent eye irritation. If air concentrations are elevated, eye irritation may become a serious issue. If a half mask respirator is used, tight fitting goggles must also be used. Workers in areas containing H2S must be monitored for signs of overexposure.

NEVER attempt a rescue in an area that may contain H2S without using appropriate respiratory protection and without being trained to perform such a rescue.

Detectors

Commercially available devices can be used for quantitative estimation of low concentrations of H2S by ‘spot- sampling.’ These instruments indicate the amount of the gas present by a color change in chemically coated granules in a narrow glass tube.

A strip filter paper sampler has been developed for the measurement of H2S. Air is drawn through a lead acetate impregnated tape where the H2S reacts to form lead sulfide. Concentrations are determined by comparing the optical density of the black spot with standards. Each worker will always have on their person, personal or area monitors that alarm when PEL exceeds the preset level of 20 PPM for 1910 or 10 PPM for 1926.

Alarms

Continuous Fixed and/or Portable direct-reading monitor devices shall be installed to assure that complete coverage of the area(s) is achieved. An Industrial Hygiene survey may be required by AMS to accurately determine proper locations of monitors. When the concentration of 10 ppm or higher a different alarm will signal a spark-proof audible or visual alarm, one in which workers have been trained to recognize and distinguish. This device must have a response time of 20 seconds or less. When monitor alarms sound vacate the area and do not re-enter. Notify or contact necessary worker, and do not return to work area until clearance is given for re-entry. Workers in the contaminated area shall be evacuated immediately to safe areas. The monitors and alarm systems will be inspected monthly.

Exposure Limits

AMS will ensure that a worker's exposure to H2S is kept as low as reasonably achievable. An employer must ensure that a worker's exposure to H2S does not exceed its occupational exposure limits (OEL) (10 ppm ANSI, API, NIOSH), and the permissible exposure limits (PEL) (OSHA) for H2S (H2S) gas over an 8-hour time.

The occupational exposure limit (OEL) or the permissible exposure limit (PEL) that AMS limits worker exposure to H2S, as stated as an eight-hour time weighted average (TWA). The OSHA PEL for Construction is 10 parts per million (ppm) as an eight-hour TWA and the OEL followed by ANSI, API, and NIOSH is 10 ppm as an eight-hour TWA. OSHA General industry standards do not offer a PEL for industry, instead an accepted ceiling concentration (ACC) of 20 ppm is used.

A worker may not be exposed to H2S at a concentration exceeding its ceiling limit of 15 ppm at any time. If a worker must enter a work area with 15 ppm H2S or greater, the worker must wear supplied air respiratory protective equipment, unless other controls provide better protection.

Safety Precautions

H2S has an unpleasant odor, characteristic of rotten eggs, and is detectable at low concentrations, however, due to rapid onset of olfactory fatigue and paralysis (inability to smell). Alarms will sound on personal and area monitors if the exposure limit exceeds 10 parts per million (ppm) or 20 ppm. Companies subject to the 29 CFR 1926 Construction industry standards may not exceed 10 ppm.

ODOR SHALL NOT BE USED AS A WARNING MEASURE!

AMS has developed a set specific safety rules and actions which include:

- Legible H2S warning sign with yellow flag warning device present
- Keep a safe distance from dangerous locations if not working to decrease danger
- Pay attention to audible and visual alarm systems
- Follow the guidance of the operator representative
- Keep all safety equipment in adequate working order
- Store the equipment in accessible locations:

- An oxygen resuscitator
- A properly calibrated, metered H2S detection instrument

Respirator Specifications

AMS provides respirators for concentrations exceeding 10ppm. Supplied air respirators of a self-contained breathing apparatus must be used. when such equipment is required to protect the health of any worker. AMS only provides respirators which are sanctioned and approved for the purpose intended. Listed below are the specifications that all respirators used by AMS workers and/or subcontractors will meet:

- Daily Operations
  - Powered, air-purifying respirator with cartridge(s) providing protection against the H2S/(APF = 50)
  - Constant supplied-air respirator*/ (APF = 50)
  - Any self-contained breathing apparatus with a full facepiece. (SCBA)
- Emergency or Planned Entry into Unknown Concentrations
  - Self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/ (APF = 10,000)
  - Constant supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus/ (APF = 10,000)
- Escape
  - Air-purifying, full-facepiece respirator with a chin-style, front or back mounted canister providing protection against the H2S/ (APF = 50)
  - Appropriate escape-type, self-contained breathing apparatus/ (APF = 50)

Safety Procedures

All workers must be aware of AMS's contingency plan as well as the client's contingency plan. Implementation of AMS's contingency plan will include but not limited to:

- Appropriate instruction in the use of H2S safety equipment to all workers present at all H2S hazard areas
- Gas detection where H2S may exist
- Appropriate respiratory protection for normal and emergency use
- The characteristics, sources, and hazards of H2S
- Proper use of the H2S detection methods used on the site

- Recognition of, and proper response to, H2S warnings at the workplace
- Symptoms of H2S exposure
- Proper rescue techniques and first-aid procedures to be used in a H2S exposure
- Proper use and maintenance of personal protective equipment (Demonstrated proficiency in using PPE should be required.)
- Worker awareness and understanding of workplace practices and maintenance procedures to protect worker from exposure to H2S
- Wind direction awareness and routes of egress
- Confined space and enclosed facility entry procedures
- Locations and use of safety equipment
- Locations of safe briefing areas
- Use and operation of all H2S monitoring systems
- Emergency response procedures, corrective action, and shutdown procedures
- Effects of H2S on the components of the H2S handling system
- The importance of drilling fluid treating plans prior to encountering H2S

AMS provides training so that all workers whose work is regulated by this section acquire the understanding, knowledge, and skills necessary for the safe performance of the duties assigned.

Training received by each affected worker occurs:

- Before the worker is first assigned duties under this section
- Before there is a change in assigned duties
- Whenever there is a change in permit space operations that presents a hazard about which an worker has not previously been trained

Special Precautions for Working on Tanks or Vessels

Do not weld or cut tanks or vessels which may have contained petrol, oil, spirits, paint or any flammable or explosive substance without making sure that the vessel has been treated to make it safe and that it no longer contains any vapors or trace of the substance.

Training

AMS will ensure that a worker who may be exposed to H2S:

- Is informed of the health hazards associated with exposure to that substance
- Is informed of measurements made of airborne concentrations of harmful substances at the work site
- Is trained in procedures developed by AMS to minimize the worker's exposure which will include but not be limited to proper use of H2S detectors (bump testing and calibration), monitors, respiratory protection (medical evaluation, fit testing and selected respirator training) and personal protection equipment
- Is aware of the emergency action plan to include evacuation procedures

Workers that have potential to be exposed above the OEL or PEL shall be trained to recognize and distinguish the alarms that will signal a spark-proof audible or visual alarm that notifies them to vacate the area and do not re-enter. Necessary worker would need to be contacted and clearance would

need to be given for reentry. Workers shall be trained to evacuate contaminated areas immediately to safe areas. AMS will train affected AMS workers on site specific emergency action plans to include evacuation procedures.

Training programs shall adhere to the ANSI/ASSE Z390.1-2017 (Accepted Practices for H2S Training Programs.) Training will be conducted in a classroom setting and will be required initially prior to commencing work and be given annually thereafter. Instructor led classroom training will be concluded upon demonstration of competency but not be less than 4 hours. AMS requires instructor led, classroom training for a minimum of 3.5 hours and that the training be refreshed on an annual basis.

AMS shall train workers who have the potential to be exposed to H2S above the occupational exposure limit (OEL) or the permissible exposure limit (PEL) in:

- The operation and maintenance of the portable and personal gas detection equipment they are expected to use
- How to bump test the portable and personal gas detection equipment they are expected to us
- How to accurately calibrate the portable and personal gas detection equipment they are expected to use
- The required elements of OSHA's Respiratory Protection standard, 29 CFR 1910.134, to include medical evaluations, fit testing, and selected respirator training

Steps to Take During H2S Emergency

Step One: Evacuate immediately. An H2S alarm indicates that there may be hazardous concentrations in the building or area. Get to a safe new area immediately by moving upwind or crosswind from the release. Move to higher ground in possible.

Step Two: Sound the alarm. Immediately notify someone that there is an H2S release, relay any information you may have and that you may require assistance.

Step Three: Assess the situation. Do a head count and consider other hazards.

Step Four: Protect rescue worker. Put on SCBA/SABA to protect rescue worker. If necessary, shut down the plant.

Step Five: Rescue victim. Start by ventilating the building with fans or by opening all doors. If safe, you may perform the rescue by yourself with backup or with assistance. Enter the area and remove the victim to fresh air (upwind if possible).

Step Six: Revive victim. Apply artificial respiration or CPR on the victim until the victim revives or until help arrives. Only qualified worker may use mechanical resuscitators or oxygen.

Step Seven: Get medical aid. All H2S victims require medical attention. Even if they revive quickly, there is still a possibility that the lungs may collect fluid some hours after exposure. Arrange a transport of the victim to medical aid and provide the necessary information to Emergency Medical Services.

JOB COMPETENCY

PURPOSE

The purpose of this policy is to establish general job competency requirements for all ALLEN MECHANICAL SERVICES-AMS, hereafter referred to as “AMS”, workers.

RESPONSIBILITIES

Designated Safety Representative will be responsible for:

- Identifying, updating, and monitoring minimum qualification requirements, job titles and training documentation.
- Supplying training reports to clients and AMS Management.
- Company Management will be responsible for:
    - Ensuring all workers assigned to their project meet job competency requirements and complete training identified in the training matrix prior to being assigned to the task.
    - Ensuring that any work that may endanger a worker must be completed by a worker who is competent to do the work.
    - Ensuring all workers have sufficient experience to safely perform work without supervision or with only a minimal degree of supervision.
- All workers will be responsible for:
    - Attending and following requirements of safety and health management training.

PROCEDURES

Competence

Competence is a combination of knowledge, skills, and abilities to sufficiently perform the task. Knowledge, skills and abilities are acquired by training and experience.

The following components are to be considered for each worksite’s delivery team for competency assurance:

- Experience
- Level of Knowledge
- Capability to Perform

AMS’s view of competency assurance involves the continuous assessment of training and development needs against a person’s responsibilities, abilities, and critical activities. This process enables the continuous improvement loop that feeds back into training and development activities that ensure competency assurance is an ongoing career cycle process.

1. **Job Description Identified** → Candidate Selection and Hiring Process (Reference and Background Check, Drug Screen, Physical Assessment) → Person Assessed and Hired for Open Position
2. **Experience, Qualifications Assessed for Initial Training** ↔ Initial Induction Training Completion
3. **Further Training Required?** If no → Ready for Work → On the Job Training → Competency Continually Assessed
4. **Annual Performance Appraisal** → Ready to Promote? → Worker Promoted → Further Training Required?

Competency is verified before workers are permitted to perform tasks independently. A competent person (supervisor, lead hand, instructor, etc.) must verify that a worker is competent to perform their roles and responsibilities before being allowed to work independently. If there is Short Service Worker (SSE) program established the new or transferred worker will fall under the SSE requirements until they are determined to be competent and removed from the SSE program.

Identification of Documentation

Documentation is obtained from workers to demonstrate they meet the qualifications of their job. Based on the job description requirements documentation may include educational, certifications, licenses, prior acceptable training course completion, etc. Documentation is reviewed and confirmed during the worker hiring process.

Identification of Positions

An organizational chart and list of job titles has been established by AMS. Based on the positions and their exposure to risk their required training is entered into each worksite's training matrix. Job descriptions are prepared for each job title.

Identification of Qualifications

Minimum qualification requirements for each job title have been established by AMS Management. Qualifications may include a combination of education, certifications, and work experience. Safety training completion for the indicated job title is required before full qualifications are met to allow a worker to begin work.

Identification of Training and Competency Needs

Workers (new or transferred) are provided job specific training related to their roles and responsibilities and trained on the tasks they perform on a regular basis. Training is identified in our training matrix which specifies safety and health training needs by job title. Our training matrix is updated based on changing risks.

Training Records

All training records are maintained by AMS's Safety Coordinator or HR Manager or their designee.

Delivery of Induction, Transfer and Refresher Training

Workers receive initial induction training. No work by any worker is allowed to begin until the orientation is completed. Training requirements are tracked by AMS Safety Coordinator and formal training sessions are conducted by the Safety Coordinator or competent/qualified instructor for the required subject matter. Applicable training will be completed annually or according to certification requirements.

Supervisor Safety Management Training

Supervisors and managers receive annual, documented safety management system training.

Training Documentation

All training must be documented with the date, worker name, worker signature, instructor's name, instructor's signature, and title of course. Each new worker shall receive an orientation prior to beginning any work.

PURPOSE

The purpose of the Job Hazard Analysis (JHA) is to provide a method for a supervisor and their workers to inspect an upcoming job, identify potential hazards related to that job, and to arrive at agreement on the development of a Safe Work Plan for completing their assignment.

POLICY

It is each ALLEN MECHANICAL SERVICES-AMS, hereafter referred to as "AMS", worker's responsibility to ensure that the Safe Work Plan is properly developed. A JHA will be conducted prior to the start of each job or as required. After receiving a valid work permit and before starting a job, each worker shall review the permit requirements and perform a thorough JHA. The JHA process serves as AMS's Safe Work Plan. As such, by completing the process and signing the form, workers are indicating that they are prepared to accomplish the assigned task efficiently and safely.

In the event conditions change, the JHA Form must be updated. Potential hazards, including those specific to the task and those general to the work area, must be discussed and a plan formulated to eliminate or minimize identified hazards. Each worker on the job must understand their role relating to the tasks at hand. When a new worker is assigned to a job in progress, the JHA must be reviewed with this worker, and they must sign the form before beginning work.

PROCEDURES

Once the work permit has been issued, the assigned worker shall conduct a thorough JHA session at the job site, which includes, but is not limited to:

- Walking the job and reviewing all elements of the assignment. Verifying that a site safety inspection is conducted as required. The supervisor shall identify all the equipment that is to be worked on.
- Identifying existing and/or potential hazards, including hazards from workers performing tasks with other trades or crafts that may affect AMS workers, and taking appropriate action to eliminate or minimize identified hazards; reaching agreement on the safest plan to complete the assigned task. Each worker on the job must thoroughly understand their role in the upcoming tasks.
- Evaluating personal protective equipment (PPE) requirements and upgrading permit required PPE or providing additional PPE whenever necessary to provide maximum level of worker protection.
- Ensuring that all workers know and are properly trained for their assignment(s).
- Posting the completed form(s) along with the work permit in a conspicuous place in the work area. In the event it is not possible to post the form(s), they shall be kept readily available at the job site. The forms shall be kept in a manner that protects them from weather damage.

Whenever possible the supervisor shall be involved in the JHA session. However, there are times when this is not possible. Should the supervisor find that they will not be available, they shall assign a competent person to lead the session. As soon as practical following the beginning of a job, the supervisor shall review all JHA forms of workers assigned to them and sign the back of the form in the section provided.

General Instructions

Print and make sure the forms are legible/readable. The only place you do not print the required information is when you place your signature on the form.

Involve all workers in the process. The more eyes and experience used to identify hazards, the better.

Whenever possible, the completed JHA should be reviewed for proper completion and signed by the designated lead person, foreman, supervisor, or safety dept. representative **before** the work is started. If this is not possible, the form should be reviewed as soon as practical.

When the form(s) is completed, it must be posted & readily available at the job site.

JHA Form:

Description of job – The first step of JHA is to accurately describe the work to be performed. This will provide the basis for the rest of the process. At the top of the form, provide a brief, but specific description of the job you will perform.
Date and Time – Enter the date the work will be performed and the time you started the JHA process. Location – Enter the name of the facility/location where the work will be performed.
Supervisor – Enter the name of the immediate foreman or supervisor.
Worker – Clearly **print** the name(s) of each person that will be working on the job. This may include non-AMS workers, such as other contractors or client personnel working with you.
Equipment – Enter the number or name of the equipment you will be working on. Be as specific as possible. Make sure that you are preparing to work on the right equipment. If there is no number or name for the equipment, enter the number or name of the equipment it is connected to.
Yes, No, N/A Questions – Each one of these questions requires an answer. Carefully consider each question and how it will affect or apply to the work being performed. If the question doesn't apply to the job, mark it "N/A" (Not applicable). Each question is important.
Job Steps – Outline or list the steps necessary to safely complete the job from start to finish. If the task requires more than 7 steps the task should be broken down into multiple steps. For example: Inspect/Prepare job site, obtain permit, complete JHA form and review with worker, obtain/inspect tools, and PPE, perform job, cleanup, return tools.
Existing Hazards – List hazards that are present at the job site. These will primarily be existing physical hazards. For example: Elevated work, uneven surfaces, confined space, high noise levels, pinch points, conflicting work above/below, weather conditions.
Potential Hazards – List hazardous conditions that may be created/exposed while doing the work. For example: Hot Pipes, product release, exposure to hazardous material(s), sparks/slag, heavy lifting, explosive atmosphere. Action Taken to Eliminate or Minimize Hazards – List what you are going to do to eliminate or control each of the identified hazards.

Worker(s) Signatures – Now that you have filled in the blanks and answered the questions, review the JHA form with all workers on the job. When each worker understands the hazards present, is properly trained for their assigned task, and understands how to complete the work safely, they must sign their name in the same numbered space as they printed their name on the form. Do not sign if you don't understand or aren't properly trained.
JHA session lead by – The supervisor, foreman or lead person that conducts the JHA review with all workers and check the form for proper completion must print and sign their name and indicate the date and time the review was held.

Now you can start the job. Remember, the form is complete, but **the process continues**. Always remain alert for changing conditions. The JHA form must be modified/updated if conditions change, or new hazards are found. Any modifications must be communicated with all workers. *Remember to review the JHA with any new workers that are added while the job is in progress. Their name(s) and signature(s) must also be added to the JHA form.

JHA/SAFE WORK PLAN – GENERAL WORK

THIS WORKER IS TO PERFORM THE FOLLOWING:

DATE TIME	LOCATION	LOCATION OF:	PPE ✓ Check Applicable
SUPERVISOR	CLIENT CONTACT	Telephone Emergency Phone No. (s)?	❑ MINIMUM Hard Hat, Safety Glasses with Side Shields, Goggles, Ear Plugs, Gloves, Fire Retardant Coveralls, Work Boots ADDITIONAL <u>ALWAYS provide maximum level of worker protection</u> ❑ Vibration Dampening Gloves ❑ Knee Pads ❑ Face Shield ❑ Earmuffs ❑ Safety Harness & Lanyard ❑ Supplied Air ❑ Half Face Respirator ❑ Full Face Respirator ❑ Acid Gear ❑ Rain Suit ❑ Rubber Gloves ❑ Rubber Boots ❑ Other
WORKER: (Print name below and sign in the same numbered space on the back of this sheet.			
☐	UNIT		
☐	EQUIPMENT	Fire Extinguisher	
☐	What product is/was in the equipment?	Eyewash/Safety Shower	
☐			
☐	All permit numbers must be listed below. HOT WORK#	Evacuation Area Primary: Secondary:	
☐			
☐	COLD WORK#		
☐	UNIT ENTRY#	IF IN DOUBT? STOP AND ASK!	
☐	CONFINED SPACE #		
	OTHER #		

Worker PSM trained?	YES	NO	N/A	Motorized equipment inspected?	YES	NO	N/A
Worker properly trained for job?	YES	NO	N/A	Operator(s) trained? Operator(s) on approved list?	YES	NO	N/A

Entire worker knows emergency evacuation procedure?	YES	NO	N/A	Rigging (slings, ropes, wire ropes, come-along, chain hoists) inspected and found safe?	YES	NO	N/A
Actions taken to prevent worker exposure to Hazardous Material?	YES	NO	N/A	Equipment blocked, de-pressured and drained?	YES	NO	N/A

Worker knows potential hazards?	YES	NO	N/A	Equipment locked/tagged out?	YES	NO	N/A
Worker knows location of SDS?	YES	NO	N/A	GFCI's/low voltage lighting used?	YES	NO	N/A
Entire worker familiar with safety manual?	YES	NO	N/A	Worker knows hand signals?	YES	NO	N/A
Weather presents a problem?	YES	NO	N/A	Worker aware of pinch points?	YES	NO	N/A
Conflicting jobs in the area?	YES	NO	N/A	Tools/equipment inspected and found safe?	YES	NO	N/A
Barricades installed as needed & tagged?	YES	NO	N/A	Tool holders available for use with knocker wrench?	YES	NO	N/A
Work area clean, orderly & safe?	YES	NO	N/A	Equipment blinded?	YES	NO	N/A
Hoses and cords out of walkways?	YES	NO	N/A	Correct type of blinds & gaskets for job?	YES	NO	N/A
Drains properly covered?	YES	NO	N/A	Is work in confined space?	YES	NO	N/A

PLAN YOUR WORK, AND THEN WORK YOUR PLAN SAFELY!!!

FALL PROTECTION

Is work being performed at an unprotected elevated area where workers may be exposed to a fall of 6 feet or more? Note: Client/Owner or working conditions may require fall protection at lower elevations. If yes, complete the following information.	Yes No

Have workers that require fall protection been provided with a full body harness, appropriate lanyard(s) with shock absorbing device and boom strap (if needed)?	Yes	No	Is static line required?	Yes No
			If yes, has it been inspected by a competent person prior to use?	Yes No
Have all workers completed fall	Yes	No	Are adequate anchor	Yes No

	Yes No
List any other fall protection equipment required:	

SCAFFOLD USER INSPECTION: Does job require use of scaffold? YES ☐ NO ☐ If ☒ complete the section below.

Inspect the following items before using *(Check box when found safe for use)*

Top and mid rails in place

Toe boards and falling object protection in place and secure

Weather conditions do not present a hazard

Planks in safe condition and secured

Bars and clamps tight and secure

Personnel barriers installed on hot lines/equipment

List any hazards:		*(Heavy Duty Formula is Square Feet x 75 PSF = Max Capacity in pounds)*	
Steps of Task (List steps necessary to complete the task)	**Potential Hazards** Evaluate hazards associated with Tools being used, Methods employed to accomplish task, Materials required to complete task, and Working Environment/Conditions	**Controls** (Identify preventative measures to be used to control each identified hazard)	PSM standards require workers to be trained on the hazards associated with each task. Do not sign this form unless you have been trained and understand the potential hazards associated with this task. If you have not been trained, do not understand, or feel you cannot complete this job safely, speak to your supervisor before starting work.
			Sign your name:
			1
			2
			3
			4
			5
			6

LEAD EXPOSURE

PURPOSE

This safety guideline is intended to provide suitable information to all workers regarding the potential effects of lead and where lead may be found so that adequate measures can be taken to limit exposure through controls in the workplace.

GENERAL

The objective of this guideline is to prevent absorption of harmful quantities of lead pertaining to the service provided by ALLEN MECHANICAL SERVICES-AMS; hereafter referred to as “AMS”. The guideline is intended to protect AMS workers from the immediate toxic effects of lead and from the serious toxic effects that may not become apparent until years of exposure have passed.

Characteristics & Where It Can Be Found

To understand why lead is so hazardous, it is important to know what it is, the hazardous effects on people, and which materials do or may contain lead. Once this is understood, workers will gain respect for the safety guidelines set forth in this policy.

What Is It?

Pure lead (Pb) is a heavy metal and is a basic chemical element. It can combine with various other substances to form numerous lead compounds.

Lead can be found in:

- Old glossy paints used on walls and pipe.
- Building and roof metal support frames.

Report to AMS Project Manager anytime you suspect lead-containing materials that may not have been disclosed:

- Cracked or peeling paint,
- Visible paint dust, grindings, or shavings.

Health Effects

<u>Ways in which lead enters your body.</u>

Lead can be absorbed into your body by inhalation (breathing) and ingestion (eating). When lead is scattered in the air it can be inhaled and absorbed through your lungs and upper respiratory tract. Inhalation of airborne lead is generally the most important source of occupational lead absorption. You can also absorb lead through your digestive system if lead gets into your mouth and is swallowed.

Hazards encountered with lead occur when:

- Inhaling lead as a dust, fume, or mist.
- Ingesting lead through food, cigarettes, and chewing tobacco when handled with contaminated hands.

Lead (except for certain organic lead compounds not covered by the standard, such as tetraethyl lead) is not absorbed through your skin. When lead is scattered in the air as a dust, fume or mist it can be inhaled and absorbed through your lungs and upper respiratory tract. Inhalation of airborne lead is generally the most important source of occupational lead absorption. You can also absorb lead through your digestive system if lead gets into your mouth and is swallowed. If you handle food, cigarettes, chewing tobacco, or make-up, which have lead on them or handle them with hands contaminated with lead, this will contribute to ingestion.

A significant portion of the lead that you inhale or ingest gets into your blood stream. Once in your blood system, lead is circulated throughout your body and stored in various organs and body tissues. Some of this lead is quickly filtered out of your body and excreted, but some remains in the blood and other tissues. As exposure to lead continues, the amount stored in your body will increase if you are absorbing more lead than your body is excreting. Even though you may not be aware of any immediate symptoms of disease, this lead stored in your tissues can be slowly causing irreversible damage, first to individual cells, then to your organs and whole-body systems.

Effects of overexposure to lead <u>Short-term (acute) overexposure.</u>

Lead is a potent, systemic poison that serves no known useful function once absorbed by your body. Taken in large enough doses, lead can kill you in a matter of days. A condition affecting the brain called acute encephalopathy may arise which develops quickly to seizures, coma, and death from cardiorespiratory arrest. A short-term dose of lead can lead to acute encephalopathy. Short-term occupational exposures of this magnitude are highly unusual, but not impossible. Similar forms of encephalopathy may, however, arise from extended, chronic exposure to lower doses of lead. There is no sharp dividing line between rapidly developing acute effects of lead and chronic effects, which take longer to acquire. Lead adversely affects numerous body systems and causes forms of health impairment and disease which arise after periods of exposure as short as days or as long as several years.

<u>Long-term (chronic) overexposure.</u>

Chronic overexposure to lead may result in severe damage to your blood-forming, nervous, urinary, and reproductive systems. Some common symptoms of chronic overexposure include loss of appetite, metallic taste in the mouth, anxiety, constipation, nausea, pallor, excessive tiredness, weakness, insomnia, headache, nervous irritability, muscle and joint pain or soreness, fine tremors, numbness, dizziness, hyperactivity, and colic. In lead colic there may be severe abdominal pain.

Damage to the central nervous system in general and the brain (encephalopathy) is one of the most severe forms of lead poisoning. The most severe, often fatal, form of encephalopathy may be preceded by vomiting, a feeling of dullness progressing to drowsiness and stupor, poor memory,

restlessness, irritability, tremor, and convulsions. It may arise suddenly with the onset of seizures, followed by coma, and death. There is a tendency for muscular weakness to develop at the same time. This weakness may progress to paralysis often observed as a characteristic "wrist drop" or "foot drop" and is a manifestation of a disease to the nervous system called peripheral neuropathy.

Chronic overexposure to lead also results in kidney disease with few, if any, symptoms appearing until extensive and most likely permanent kidney damage has occurred. Routine laboratory tests reveal the presence of this kidney disease only after about two-thirds of kidney function is lost. When overt symptoms of urinary dysfunction arise, it is often too late to correct or prevent worsening conditions, and progression to kidney dialysis or death is possible.

Chronic overexposure to lead impairs the reproductive systems of both men and women. Overexposure to lead may result in decreased sex drive, impotence, and sterility in men. Lead can alter the structure of sperm cells raising the risk of birth defects. There is evidence of miscarriage and stillbirth in women whose husbands were exposed to lead or who were exposed to lead themselves. Lead exposure also may result in decreased fertility and abnormal menstrual cycles in women. The course of pregnancy may be adversely affected by exposure to lead since lead crosses the placental barrier and poses risks to developing fetuses. Children born of parents either one of whom were exposed to excess lead levels are more likely to have birth defects, mental retardation, or behavioral disorders or to die during the first year of childhood.

Overexposure to lead also disrupts the blood-forming system resulting in decreased hemoglobin (the substance in the blood that carries oxygen to the cells) and ultimately anemia. Anemia is characterized by weakness, pallor, and fatigue because of decreased oxygen-carrying capacity in the blood.

PROCEDURES

Permissible Exposure Limit (PEL)

The current OSHA lead standard is 50 µg/m^3 as an 8-hour Time Weighted Average (TWA). The standard as it applies to construction is unique in that it groups tasks ***presumed*** to create worker exposures above the PEL of 50 µg/m^3 as an 8-hour TWA, as follows:

LEAD-RELATED CONSTRUCTION TASKS AND THEIR 8-HOUR TWA EXPOSURE LEVELS

> 50 to 500 µg/m^3	**> 500 µg/m^3 to 2,500 µg/m^3**	**> 2,500 µg/m^3**
Manual demolition	Using lead-containing mortar	Abrasive blasting
Dry manual scraping	Lead burning	Welding
Dry manual sanding	Rivet busting	Torch cutting
Heat gun use	Power tool cleaning without dust detection systems	Torch burning
Power tool cleaning with dust collection systems	Cleanup of dry expendable abrasive blasting jobs	
Spray painting with lead paint	Abrasive blasting enclosure movement and removal	

Action Level

The standard also establishes an action level of 30 micrograms per cubic meter of air (30 µg/m^3), time-weighted average, based on an 8-hour workday. The action level initiates several requirements of the standard, such as exposure monitoring, medical surveillance, and training and education.

Evaluation Process

AMS's Project Manager will provide workers with results of any evaluation processes and a listing of lead containing material. AMS will provide all precautions and render the area safe for workers before work begins.

Safety Measures

Workers are not permitted to work in areas where there may be a potential for Lead exposure. If it is necessary to perform any work where the exposure to Lead is about the acceptable limits, then must implement a comprehensive mandated safety policy and procedure that includes special elements of exposure monitoring, formal medical program, special personal protective equipment, and much more.

Below are listed possible work controls and practices:

1. WELDING, BURNING, AND TORCH CUTTING.

   Welding and cutting activities that potentially involve exposure to lead can occur as part of a number of construction projects such as highway/railroad bridge rehabilitation (including elevated 5mass-transit lines), demolition, and indoor and outdoor industrial facility maintenance and renovation.

   Lead exposures are generated when a piece of lead-based painted steel is heated to its melting point either by an oxyacetylene torch or an arc welder. In this situation, lead becomes airborne as a volatilized component of the coating. The amount of time a worker may spend welding or cutting can vary from only a few minutes up to a full shift. In addition, the coating being worked on may consist of several layers of lead-based paint, each of which could contain as much as 50% lead. Taken together, these factors suggest that a worker's exposure to airborne lead during welding or cutting activities can vary widely and may be exceedingly high. Lead burning, a process by which virgin or alloyed lead is melted with a torch or otherwise fused to another lead object, is typically performed in maintenance operations on electrostatic precipitators or during the installation of lead shot, bricks, or sheets in the walls or floors of health-care x-ray units or industrial sites. Lead health hazards in this operation, as in welding and torch cutting, are from lead that is superheated and released into the worker's breathing zone in the form of a fume.

   - Engineering Controls. The engineering controls that can be used, depending on feasibility, are:

     - Local exhaust ventilation (LEV) that has a flanged hood and is equipped

with HEPA filtration may be appropriate where the use of LEV does not create safety hazards. Use of a flexible duct system requires that the welder be instructed to keep the duct close to the emission source and to ensure the duct is not twisted or bent

- A fume-extractor gun that removes fumes from the point of generation is an alternative to an exhaust hood for gas-shielded arc-welding processes. Such extraction systems can reduce breathing zone concentrations by 70% or more. These systems require that the gun and shielding gas flow rates be carefully balanced to maintain weld quality and still provide good exhaust flow
- A longer cutting torch can be used in some situations to increase the distance from the lead source to the worker's breathing zone
- Hydraulic shears can sometimes be used to mechanically cut steel that is coated with lead-based paint. The use of this method is limited by the ability of the shears to reach the cutting area
- Whenever possible, pneumatic air tools should be used to remove rivets in lieu of burning and torch cutting

- Work Practice Controls. The following work practice controls will help to reduce worker exposures to lead during welding, burning, and torch cutting:

  - Strip back all lead-based paint for a distance of at least 4 inches in all directions from the area of heat application. Chemical stripping, vacuum-shrouded hand tools, vacuum blasting, or other suitable method may be used. However, in enclosed spaces, strip back or protect the workers with air-line respirators
  - Ensure that workers avoid the smoke plume by standing to the side or upwind of the cutting torch whenever the configuration of the job permit
  - Prohibit burning to remove lead-based paint. Paint should be removed using other methods, such as chemical stripping, power tools (e.g., needle guns) with vacuum attachments, etc.

2. MANUAL SCRAPING AND SANDING OF LEAD-BASED PAINTS

Hand scraping of lead-based paints involves the use of a hand-held scraping tool to remove paint from coated surfaces. The health hazards in this activity are caused by the lead dust and paint chips produced in the scraping process. Hand sanding can also produce excessive dust. These activities are typically performed during residential and commercial/institutional lead abatement projects.

- Engineering and Work Practice Controls. Controls which employers can implement to protect workers performing scraping and sanding of lead-based paints are:

  - Use of wet-sanding and wet-scraping methods in conjunction with HEPA vacuuming or HEPA mechanical ventilation. Wet methods include misting of peeling paint with water before scraping, and sanding and

misting of debris prior to sweeping or vacuuming
- Use of shrouded power tools with HEPA vacuum attachments. The shroud must be kept flush with the surface
- Use of techniques with known low exposure potential, such as encapsulation and removal or replacement instead of hand scraping and hand sanding

Regulated Areas

AMS will ensure a work plan is designed and implemented that will:

- Eliminate lead dust or fumes from exposing both work personnel and building occupants
- Ensure that unauthorized persons cannot access the area
- Use of signage - warning signs shall be provided and displayed at each regulated area and is posted at all approaches to regulated areas

Training

All AMS workers will be provided awareness training in this program to be familiar with the potential hazards and proper safe work procedures to follow if exposed to this health hazard. Training and information will be provided for all workers exposed to lead at or above the action level, or who may suffer skin or eye irritation from lead. The training will inform exposed workers of:

- Specific hazards associated with their work environment
- Protective measures which can be taken
- Danger of lead to their bodies (including their reproductive systems)
- Their rights under the standard

MOBILE ELEVATING WORK PLATFORMS

PURPOSE

To define the procedures and standards that apply to the care, control, maintenance, inspection, and operation of Mobile Elevating Work Platforms (MEWPs).

SCOPE

Applies to all ALLEN MECHANICAL SERVICES-AMS, hereafter referred to as “AMS”, work sites, i.e., AMS offices, client job sites, etc., requiring the use of MEWPs.

DEFINITIONS

Aerial personnel lift - any vehicle-mounted device, telescoping or articulating, or both, which is used to position personnel. These include extensible boom platforms, aerial ladders, articulating boom platforms, vertical towers, and a combination of any of the above.
Articulating boom platform - an aerial personnel lift with two or more hinged boom sections.
Extension boom platform- an aerial personnel lift (except ladders) with a telescopic or extension boom. Telescopic derricks with personnel platform attachments shall be considered to be extension boom platforms when used with a personnel platform.
Insulated aerial device - an aerial personnel lift designed for work on energized lines and apparatus.
Mobile Elevating Work Platform (MEWP)- a machine/device intended for moving persons, tools, and materials to working positions; consisting of at least a work platform with controls, extending structure, and a chassis. Examples: JLG’s, Scissor Lifts, Genie Lifts. Spiders, Lulls, Zoom Booms, etc.
Platform - any personnel-carrying device (basket or bucket) that is a component of an aerial personnel lift.
Vertical tower - an aerial personnel lift designed to elevate a platform in a substantially vertical axis.

PROCEDURES

Training

Only workers properly trained in compliance with ANSI and OSHA standards and who have received unit-specific familiarization can operate a MEWP. Operators who successfully demonstrate safe operation of each individual MEWP device will be qualified and authorized by AMS.

Training must be provided to MEWP operators and their supervisors and include the inspection, maintenance, use, application, and operation of MEWPs.

Inspection & Maintenance

MEWPs will be inspected prior to use by authorized person. Any deficiencies found in the inspection shall be clearly noted with the MEWP tagged out of service until it is restored to safe to operation.

MEWPs shall receive routine maintenance and servicing per the manufacturer's recommendations. Trained personnel who perform maintenance or servicing to MEWPS will follow manufacturer's instructions for electrical safety and AMS procedure for the control of hazardous energy.

Safe Operations

Lift controls shall be tested prior to use to determine that such controls are in safe working condition. Positioning devices and/or outriggers will be used to per safe operating manual instructions.

Fall Protection - A body harness or Personal Fall Arrest System (PFAS) shall be worn with a lanyard appropriately attached per the recommendations of the mobile elevating work platform's manufacturers operating manual.

Personnel should not be permitted to stand on the rails of MEWPs or use rails as a means of access. In the event that there are no other means of access to an area requiring work, specific procedures including rationale (feasibly), duration, evacuation, fall protection plan, etc. shall be developed and reviewed with affected workers prior to implementation.

Large or excessive amounts of material, excluding tools, shall not be transported in a MEWP. Other material lifts would be necessary for such activities. Load limits specified by the manufacturer shall not be exceeded.

MEWPs that can operate horizontally shall set brakes and outriggers, when used, be positioned on pads or a solid surface, and chock wheels before using on an incline.

Boom and Ladder Lift Units

Before ladder trucks and tower trucks are moved from site to site, the aerial ladders shall be secured in the lower traveling position by the locking device above the truck cab, and the manually operated device at the base of the ladder, or by other equally effective means (e.g., cradles which prevent rotation of the ladder in combination with positive acting linear actuators).

A mobile elevating work platform may not be moved when the boom is elevated in a working position with personnel in the basket, except for equipment that is specifically designed for this type of operation.

Articulating boom and extendible boom platforms, primarily designed as personnel carriers, shall have both platform (upper) and lower controls. Upper controls shall be in or beside the platform within easy reach of the operator. Lower controls shall provide for overriding the upper controls. Controls shall be plainly marked as to

their function. Lower-level controls shall not be operated unless permission has been obtained from the worker in the lift, except in case of emergency.

MEWP devices that are insulated shall not be altered in any manner that might reduce its insulating value. The insulated boom of a MEWP shall be regularly maintained and certified to ensure the continued insulating properties.

Before moving a MEWP for travel, the boom(s) shall be inspected to see that it is properly cradled and outriggers are in stowed position.

Modifications

MEWPs may be "field modified" for uses other than those intended by the manufacturer, provided the modification has been certified in writing.

Overhead Lines

Any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines will be operated so that a clearance of 10 ft. (305 cm) is maintained. If the voltage is higher than 50kV, the clearance will be increased 4 in. (10 cm) for every 10kV over that voltage. See Table A

TABLE A—MINIMUM CLEARANCE DISTANCES

Voltage (nominal, kV, alternating current)	Minimum clearance distance (feet)
up to 50	10
over 50 to 200	15
over 200 to 350	20
over 350 to 500	25
over 500 to 750	35
over 750 to 1,000	45
over 1,000	(as established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution).

Note: The value that follows "to" is up to and includes that value. For example, over 50 to 200 means up to and including 200kV.

MOBILE VEHICLE SAFETY

PURPOSE

This written Motor Vehicle Safety Program establishes guidelines to ensure that we hire capable operators, only allow eligible operators to drive a "covered motor vehicle," train and supervise operators, and maintain vehicles properly pertaining to the service provided by ALLEN MECHANICAL SERVICES-AMS; hereafter referred to as “AMS”. A covered motor vehicle" is a motor vehicle that is owned, leased, or rented by AMS or is a driver-owned vehicle operated during work time. AMS drivers may be assigned to use a AMS vehicle to visit clients, make deliveries, attend meetings, pick up supplies, or to do a variety of other tasks. When driving is part of the job, like every other task, it must be done safely. Adherence to this written program can improve traffic safety performance, minimize the risk of motor vehicle incidents, and help to keep our drivers safe and our costs as low as possible. Management leads, supports, and enforces this program; but driver input is essential for its success. AMS will comply with all Federal and State agency requirements.

RESPONSIBILITIES

Administration

AMS Safety Manager is our Motor Vehicle Safety Program Administrator. The Program Administrator coordinates the Motor Vehicle Operation Program elements for our AMS. This person is responsible for setting up and managing the program so that managers, supervisors, and drivers know what our company expects. The Safety Manager will examine our existing policies and practices to ensure that they encourage and do not discourage reporting and participation in our program. In this way, early reporting of motor vehicle incidents and hazards and meaningful driver participation in the program are more likely to occur. All AMS incentive programs are designed to reward safe motor vehicle operation (such as active participation in the program, the identification of motor vehicle hazards in the workplace, and the reporting of motor vehicle incidents early), rather than to reward drivers for having fewer or lower rates of motor vehicle incidents. The responsibility and authority to allow a driver to operate a AMS vehicle lies squarely on the shoulders of AMS Management Representative in charge of the keys to the vehicle that will be driven. For this program to be administratively effective, good judgment, and correct choices must be made by the person in charge of their section or group of drivers and vehicles. Prior to the assignment of any vehicle to any driver or prior to allowing a driver to drive their own vehicle on AMS business or the continuation of driving any vehicle, AMS or driver owned vehicle, the following will be reviewed for the criteria below.

A current valid state driver’s license with no “Status Actions”; driver must be at least 18 years old or 21 years old to drive interstate vehicles, or 18 years of age or older to drive a Fleet Vehicle. A review of the driving record (3 years back initially, then annual thereafter) will be done. If the MVR indicates no violations, or the following minor violations, the driver may be considered for qualification by AMS management. They are:

- conviction of one or more minor moving violations, if no more than 6 points have been assessed

- minor accident (no injuries) Note: If the driver/operator can remove the citation by going to traffic school, AMS will take this action into consideration for final qualification of the driver.

If the driver's MVR indicates the following major violations, then the driver is NOT qualified to drive for AMS:

- Operating a vehicle under the influence of a drug or alcohol
- Implied Consent Refusal (refusal to take blood alcohol test and or urine analysis)
- Committing homicide, manslaughter, or aggravated assault with a vehicle
- Failing to stop if you are involved in a traffic accident
- Reckless driving
- Felony speeding
- License Suspension or Revocation

Notification by AMS insurance carrier that the driver is ineligible for auto insurance coverage will cause the driver to be ineligible to drive. The above-listed violations should not be considered all inclusive, and these are not the only major violations that would disqualify the worker as a driver for AMS. Management reserves the right to make the final decision as to whether the driver will be qualified to drive for AMS.

DEFINITIONS

Fleet Vehicle - Any motor vehicle AMS owns or leases that is used in the normal operations of AMS. Vehicles which are used in the operation of AMS, but are owned by AMS drivers, are not fleet vehicles. Fleet vehicles include gasoline/diesel powered vehicles and alternative-fuel vehicles. Commercial driver's license (CDL) A license issued to an individual by a State or other jurisdiction of domicile, in accordance with the standards contained in this part, which authorizes the individual to operate a class of a commercial motor vehicle.

Commercial motor vehicle (CMV) - A motor vehicle or combination of motor vehicles used in commerce to transport passengers or property if the motor vehicle:

- Has a gross combination weight rating or gross combination weight of 11,794 kilograms or more (26,001 pounds or more), whichever is greater (including) towed unit(s) with a gross vehicle weight rating or gross vehicle weight of more than 4,536 kilograms (10,001 pounds), whichever is greater; or
- Has a gross vehicle rating, gross combination weight rating, gross vehicle weight or gross combination weight of 4,536 kg (10,001 lbs.) or more; or
- Is designed or used to transport more than 8 passengers for compensation or more than 15 passengers without compensation: or
- Is of any size and is used in the transportation of hazardous materials.

Gross combination weight rating (GCWR) - The value specified by the manufacturer as the loaded weight of a combination (articulated) vehicle. In the absence of a value specified by the manufacturer, GCWR will be determined by adding the GVWR of the power unit and the total weight of the towed unit and any load thereon. **Gross vehicle weight rating (GVWR) -** The value specified by the manufacturer as the loaded weight of a single vehicle.
Out-of-service order (OOS) - A declaration by an authorized enforcement officer of a Federal, State, Canadian, Mexican, or local jurisdiction that a driver, a commercial motor vehicle, or a motor carrier operation, is out-of- service pursuant to FMCSR 386.72, 392.5, 395.13, 396.9, or compatible laws, or the North American Uniform Out-of-Service Criteria.
Motor vehicle - A vehicle, machine, tractor, trailer, or semitrailer propelled or drawn by mechanical power that is used on highways.

PROCEDURES

Commercial Driver Qualifications (CMV and CDL)

A person shall not drive a commercial motor vehicle unless they are qualified to drive a commercial motor vehicle. AMS shall not require or permit a driver to drive a commercial motor vehicle unless that driver is qualified to drive a commercial motor vehicle.

- A driver is qualified to drive a CMV:

    - If they are at least 18 years old or 21 years old to drive interstate vehicles.
    - Can read and speak the English language sufficiently to converse with the public, to understand highway traffic signs and signals in the English language, to respond to official inquiries, and to make entries on reports and records.
    - Can, by reason of experience, training, or both, safely operate the type of commercial motor vehicle they drive.
    - Is physically qualified to drive a commercial motor vehicle in accordance with FMCSR's Physical Qualifications and Examinations. Holds a current medical card and has provided a copy to their employer.
    - Has a currently valid commercial motor vehicle operator's license issued only by one State or jurisdiction (for GVWs or GCVWs of 26,001+ lbs).
    - Has prepared and furnished AMS with the list of violations or the Certificate of Violations.
    - Is not disqualified to drive a commercial motor vehicle under FMCSR §391.15.
    - Has successfully completed a driver's road test and has been issued a certificate of driver's road test or has presented an operator's license or a certificate of road test which we may accept as equivalent to a road test under FMCSR §391.33.

Final determination will be the responsibility of AMS Management with the advice of the Safety Manager.
All commercial drivers for AMS must always be prepared for their driving of company CMV. There are many items, mainly documentation and proofs. Most CMV/CDL drivers will need:

- Certificate of Registration
- Hours of service records (logbook)
- Registration papers (cab cards, permits, etc.)
- Proof of insurance
- Driver's license documents and any related certificates
- Special permits for oversize and overweight loads, if required
- Hazardous materials shipping papers, and placards if required
- Fuel tax permits (IFTA)
- Bills/Invoices, etc. showing content and origin of agricultural products, if required
- Evidence of financial responsibility

Only pre-qualified and authorized drivers may operate AMS owned, rented, leased or their personal vehicle, used for AMS business.

Cell Phone Use and Texting

There shall be no cell phone usage by any AMS CMV/CDL drivers while operating a AMS vehicle unless that vehicle or the driver's phone is equipped with a "Hands-free" operating system. The commercial driver should pull over at a safe location and then return the phone call if necessary. There shall be NO TEXTING while driving by anyone operating a vehicle (Fleet or CMV); the driver shall read or create texts only when stopped and parked in a safe location for him/her and the vehicle.

Driving Safety

While it's important to understand AMS vehicle safety program, as a driver, you must put safe driving techniques into practice each time you get behind the wheel. The following safe driving strategies are under the driver's control:

- Make sure the vehicle is safe to operate.
- Bring supplies you may need in case of an emergency.
- Wear your seat belt.
- Drive defensively, not aggressively.
- Pay attention to your driving and avoid distractions.
- Only drive when you're alert and fully awake.
- Never drive under the influence of alcohol, medications, or illegal drugs.

Note: Seat belts are the single most effective means of reducing deaths and serious injuries in traffic crashes.

Vehicle Inspections

Safe driving starts before you turn the ignition key. Always inspect the vehicle before you start your trip. Make sure:

- The vehicle does not have any visible damage that affects its safe operation.
- The tires are properly inflated (use the vehicle manufacturer's recommendations that are typically noted on a sticker inside the door, glove box, or trunk - the pressures stamped on the tire are not specific to the vehicle). Check the pressure when the tires are cold.
- Tires have sufficient tread depth (tread depth should be at least 1/16 inch).
- The vehicle's fluid levels are correct (oil, brake, transmission, battery, and wiper fluids).
- Belts and hoses are free of blisters, cracks, and cuts.
- The vehicle has plenty of fuel.
- The windshield wipers are in good condition and are functional.
- You are familiar with the location and operation of all the vehicle's controls; and the seat, steering wheel, and mirrors are properly adjusted.
- Headlights, brake lights, turn signals, emergency flashers, and interior lights are working.
- The seat belt is properly adjusted, and it's in good condition.
- The vehicle is equipped with an emergency kit.
- Loose objects are secured so they won't shift during a sudden stop or turn.

Plan for Emergencies

In case of a breakdown or accident, your first actions should be to move the car to a safe area, remain in the car (if there is no risk of fire or other danger), and call for help. Some basic provisions to include in an emergency supply kit can include:

- A phone and a list of emergency phone numbers.
- First aid supplies.
- Roadside warning triangles or flares (follow instructions for their safe use).
- A fire extinguisher.
- Water and food.
- Clothing (raincoat; warm clothing, hat, mittens/gloves; comfortable boots/shoes).
- Basic car maintenance tools (a flashlight with fresh batteries; battery jumper cables; a jack, lug nut wrench, and spare tire; water for the radiator; oil; windshield wiper fluid; rags; gloves; etc.)

Be Defensive

It's best to always practice defensive driving techniques. Continually check your mirrors, leave enough following distance, and keep a cushion of space around the vehicle in case you need to quickly change lanes or go onto the shoulder. Aggressive driving acts include:

- Speeding.
- Tailgating.
- Failing to signal lane changes.
- Running red lights or stop signs.
- Passing on the right.

Aside from being aggressive, taking these actions can result in getting a ticket. The best advice is to share the road - allow other drivers to merge as needed. Safely move out of an aggressive driver's way; don't become part of a conflict.

Stay focused and alert

Driving is no time to multi-task. Stay focused on the road. Drivers can be distracted by a variety of things:

- Conversations with passengers.
- Eating, drinking, or grooming.
- Tuning the radio or selecting a CD to play.
- Reading maps or directions.
- Using electronic navigation systems.
- Using a cell phone.
- Get a full night of rest before driving.
- Stop and get out of the car to stretch and walk about every two hours.
- Set a realistic goal of how many miles you can safely drive each day.
- Avoid taking medications that cause drowsiness.

What to do in Case of an Accident

Stop at Once! Check for personal injuries and send for an ambulance, if needed. Do not leave the scene but ask for the assistance of bystanders.

- If Fire or Smoke Is Present evacuate vehicle occupants to a safe location. If stalled on a railroad track, evacuate occupants to a safe location away and at a right angle from the tracks.
- If Fire, Smoke, or Spilled Fuel is Present send for the fire department. Do not leave the scene; ask a bystander to call the fire department. If possible, use a spill kit to absorb the spill.

Protect the Scene. Set emergency warning devices to prevent further injury or damage. Secure your vehicle and its contents from theft.

Secure Assistance of the police whenever possible. Record names and badge numbers. Do not leave without law enforcement presence on scene.

Record Names, Addresses, and Phone Numbers of all witnesses injured and driver(s) and their passengers, record vehicle license numbers. Take complete pictures with cell phone or camera.

Do Not Argue! Make no statement except to the proper authorities and to Management. Sign only official police reports. Do not make statements regarding the operating condition of your vehicle and do not admit fault.

Report the Incident to Your Supervisor/Safety Manager IMMEDIATELY after first aid has been given, authorities have been notified, the scene has been protected and you are able to do so.

Complete the Incident Report at the scene (or with your Supervisor ASAP) and as thoroughly as possible. Make sure the Safety Manager gets copies of all incident paperwork and related information within 24 hours.

If You Strike an Unattended Vehicle and cannot locate the owner, leave a note with your name and AMS's address and phone number, get the vehicle description, VIN number and license plate number.

A motor vehicle incident is a negative occurrence that involves a "covered" motor vehicle and that caused or could have caused injury, illness, or property damage.

All motor vehicle incidents will be investigated to determine their causes and whether the incidents were preventable. Understanding the root causes of incidents and why they are happening, regardless of fault, forms the basis for eliminating them in the future.

If any of the following traffic violations occur, whether in the driver's personal vehicle (on or off AMS business) or while operating an owned, rented, or leased vehicle, suspension of driving or operating any vehicle will be immediate:

- Operating a vehicle under the influence of a drug or alcohol
- Implied Consent Refusal (refusal to take blood alcohol test and or urine analysis) • Committing homicide, manslaughter, or aggravated assault with a vehicle
- Failing to stop if you are involved in a traffic accident
- Reckless driving
- Felony speeding
- License Suspension or Revocation
- Cancellation of the driver's auto insurance by the driver's insurance carrier.

The above-listed violations should not be considered all inclusive, and these are not the only major violations that would suspend the driver as a driver. Management reserves the right to make the final decision. AMS follows 49 CFR Subpart C 383.33 for CMV drivers. If the driver is found to not have reported to AMS any traffic violation, suspension, or revocation of their license, by reviewing their MVR on an annual basis or as often as deemed necessary, the driver will be subjected to disciplinary

action up to and including termination. It is the overall responsibility of all drivers to maintain proper and acceptable driving records and all licenses required for their position.

Drugs and Alcohol

In accordance with our Drugs and Alcohol Policy driving a AMS owned, rented, leased or personal vehicle on AMS business, while under the influence of drugs or alcohol shall result in immediate termination.

Training

Under no circumstances may a driver operate a covered motor vehicle until they have successfully completed this AMS's initial training on motor vehicle safety. AMS supervisor of that driver is responsible for conducting training if they assign that driver to driving duties. AMS requires a preceding state issued, driving record (Motor Vehicle Report "MVR"), for each driver-applicant operating a vehicle which is AMS owned, rented, or leased as well as any personal vehicle used on AMS business. If the driver has an out-of- state license, they will be required to submit their MVR from that state for our review. The MVR will be reviewed by a responsible management official for determination of qualification of each driver. AMS shall also obtain an MVR on each driver thereafter on an annual basis. Through training we ensure that motor vehicle operators are knowledgeable in practices such as AMS expectation; impaired, fatigued, aggressive, distracted, and defensive driving; seat belt use; vehicle inspection; security and motor vehicle incident procedures; cargo securement; handling hazardous materials and spills; and safety features and emergency equipment.

Driver training must include the following:

- Pre-trip safety inspection.
- Use of vehicle controls and equipment, including operation of emergency equipment.
- Operation of vehicle, including turning, backing, braking, parking, handling, and vehicle characteristics including those that affect vehicle stability, such as effects of braking and curves, effects of speed on vehicle control, dangers associated with maneuvering through curves, dangers associated with weather or road conditions that a driver may experience (e.g., blizzards, mountainous terrain, high winds), and high center of gravity;
- Procedures for maneuvering tunnels, bridges, and railroad crossings.
- Requirements pertaining to attendance of vehicles, parking, smoking, routing, and incident reporting; and
- Loading and unloading of materials, including:
    - Compatibility and segregation of cargo in a mixed load.
    - Package handling methods; and
    - Load securement.

After a driver has completed the training program, management will determine whether the driver can safely operate a motor vehicle. If the driver passes, management places a training record in the driver's personnel file or driver qualification (DQ) file.

Evaluation

Individual assigned management evaluates each trained operator to verify that the driver has retained and uses the knowledge and skills needed to operate safely. If the evaluation shows that the driver is lacking the appropriate skills and knowledge, the driver is retrained.

The Safety Manager will review motor vehicle records periodically to ensure that operators maintain a good driving record. The results of each check are made known to Human Resources.

A driver may lose their privilege to operate a AMS vehicle for work or operate AMS-owned- leased-rented vehicle for personal use, if after an incident(s), accident(s), or after a violation(s) it was discovered to be the driver's fault and preventable; the Safety manager may recommend the driver receive additional training if warranted. Besides all the safety issues surrounding the driving of a commercial motor vehicle, there are other safety issues that can affect a driver. Examples of these are back strain and lifting concerns; slip- trip-falls; and personal safety in parking lots and other places.

Training and policy documents have been developed to address some of these driver safety topics. It is inherent that deficiencies may occasionally arise in this Motor Vehicle Safety Program. By having our program thoroughly evaluated, periodically and as necessary, and promptly taking action to correct any deficiencies in our program, we can eliminate problems effectively. Note: The occurrence of a motor vehicle incident does not in itself mean that the program is ineffective.

All drivers have a general obligation to work and drive safely.

NATURALLY OCCURRING RADIOLOGICAL MATERIALS

Background/Introduction

Naturally occurring radiological materials (NORM) is all around us. It is naturally present in our environment, generated by cosmic, terrestrial, and human sources. NORM is present in rock formations, soil, groundwater, coal / oil, and natural gas deposits. Exposure to NORM is continual and accumulative.

Technologically enhanced naturally occurring radioactive materials (TENORM) are materials that have been concentrated or exposed to the accessible environment as a result of human activities such as manufacturing, mineral extraction, or water processing.

Radon is a radioactive gas with a boiling point and vapor pressure similar to that of propane, resulting in higher concentrations of radon in natural gas liquids. Radon decays to low-level particulate radioactive lead-210, bismuth-210 and polonium-210, and can cause concentrated or accumulated quantities in or around AMS work areas.

Levels of natural or background radiation vary greatly depending on location. Approximately one-half of a U.S. person's total annual average radiation exposure comes from natural sources. The average annual radiation exposure from natural occurring sources is about 3.1 millisieverts (mSv). Radon and Thoron gases account for two-thirds of this exposure, while cosmic, terrestrial, and internal radiation account for the remainder (Although no adverse health effects have been discerned from doses arising from these sources of natural radiation exposure and NORM).

The potential for buildup of NORM substances is some ALLEN MECHANICAL SERVICES-AMS, hereafter referred to as "AMS", work sites. Examples of these sites include:

- Pipelines possessing residual hydrocarbons like propane, butane, demethanized mix and natural gasoline.
- Hydrocarbon process vessels
- Hydrocarbon storage tanks
- Geothermal process equipment and waste streams

Regulations

AMS has adopted the prescribed exposure prevention measures outlined in Title 29 CFR 1910.1096; although worker exposures are not anticipated to exceed the defined annual average radiation exposures of natural occurring radiation.

PURPOSE

This procedure establishes a baseline process to educate and protect our workforce from the potential harmful effects of radiation exposure in excess of background levels. This is accomplished by establishing assessment, mitigation measures and implementation strategies to be implemented when historical and/or facility information indicates NORM is likely present.

SCOPE

This section applies to all field operations personnel performing work in an environment known, or suspected, to contain NORM. Project Management (PM) and Supervision are primarily responsible for ensuring work areas are free of NORM that may potentially exceed natural occurring dose thresholds.

RESPONSIBILITIES

The EHS Manager or delegate is responsible for ensuring this policy is fully implemented and executed when site specific information and a job hazard analysis (JHA) indicates the presence of NORM.

The designated EHS Coordinator or delegate for each project location is primarily responsible for conducting a field survey, including an assessment for NORM exposure, and conduct all necessary field monitoring /testing to determine the level of radiation in the planned work area. The results shall be reported to the EHS Manager or delegate.

The EHS Manager or delegate will consult with AMS's Certified Industrial Hygienist (CIH).

Before any work activities begins, the designated CIH must approve:

- Any exposure control plans
- The sampling methods and verify sampling equipment is properly calibrated.

Company PMs must:

- Ensure an initial survey is conducted where radiation exposure is suspected,
- (2) Ensure workers are informed of the potential hazards and the safeguarding required for the intended operation.
- Work closely with EHS Coordinators to confirm the identified Personal Protective Equipment (PPE) is adequate for the potential exposure.

AMS designated Environmental Specialist must be notified of NORM related waste management activities. The Environmental Specialists will advise on appropriate waste characterization methods, containerization, and disposal /transportation options.

AMS CIH or delegate will conduct all necessary NORM survey and testing instrument training as required.

DEFINITIONS

Radiation includes alpha rays, beta rays, gamma rays, X-rays, neutrons, high-speed electrons, high-speed protons, and other atomic particles; but such term does not include sound or radio waves, or visible light, or infrared or ultraviolet light.
Radioactive material- any material which emits, by spontaneous nuclear disintegration, corpuscular or electromagnetic emanations.

Restricted area- any area controlled by AMS for purposes of protection of individuals from exposure to radiation or NORM.
Unrestricted area- any area not controlled by the employer for purposes of protection of individuals from exposure to radiation or radioactive materials.
Dose- the quantity of ionizing radiation absorbed, per unit of mass, by the body or by any portion of the body. When the provisions in this section specify a dose during a period of time, the dose is the total quantity of radiation absorbed, per unit of mass, by the body or by any portion of the body during such period of time.
Rem- a measure of the dose of any ionizing radiation to body tissue in terms of its estimated biological effect relative to a dose of 1 roentgen (r) of X-rays (1 millirem (mrem)=0.001 rem). The relation of the rem to other dose units depends upon the biological effect under consideration and upon the conditions for irradiation.
Roentgen(R) - a special unit of exposure. A common exposure rate unit when dealing with NORM is micro- Roentgens per hour.
Background radiation- the amount radiation an individual is exposed to from natural radiation sources such as radionuclides in solids, cosmic radiation from space, naturally occurring radionuclides deposited in the body from foods, etc.
Decontamination - the act of removing regulated NORM to reduced levels of radiation.
Naturally Occurring Radioactive Material (NORM) -any nuclide that is radioactive in its natural physical (not man made) but does not include by-products, source, or special nuclear material.
Technically Enhanced Naturally Occurring Radioactive Material (TENORM) -altered radiological, physical, and chemical properties of a radioactive material, introducing a potential for; -redistribution and contamination of environmental media (soil, water, air, and biota), -increased environmental mobility in soils and surface and ground water, -incorporation of elevated levels of radioactivity or increased accessibility in products and construction material, or -improper disposal or use of disposal methods that may result in unnecessary or elevated exposures to individuals and populations via the accessible environment4
Radiation area- any area, accessible to personnel, where radiation exists at levels that may subject the human body to a dose in excess of five millirem per hour, or 100 millirem in five consecutive days.
Survey - evaluation of planned work areas, uses, disposal, transfer, and/or presence of radiation sources under a specific set of conditions to determine actual or potential radiation hazards. Functional surveys include tests, physical evaluations/inspections, and radiation measuring to determine the concentration of radioactive materials present.

PROCEDURES

Occupational Dose Limits for Adults

An annual limit, which is the more limiting of:

- The total effective dose equivalent being equal to 5 rems (0.05 Sv)
- The sum of the deep-dose equivalent and the committed dose equivalent to any individual organ or tissue (other than the lens of the eye) being equal to 50 rems (0.5 Sv)

The annual limits to the lens of the eye, to the skin of the whole body, and to the skin of the

extremities, which are:

- A lens dose equivalent of 15 rems (0.15 Sv)
- A shallow-dose equivalent of 50 rem (0.5 Sv) to the skin of the whole body or to the skin of any extremity

Doses in excess of the annual limits, including doses received during accidents, emergencies, and planned special exposures, must be subtracted from the limits for planned special exposures that the individual may receive during the current year and during the individual's lifetime.

Radiation Monitoring

The following NORM monitoring equipment or equivalent is required. Equivalent testing instrumentation must be approved by the EHS Manager and designated CIH.

- A Ludlum Model 3 survey meter that reads radiation levels in both micro-Roentgens per hour (µR/hr) and counts per minute (CPM)
- A Ludlum Model 44-2 gamma scintillator probe-measures in (µR/hr)
- A Ludlum Model 44-9 alpha, beta, gamma probe (Pancake Probe)- measures in CPM
- A known source, attached to the meter, for daily instrument checks

NOTE: Survey equipment must be calibrated as per the manufacturer specifications.

Applications

AMS Project Management Team and the EHS Department must conduct surveys as necessary to comply with the provisions of this section.

Project site surveys include a physical or administrative survey of project locations. Historical monitoring data provided by customer facilities, property owners, etc. resulting in suspected NORM contamination will require a AMS exposure control plan.

Company Project Management must notify the EHS Department of NORM exposure concerns immediately upon suspicion or confirmation.

The EHS Department will coordinate with the Project Management team in developing NORM exposure control plans. Radiation levels/concentrations will be measured and professionally evaluated to determine appropriate protective measures and work strategies.

Personnel Protective Methods

AMS uses three principles of protection as established by the US-EPA:

1. Implementing work periods/cycles that limit worker exposure to a known quantity of radiation.
2. Placing distance between the worker and the radiation source

    i. The intensity and type of radiation will be closely evaluated in determining

exposure distance thresholds. For example, gamma rays travel long distances, but alpha and beta rays have very short travel distance.

ii. As a rule, doubling the distance from the source reduces the exposure by a factor of four, and vice versa.

3. Shielding reduces exposure

   i. Shielding is a material located/placed in between you and the source of the radiation. The amount of shielding required depends on the type and strength of the radiation.

The level of PPE required is based on the anticipated exposure to site specific NORM-material and background NORM levels and must be determined before work starts. At a minimum, the PPE ensemble should consist of the following when working in NORM contaminated areas:

Protective Clothing (Medium- High Exposure Concentrations)

- Approved full-face APR Respirator with HEPA (P-100 cartridge), or SAR.
- (ii) Protective Clothing –6
  - DuPont Tempro or equivalent
  - impervious gloves
  - impervious boots
  - hard hat or safety glasses (or goggles/ face shields)

All garment seams must be taped to eliminate potential gaps.

The EHS Manager and CIH must agree on a PPE ensemble for the specific work/exposure environment before work begins.

Personnel Decontamination Procedures

Personnel shall not begin doffing of PPE until radiation measurements are taken of the entire PPE ensemble to identify potential contamination “hot spots”.

Any potentially contaminated body parts must be thoroughly washed in the decontamination area before leaving the area.

PMs must consult with AMS Environmental Specialist for specific handling procedures of any waste generated during decontamination measures.

Decontamination plans must be developed prior to the commencement of any NORM related project and integrated into the overall site health and safety plan.

RIGGING SAFETY

PURPOSE

To outline safe operations and training requirements regarding hoisting and rigging operations and devices that are designed, constructed, installed, maintained, and operated to perform safely. It applies to all ALLEN MECHANICAL SERVICES-AMS, hereafter referred to as “AMS”, workers who use rigging equipment in the scope of their job duties and assignments.

PROCEDURES

Hoisting and Rigging Program

A thorough annual inspection of rigging equipment shall be made by a competent person. AMS shall maintain a record of the dates and results of inspections and rated load tests for each hoisting machine and piece of equipment.

Any defects found will be repaired by a qualified person before the crane is used. Before a crane is placed in service for use, rope components shall be inspected by a qualified person for defects, damage, and deformities and at least monthly thereafter. Certification of this inspection shall be in writing and document the date of inspection; inspector’s name and signature; and identification number of the rope component inspected.

Rigging and hoisting refers to the lifting and moving of loads using mechanical devices such as hoists, slings, wire ropes, shackles, chain-falls, etc. Improper design, use, or maintenance of hoists, lifting devices, and rigging equipment can cause equipment to fail or a load to be dropped, which can result in injury, death, or significant property loss. Workers that perform rigging activities have a critical role in helping to ensure each lift is a safe lift. The fact that an object is lifted off the ground does not mean it was rigged properly.

Inspection of Slings

A visual inspection for damage shall be performed by the user or designated person each day or shift the sling is used. Additional inspections shall be performed during sling use where service conditions warrant. A complete inspection for damage shall be performed periodically by a designated person, at least annually or as regulatory required. Damaged or defective slings shall be immediately removed from service. Written records of the most recent periodic inspection shall be maintained.

Inspection of wire rope

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

- In running ropes, 6 randomly distributed broken wires in 1 lay or 3 broken wires in one strand in one lay.

- Wear of 1/3 the original diameter of outside individual wires.
- Kinking, crushing, bird caging, or any other damage resulting in distortion of the rope structure.
- Evidence of any heat damage from any cause.
- Reductions from nominal diameter of more than 1/64 inch for diameters up to and including 5/16-inch, 1/32 inch for diameters 3/8 inch to and including 1/2-inch, 3/64 inch for diameters 9/16 inch to and including 3/4-inch, 1/16 inch for diameters 7/8 inch to 1 1/8 inches inclusive, 3/32 inch for diameters 1 1/4 to 1 1/2 inches inclusive.
- In standing ropes, more than 2 broken wires in 1 lay in sections beyond end connections or more than 1 broken wire at an end connection.
- Wire rope safety factors shall be in accordance with American National Standards Institute B 30.5-1968 or SAE J959-1966.

Heavy wear and/or broken wires may occur in sections that have contact with equalizer sheaves or other sheaves (where rope travel is limited) or with saddles. Care shall be taken to inspect ropes at these locations.

If rope has not been used for a month or longer this rope shall be given a thorough inspection before it

is used. This inspection shall be made by a designated person who is authorized by AMS.

This inspector shall examine rope for any kind of damage, deterioration or defect that might compromise the safety and specifications of the rope. Specific attention and care shall be given to the inspection of non-rotating rope.

Only this designated and authorized inspector shall give approval for use of this rope following satisfactory safety inspection as described above.

A written record of the inspector's certification shall be maintained by the Safety Coordinator or delegate and be readily available for review and confirmation. This certification shall include the inspection date, name and signature of the inspector, and the identification number of the rope component that was inspected.

Inspection of Hoist Chains

Hoist chains and end connections shall be inspected daily for damage, deterioration, excessive wear, twist, distorted links interfering with proper function, or stretch beyond manufacturer's recommendations.

Chains shall be inspected visually by the operator each day or before first use.

Chains also shall be inspected periodically for safety certification. The written certification shall include the date of inspection, name and signature of the inspector, and the identification number of the chain that was inspected. Written certification records shall be maintained by the Safety Coordinator or delegate.

Inspection of hooks and hook components (Rigging Hardware)

Crane hooks and safety latches shall be visually inspected each day or at the beginning of a shift prior to use for damage, cracks, or deformation.

Hooks and safety latches also shall be inspected monthly for safety certification. The written certification shall include the date of inspection, name and signature of the inspector, and the identification number of the hook that was inspected. Written certification records shall be maintained by the Safety Coordinator or delegate.

Hooks that have cracks or a throat opening that is greater than 15 percent more than normal or more than 10- degree twist from the plane of the unbent hook shall be discarded.

Preventive Maintenance

AMS has implemented a preventive maintenance program to help ensure the safety of cranes, hoists, rigging, and related equipment. Preventive maintenance shall be performed in accordance with manufacturer's recommendations. Each crane shall have a written record of preventive maintenance that is maintained by the Safety Coordinator.

Type of Inspection	Who?
Modified or repaired/adjusted	Qualified person
Post-assembly	Qualified person
Shift	Competent person
Monthly	Competent person
Annual	Qualified person

Inspection of Synthetic slings

The qualified person will inspect slings each day before use for damage or defects.

The qualified person also performs additional periodic inspections where service conditions warrant, as determined based on:

- Frequency of sling use,
- Severity of service conditions,
- Nature of lifts being made, and
- Experience gained during the service life of slings used in similar circumstances.

Periodic inspections of synthetic web slings at intervals no greater than 12 months. Common inspection guidelines:

- Yearly for normal service use,
- Monthly to quarterly for severe service use, and
- As recommended by a qualified person for special and infrequent service use.

Safe Sling Operation

The following procedures will be followed when using slings:

- Slings damaged or defective will be removed from service.
- Slings will not be shortened with knots or bolts or other makeshift devices
- Sling legs will not be kinked
- Slings will not be loaded beyond their rated capacity
- Slings used in a basked hitch will have the loads balanced to prevent slippage.
- Slings will be securely attached to their loads
- Slings will be padded or protected from the sharp edges of loads
- Suspended loads will be kept clear of obstructions
- All employees will be kept clear of loads about to be lifted and of suspended loads
- Hands or fingers will be kept clear of loads and not placed between the load and the strap
- Shock loading will not be allowed
- Slings will not be removed while loads are resting on the sling

Qualified Riggers

All riggers of AMS will be qualified person for the performance of specified hoisting activities such as during assembly/disassembly work and those that require workers to be in the fall zone to handle a load. The rigger would be considered qualified through possession of a recognized degree, certificate, or professional standing; or by extensive knowledge, training, and experience, successfully demonstrating the ability to solve/resolve problems related to rigging work and related activities.

ROAD TRANSPORTATION SAFETY

PURPOSE

ALLEN MECHANICAL SERVICES-AMS; hereafter referred to as “AMS” has created this policy to ensure all responsibilities are defined and AMS’s commitment to the safe operation of transportation vehicles. This written Motor Vehicle Safety Program establishes guidelines to ensure that we hire capable drivers, only allow eligible drivers to drive a "covered motor vehicle," train and supervise drivers, and maintain vehicles properly. A "covered motor vehicle" is a motor vehicle that is owned, leased, or rented by AMS or is a driver-owned vehicle operated during work time. A driver may be assigned to use a AMS vehicle to visit clients, make deliveries, attend meetings, pick up supplies, or to do a variety of other tasks. When driving is part of the job, like every other task, it must be done safely adherence to this written program can improve traffic safety performance, minimize the risk of motor vehicle incidents, and help to keep our drivers safe and our costs as low as possible. Management leads, supports, and enforces this program; but driver input is essential for its success. AMS will comply with all Federal and State agency requirements.

PROCEDURES

AMS Safety Manager or delegate is our Motor Vehicle Safety Program Administrator. The Program Administrator is responsible for ensuring all jurisdictional regulatory compliance requirements are met. The Program Administrator coordinates the Motor Vehicle Operation Program elements for our AMS. This Program Manager is responsible for setting up and managing the program so that managers, supervisors, and drivers know what our AMS expects. The Safety Manager will examine our existing policies and practices to ensure that they encourage and do not discourage reporting and participation in our program. In this way, early reporting of motor vehicle incidents and hazards and meaningful driver participation in the program are more likely to occur. For this program to be administratively effective, good judgment and correct choices must be made by the person in charge of their section or group of drivers and vehicles. Prior to the assignment of any vehicle to any driver or prior to allowing a driver to drive their own vehicle on AMS business or the continuation of driving any vehicle, AMS or driver owned vehicle, the following will be reviewed:

- A current valid state driver’s license with no “Status Actions”; must be at least 21 years of age to drive a CMV or 18 years of age or older to drive a Fleet Vehicle. A current medical card is required, and a copy must be provided for recordkeeping in the driver qualification files. Drivers who hold a CDL or commercial learner's permit (CLP) must provide each new certificate to their state licensing agency and carry a copy for at least 15 days after issuance, until their state driving record is updated. AMS must also have a copy of the certificate in the file for up to 15 days. By the end of those 15 days, a new Motor Vehicle Report (MVR) must be placed in the employee’s file as proof of medical certification. The medical certificate must be updated by an approved medical examiner at least once every 24 months, unless more frequently due to underlying conditions. The driver must carry the medical certificate or a copy of it on their person. Another copy must be provided to AMS to be retained in the driver’s qualification file.

- A review of the driver's background and MVR (MVR 3 years back initially, then annual thereafter) will be done. AMS requires a preceding 3-year, state issued, driving record (MVR), for each driver-applicant operating a vehicle which is AMS owned, rented, or leased as well as any personal vehicle used on AMS business. If the driver has an out-of-state license, they will be required to submit their MVR from that state for our review. The MVR will be reviewed by a responsible management official for determination of qualification of each driver. If the MVR indicates no violations, or the following minor violations, the driver may be considered for qualification by AMS management. They are:

    - conviction of one or more minor moving violations, as long as no more than 6 points have been assessed
    - minor accident (no injuries) Note: If the driver/driver can remove the citation by going to traffic school, AMS will take this action into consideration for final qualification of the driver.

- If the driver's MVR indicates the following major violations, then the driver is NOT qualified to drive for AMS:

    - Operating a vehicle under the influence of a drug or alcohol
    - Implied Consent Refusal (refusal to take blood alcohol test and or urine analysis)
    - Committing homicide, manslaughter, or aggravated assault with a vehicle
    - Failing to stop if you are involved in a traffic accident
    - Reckless driving
    - Felony speeding
    - License Suspension or Revocation

- Notification by AMS insurance carrier that the driver is ineligible for auto insurance coverage will cause the driver to be ineligible to drive. The above listed violations should not be considered all inclusive, and these are not the only major violations that would disqualify the driver as a driver. Management reserves the right to make the final decision as to whether the driver will be qualified to drive.

Fleet Vehicle

Any motor vehicle AMS owns or leases that is used in the normal operations of AMS. Vehicles which are used in the operation of AMS but are owned by AMS drivers are not fleet vehicles. Fleet vehicles include gasoline/diesel powered vehicles and alternative-fuel vehicles. Commercial driver's license (CDL) A license issued to an individual by a State or other jurisdiction of domicile, in accordance with the standards contained in this part, which authorizes the individual to operate a class of a commercial motor vehicle. All motor vehicles will be placed on a preventive maintenance and inspection program maintained per the manufacture's specifications. All maintenance reports will be retained for the duration of when the vehicle is in

use. A pre and post trip inspection will be performed and documented by each driver. The driver will provide the documentation to the maintenance department as part of the recordkeeping requirements. During the pre and post trip inspections if any defects are identified the driver will alert their supervisor or maintenance department before the motor vehicle is placed back in service.

Commercial motor vehicle (CMV)

A motor vehicle or combination of motor vehicles used in commerce to transport passengers or property if the motor vehicle:

- Has a gross combination weight rating or gross combination weight of 11,794 kilograms or more (26,001 pounds or more), whichever is greater (including) towed unit(s) with a gross vehicle weight rating or gross vehicle weight of more than 4,536 kilograms (10,001 pounds), whichever is greater
- Has a gross vehicle rating, gross combination weight rating, gross vehicle weight or gross combination weight of 4,536 kg (10,001 lbs.) or more
- Is designed or used to transport more than 8 passengers for compensation or more than 15 passengers without compensation
- Is of any size and is used in the transportation of hazardous materials

Gross Combination Weight Rating (GCWR)

The value specified by the manufacturer as the loaded weight of a combination (articulated) vehicle. In the absence of a value specified by the manufacturer, GCWR will be determined by adding the GVWR of the power unit and the total weight of the towed unit and any load thereon.

Gross Vehicle Weight Rating (GVWR)

The value specified by the manufacturer as the loaded weight of a single vehicle. Out-of-service order (OOS) A declaration by an authorized enforcement officer of a Federal, State, Canadian, Mexican, or local jurisdiction that a driver, a commercial motor vehicle, or a motor carrier operation, is out-of-service pursuant to FMCSR 386.72, 392.5, 395.13, 396.9, or compatible laws, or the North American Uniform Out-of-Service Criteria.

Motor Vehicle

A vehicle, machine, tractor, trailer, or semitrailer propelled or drawn by mechanical power that is used on highways.

Commercial Driver Qualifications (CMV and CDL)

A person shall not drive a commercial motor vehicle unless he/she is qualified to drive a commercial motor vehicle. AMS shall not require or permit a person to drive a commercial motor vehicle unless that person is qualified to drive a commercial motor vehicle.

A person is qualified to drive a CMV:

- If at least 21 years old
- Can read and speak the English language sufficiently to converse with the public, to understand highway traffic signs and signals in the English language, to respond to official inquiries, and to make entries on reports and records
- Can, by reason of experience, training, or both, safely operate the type of commercial motor vehicle they drive
- Is physically qualified to drive a commercial motor vehicle in accordance with FMCSR's Physical Qualifications and Examinations
- Has a currently valid commercial motor vehicle driver's license issued only by one State or jurisdiction (for GVWs or GCVWs of 26,001+ lbs.)
- Has prepared and furnished AMS with the list of violations or the Certificate of Violations
- Is not disqualified to drive a commercial motor vehicle under FMCSR §391.15
- Has successfully completed a driver's road test and has been issued a certificate of driver's road test or has presented a driver's license or a certificate of road test which we may accept as equivalent to a road test under FMCSR §391.33

Final determination will be the responsibility of AMS Management with the advice of the Safety Manager.

All commercial drivers must always be prepared for their driving of a AMS CMV. There are many items, mainly documentation and proofs. CMV/CDL drivers will need:

- Certificate of Registration
- Hours of service records (logbook)
- Registration papers (cab cards, permits, etc.)
- Proof of insurance
- Driver's license documents and any related certificates or endorsements, if applicable
- Special permits for oversize and overweight loads, if required
- Hazardous materials shipping papers and placards, if required
- Fuel tax permits (IFTA)
- Bills/Invoices, etc. showing content and origin of agricultural products, if required
- Evidence of financial responsibility

Only pre-qualified and authorized drivers may operate AMS owned, rented, leased or their personal vehicle, used for company business.

Mobile Phone Use and Texting

There shall be no mobile phone usage by any CMV/CDL drivers while operating a company vehicle unless that vehicle or the driver's phone is equipped with a "hands-free" operating system. The commercial driver should pull over at a safe location and then return the phone call if necessary. There shall be NO TEXTING while driving a vehicle (Fleet or CMV); the driver shall read or create texts only when stopped and parked in a safe location for them and the vehicle.

Two-way radios are not restricted by the DOT banning of mobile phones, push to talk communications allow for a safer communication.

Driving Safety

While it's important to understand AMS vehicle safety program, as a driver, you must put safe driving techniques into practice each time you get behind the wheel. The following safe driving strategies are under the driver's control:

- Make sure the vehicle is safe to operate
- Bring supplies you may need in case of an emergency
- Wear your seat belt
- Drive defensively, not aggressively
- Pay attention to your driving and avoid distractions
- Only drive when you're alert and fully awake
- Never drive under the influence of alcohol, medications, or illegal drugs

Note: Seat belts are the single most effective means of reducing deaths and serious injuries in traffic crashes.

Vehicle Inspections

Safe driving starts before you turn the ignition key. Always inspect the vehicle before and after your trip. Make sure:

- The vehicle does not have any visible damage that affects its safe operation
- The tires are properly inflated (use the vehicle manufacturer's recommendations that are typically noted on a sticker inside the door, glove box, or trunk - the pressures stamped on the tire are not specific to the vehicle). Check the pressure when the tires are cold
- Tires have sufficient tread depth (tread depth should be at least 1/16 inch)
- The vehicle's fluid levels are correct (oil, brake, transmission, battery, and wiper fluids)
- Belts and hoses are free of blisters, cracks, and cuts
- The vehicle has plenty of fuel
- The windshield wipers are in good condition and are functional
- You are familiar with the location and operation of all the vehicle's controls; and the seat, steering wheel, and mirrors are properly adjusted
- Headlights, brake lights, turn signals, emergency flashers, and interior lights are working
- The seat belt is properly adjusted, and it's in good condition
- The vehicle is equipped with an emergency kit
- Loose objects are secured so they won't shift during a sudden stop or turn

Plan for Emergencies

In case of a breakdown or accident, your first actions should be to move the vehicle to a safe area, remain in the vehicle (if there is no risk of fire or other danger), and call for help. Some basic provisions to include in an emergency supply kit can include:

- A phone and a list of emergency phone numbers
- First aid supplies
- Roadside warning triangles or flares (follow instructions for their safe use)
- A fire extinguisher
- Water and food
- Clothing (raincoat; warm clothing, hat, mittens/gloves; comfortable boots/shoes).
- Basic car maintenance tools (a flashlight with fresh batteries; battery jumper cables; a jack, lug nut wrench, and spare tire; water for the radiator; oil; windshield wiper fluid; rags; gloves; etc.)

Be Defensive

It's best to always practice defensive driving techniques. Continually check your mirrors, leave enough following distance, and keep a cushion of space around the vehicle in case you need to quickly change lanes or go onto the shoulder. Aggressive driving acts include:

- Speeding.
- Tailgating.
- Failing to signal lane changes.
- Running red lights or stop signs.
- Passing on the right.

Aside from being aggressive, taking these actions can result in getting a ticket. The best advice is to share the road - allow other drivers to merge as needed. Safely move out of an aggressive driver's way; don't become part of a conflict.

Stay Focused and Alert

Driving is no time to multi-task. Stay focused on the road. Drivers can be distracted by a variety of things:

- Conversations with passengers.
- Eating, drinking, or grooming.
- Tuning the radio or selecting a CD to play.
- Reading maps or directions.
- Using electronic navigation systems.
- Using a mobile phone.
- Get a full night of rest before driving.
- Stop and get out of the car to stretch and walk about every two hours.
- Set a realistic goal of how many miles you can safely drive each day.
- Avoid taking medications that cause drowsiness.

Hours of Service

The hours of service (HOS) rule refers to the maximum amount of time drivers are permitted to be on duty including driving time, and specifies number and length of rest periods, to help ensure that drivers stay awake and alert. AMS will comply with HOS regulations found in 49 CFR 395.

Hazardous Materials Shipping

All drivers transporting hazardous will have been properly trained. Drivers are responsible for ensuring that the applicable markings/placards that are required are placed on the CMV based on jurisdictional requirements. Drivers will ensure that the proper shipping papers or manifests are properly prepared, stored and retained for the required times based on jurisdictional and AMS requirements.

What to do in Case of an Accident

Stop at once! Check for personal injuries and send for an ambulance, if needed. Do not leave the scene but ask for the assistance of bystanders.

- If fire or smoke is present evacuate vehicle occupants to a safe location. If stalled on a railroad track, evacuate occupants to a safe location away and at a right angle from the tracks.
- If fire, smoke, or spilled fuel is present send for the fire department. Do not leave the scene; ask a bystander to call the fire department. If possible, use a spill kit to absorb the spill.

Protect the scene. Set emergency warning devices to prevent further injury or damage. Secure your vehicle and its contents from theft, if possible.
Secure assistance of the police whenever possible. Record names and badge numbers. Do not leave without law enforcement presence on scene.
Record names, addresses, and phone numbers of all witnesses injured and driver(s) and their passengers, record vehicle license numbers. Take complete pictures with mobile phone or camera.
Do not argue! Make no statement except to the proper authorities and to Management. Sign only official police reports. Do not make statements regarding the operating condition of your vehicle and do not admit fault.
Report the incident to your supervisor/safety manager IMMEDIATELY after first aid has been given, authorities have been notified, the scene has been protected and you are able to do so.
Complete the incident report at the scene (or with your Supervisor ASAP) and as thoroughly as possible. Make sure the Safety Manager gets copies of all incident paperwork and related information within 24 hours.
If you strike an unattended vehicle and cannot locate the owner, leave a note with your name and AMS's address and phone number, get the vehicle description, VIN number and license plate number. If possible, take a picture with your mobile phone or camera of the damage.
A motor vehicle incident is a negative occurrence that involves a "covered" motor vehicle and that caused or could have caused injury, illness, or property damage.
All motor vehicle incidents will be investigated to determine their causes and whether the incidents were preventable. Understanding the root causes of incidents and why they are happening, regardless of fault, forms the basis for eliminating them in the future.
If any of the following traffic violations occur, whether in the driver's personal vehicle (on or off AMS business) or while operating an owned, rented, or leased vehicle, suspension of driving or operating any vehicle will be immediate:

- Operating a vehicle under the influence of a drug or alcohol
- Implied Consent Refusal (refusal to take blood alcohol test and or urine analysis)
- Committing homicide, manslaughter, or aggravated assault with a vehicle
- Failing to stop if you are involved in a traffic accident
- Reckless driving
- Felony speeding
- License Suspension or Revocation
- Cancellation of the driver's auto insurance by the driver's insurance carrier.

The above listed violations should not be considered all inclusive, and these are not the only major violations that would suspend the driver as a driver. Management reserves the right to make the final decision. AMS follows 49 CFR Subpart C 383.33 for CMV drivers. If the driver is found to not have reported to AMS any traffic violation, suspension, or revocation of their license, by reviewing their MVR on an annual basis or as often as deemed necessary, the driver will be subjected to disciplinary action up to and including termination. It is the overall responsibility of all drivers to maintain proper and acceptable driving records and all licenses required for their position.

Drugs and Alcohol

In accordance with our Drugs and Alcohol Policy driving a AMS owned, rented, leased or personal vehicle on AMS business, while under the influence of drugs or alcohol shall result in immediate termination.

Training

Under no circumstances may a driver operate a covered motor vehicle until they have successfully completed this AMS's initial training on motor vehicle safety. Training can include reading material, watching a presentation, and driving with a supervisor as a ride-a-long. The supervisor of that individual is responsible for conducting training if they assign a driver to driving duties.
AMS training program includes the topics of driving that the driver will have to deal with. Through training we ensure that motor vehicle drivers are knowledgeable in practices such as impaired, fatigued, aggressive, distracted, and defensive driving; seat belt use; vehicle inspection; security and motor vehicle incident procedures; cargo securement; handling hazardous materials and spills; and safety features and emergency equipment.

Driver training must include the following:

- Pre-trip safety inspection
- Use of vehicle controls and equipment, including operation of emergency equipment
- Operation of vehicle, including turning, backing, braking, parking, handling, and vehicle characteristics including those that affect vehicle stability, such as effects of braking and curves, effects of speed on vehicle control, dangers associated with maneuvering through curves, dangers associated with weather or road conditions that a driver may experience (e.g., blizzards, mountainous terrain, high winds), and high center of gravity
- Procedures for maneuvering tunnels, bridges, and railroad crossings

- Requirements pertaining to attendance of vehicles, parking, smoking, routing, and incident reporting
- Loading and unloading of materials, including:

    - Compatibility and segregation of cargo in a mixed load
    - Package handling methods
    - Load securement

- Defensive driving including:

    - proper attitude
    - visual habits
    - proper decision making
    - road rage
    - distracted driving

- Fatigue management
- Hazardous Materials in compliance with jurisdictional requirements

After a driver has completed the training program, management will determine whether the driver can safely operate a motor vehicle. If the driver passes, management places a training record in the driver's personnel file or driver qualification file.

Evaluation

The Safety Manager evaluates each trained driver to verify that the driver has retained and uses the knowledge and skills needed to operate safely. If the evaluation shows that the driver is lacking the appropriate skills and knowledge, the driver is retrained.

The Safety Manager also reviews motor vehicle records periodically to ensure that drivers maintain a good driving record. The results of each check are made known to the appropriate departments.
A driver may lose their privilege to operate a AMS vehicle for work or operate a AMS-owned- leased-rented vehicle for personal use, if after an incident(s), accident(s), or after a violation(s) it was discovered to be the driver's fault and preventable; the Safety Manager may recommend the driver receive additional training if warranted.

In addition to the safety issues surrounding the driving of a commercial motor vehicle, there are other safety issues that can affect a driver. Examples of these are back strain and lifting concerns; slip- trip-falls; and personal safety in parking lots and other places.

Training and policy documents have been developed to address some of these driver safety topics. It is inherent that problems may occasionally arise. By having our program thoroughly evaluated, periodically and as necessary, and promptly taking action to correct any deficiencies in our program, we can eliminate problems effectively. Note: The occurrence of a motor vehicle incident does not in itself mean that the program is ineffective.

Disciplinary Actions

AMS's progressive driver discipline policy and procedures are designed to provide a structured corrective action process to improve and prevent a recurrence of undesirable driver behavior and performance issues.

Outlined below are the potential steps of our progressive discipline policy and procedures. AMS reserves the right to combine or skip steps depending on the facts of each situation and the nature of the offense.

Some of the factors that will be considered are whether the offense is repeated despite coaching, counseling, or training; the drivers work record; and the impact the conduct and performance issues have on AMS, driver, or public.

Drivers who receive three unsafe driving-related complaints may be subject to mandatory training and/or disciplinary action up to and including a recommendation for termination.

- First validated complaint—Supervisor will discuss complaint with driver and give a verbal warning. Driver may be required to complete a mandatory driver training provided by Risk Management Services or his or her assigned department.
- Second validated complaint—Supervisor will discuss complaint with driver and provide driver with a written warning (summary of conference). Driver will need to complete mandatory driver training provided by their supervisor.
- Third validated complaint—Driver will need to complete mandatory driver training provided by their supervisor. Driver may receive additional disciplinary action up to and including a recommendation for termination.

At no time will aggressive driving be tolerated by any driver who is driving a AMS vehicle. If it is determined that a driver is exhibiting unsafe driving behavior that includes, but is not limited to, rude gestures, verbal insults, deliberately driving in an unsafe or threatening manner, or making threats, they will be removed from driving status and may receive additional disciplinary action up to and including a recommendation for termination.

Drivers are subject to disciplinary actions for being involved in three preventable vehicle accidents within a five- year period. (After five years, one accident will be removed.)

Disciplinary actions are as follows:

- First incident—Driver will receive a written warning from their supervisor, must attend defensive driving class and any retraining course required by their supervisor, and may receive additional disciplinary action up to and including a recommendation for termination.
- Second incident—Driver will be placed on an intervention plan, must attend defensive driving class and any retraining course required by their supervisor, and may receive additional disciplinary action up to and including a recommendation for termination.
- Third incident—Driver will be removed from driving status and may receive additional disciplinary action up to and including a recommendation for termination.

All drivers have a general obligation to work and drive safely.

STOP WORK AUTHORITY

PURPOSE

The purpose of this policy is to ensure that all workers are given the responsibility and authority to Stop Work when they believe that a situation exists that places them, coworker(s), contractors, or the public at risk or in danger pertaining to the service provided by ALLEN MECHANICAL SERVICES-AMS; hereafter referred to as “AMS”. A worker’s responsibility and authority to Stop Work also includes situations, that if allowed to continue, could adversely affect the safe operation, or cause serious damage to a facility or equipment, or adversely affect the environment.

SCOPE

This policy applies to all AMS locations, work sites, and areas. It is applicable to all AMS workers working at these locations

RESPONSIBILITIES

All workers have the right and obligation to stop any job or task when there are questions or concerns regarding the control of hazards or unsafe acts.

Management establishes a culture that promotes SWA and supports use of SWA without potential for retribution, supervisors, and managers honor SWA requests and resolve before resuming operations, HSE provides training, support, documentation, and monitors compliance of SWA program, workers and contractors initiate stop work and support stop work initiated by others.

PROCEDURES

A Stop Work intervention should be initiated for conditions or behaviors that could reasonably be expected to pose a risk or danger to worker(s), safe operation of a facility, serious damage to equipment or adversely affect the environment. Situations that warrant a Stop Work intervention may include, but are not limited to the following:

- Unsafe conditions
- Change in conditions
- Changes to scope of work or work plan
- Equipment used improperly
- Lack of knowledge, understanding or information
- Clarify work instructions
- Propose additional controls

Any Stop Work issue(s) requiring corrective action(s) to resolve the issue(s), shall be documented on a Stop Work Authority Form (Attachment A)

Steps of Stop Work Authority

1. Stop - When a worker(s) perceives conditions or behaviors that pose imminent danger, they must immediately initiate a stop work intervention.

    i. Workers are protected from retribution or reprimand for exercising SWA. Any form of retribution or reprimand will not be tolerated against workers who exercise SWA.

2. Notify - Notify affected workers and supervision of the stop work action.
3. Investigate - Affected workers will discuss the situation and come to an agreement on the stop work action.

    i. No work can resume once SWA is exercised until all issues and concerns have been addressed.

4. Correct – Take immediate or as soon as possible actions to rectify the known unsafe act or condition
5. Corrective actions - Will be made according to the corrections agreed upon in the investigation to prevent a recurrence of the unsafe act or condition.
6. Resume - All affected workers will be notified of what corrective actions were implemented and work will resume only when it is safe to do so.

Documentation

All SWA when exercised must be documented for lessons learned and corrective actions.

All SWA occurrences shall be documented to evaluate effectiveness of the program and identify areas for improvement.

Management must review SWA reports to measure participation, establish the quality of SWA interventions, and corrective actions, establish trends, discover opportunities for improvement, and establish lessons learned.

AMS places a high importance of follow-up after a Stop Work Intervention has been initialed and closed. It is the desired outcome of any Stop Work Intervention that the identified safety concern(s) have been addressed to the satisfaction of all involved workers prior to the resumption of work. Most issues can be adequately resolved in a timely manner at the job site, occasionally additional investigation and corrective actions may be required to identify, address and correct root causes.

Training

All workers are trained on SWA prior to their initial assignment. The training be documented and include the worker(s) name(s) and dates of training.

Attachment A
STOP WORK INTERVENTION FORM

Section 1: Stop Work Issuance			
Location of operation		Date & Time	
Supervisor		Phone	
Person initiating stop work			
Person performing work			
Work operation or condition (include names of individuals performing work)			
Hazard (as stated by person initiating stop work)			

Section 2: Date / Time Informed			
Supervisor		Safety Manager	
Area Manager		Client Safety (If required)	

Section 3: Follow-up Action (Be specific – what by, who by, when by to correct hazard)			
Section 4: Restart Concurrence			
Supervisor		Date	
Area Manager		Date	
Safety Manager		Date	

SUBCONTARACTOR SAFETY MANAGEMENT

PURPOSE

To set forth a basis for the selection of safe subcontractors and to set forth procedures to assure that the subcontractor's safety activities are equal to or exceed those of AMS.

POLICY

Subcontractors for ALLEN MECHANICAL SERVICES-AMS; hereafter referred to as "AMS" work sites shall be selected and managed in a manner consistent with the overall AMS safety objectives, policies, and procedures embodied in the other sections of this manual.

SCOPE

Applies to all AMS work sites, i.e., AMS offices, client job sites, etc., that have occasion to use subcontractors.

DEFINITIONS

Experience Modification Rate (EMR) is a term related to Workers' Compensation insurance and means a factor developed by measuring the difference between an employer's actual past claim experience and the expected or actual experience of the industry classification of the employer. Depending on the workers compensation program in which the subcontractor participates, the EMR may be determined by a single state entity or a multi- state agency such as the National Council on Compensation Insurance (NCCI). The EMR is based on a point scale where 1.0 means average or expected losses for that type of industry classification. EMR's below 1.0 means below average loss history and EMR's above 1.0 mean above-average loss history.

Hours of Exposure means the total number of hours that all AMS's workers are exposed to occupational injuries or illnesses during a normal work year. Salaried and hourly workers are included. Straight-time and over- time hours are included.

Subcontractor for purposes of this section, means a person or business, which has a standard subcontract agreement with AMS, as an "independent contractor" (not a worker), to provide some portion of the fieldwork on a project for AMS.

PROCEDURES

Subcontractor Selection

Form 5-1.1 of Appendix 5-1 is a Pre-Qualification Questionnaire that shall be used to capture the information noted within this section. It is required that safety performance be considered initially, and annually thereafter, in the selection of subcontractors, using the following criteria:

Experience Modification Rate ("EMR")

Prospective subcontractors shall be required to furnish their EMR for the past three years. This information should come directly from the subcontractor's broker. An EMR greater than 1.0 can indicate an employer with a high frequency and/or severity of workers compensation claims. In the event of an EMR greater than 1.0, a more detailed evaluation of their safety program is required.

OSHA Log

Prospective subcontractors shall be required to submit copies of OSHA logs (or equivalent summary data) for the previous three years and applicable hours of exposure. Incident frequency and severity rates should be examined and compared for acceptability with:

- Comparable incident rates for relevant work sites (if available)
- Industry average incident rates for their Standard
- Industrial Code (SIC or NAICS code) as published by the Bureau of Labor Statistics
- An incident rate specified by AMS
- Safety Coordinator or delegate

Evaluation of Subcontractor Safety Program

The prospective subcontractor shall demonstrate that their program meets or exceeds AMS's safety program requirements, industry standards or governing jurisdiction. The following areas are a minimum that shall be addressed by the subcontractor:

- The program should be industry specific, not generic, and should be responsive to the exposures prevalent in the industry and anticipated on the prospective project
- There should be elements of supervisor accountability for safety, accidents, and claim costs
- Safety meetings should be held regularly, with documentation as to the subject, who attended, and a review of past losses
- Safety audits (inspections) should be conducted by the subcontractor on a regular basis.
- Audit results should be documented to identify deficiencies and corrective action taken
- The program should provide for worker safety training, including the documentation thereof

OSHA Citations

The prospective subcontractor shall be required to provide information (reason, corrective action, and fines) regarding OSHA citations during the past three years. A history of frequent violations, infrequent but repeated violations, or violations applicable to the work to be performed would warrant further investigation.

Pre-Job Planning

The understanding of AMS and the subcontractor on important issues should be written and signed by both parties as part of the subcontract agreement and scope of work. All subcontractors are required to report incidents/injuries immediately or as soon as possibly to AMS. The subcontractor and AMS will review and assign notification and recordkeeping requirements.
Examples of such issues would be:

- Provision of tools and equipment and inspection thereof
- Performance in accordance with OSHA and other regulatory bodies
- Provision of all necessary personal protective equipment (PPE), training on its use, and enforcement of usage at the worksite
- Responsibility for housekeeping and debris removal efforts
- Responsibility for utility mark out, maintenance, and protection of traffic on underground and road projects during the project
- Defining the roles and responsibilities for the supervision and direction of the subcontractors
- Reporting and recordkeeping of incidents/injuries including near misses

Typical Actions Recommended During Performance of Work

Include subcontractors in the following safety activities:

- Manager Audits
- Safety Meetings
- Training Sessions
- Safety Audits
- Work Observations
- Job Safety Analysis Systems
- Hazard Analysis including Site inspections and hazards created by others
- Injury Intervention Processes
- Root Cause Analysis
- Client-Required Programs

Post Job Review

A post job review will be performed to evaluate the overall safety performance of the subcontractor.

Appendix 5-1

ALLEN MECHANICAL SERVICES-AMS
SUBCONTRACTOR PRE-QUALIFICATION QUESTIONNAIRE

All subcontractors are required to complete this questionnaire. The contents of this questionnaire will be considered confidential and used solely to determine your company qualifications and will not be disclosed to the project staff. Please direct any questions, and return this completed form, to:

{Allen Mechanical Services-AMS}
{Address}
Telephone:
{Phone}
Fax No.:
{Fax}

GENERAL INFORMATION. Please fill in the following:

Name of Business: _____ Street Address: _____ Post O

ORGANIZATION. Please indicate your firm's legal structure:

This firm is a: ( ) C Corporation ( ) S Corporation ( )
Partnership ( ) Sole Proprietor ( )
Limited Liability Company

Federal Employer Identification Number: _____

Names, Titles and ages and length in position of Officers, Managers, or Principals:

Name Title Age Time in Position
_____|_____|_____|_____
_____|_____|_____|_____
_____|_____|_____|_____

Is your firm a qualified minority business? _____ Certification No.: _____

WORK CLASSIFICATION

Please list the type(s) of work you are interested in bidding:

Please list the geographic areas you prefer to work in:

WORK EXPERIENCE

Please attach a list of the major projects your firm currently has in progress showing the project name, location, owner, architect/engineer, general contractor, contract amount, percent complete and scheduled completion date, and contact person.

Please attach a list of the major projects your firm has completed in the last three years showing the project name, location, owner, architect/engineer, general contractor, contract amount and completion date, and contact person.

FINANCIAL INFORMATION

Please attach your firm's most current financial statements (audited, if available), for the entity that will be signing the subcontract.

REFERENCES

Bank Reference
Name
Contact Person
Telephone

Bonding Reference
Bonding Company:
Bonding Agent:
Name Address Phone #
Bonding Capacity: $ _____ Per Project
$ _____ Aggregate
Date, amount, and type of last bond issued:
Bond Rate:

Credit References
Name
Contact Person
Telephone

CONTRACTOR PROFILE

Current Number of workers:
Office_____ Field _____

Does your firm operate as a Union shop? ( ) Yes
( ) No
Merit shop? ( ) Yes ( ) No

SAFETY, HEALTH AND ENVIRONMENTAL

Please list your firm's Workers Compensation Interstate Experience Modification

Rate. Does your company have a written safety program? ( ) Yes ( ) No

INSURANCE

Attach the certificate provided by your insurance carrier.

ADDITIONAL INFORMATION

Please list any additional information that you feel will help us determine your firm's qualifications and expertise:

_____

_____

_____

This Pre-qualification Questionnaire was completed by:

Name: _____ **Title:** _____

Date: _____

TRENCHING AND EXCAVATING SAFETY

SCOPE

This policy sets forth the official practices required for trenching and excavations pertaining to the service provided by ALLEN MECHANICAL SERVICES-AMS; hereafter referred to as “AMS”.

DEFINITITIONS

Aluminum hydraulic shoring- an engineered shoring system comprised of aluminum hydraulic cylinders (cross braces), used in conjunction with vertical rails (uprights) or horizontal rails (walers).
Such a system is designed specifically to support the sidewalls of an excavation and prevent cave-ins.
Benching - a method of protecting workers from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.
Cave-in - the separation of a mass of soil or rock material from the side of an excavation, or the loss of soil from under a trench shield or support system, and its sudden movement into the excavation, either by falling or sliding, in sufficient quantity so that it could entrap, bury, or otherwise injure and immobilize a person.
Competent person -one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions that are unsanitary, hazardous, or dangerous to workers, and who has authorization to take prompt corrective measures to eliminate them. All competent persons must complete the 4-hour Physical Plant trenching and shoring class, successfully pass the exam, and be certified for successful completion of the class. A competent person should have and be able to demonstrate the following:

- Training, experience, and knowledge of:
    - soil analysis
    - use of protective systems
    - requirements of 29 CFR 1926 Subpart P
- Ability to detect:
    - conditions that could result in cave-ins
    - failures in protective systems
    - hazardous atmospheres
    - other hazards including those associated with confined spaces
- Authority to take prompt corrective measures to eliminate existing and predictable hazards and to stop work when required.

Excavation -any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.
Registered professional engineer- a person who is registered as a professional engineer.
Shield (shield system) -a structure that can withstand the forces imposed on it by a cave-in and thereby protect workers with the structure. Shields can be permanent structure or can be designed to be portable and moved along as work progresses. Also known as trench box or trench shield.
Shoring (shoring system) -a structure such as a metal hydraulic, mechanical, or timber shoring system that supports the sides of an excavation and which is designed to prevent cave-ins.

Sloping (sloping system) - a method of protecting workers from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation to prevent cave-ins. The angle of incline varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.
Trench (trench excavation) -a narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench is not greater than 15 feet. If forms or other structures are installed or constructed in an excavation to reduce the dimension measured from the forms or structure to the side of the excavation to 15 feet or less, the excavation is also considered to be a trench.

PROCEDURES

All excavations shall be made in accordance with the rules, regulations, requirements, and guidelines set forth in 29 CFR 1926.650, .651, and .652; the Occupational Safety and Health Administration's standard on excavations, except where otherwise noted below.

Training

AMS will ensure all workers and associates are trained in trenching and excavation safety and specific work-related practices. AMS requires all subcontractors whose work does not include trenching/excavations, but are in close proximity, to provide a basic awareness program that addresses all job scope activities. The awareness program shall include information regarding safe access and egress and protective measures associated with trenching.

A competent person shall be placed in charge of all excavations. Underground utilities must be located and marked before excavation begins. Before digging, driving equipment into the ground, or engaging in earth moving activities are conducted, the appropriate one-call center will be contacted. Workers are not allowed in the excavation while heavy equipment is digging.

Inspections

The competent person shall conduct inspections:

- Daily and before the start of each shift by using the DAILY EXCAVATION CHECKLIST found at the end of this chapter.
- As dictated by the work being done in the trench.
- After every rainstorm.
- After other events that could increase hazards, such as snowstorm, windstorm, earthquake, dramatic change in weather, etc.

- When fissures, tension cracks, sloughing, undercutting, water seepage, bulging at the bottom, or other similar conditions occur.
- When there is a change in the size, location, or placement of the spoil pile.
- When there is any indication of change or movement in adjacent structures.

(For excavations 4 feet or greater in depth, a trench inspection form shall be filled out for each inspection.) If problems are found, provisions should be made for immediate personnel removal.

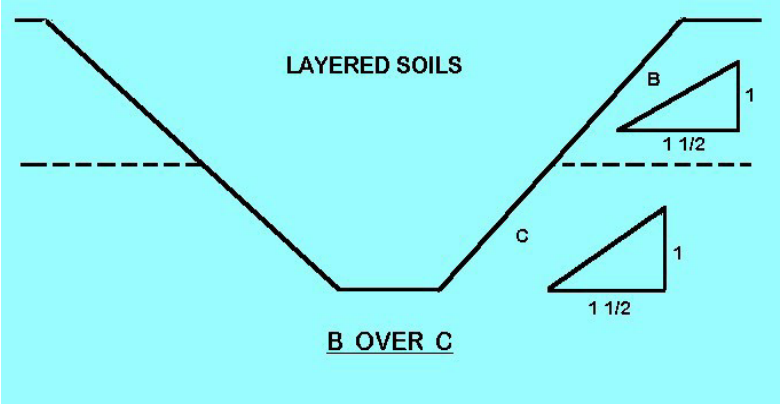
Soil Types:

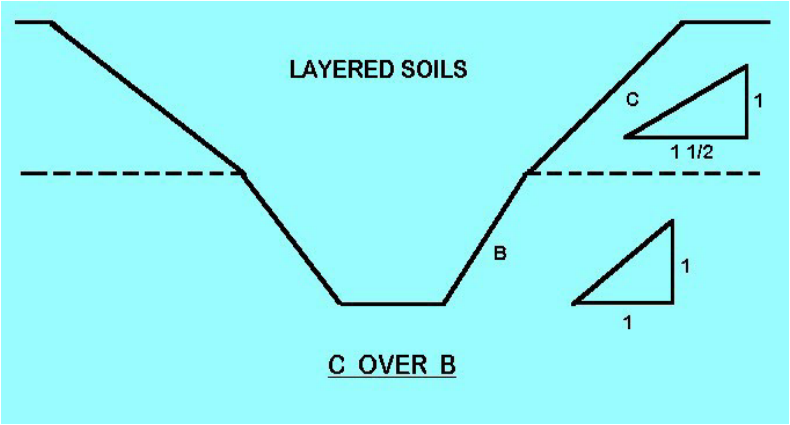
Type A - Most stable: clay, silty clay, and hardpan (resists penetration). No soil is Type A if it is fissured, is subject to vibration of any type, has previously been disturbed, or has seeping water.

Type B - Medium stability: silt, sandy loam, medium clay, and unstable dry rock; previously disturbed soils unless otherwise classified as Type C; soils that meet the requirements of Type A soil but are fissured or subject to vibration.

Type C - Least stable: gravel, loamy sand, soft clay, submerged soil or dense, heavy unstable rock, and soil from which water is freely seeping.

Layered geological strata (where soils are configured in layers) - The soil must be classified based on the soil classification of the weakest soil layer. Each layer may be classified individually if a more stable layer lies below a less stable layer, i.e., where a Type C soil rests on top of stable rock.





Testing Methods

The competent person in charge of the excavation shall be responsible for determining whether the soil is Type B or C. The competent person shall use a visual test coupled with one or more manual tests.

Visual test

In addition to checking the items on the trench inspection form, the competent person should perform a visual test to evaluate the conditions around the site. In a visual test, the entire excavation site is observed, including the soil adjacent to the site and the soil being excavated. The competent person also checks for any signs of vibration.

During the visual test, the competent person should check for crack-line openings along the failure zone that would indicate tension cracks, look for existing utilities that indicate that the soil has been previously disturbed, and observe the open side of the excavation for indications of layered geologic structuring.

The competent person should also look for signs of bulging, boiling, or sloughing, as well as for signs of surface water seeping from the sides of the excavation or from the water table.

In addition, the area adjacent to the excavation should be checked for signs of foundations or other intrusions into the failure zone, and the evaluator should check for surcharging and the spoil distance from the edge of the excavation.

Manual tests

Thumb penetration test- Attempt to press the thumb firmly into the soil in question. If the thumb penetrates no further than the length of the nail, it is probably Type B soil. If the thumb penetrates the full length of the thumb, it is Type C. It should be noted that the thumb penetration test is the least accurate testing method.

Dry strength test- Take a sample of dry soil. If it crumbles freely, or with moderate pressure into individual grains, it is considered granular (Type C). Dry soil that falls into clumps that subsequently break into smaller clumps (and the smaller clumps can only be broken with difficulty) it is probably clay in combination with gravel, sand, or silt (Type B).

Plasticity or Wet Thread Test- Take a moist sample of the soil. Mold it into a ball and then attempt to roll it into a thin thread approximately 1/8 inch in diameter by two inches in length. If the soil sample does not break when held by one end, it may be considered Type B.

A pocket penetrometer, shear vane, or torvane may also be used to determine the unconfined compression strength of soils.

Spoil

Temporary spoil shall be placed no closer than 2 feet from the surface edge of the excavation, measured from the nearest base of the spoil to the cut. This distance should not be measured from the crown of the spoil deposit. This distance requirement ensures that loose rock or soil from the temporary spoil will not fall on workers in the trench.

Spoil should be placed so that it channels rainwater and other run-off water away from the excavation. Spoil should be placed so that it cannot accidentally run, slide, or fall back into the excavation.

Permanent spoil should be placed some distance from the excavation.

Surface Crossing of Trenches

Surface crossing of trenches should not be made unless absolutely necessary. However, if necessary, they are only permitted under the following conditions:

Vehicle crossings must be designed by and installed under the supervision of a registered professional engineer.

Walkways or bridges must have a minimum clear width of 20-inches and be fitted with standard rails and extend a minimum of 24 inches past the surface edge of the trench.

Access and Egress

Trenches 4 feet or more in depth shall be provided with a fixed means of egress.

Spacing between ladders or other means of egress must be such that a worker will not have to travel more than 25 feet laterally to the nearest means of egress.

Ladders must be secured and extend a minimum of 36 inches above the landing.

Metal ladders should be used with caution, particularly when electric utilities are present.

Any structural ramps used solely for worker access or egress must be designed by a competent person.

Exposure to Vehicles

Workers exposed to vehicular traffic shall be provided with and required to wear reflective vests or other suitable garments marked with or made of reflectorized or high-visibility materials.

Trained flag persons, signs, signals, and barricades shall be used when necessary.

Exposure to Falling Loads

All workers on an excavation site must wear hard hats.

Workers are not allowed to work under raised loads.

Workers are not allowed to work under loads being lifted or moved by heavy equipment used for digging or lifting.

Workers are required to stand away from equipment that is being loaded or unloaded to avoid being struck by falling materials or spillage.

Equipment operators or truck drivers may remain in their equipment during loading and unloading if the equipment is properly equipped with a cab shield or adequate canopy.

Warning Systems for Mobile Equipment

The following steps should be taken to prevent vehicles from accidentally falling into the trench:

- Barricades must be installed where necessary when:
    - Hand or mechanical signals must be used as required
    - Stop logs must be installed if there is danger of vehicles falling into the trench

- Soil should be graded away from the excavation; this will assist in vehicle control and channeling of run-off water
- Trenches left open overnight shall be fenced and barricaded

Hazardous Atmospheres and Confined Spaces

Workers shall not be permitted to work in hazardous and/or toxic atmospheres. Such atmospheres include those with:

- less than 19.5% oxygen
- a combustible gas concentration greater than 20% of the lower flammable limit
- concentrations of hazardous substance that exceed those specified in the Threshold Limit Values for airborne contaminants established by the ACGIH

All operations involving such atmospheres must be conducted in accordance with OSHA requirements for occupational health and environmental controls for personal protective equipment and for lifesaving equipment. Engineering controls (such as ventilation) and respiratory equipment may be required.

Testing for Atmospheric Contaminants

If there is any possibility that the trench or excavation could contain a hazardous atmosphere, atmospheric testing must be conducted prior to entry. Conditions that might warrant atmospheric testing would be if the excavation was made in a landfill area or if the excavation was crossed by, was adjacent to, or contained pipelines containing a hazardous material (for example, natural gas lines).

Testing should be conducted before workers enter the trench and should be done regularly to ensure that the trench remains safe. The frequency of testing should be increased if equipment is operating in the trench.

Testing frequency should also be increased if welding, cutting, or burning is done in the trench.

Workers required to wear respiratory protection must be trained, fit-tested, and enrolled in a respiratory protection program.

Some trenches qualify as confined spaces. When this occurs, compliance with AMS's Confined Space Program is also required.

Standing Water and Water Accumulation

Methods for controlling standing water and water accumulation must be provided and should consist of the following if workers must work in the excavation:

- Use of special support or shield systems approved by a registered professional engineer
- Water removal equipment, such as well pointing, used, and monitored by a competent person
- Safety harnesses and lifelines used in conformance with 29 CFR 1926.104
- Workers removed from the trench during rainstorms
- Trenches carefully inspected by a competent person after each rain and before workers are permitted to re-enter the trench

Benching, Sloping, Shoring, and Shielding Requirements

All excavations or trenches 4 feet or greater in depth shall be appropriately benched, shored, or sloped according to the procedures and requirements set forth in OSHA's Excavation standard, 29 CFR 1926.650, .651, and .652.

Excavations or trenches 20 feet deep or greater must have a protective system designed by a registered professional engineer.

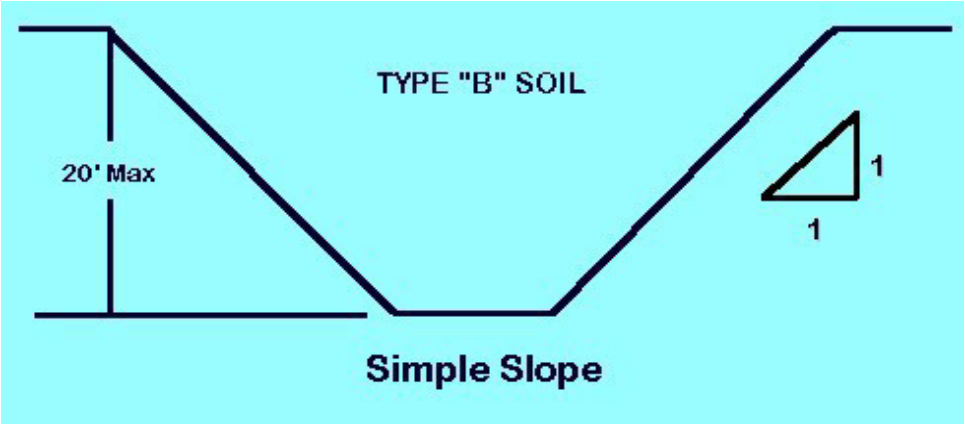
Excavations under the base of footing of a foundation or wall require a support system designed by a registered professional engineer.

Sidewalks and pavement shall not be undermined unless a support system or another method of protection is provided to protect workers from their possible collapse.

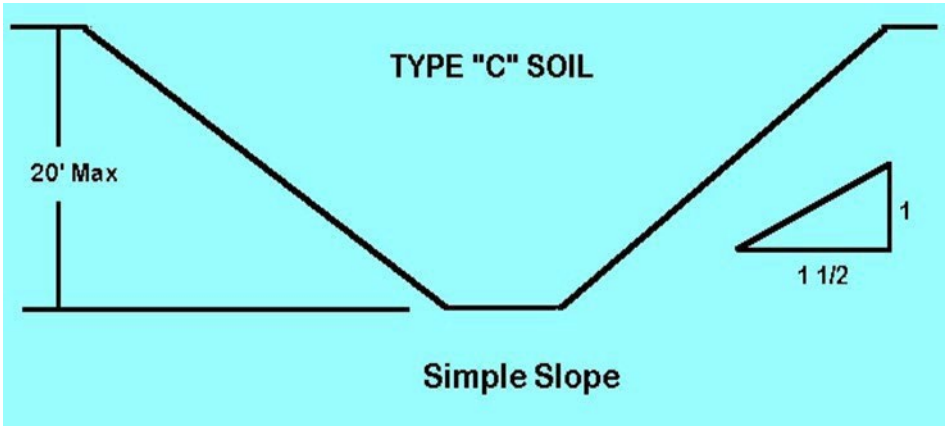
Sloping

Maximum allowable slopes for excavations less than 20' based on soil type and angle to the horizontal are as follows:

Soil Type	Height/depth ratio	Slope angle
Type B	1:1	45 degrees
Type C	1 1/2:1	34 degrees



A 10-foot-deep trench in Type B soil would have to be sloped to a 45-degree angle or sloped 10 feet back in both directions. Total distance across a 10-foot-deep trench would be 20 feet, plus the width of the bottom of the trench itself. In Type C soil, the trench would be sloped at a 34-degree angle, or 15 feet back in both directions for at least 30 feet across, plus the width of the bottom of the trench itself. All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1 1/2:1.



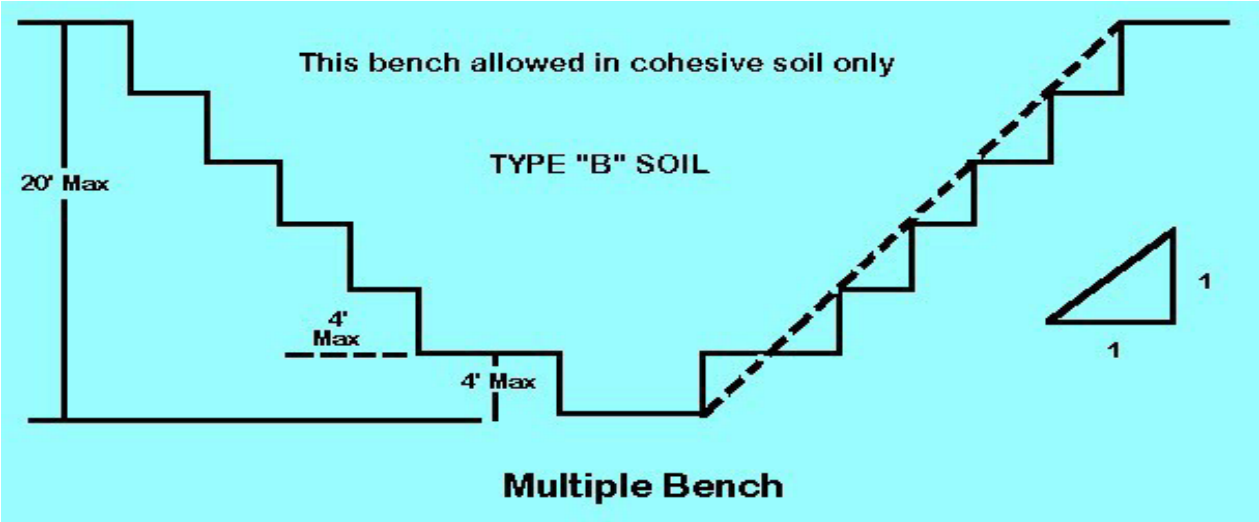
Benching

There are two basic types of benching, single and multiple, which can be used in conjunction with

sloping. All benched excavations 20 feet or less in depth shall have a maximum allowable slope of

1:1.

In Type B soil, the vertical height of the benches must not exceed 4 feet. Benches must be below the maximum allowable slope for that soil type. In other words, a 10-foot-deep trench in Type B soil must be benched back 10 feet in each direction, with a maximum of a 45-degree angle.



Benching is not allowed in Type C soil.

Shoring

Shoring or shielding is used when the location or depth of the cut makes sloping back to the maximum allowable slope impractical. There are two basic types of shoring, timber, and aluminum hydraulic.

Hydraulic shoring provides a critical safety advantage over timber shoring because workers do not have to enter the trench to install them. They are also light enough to be installed by one worker; they are gauge-regulated to ensure even distribution of pressure along the trench line; and they can be adapted easily to various trench depths and widths. However, if timber shoring is used, it must meet the requirements of 29 CFR 1926.650, .651, and .652.

All shoring shall be installed from the top down and removed from the bottom up. Hydraulic shoring shall be checked at least once per shift for leaking hoses and/or cylinders, broken connections, cracked nipples, bent bases, and any other damaged or defective parts.

The top cylinder of hydraulic shoring shall be no more than 18 inches below the top of the excavation.

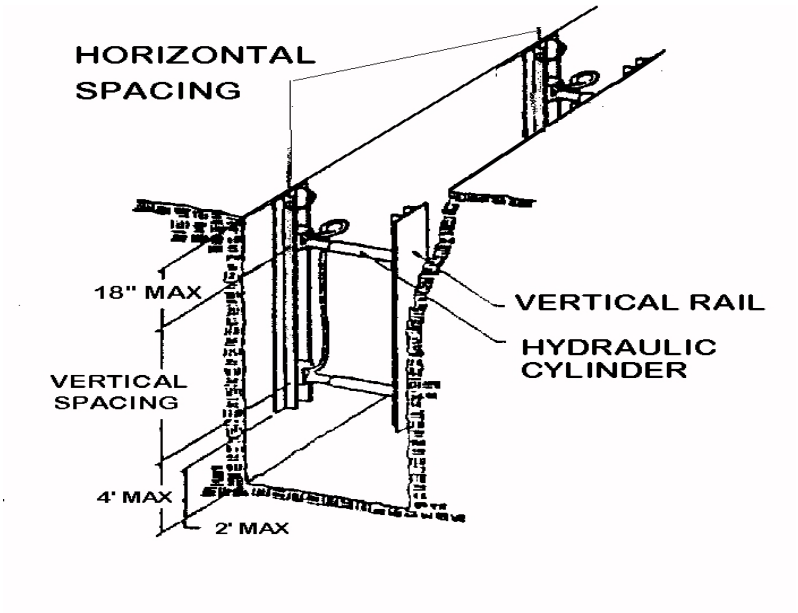
The bottom of the cylinder shall be no higher than four feet from the bottom of the excavation. (Two feet of trench wall may be exposed beneath the bottom of the rail or plywood sheeting, if used.)

Three vertical shores, evenly spaced, must be used to form a system.

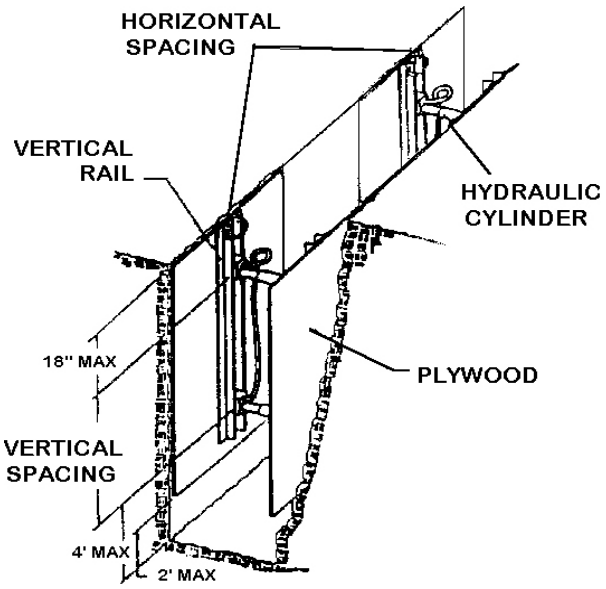
Wales are installed no more than two feet from the top, no more than four feet from the bottom, and no more than four feet apart, vertically.

Typical installations of aluminum hydraulic shoring:

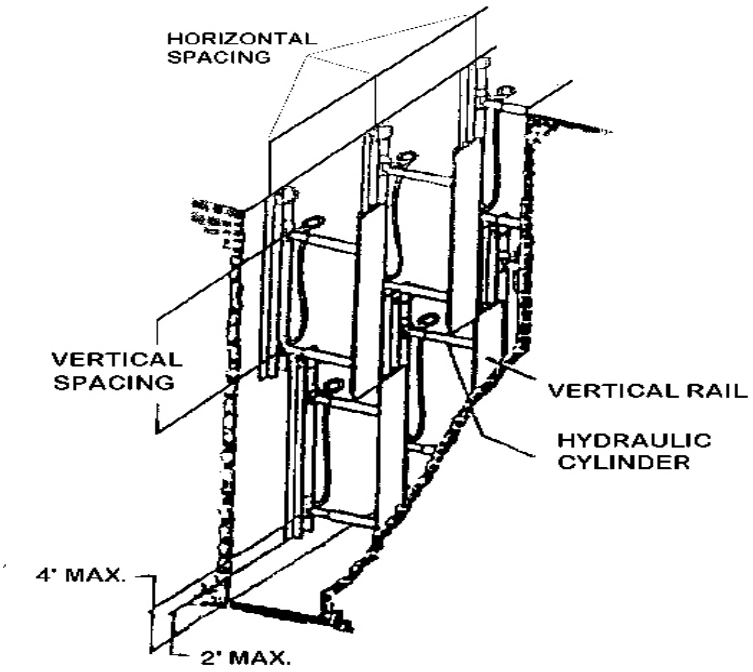
- **Vertical aluminum hydraulic shoring (spot bracing)**



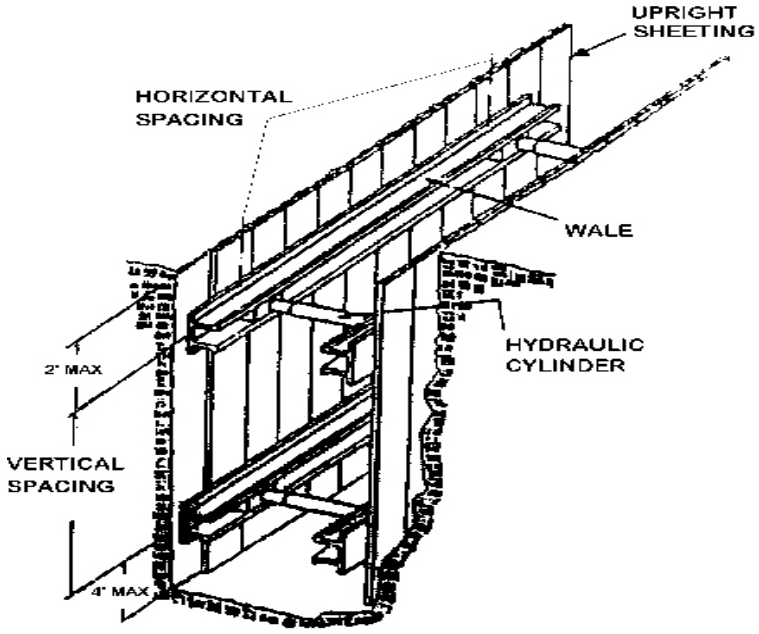
- **Vertical aluminum hydraulic shoring (with plywood)**



- **Vertical aluminum hydraulic shoring (stacked)**



- **Aluminum hydraulic shoring waler system (typical)**



Shielding

Trench boxes are different from shoring because, instead of shoring up or otherwise supporting the trench face, they are intended primarily to protect workers from cave-ins and similar incidents.

The excavated area between the outside of the trench box and the face of the trench should be as small as possible. The space between the trench box and the excavation side must be backfilled to prevent lateral movement of the box. Shields may not be subjected to loads exceeding those which the system was designed to withstand.

Trench boxes are generally used in open areas, but they also may be used in combination with sloping and benching.

The box must extend at least 18 inches above the surrounding area if there is sloping toward the excavation. This can be accomplished by providing a benched area adjacent to the box.

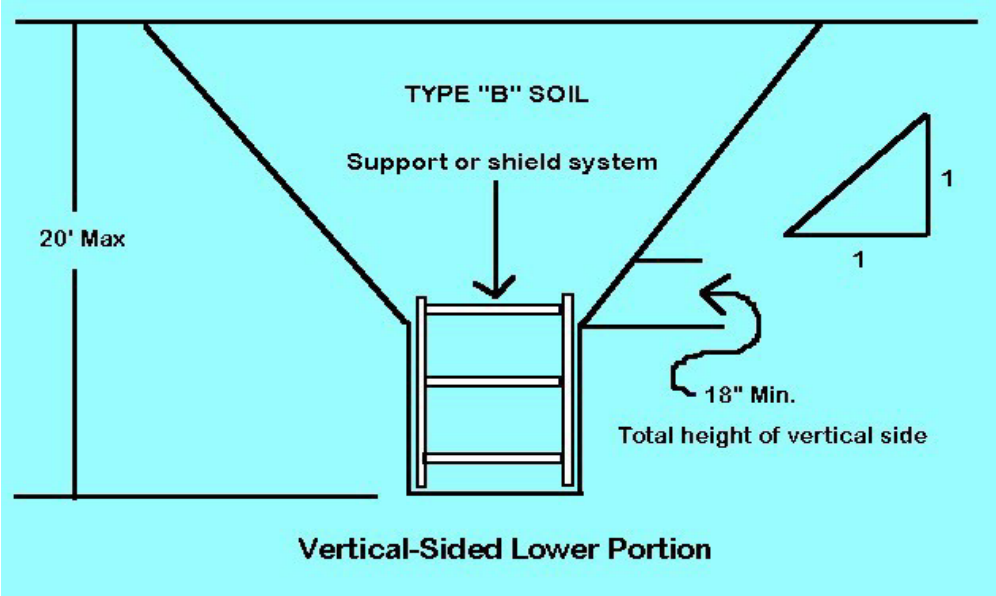
Any modifications to the shields must be approved by the manufacturer.

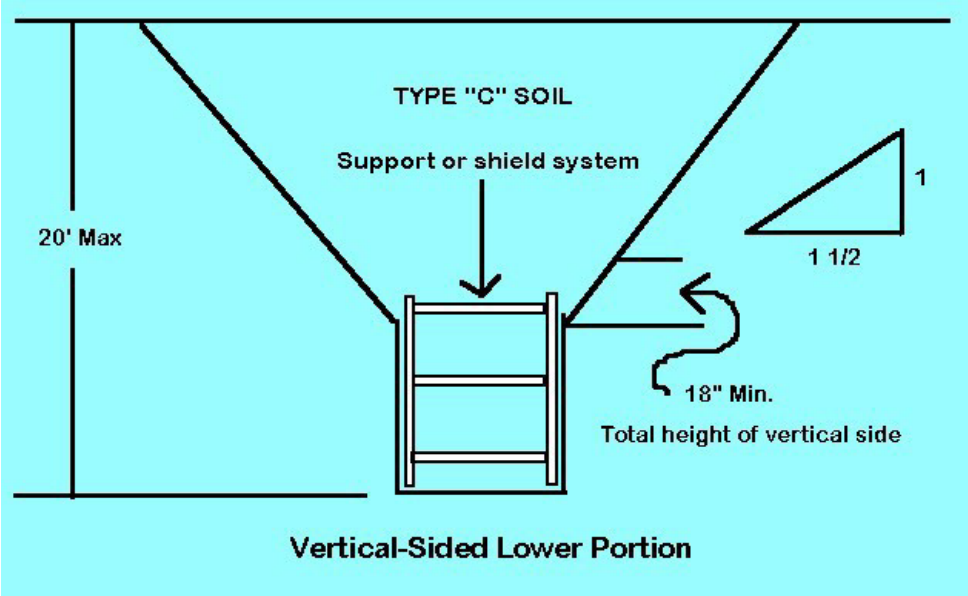
Shields may ride two feet above the bottom of an excavation, provided they are calculated to support the full depth of the excavation and there is no caving under or behind the shield.

Workers must enter and leave the shield in a protected manner, such as by a ladder or

ramp. Workers may not remain in the shield while it is being moved.

Illustration of shielding systems in B and C type soils.





DAILY EXCAVATION CHECKLIST

Client		Date	
Project Name		**Approximate Temp.**	
Project Location		**Approximate Wind Direction**	
Job Number		**Safety Rep**	
Excavation Depth and Width		**Soil Classification**	
Protective System Used			
Activities in Excavation			
Competent Person			

Excavation > 4 feet deep? ___Yes ___No.

If YES, fill out a Confined Space Permit PRIOR to ANY person entering the excavation.

NOTE: Trenches over 4 feet in depth are considered excavations. Any items marked NO on this form MUST be remediated prior to any workers entering the excavation.

YES	NO	N/A	DESCRIPTION
			GENERAL
			Workers protected from cave-ins & loose rock/soil that could roll into the excavation
			Spoils, materials & equipment set back at least 2 feet from the edge of the excavation
			Engineering designs for sheeting &/or manufacturer's data on trench box capabilities on site
			Adequate signs posted and barricades provided
			Training (toolbox meeting) conducted w/ workers prior to entering excavation

YES	NO	N/A	UTILITIES
			Utility company contacted & given 24 hr. notice &/or utilities already located & marked
			Overhead lines located, noted, and reviewed with the operator

			Utility locations reviewed with the operator, & precautions taken to ensure contact does not occur
			Utilities crossing the excavation supported, and protected from falling materials
			Underground installations protected, supported, or removed when excavation is open
			WET CONDITIONS
			Air in the excavation tested for oxygen deficiency, combustibles, other contaminants
			Ventilation used in atmospheres that are oxygen rich/deficient &/or contains hazardous substances
			Ventilation provided to keep LEL below 10 %
			Emergency equipment available where hazardous atmospheres could or do exist
			Safety harness and lifeline used
			Supplied air necessary (if yes, contact safety department)
			ENTRY & EXIT
			Exit (i.e., ladder, sloped wall) no further than 25 feet from ANY worker
			Ladders secured and extended 3 feet above the edge of the trench
			Wood ramps constructed of uniform material thickness, cleated together @ the Bottom
			Workers protected from cave-ins when entering or exiting the excavation

KEEP 1 COPY OF EACH DAILY EXCAVATION CHECKLIST ON SITE FOR THE PROJECT DURATION, AND FORWARD THE ORIGINAL TO THE SAFETY MANAGER

SOIL ANALYSIS CHECKLIST

Client		Date	
Project Name		Job #	
Project Location		Weather	
Competent Person			
Where was the sample taken from			
Excavation length, depth, and width	L:	D:	W:

VISUAL TEST					
Particle type	Fine Grained (Cohesive)		Granular (sand/silt or gravel)	Other:	
Water Conditions	Wet	Dry	Seeping Water	Surface Water present	Submerged
Notes					

Yes	No	N/A	Description
			Layered Soils Dipping Into excavation? If yes, describe:
			Excavation exposed to vibrations. If yes, describe:
			Previously disturbed soils?
			Crack like openings or sprawling observed?
			Underground utilities? If yes, what type:
			Layered soils? (Note: the least stable layer controls the soil type)

MANUAL TEST					
Plasticity	Cohesive	Non-cohesive	Dry Strength	Cohesive (broken w/ difficulty)	Granular
Wet Shake	Water comes to surface (granular material)			Surface remains dry (clay material)	

THUMB TEST Note: Used to estimate unconfined compression strength of cohesive soil.			
Test Performed	Yes	No	N/A, Explain:

Soil indented by thumb with very great effort?	Type A
Soil indent by thumb with some effort?	Type B
Soil easily penetrated several inches by thumb with little or no effort. NOTE: If soil is submerged, seeping water, subjected to surface water, runoff, exposed to wetting.	Type C

PENETROMETER or SHEARVANE TEST Note: Used to estimate unconfined compressive strength of cohesive soils.				
Test Performed	Yes	No	Device Used / Serial Number:	
Soil with unconfined compressive strength of 1.5 tsf of greater				Type A
Soil with unconfined compressive strength of greater than 0.5 tsf and less than 1.5 tsf.				Type B
Soil with unconfined compressive strength of 0.5 tsf or less. Note: if the soil is submerged, seeping water, subjected to surface water, runoff, exposed to wetting.				Type C

No soil is Type A if fissured, subject to vibration, previously disturbed, layered dipping into excavation on a slope of 4h: 1v

SOIL CLASSIFICATION			
Stable Rock	Type A	Type B	Type C
SELECTION OF PROTECTIVE SYSTEM (Refer to Appendix F of 29CFR1926)			
Sloping (Appendix B) Specify angle:	Timber Shoring (Appendix C)	Trench Shield Max depth in this soil:	Hydraulic Shoring (Appendix D)

Keep one copy of each Soil Analysis Checklist on site for project duration – Forward original to the Safety Director at the Main Office

WORK ZONE SAFETY

POLICY

This policy is to provide guidance and instruction to prevent incidents and injuries resulting from highway/roadway construction for all workers for ALLEN MECHANICAL SERVICES-AMS; hereafter referred to as “AMS” work sites.

SCOPE

Applies to all AMS work sites, i.e., AMS offices, client job sites, etc., that have occasion to use subcontractors.

PROCEDURES

Overview

The number of persons killed in the United States in motor vehicle crashes in work zones continue to rise. There are now more than 1,000 deaths annually. In addition, more than 40,000 people are injured each year because of vehicle crashes in a work zone. It is for this reason that we have established this Traffic Control and Work Zone Safety Program. At times the nature of our operations does not require freeway lane closures, we often find that unloading material, installing conduit in excavation, overhead lighting installation and other work activities cause workers to be adjacent to or in actual vehicular traffic. Further, our work may also expose pedestrians or bicycle traffic to hazard, and this program will address that issue as well. Obviously, we are concerned that our materials, tools, equipment, etc. could cause damage to vehicles or cause injury to the public when our work encroaches into accessible areas. But we are most concerned about the health and safety of our workers who may work in these hazardous conditions.

Program Objectives

- Our first and most important objective is to ensure a high level of safety for our workers, other workers, and the public.
- Our second objective is to minimize adverse traffic impacts associated with construction in terms of delays and congestion, noise, and other environmental impacts, to ensure a high level of satisfaction by our ultimate customer – the public.
- Our third objective is the identification of specific risk factors associated with individual projects that present traffic hazard conditions and the development of countermeasures to mitigate those hazards to minimize the risk.

Program Goals

- No workers or others will be seriously injured because of traffic accidents in our work zones, regardless of the cause of the accident.

- No members of the public traveling through our work sites will be injured because of traffic accidents caused by or made more serious by our work or traffic control operations.
- Traffic delays and congestion associated with our work activities will be held to the minimum level that can be achieved, consistent with the traffic volumes through the project, the characteristics of the roadway where the work occurs, and the nature of the work operations that must be completed.
- Interference with businesses and other activities adjacent to the project will be held to a Minimum, consistent with traffic volumes, roadway characteristics and work operations.
- Traffic controls will be carried out in a manner that ensures that emergency services in and through the project can be delivered in a timely manner, and transit operations will not be disrupted.
- Traffic controls will be conducted in a manner that provides us with adequate access to the work area to complete the planned work on schedule, in compliance with quality requirements of the contract. Efficient delivery of materials and equipment to work sites will be available.
- All traffic control operations will be in full compliance with the terms and requirements of the construction contract and/or in keeping with current States and Federal traffic control standards. Full understanding of the Manual on Uniform Traffic Control Devices (MUTCD) may be necessary to fulfill these requirements. Temporary Traffic Control Part 6 refers to the traffic control procedures and methods to be followed, and additional state addendums may apply.
- All traffic control devices, safety features, and work zone operations shall be always maintained in good condition, with full documentation of all work zones operations recorded according to the requirements of this Work Zone Program.

Regulatory and Contractual Requirements

- Each project will have a particular traffic control demands and needs. AMS will determine potential hazards related to work in and around the traffic control zone prior to the start of work. Delivery of materials in public roadway locations or adjacent to roadway locations or adjacent to roadways will be determined and scheduling and planning will be accomplished to minimize hazard.
- Any foreman, supervisor or delegate with direct work zone responsibilities will have access to the Federal MUTCD and appropriate State supplementary requirements before the start of the project.
- Typically, the General Contractor (GC) is responsible for traffic control on the construction site and coordination with the temporary traffic control plan of the GC is necessary. Additional traffic control planning may be required as determined by the scope of work.
- OSHA regulations indicate that signs, barricades, and flagger signaling activities comply with the MUTCD regulations. Violations of the MUTCD requirements in these areas could be fully citable by OSHA.

- Vehicle and traffic laws of the particular state and municipality must be followed, and permits may be required for lane or sidewalk restriction or closures. All such issues should be addressed in pre-planning meetings and in conjunction with the GC.
- Department of Transportation regulations in each State may require additional measures taken and this must be coordinated at time of job start up.

Worker Visibility

- A critical element of work zone safety is high visibility of workers when adjacent to traffic.
- All workers must wear high visibility apparel when in or adjacent to traffic. Class 1, 2 or 3 garments will be used based upon specific exposure needs.
- Working during dawn or dusk conditions will require use of fluorescent colored high visibility apparel (class 2 or 3 based upon exposure).
- Yellow green apparel should be considered when a significant number of orange- colored signs, drums or vehicles are in the work zone.
- Workers will be issued appropriate high visibility vests based upon exposure. This clothing must be kept in good condition and laundered periodically to assure adequate visibility. Clothing/vests should be replaced as needed to assure color discrimination by motorist.

Worker Traffic Zone Training

- All workers exposed to traffic will be trained in how to work safely near traffic.
- Any temporary traffic control measures implemented will only be complete by workers who have been fully trained and are cognizant of MUTCD requirements.
- Any specific work procedures will be established by the Supervisor, General Foreman, or delegate when work activities present traffic hazards.
- Traffic control plans will be clearly communicated to all affected personnel.
- When personnel are responsible for traffic control device maintenance, those workers will be fully trained.

Area Planning

- Routes for work activity and traffic must be clearly established and marked properly. A control plan will be established to assure all parties are aware of encroachment and closures.
- Safe access and egress of workers and vehicles will be determined.
- Backing of vehicles should involve back up alarms and spotters whenever pedestrians or workers may be present.
- Overhead and underground utilities should be located and marked to prevent contact by equipment and workers.

Traffic Speed Control

- Compliance with posted speed limits is vital to protect workers and the traveling public. Reduction of initial posted speed limits may be required based upon job demands and work tasks.
- Appropriate speed limits should be established and application for reductions should be coordinated with the GC or whoever is responsible for the traffic control plan.
- Assure that the determined regulatory speed is properly and clearly posted immediately preceding the work zone.
- Flaggers may be needed to monitor and slow traffic as necessary.
- Local law enforcement may be needed to enforce speed limits. Coordinate with the GC to determine if law enforcement presence will be needed at the site.

Separation of Traffic and Work Activities

- Effective separation of traffic from work activity is one of the most critical aspects of work zone safety.
- Use of temporary traffic barriers, shadow vehicles or other devices must be determined and implemented according to traffic control plan.
- Factors to consider when determining what separation is needed are as follows:

    - Traffic speed
    - Traffic volume
    - Distance between workers and vehicles
    - Duration of work
    - Type of work operations
    - Physical hazards within the work zone
    - Alignment of traffic lanes through the work zone

- Coordination with GC is critical to determine work areas that require separation. Other contractors work activity may come into play when determining the work zone.
- Adequate lateral buffer space should be provided to the greatest extent possible by shifting traffic slightly away from work operation as much as available space permits.
- Where workers must work very close to traffic, a trained flagger or spotter should be used to protect workers from oncoming traffic.
- For short duration work activity like pothole patching, taking measurements, marking, etc. the operation should be planned using a flagger or at least a spotter to make sure workers are not exposed to traffic in open lanes without protection.
- Workers must not cross high speed travel lanes on foot unless the foremen, supervisor or delegate analyzes the situation and develops procedures to accommodate movement safely.
- Warning sign should be posted at locations where work vehicles regularly enter and exit traffic.

Technical Requirements for Work Zone Temporary Traffic Control

- Basic requirements are detailed in the MUTCD. This manual should be consulted when setting up a control plan.
- Flagging requirements, if applicable, mandate worker training and this should be established upon job start up.
- All manuals of traffic control will be retained on the job for ongoing review.
- Copies of any established traffic control plans will be maintained and reviewed with effected workers.
- Required signs will be determined and an adequate supply ordered to come onto the job site in advance of traffic control needs. Reasonable damage should be considered, and additional quantities should be available.
- All necessary sign supports will be ordered in quantity to allow for damage and vandalism.
- Channelizing devices (cones, drums, and barricades) must be ordered as required. Specification of 28" and 36" cones should be established to make certain that required cones are used based upon speed requirements. Type III barricades when required should be in adequate quantity to assure safe and complete closures. Channelizing devices must meet MUTCD and OSHA requirements
- Warning lights and batteries will be maintained on site when night closure or overnight securing is needed.
- Portable concrete barrier will be used when required by GC or long-term protection of workers in the work zone is needed. Appropriate warning and signage will be required.
- All barriers must be in good condition to present displacement when impacted.
- Vehicles will be installed with warning beacons, flashers and markings as required in accordance with MUTC requirements.
- Reflective markings and beacons must be kept in good condition and cleaned often to assure maximum visibility.

Work Zone Layout

- Many situations follow "typical"" MUTCD requirements and details should be followed specifically. The type of Temporary Traffic Control Guide layout should be clearly identified in the traffic control plan and appropriate page, or diagram reference should be made to MUTCD.
- Contract specifications or permit documents will typically include drawings or diagrams showing setups to be used for lane closures, flagger stations, shoulder closures and other typical set ups. This specification must be followed and referenced in foreman daily logs.
- Significant deviations from contract or permit layouts should be reviewed with GC and signed off before implementation.
- Almost all layouts will require some minor modifications based upon actual site conditions. The foreman, supervisor or delegate in charge will make the minor adjustments required, but it is expected that changes err on the side of additional warnings and be in the best judgment of the foreman, supervisor, or delegate. Any changes should be documented on the daily log. These adjustments would include:

- Minor shifts in sign location (10 percent or less) to avoid driveways, intersections, other devices and to improve visibility.
- Minor shifts in start point and length of tapers (10 percent on length, 100 ft on start point to avoid intersections and other conflicts and to improve sight distance.
- Add supplemental signs on the left side of the road to improve visibility.
- Reduce spacing of channelizing devices at potential problem areas
- Other minor changes to address obvious concerns.

- Any non-typical situation should be reviewed with a traffic control qualified person or engineer, and the layout document should be reviewed with a traffic control qualified person or engineer, and the layout document should be fully documented. Written plan should be maintained on the site for ongoing crew review for adherence to requirements.
- Additional conditions may require further devices, including “pavement ends” or “bump” signs. These should be provided and documented in the plan.

Installing and Removing Traffic Control Set Ups

- Periods during placement and removal of traffic control devices often present the highest risk of accident for workers and public because devices are not completely in place and workers and equipment are most exposed to traffic.
- Proper planning and careful execution of set ups and removals is needed, adhering to established procedures for protection of workers.
- Common sense and use of spotter or other means of identifying potential hazards are needed at all times when placement and removal.
- The following steps are required when setup/removal operations:

    - All fixed signs must be placed first, with covers attached so signs can be covered and uncovered quickly at the appropriate time. Covers will be placed at the end of the operation.
    - Portable signs will be deployed in the necessary location along the route.
    - Channelizing devices will be set into place in the proper pattern. Note the number of cones and angles of tapers and follow plan.
    - If setting devices on foot, make certain that a shadow vehicle is in place or worker carefully observes oncoming traffic.
    - Workers must not cross open lanes of high-speed traffic to place devices.
    - Arrow boards will be place in the proper sequence as cones are placed. Normally, these are towed into place and should be activated when other devices are set.

- Set up operations normally should start at the approach end and proceed downstream in the direction of traffic flow unless conditions determined by the foreman, supervisor or delegate dictate other measures and safer.
- Removal will normally proceed in the opposite direction of set up.
- The foreman, supervisor or delegate will be responsible for driving through all set ups after completion to make sure it meets all requirements.
- The foreman, supervisor or delegate is also responsible for driving through removal to assure all equipment has been removed or properly secured.

- Worker safety is paramount during set up and removal operations. The following safety rules will be followed:

  - Workers are not allowed to place cones or other devices from the bed of moving pickup trucks.
  - Workers must not ride in the bed of a pickup truck during set up or any other time.
  - Workers must not place cones or other devices or otherwise work behind a backing work vehicle.
  - If a work vehicle needs to be backing, all workers must be in front of the vehicle and in sight of the driver.
  - Violations of these rules will be grounds for disciplinary action, including suspension without pay.

Lighting

- Temporary lighting should be used in night work zones or when work is at dawn or dusk.
- Lighting should allow motorists/pedestrians to clearly see work area and potential hazard so they can safely travel through the work area. But make certain that lighting does not "blind" motorists traveling in proximity to the work area.
- Illumination should allow workers to see their work activity more clearly.
- Lighting should be directed so motorists can clearly identify locations of workers in the work zone.
- Overnight procedures to secure work area and protect hazards must be developed and may require auxiliary flashers or lighting that must be activated upon departing the work area.

Overnight Procedures

- Work locations may require multiple days of activity and may necessitate the securing of the site overnight. The foreman, supervisor or delegate will be responsible for making sure that an adequate overnight plan has been established.
- GC will be consulted if overnight procedures require special equipment, closures, or other contractor involvement.

- The foreman, supervisor or delegate must determine the proper number of signs and channelizing devices that are needed to alert drivers and pedestrians of the hazards and any changes in the roadway or walkway.
- All such devices should be reflectorized to ensure good visibility at night. Lighting may be required based upon the hazard and risk.
- All equipment and supplies should be parked and stored in a safe location where they are not accessible to vehicles or pedestrians.
- Equipment, vehicles, and materials should be secured to prevent theft and vandalism.
- Adequate pathways must be established as needed to allow passage to retail or commercial establishments as needed. Hazards should be delineated with cones, barricades, caution tape, snow fence, etc.
- The foreman, supervisor or delegate is required to conduct a job check to verify that hazards and exposures have been minimized.
- All caution tape, delineators, cones, barricades, and signs should be checked immediately prior to closing down the job for the day and inspection noted in the daily log by the foreman, supervisor, or delegate. Corrective action should be completed before departing the job.

Flagger Usage and Training

- Flaggers are in place to protect themselves, the crew, motorists, and pedestrians traveling through the work zone, and equipment. This is a critical job and one that must be taken seriously.
- Flaggers must be mentally alert, in good physical condition, be courteous but authoritative.
- All workers who flag must receive adequate training. Each State has different requirements. Most require some type of training, and many require actual certification. It is the policy that no matter what the State requirements, all workers will be properly trained before flagging.
- Training and instructions will cover at a minimum the following:

    - Flagger equipment that must be used
    - Layout of the work zone and flagging station
    - Methods to signal traffic to stop, proceed or slow down
    - Methods of one-way control
    - Actual demonstration of proper flagging methodology and operations
    - Emergency vehicles traveling through the work zone
    - Handling emergency situations
    - Methods of dealing with hostile drivers
    - Flagging procedures when a single flagger is used

- Written documentation of flagger training will be maintained with other safety training records.
- Flaggers are to be used at locations on a construction site where barricades and warning signs cannot control the moving traffic.

- Flaggers must wear proper orange, strong yellow-green or yellow warning garments, Class 2 for daytime and Class 3 for nighttime flagging, although the regulations only require Class 2 for nighttime.
- Proper STOP/SLOW paddles will be used following MUTCD requirements, including reflectorized material when used at night. 18" paddles are the minimum size allowed. 24" paddles should be used for speeds of 45 mph or greater. A flag may be used in emergencies but must be good grade red material at least 24" square and secured to a staff approximately 36" long.
- Extension staff may be used for paddles for extended periods of flagging. Long staff should be 66" long and accommodate insertion of the 12" staff paddle.
- Proper and consistent hand and paddle/flag signals must be used as specified in the MUTCD. Flaggers will be tested on appropriate signals and foremen will monitor to assure proper signals are given. Failure to provide proper signals is given. Failure to provide proper signals could expose additional liability in the event of an accident.
- Flagger stations or positions must be located so that approaching road users have sufficient distance to react and stop at an intended stopping point. Refer to the Stopping Distance Table in the MUTCD.
- Flagger stations must be illuminated if used at night or reduced light conditions.
- Advance warning signs, including "flagger" warning signs must be properly positioned for worker safety.
- Flaggers should stand either in the shoulder adjacent to the road being controlled or in a closed lane prior to stopping road users. The flagger should only stand or move into the lane being used by moving traffic after the traffic has stopped.
- The flagger should stay in line of sight of first road user to assure visibility.
- For operations requiring more than one flagger, portable radios will be used unless flaggers are close enough to permit voice or hand signals. Hand signals will be verified and agreed at time of initial operation.
- Flaggers should maintain a steady flow of traffic as much as possible and minimize unnecessary stops. Work vehicles should be held until a safe gap is available whenever possible.
- Flaggers will be relieved at least every 2 hours for a 15-minute break to assure they remain alert. No worker will be allowed to flag in excess of 10 hours in any day.
- Drinking water and restroom facilities will be available for flaggers.

Additional Safety Measures

- Safe access points will be located so workers can get into workspaces without excessive exposure to traffic.
- If safe parking areas are not available, workers will park at a central location and use work vehicles to reach the work site.
- Restroom facilities break areas and other facilities will be located to minimize worker exposure to traffic.

- Entry and exit points for work vehicles and haul trucks will be planned in advance to reduce traffic conflicts and enhance worker safety.
- Vehicles and equipment with restricted visibility to the rear may not back up in any location where workers or pedestrians are in the area unless suing a spotter.
- Blind backing (no spotter) will be done only when the driver has determined that the area is free of workers or other vehicles/equipment by physically exiting the vehicle and checking to the rear.
- Drivers, when departing their vehicles, must be properly attired, including hard hat and appropriate visibility clothing (safety vest).
- In cold weather, foreman, supervisor, or delegate will assure adequate larger sized vests are available for fit over bulky outer clothing.
- Workers and foremen, supervisor or delegate should never become involved in any altercation with drivers. Simply record the plate number and description of the vehicle and driver so local law enforcement can be notified.
- Any worker who witnesses a work zone accident must report it immediately to their foreman, supervisor, or delegate. This would include incidents involving vehicles, bicyclists, pedestrians, etc.

PURPOSE

It is ALLEN MECHANICAL SERVICES-AMS's, hereafter referred to as "AMS", purpose in issuing these procedures to further ensure a safe workplace based on the following formal, written procedures for scaffold work. These procedures should be reviewed and updated as needed to comply with new safety regulations, best industry practices, and business demands.

Application

This general scaffold plan applies to:

- All AMS workers who perform work while on a scaffold.
- All AMS workers who are involved in erecting, disassembling, moving, operating, repairing, maintaining, or inspecting scaffolds.

General Procedures Capacity

- Each scaffold and scaffold component will support, without failure, its own weight and at least four times the maximum intended load applied or transmitted to it.
- When using non-adjustable suspension scaffolds, each suspension rope, including connecting hardware, will support, without failure, at least six times the maximum intended load applied or transmitted to that rope.
- Direct connections to roofs and floors, and counterweights used to balance adjustable suspension scaffolds, shall be capable of resisting at least 4 times the tipping moment imposed by the scaffold operating at the rated load of the hoist, or 1.5 (minimum) times the tipping moment imposed by the scaffold operating at the stall load of the hoist, whichever is greater.
- Each suspension rope, including connecting hardware, used on non-adjustable suspension scaffolds shall be capable of supporting, without failure, at least 6 times the maximum intended load applied or transmitted to that rope.
- The stall load of any scaffold hoist shall not exceed 3 times its rated load.

Scaffolds shall be designed by a qualified person and shall be constructed and loaded in accordance with that design.

Platform Construction Platform – Decks

- Use wooden and metal decks according to job requirements, standards, regulations, and manufacturer's instructions.
- Only cleat planks at the ends to prevent lengthwise movement. Wiring down planks can also prevent movement, provided wire does not create a tripping hazard. Where planks overlap, rest the cleated end on the support. Do not use cleats elsewhere on the plank to prevent splitting.

- Ensure that adjoining planks are of uniform thickness for an even platform.
- Lay planks side by side across the full width of the scaffold.
- Check scaffold planks for large knots, worm holes, steeply sloping grain at the edges, spike knots, and splits. Splits wider than 10 mm (3/8 in), lengthwise closer than 75 mm (3 in.) to the edge of the plank, or lengthwise longer than ½ the length of the plank is not acceptable. Discard immediately any planks showing these or other defects.
- Check hooks and hardware of prefabricated platform units regularly for looseness, distortion, and cracks. Damage can occur if the platforms are dropped or thrown.
- Clean ice, snow, oil, and grease off planks. Platform decks should be slip-resistant and should not accumulate water.
- Inspect planks on a regular basis while on the scaffold. Weather, rot, and general use can deteriorate the planks.
- Do not jump on the planks to test their strength. Jumping can cause undetectable damage.
- Ensure that all working platforms are about 500 mm (20 in.) minimum in width.
- Use a minimum of 50 mm (2 in.) x 250 mm (10 in.) Number 1 Grade spruce-pine-fir (SPF) planking or better.
- Overlap or extend planking 150 mm (6 in.) to 300 mm (12 in.) and cleat at each end to prevent planking from slipping and blowing off.
- Support planks at intervals not exceeding 3m (10 ft) for light work and 2.1 m (7 ft.) for heavy work (bricklaying, masonry).
- Check with officials in your local jurisdiction as recommendations may vary.
- Stack planks on a firm level surface to prevent warping.
- Band the ends of the boards. Do not paint as the paint can conceal defects.
- Do not use scaffold planks as a base to stack materials, or as ramps or temporary roadways.

Supported Scaffolds

- Refer to safety regulations and standards for design and assembly requirements.
- Choose the right scaffold system for the job.
- Erect all scaffold parts according to the manufacturer's instructions.
- Select scaffold according to:

    - height required
    - type and duration of work
    - range of weather conditions
    - weight of workers, materials, and equipment location
    - requirements for pedestrian traffic

- Erect scaffold on a base that will support all the loads that will be applied including materials and equipment.
- Make sure the backfill is compact and level. Replace mud and soft soil with gravel or crushed stone.
- Provide adequate sills for scaffold posts and use base plates.
- Set scaffold feet centrally on mudsills consisting of 50x250 mm (2x10 in.) planks. Sills should extend at least 610 mm (2 ft.) beyond the scaffold base and be long enough to

extend under at least two scaffold feet.

- Install scaffold with jackscrews (adjusting screws). They allow for minor adjustments to help keep scaffold plumb and level.
- Take extra precautions when erecting scaffold on frozen ground. Thawing soil can become water- soaked and lose its ability to bear weight.
- Brace both sides of every frame for the vertical plane. Install horizontal bracing at the joint of every third tier of frames. This bracing is often attached to the point where the scaffold is tied to the structure.
- Do not force braces to fit. Level the scaffold until a proper fit can be made easily.
- Use coupling devices to join frames to prevent the joints from pulling apart.
- Do not use nails or other devices in the place of proper retention parts as recommended by the manufacturer.
- Tie or brace the scaffold to a solid structure as appropriate.
- Use a debris net, catch platform or similar structure where appropriate to catch falling objects.
- Do not allow the ratio of scaffold height to base width to exceed 3 to 1 unless the scaffold is:

    - tied into a structure
    - stabilized by guy wires
    - secured by outriggers or stabilizers to maintain the ratio

Suspension Scaffolds

- Ensure that the platform is installed and maintained according to job requirements, safety regulations, standards, and the manufacturer's specifications.
- Inspect all equipment before erecting and before each shift.
- Use a separate safety harness attached to an independent lifeline for each worker.
- Maintain lanyard attachment at highest point possible.
- Ensure that suspended platform roof beams and attachments are secure.
- Ensure that the roof or parapet wall is structurally sound to support either outriggers or cornice hooks.
- Check for kinked or damaged ropes.
- Secure all ropes at anchor ends.
- Ensure that all safety equipment, stops, override switches and brakes function properly.
- Prevent contact between welding or grinding equipment and wire safety or suspension ropes.
- Secure hand tools to the platform.
- Ensure that the power source is secured and properly grounded.
- Secure platform when not in use.
- Ensure that guardrails and toe boards are in place.
- Extend suspension ropes completely to the ground or terminate with wire rope clips to prevent the stage from running off the end of the ropes.
- Test by raising the fully loaded platform a few feet off the ground before going aloft.
- Do not exceed platform load capacity.
- Do not enter or leave the platform other than at ground level or at other safe access points.
- Do not allow electric cables or connections to lie in gutters or other areas where

water can collect.
- Do not work near exposed electrical circuits or equipment.
- Do not join platforms unless they are designed for this purpose.
- Do not use damaged or defective equipment.
- Do not alter, substitute, or remove components of platform.
- Do not use lifeline for raising or lowering tools or materials.
- Do not move work platform unless all workers on it are protected by individual safety belts and lines.

Rolling Scaffold

- Assemble the rolling scaffold according to manufacturer's instructions.
- Ensure that the surface on which the scaffold is moved is level and without holes or obstructions.
- Brace all rolling scaffolds horizontally and diagonally.
- Cleat or secure all planks.
- Prevent joints from separating.
- Secure access ladders.
- Make sure the platform has appropriate guardrails (hand, mid, toe).
- Ensure that each wheel or castor is equipped with brakes to prevent rolling and swiveling.
- Lock the caster brakes before climbing onto scaffold.
- Secure or remove all material, equipment, and personnel from platform before moving it.
- Push towards the base when moving.
- Use the built-in access ladders to reach the platform.
- Refer to safety regulations for height stability requirements.
- Do not stay on the scaffold when it is being moved. If a worker must remain on the scaffold, make sure the worker is secured to the building (not the scaffold) with an appropriate safety harness and lanyard.
- Do not try to move a rolling scaffold without enough help. Watch out for slopes, holes, debris, and overhead obstructions.
- Do not extend adjusting screws more than the manufacturer recommends.
- Do not allow the working platform height to exceed three times the base width unless it is guyed and equipped with outriggers or otherwise stabilized.
- Do not use powered devices to move scaffolds.
- Do not lean access ladders against rolling scaffolds.
- Do not over-reach from the scaffold.
- Do not climb using the frame.

Fall Protection Plan

Fall protection planning is critical to the safety and well-being of our workers. AMS's fall protection plan follows certain requirements that are different depending on the type of scaffold we are using. In this plan we address fall protection for our scaffold erectors and dismantlers separately. One fact never changes. We know we must provide fall protection for any worker on a scaffold more than 10 feet above a lower level.

Workers

This fall protection plan for our workers is for the following type(s) of scaffold(s):

- Single- or two-point adjustable suspension scaffold-We will protect each worker on our single- or two-point adjustable suspension scaffolds by a personal fall arrest system. Our personal fall arrest systems:

    - Meet the requirements of your local jurisdiction.
    - Are attached by lanyard to a vertical lifeline, horizontal lifeline, or scaffold structural member.

NOTE: Vertical lifelines shall not be used when overhead components, such as overhead protection or additional platform levels, are part of a single-point or two-point adjustable suspension scaffold.

When vertical lifelines are used, they shall be fastened to a fixed safe point of anchorage, shall be independent of the scaffold, and shall be protected from sharp edges and abrasion. Safe points of anchorage include structural members of buildings, but do not include standpipes, vents, other piping systems, electrical conduit, outrigger beams, or counterweights.

When horizontal lifelines are used, they shall be secured to two or more structural members of the scaffold, or they may be looped around both suspension and independent suspension lines (on scaffolds so equipped) above the hoist and brake attached to the end of the scaffold. Horizontal lifelines shall not be attached only to the suspension ropes.

When lanyards are connected to horizontal lifelines or structural members on a single-point or two-point adjustable suspension scaffold, the scaffold shall be equipped with additional independent support lines and automatic locking devices capable of stopping the fall of the scaffold in the event one or both suspension ropes fail. The independent support lines shall be equal in number and strength to the suspension ropes.

Vertical lifelines, independent support lines, and suspension ropes shall not be attached to each other, nor shall they be attached to or use the same point of anchorage, nor shall they be attached to the same point on the scaffold or personal fall arrest system.

Using Scaffolds

Site preparation, scaffold erection, fall protection, and gaining access to the working platform are only some of the requirements for scaffold work. While this takes concentration and safe work practices, the most dangerous time can be when workers are concentrating on their work and not aware of the hazards of working from scaffolds. It is critical that workers who use scaffolds be trained, among other things, in the recognition of the hazards associated with the type of scaffold being used and to understand the procedures to control or minimize those hazards. AMS's competent person will inspect all scaffolds and scaffold components for visible defects before each work shift, and after any occurrence that could affect a scaffold's structural integrity. However, in addition to that, all users of scaffolds in AMS will know and understand the following safety rules:

- Scaffolds and scaffold components will never be loaded more than their maximum intended loads or rated capacities.
- Debris must not be allowed to accumulate on platforms.
- Scaffolds and scaffold components shall be inspected for visible defects by a competent person before each work shift, and after any occurrence which could affect a scaffold's structural integrity.
- Any part of a scaffold damaged or weakened such that its strength is less than that required by paragraph (a) of this section shall be immediately tagged out, repaired, or replaced, braced to meet those provisions, or removed from service until repaired. An example of tag used in tagging out scaffolding equipment is provided at the back of this program.
- Scaffolds shall not be moved horizontally while workers are on them, unless they have been designed by a registered professional engineer specifically for such movement or, for mobile scaffolds.
- The clearance between scaffolds and power lines shall be as follows: Scaffolds shall not be erected, used, dismantled, altered, or moved such that they or any conductive material handled on them might come closer to exposed and energized power lines.
- Scaffolds shall be erected, moved, dismantled, or altered only under the supervision and direction of a competent person qualified in scaffold erection, moving, dismantling or alteration. Such activities shall be performed only by experienced and trained workers selected for such work by the competent person.
- Workers shall be prohibited from working on scaffolds covered with snow, ice, or other slippery material except as necessary for removal of such materials.
- Where swinging loads are being hoisted onto or near scaffolds such that the loads might contact the scaffold, tag lines or equivalent measures to control the loads shall be used.
- Suspension ropes supporting adjustable suspension scaffolds shall be of a diameter large enough to provide sufficient surface area for the functioning of brake and hoist mechanisms.
- Suspension ropes shall be shielded from heat-producing processes. When acids or other corrosive substances are used on a scaffold, the ropes shall be shielded, treated to protect against the corrosive substances, or shall be of a material that will not be damaged by the substance being used.
- Work on or from scaffolds is prohibited during storms or high winds unless a competent person has determined that it is safe for workers to be on the scaffold and those workers are protected by a personal fall arrest system or wind screens. Wind screens shall not be used unless the scaffold is secured against the anticipated wind forces imposed.
- Debris shall not be allowed to accumulate on platforms.
- Makeshift devices, such as but not limited to boxes and barrels, shall not be used on top of scaffold platforms to increase the working level height of workers.
- Ladders shall not be used on scaffolds to increase the working level height of workers, except on large area scaffolds where employers have satisfied the following criteria:

- When the ladder is placed against a structure which is not a part of the scaffold, the scaffold shall be secured against the sideways thrust exerted by the ladder
- The platform units shall be secured to the scaffold to prevent their movement
- The ladder legs shall be on the same platform or other means shall be provided to stabilize the ladder against unequal platform deflection
- The ladder legs shall be secured to prevent them from slipping or being pushed off the platform

- Platforms shall not deflect more than 1/60 of the span when loaded.
- To reduce the possibility of welding current arcing through the suspension wire rope when performing welding from suspended scaffolds, the following precautions shall be taken, as applicable:

    - An insulated thimble shall be used to attach each suspension wire rope to its hanging support (such as cornice hook or outrigger). Excess suspension wire rope and any additional independent lines from grounding shall be insulated
    - The suspension wire rope shall be covered with insulating material extending at least 4 feet (1.2 m) above the hoist. If there is a tail line below the hoist, it shall be insulated to prevent contact with the platform. The portion of the tail line that hangs free below the scaffold shall be guided or retained, or both, so that it does not become grounded
    - Each hoist shall be covered with insulated protective covers
    - In addition to a work lead attachment required by the welding process, a grounding conductor shall be connected from the scaffold to the structure. The size of this conductor shall be at least the size of the welding process work lead, and this conductor shall not be in series with the welding process or the work piece
    - If the scaffold grounding lead is disconnected at any time, the welding machine shall be shut off
    - An active welding rod or uninsulated welding lead shall not be allowed to contact the scaffold or its suspension system

Prohibited Practices

The following practices will never be tolerated at AMS:

- Scaffold components manufactured by different manufacturers will never be intermixed unless the components fit together without force and the scaffold's structural integrity is maintained.
- Unstable objects will never be used to support scaffolds or platform units. Footings must be level, sound, rigid, and capable of supporting the loaded scaffold without settling or displacement.
- Cross braces will never be used as a means of access.

Duties of Competent and Qualified Persons

Only qualified and competent personnel are allowed to modify scaffolding systems. Modifications made by non-qualified personnel may create more hazards and are prohibited. If modifications are attempted by non- qualified personnel, they will be subject to disciplinary action up to and including termination of employment.

Tagging

Tags must be placed at each point of entry to the scaffold. This includes access points from ground level and any access points from the structure with which the scaffold is being used.

Doing so ensures that workers are aware of the status and condition of the scaffold, regardless of where they access it. Whatever their color, tags must include:

- The duty rating of the scaffold
- The date on which the scaffold was last inspected
- The name of the competent worker who inspected the scaffold
- Any precautions to be taken while working on the scaffold, and
- The expiry date of the tag

Scaffolds must be inspected prior to initial use and after any occurrence which could affect the scaffolds structural integrity

The tags let workers know that a particular scaffold is safe for use, that a potential or unusual hazard is present, or the scaffold is unsafe for use. The yellow tag is required to describe any precautions to be taken while working on the scaffold. A scaffold being modified on a particular level requires a yellow tag. The tag alerts workers climbing onto the scaffold of the modification work and any special precautions that might affect them.

Color of Inspection Tag	**Wording to Appear on Tag**
Green	“Safe for Use” or similar wording
Yellow	“Caution: Potential or Unusual Hazard” or similar wording
Red	“Unsafe for Use” or similar wording

Training

Recognizing the need for training for workers who:

- perform work while on scaffolds
- are involved in erecting, disassembling, moving, operating, repairing, maintaining, or inspecting scaffolds
- have lost the requisite proficiency, training is one of the highest priorities of this program

Workers Who Use Scaffolds

AMS workers who perform work on scaffolds will be trained by a qualified person to recognize the hazards associated with the type of scaffold being used and to understand the procedures to control or minimize those hazards. All AMS workers will comply with scaffold tags. The training will include the following areas as applicable:

- The nature of and the correct procedures for dealing with electrical hazards.
- The nature of and the correct procedures for erecting, maintaining, and disassembling the fall protection and falling object protection systems used.
- The proper use of the scaffold, and the proper handling of materials on the scaffold.
- The maximum intended load and the load-carrying capacities of the scaffolds used.
- Tagging of scaffolds.
- Any other pertinent requirements of the local standards and regulations.

Workers Who Erect, Disassemble, Move, Operate, Repair, Maintain, or Inspect Scaffolds

AMS workers who erect, disassemble, move, operate, repair, maintain, or inspect scaffolds will be trained by our competent person to recognize the hazards associated with the work being done. The training will include the following:

- The nature of scaffold hazards.
- The correct procedures for erecting, disassembling, moving, operating, repairing, inspecting, and maintaining the type of scaffold in question.
- The design criteria, maximum intended load-carrying capacity, and intended use of the scaffold.
- Tagging of scaffolds.
- Any other pertinent requirements of this subpart.

Workers Who Need Retraining

When we have reason to believe that one of our workers lacks the skill or understanding needed for safe work involving the erection, use or dismantling of scaffolds, we will retrain the worker so that the requisite proficiency is regained. Retraining will be done in at least the following situations:

- Where changes at the worksite present a hazard about which the worker has not been previously trained.
- Where changes in the types of scaffolds, fall protection, falling object protection, or other equipment present a hazard about which a worker has not been previously trained.
- Where inadequacies in an affected worker's work involving scaffolds indicate that the worker has not retained the requisite proficiency.

FATIGUE MANAGEMENT

PURPOSE

To ensure ALLEN MECHANICAL SERVICES-AMS, hereafter referred to as “AMS”, workers recognize the effect of fatigue as related to safely being able to perform work and to establish guidelines for work hours and equipment to reduce fatigue in our business and at our client locations.

SCOPE

This program applies to all AMS projects and operations.

POLICY

The guiding principles of fatigue management shall be incorporated into the normal management functions of the business and include the following:

- Workers must be in a fit state to undertake work
- Workers must be fit to complete work
- Workers must take minimum periods of rest to safely perform

their work These principles will be managed through:

- The appropriate planning of work tasks, including driving, vehicle, and equipment maintenance, loading, and unloading and other job-related duties and processes
- Providing appropriate equipment to help reduce stress and fatigue
- Regular medical checkups and monitoring of health issues as required by legislation
- The provision of appropriate sleeping accommodation where required
- Ongoing training and awareness of worker health and fatigue issues

RESPONSIBILITIES

Managers

Management accepts responsibility for the implementation of this fatigue management policy.

Supervisors

Responsible for the implementation and maintenance of this program for their site and ensuring all assets are made available for compliance with the program.

Workers

Workers must present in a fit state free from alcohol and drugs.

Workers must not chronically use over the counter or prescription drugs to increase mental alertness.

Workers are prohibited from taking any substance known to increase fatigue in that worker, including fatigue that sets in after the effects of the drug wear off.

Workers shall report tiredness/fatigue to supervision and supervisors shall take appropriate action to assist the worker.

Workers must report fatigue/tiredness and lack of mental acuity to supervision. Supervision must take appropriate actions to prevent loss.

Workers need to be rested prior to starting work.

Workers need to monitor their own performance and take regular periods of rest to avoid continuing work when tired.

PROCEDURES

Work Hour Limitations

AMS has set the following work hour limitations and will control job rotation schedules to control fatigue, allow for sufficient sleep and to increase mental fitness.

- Breaks - Workers shall have necessary work breaks to avoid fatigue. These scheduled breaks will apply to both driving and on-site hours. The following shall be a minimum:
    - 30 Minutes after 5 Hours
    - 30 Minutes after 12 Hours

- No Workers shall work more than:
    - 16 hours per day
    - 16 Days Continuous

- Unfamiliar or irregular work should be avoided.
- Driving
    - Property Carrying Drivers

        - 30-Minute Driving Break - Drivers must take a 30-minute break when they have driven for a period of 8 cumulative hours without at least a 30-minute interruption.
        - 11-Hour Driving Limit – Workers may drive a maximum of 11 hours after 10 consecutive hours off duty.
        - 14-Hour Limit – Workers may not drive beyond the 14th consecutive hour after coming on duty, following 10 consecutive hours off duty. Off-duty time does not extend the 14-hour period.

    - Passenger Carrying Drivers

        - 10-Hour Driving Limit - may drive a maximum of 10 hours after 8 consecutive hours off duty.
        - 15-Hour Limit - may not drive after having been on duty for 15 hours, following 8 consecutive hours off duty. Off-duty time is not included in the 15-hour period.

Equipment and Evaluation

AMS will provide equipment such as anti-fatigue mats for standing, lift assist devices for repetitive lifting and other ergonomic devices as deemed appropriate, chairs for workers to sit periodically and will provide periodic rest breaks for personnel.

AMS will also periodically analyze and evaluate work tasks to control fatigue.

Training

AMS is committed to ensuring that all workers are competent to perform their tasks including:

- Fatigue management
- Health issues

AMS will provide initial and annual training on how to recognize fatigue, how to control fatigue through appropriate work and personal habits and reporting of fatigue to supervision.

A record of individual fatigue training and competency will be maintained.

BACKGROUND/INTRODUCTION

Ionizing Radiation are atoms that are the basic building blocks of all matter, and atoms of different elements occur naturally on the earth. Atoms consist of a nucleus containing protons and neutrons surrounded by electrons in orbitals around the nucleus. Types of Ionizing Radiation include alpha, beta, and neutron particles; gamma rays; and X-rays. In contrast, non-Ionizing Radiation has a lower energy that is not capable of ionizing other atoms. Examples include radio waves, microwaves, and visible light.

REGULATIONS

ALLEN MECHANICAL SERVICES-AMS; hereafter referred to as “AMS” has adopted the prescribed exposure prevention measures outlined in Title 29 CFR 1910.1096; although worker exposures are not anticipated to exceed the defined annual average radiation exposures.

PURPOSE

This procedure establishes a baseline process to educate and protect our workforce from the potential harmful effects of radiation exposure in excess of background levels. This is accomplished by establishing assessment, mitigation measures and implementation strategies to be implemented when historical and/or facility information indicates Ionizing Radiation is likely present.

SCOPE

This section applies to all workers performing work in an environment known, or suspected, to contain Ionizing Radiation. Supervisors or delegate are primarily responsible for ensuring work areas are free of Ionizing Radiation that may potentially exceed dose thresholds in compliance with local and jurisdictional requirements.

DEFINITIONS

Radiation includes alpha rays, beta rays, gamma rays, X-rays, neutrons, high-speed electrons, high-speed protons, and other atomic particles; but such term does not include sound or radio waves, or visible light, or infrared or ultraviolet light.
Radioactive material- any material which emits, by spontaneous nuclear disintegration, corpuscular or electromagnetic emanations.
Restricted area- any area controlled by AMS for purposes of protection of individuals from exposure to Ionizing Radiation.

Unrestricted area- any area not controlled by the employer for purposes of protection of individuals from exposure to radiation or radioactive materials.
Dose- the quantity of Ionizing Radiation absorbed, per unit of mass, by the body or by any portion of the body. When the provisions in this section specify a dose during a period of time, the dose is the total quantity of radiation absorbed, per unit of mass, by the body or by any portion of the body during such period of time.
Rem- a measure of the dose of any Ionizing Radiation to body tissue in terms of its estimated biological effect relative to a dose of 1 roentgen (r) of X-rays (1 millirem (mrem)=0.001 rem). The relation of the rem to other dose units depends upon the biological effect under consideration and upon the conditions for irradiation.
Roentgen(R) - a special unit of exposure. A common exposure rate unit when dealing with Ionizing Radiation is micro-Roentgens per hour.
Background radiation- the amount radiation an individual is exposed to from natural radiation sources such as radionuclides in solids, cosmic radiation from space, naturally occurring radionuclides deposited in the body from foods, etc.
Decontamination - the act of removing regulated Ionizing Radiation to reduced levels of radiation.
Radiation area- any area, accessible to personnel, where radiation exists at levels that may subject the human body to a dose in excess of five millirem per hour, or 100 millirem in five consecutive days.
Survey - evaluation of planned work areas, uses, disposal, transfer, and/or presence of radiation sources under a specific set of conditions to determine actual or potential radiation hazards. Functional surveys include tests, physical evaluations/inspections, and radiation measuring to determine the concentration of radioactive materials present.

RESPONSIBILITIES

- The Supervisor or delegate is responsible for ensuring this policy is fully implemented and executed when site specific information and a job hazard analysis (JHA) indicates the presence of Ionizing Radiation
- The Supervisor or delegate will ensure that all workers with the potential to be exposed to concentrations of ionizing radiation will receive the appropriate training for the work performed.
- The Supervisor or delegate for each project location is primarily responsible for conducting a survey, including an assessment for Ionizing Radiation exposure, and conduct all necessary monitoring /testing to determine the level of radiation in the planned work area.
- The Supervisor or delegate will consult with AMS's Certified Industrial Hygienist (CIH).
- Before any work activities begins, the designated CIH must approve:
    - Any exposure control plans
    - The sampling methods and verify sampling equipment is properly calibrated.

- The Supervisor or delegate shall:

    - Ensure an initial survey is conducted where radiation exposure is suspected,

- (2) Ensure workers are informed of the potential hazards and the safeguarding required for the intended operation.
- Work closely with Supervisor or delegate to confirm the identified Personal Protective Equipment (PPE) is adequate and provided for the potential exposure.

- AMS designated Environmental Specialist or delegate must be notified of Ionizing Radiation related waste management activities. The Environmental Specialists or delegate will advise on appropriate waste characterization methods, containerization, and disposal transportation options.
- AMS CIH or delegate will conduct all necessary Ionizing Radiation survey and testing instrument training as required.

PROCEDURES

Occupational Dose Limits for Adults

An annual limit, which is the more limiting of:

- The total effective dose equivalent being equal to 5 rems (0.05 Sv); or
- The sum of the deep-dose equivalent and the committed dose equivalent to any individual organ or tissue (other than the lens of the eye) being equal to 50 rems (0.5 Sv).
- The annual limits to the lens of the eye, to the skin of the whole body, and to the skin of the extremities, which are:

  - A lens dose equivalent of 15 rems (0.15 Sv), and
  - A shallow-dose equivalent of 50 rem (0.5 Sv) to the skin of the whole body or to the skin of any extremity.

Doses in excess of the annual limits, including doses received during accidents, emergencies, and planned special exposures, must be subtracted from the limits for planned special exposures that the individual may receive during the current year and during the individual's lifetime.

Training

AMS will provide workers with information and training to ensure that those who are potentially exposed to ionizing radiation hazards understand how to safely use all radiation-producing equipment or radiation sources in the workplace.

Medical Surveillance

AMS shall institute a medical surveillance program for all workers who are or may be exposed at or above the action level (AL) for more than 30 days per year. Medical examinations and procedures shall be performed by or under the supervision of a licensed physician.

When a worker's exposure is at or above the AL for more than 30 days in any consecutive 12 months, an immediate medical consultation is required when the worker notifies AMS that they:

- Has developed signs or symptoms commonly associated with ionizing radiation disease
- Has demonstrated difficulty in breathing during respirator use or a fit test
- Desires medical advice concerning the effects of past or current ionizing radiation exposure on the worker's ability to have a healthy child
- Is under medical removal and has a medically appropriate need

The medical surveillance is provided without cost to the workers and consists of the following:

- The name, social security number, and description of the duties of the worker
- A copy of the physician's written opinions
- Results of any exposure monitoring done for that worker and the representative exposure levels supplied to the physician
- Any worker medical complaints related to exposure to ionizing radiation
- A copy of the medical examination results including medical and work history
- A description of the laboratory procedures and a copy of any standards or guidelines used to interpret the test results or references to that information
- A copy of the results of biological monitoring

Radiation Monitoring

AMS will not possess, use, or transport radioactive material in such a manner as to cause any worker, within a restricted area, to be exposed to airborne radioactive material in an average concentration in excess of the limits. The limits given for exposure to the concentrations specified for 40 hours in any workweek of 7 consecutive days. In any such period where the number of hours of exposure is less than 40, the limits specified in the table may be increased proportionately. In any such period where the number of hours of exposure is greater than 40, the limits specified in the table shall be decreased proportionately.
AMS shall make surveys, as may be necessary, for compliance with the provisions in this section. ***Survey*** means an evaluation of the radiation hazards incident to the production, use, release, disposal, or presence of radioactive materials or other sources of radiation under a specific set of conditions. When appropriate, such evaluation includes a physical survey of the location of materials and equipment, and measurements of levels of radiation or concentrations of radioactive material present.

NOTE: Survey equipment must be calibrated as per the manufacturer specifications.

Applications

AMS must conduct surveys as necessary to comply with the provisions of this section.
Project site surveys include a physical or administrative survey of project locations. Historical monitoring data provided by customer facilities, property owners, etc. resulting in suspected Ionizing Radiation contamination will require AMS exposure control plan.

AMS must notify the Supervisor or delegate of Ionizing Radiation exposure concerns immediately upon suspicion or confirmation.

AMS will coordinate with the Supervisor or delegate in developing Ionizing Radiation exposure control plans. Radiation levels/concentrations will be measured and professionally evaluated to determine appropriate protective measures and work strategies.

Engineering Controls

AMS will use engineering controls and safe work practices to reduce and maintain ionizing radiation exposure below applicable limits in compliance with local and jurisdictional requirements. AMS will also place the appropriate caution signs, labels, and signals to alert the worker of the potential and level of exposure.

Radiation area

Each radiation area shall be conspicuously posted with a sign or signs bearing the radiation caution symbol and the words:

CAUTION
RADIATION AREA

Each high radiation area shall be conspicuously posted with a sign or signs bearing the radiation caution symbol and the words:

CAUTION
HIGH RADIATION AREA

Each airborne radioactivity area shall be conspicuously posted with a sign or signs bearing the radiation caution symbol the words:

CAUTION
AIRBORNE RADIOACTIVITY AREA

Each area or room in which radioactive material is used or stored and which contains any radioactive material (other than natural uranium or thorium) in any amount exceeding 10 times the quantity of such material specified in appendix C to 10 CFR part 20 shall be conspicuously posted with a sign or signs bearing the radiation caution symbol and the words:

CAUTION
RADIOACTIVE MATERIALS

Each area or room in which natural uranium or thorium is used or stored in an amount exceeding 100 times the quantity of such material specified in 10 CFR part 20 shall be conspicuously posted with a sign or signs bearing the radiation caution symbol and the words:

CAUTION
RADIOACTIVE MATERIALS

Each container in which is transported, stored, or used a quantity of any radioactive material (other than natural uranium or thorium) greater than the quantity of such material specified in appendix C to 10 CFR part 20 shall bear a durable, clearly visible label bearing the radiation caution symbol and the words:

CAUTION
RADIOACTIVE MATERIALS

Each container in which natural uranium or thorium is transported, stored, or used in a quantity greater than 10 times the quantity specified in appendix C to 10 CFR part 20 shall bear a durable, clearly visible label bearing the radiation caution symbol and the words:

CAUTION
RADIOACTIVE MATERIALS

Personnel Protective Methods

AMS uses three principles of protection:

1. Implementing work periods/cycles that limit worker exposure to a known quantity of radiation.
2. Placing distance between the worker and the radiation source

    i. The intensity and type of radiation will be closely evaluated in determining exposure distance thresholds. For example, gamma rays travel long distances, but alpha and beta rays have very short travel distance.
    ii. As a rule, doubling the distance from the source reduces the exposure by a factor of four, and vice versa.

3. Shielding reduces exposure

i. Shielding is a material located/placed in between you and the source of the radiation. The amount of shielding required depends on the type and strength of the radiation.

- **Lead aprons or vests**. Wearing lead aprons can reduce a worker's radiation dose. Customized lead (or lead equivalent) aprons are available for a wide range of occupational settings and job tasks. A lead apron is only effective when it is worn properly and provides adequate protection necessary from the radiation source. Workers should ensure that visual and tactile inspections of lead aprons are performed regularly for signs of damage (e.g., wear and tear, holes, or cracks) or prior misuse (e.g., sagging, or deformed lead arising from a lead apron being folded or otherwise stored improperly). Potential defects in lead aprons can also be inspected radiographically. Workers in high-dose fluoroscopy settings may be asked to wear two dosimeters for additional monitoring. Oftentimes one dosimeter is worn on the outside of the lead apron at the collar (unshielded) and one on the inside at the waist (shielded).
- **Lead thyroid collar**. A lead thyroid collar offers additional radiation protection for the thyroid (a gland located in front of the neck) that is particularly sensitive to radiation.
- **Lead gloves**. Lead-lined gloves offer some protection for workers from radiation exposure to the hands and should be used for some X-ray equipment if hands must be placed in the direct X-ray field. During fluoroscopy, however, wearing lead gloves when the worker's hand is in the primary beam (sometimes unavoidable for clinical reasons) can cause the equipment to automatically increase radiation production rate that will increase dose to the worker's hands, to the patient, and other workers in the room.
- **Safety goggles**. Leaded eye wear (lead glasses or radiation glasses) or opaque safety goggles can protect a worker's eyes from radiation exposure.
- **Respirators** Although respirators are typically the last choice for controlling internal exposure to airborne radionuclides, reducing internal radiation dose, AMS shall ensure that workers use properly selected respirators and wear those respirators when required. Respirators should only be used by workers qualified to wear them and have been fit-tested and medical cleared.

AMS shall supply and require the use of appropriate personnel monitoring equipment such as:

- film badges,
- pocket chambers,
- pocket dosimeters,
- film rings,
- handheld survey meters
- radioisotope identification devices
- personal radiation detectors

The level of PPE required is based on the anticipated exposure to site specific Ionizing Radiation -material and background Ionizing Radiation levels and must be determined before work starts.

Personnel Decontamination Procedures

Personnel shall not begin doffing of PPE until radiation measurements are taken of the entire PPE ensemble to identify potential contamination "hot spots".

Any potentially contaminated body parts must be thoroughly washed in the decontamination area before leaving the area.

Supervisors or delegate must consult with AMS Environmental Specialist for specific handling procedures of any waste generated during decontamination measures.

Decontamination plans must be developed prior to the commencement of any Ionizing Radiation related project and integrated into the overall site health and safety plan.

Notification of Incidents

Each employer shall immediately notify the Assistant Secretary of Labor or his duly authorized representative, for employees not protected by the Nuclear Regulatory Commission by means of 10 CFR 1910.1096 part 20; paragraph (p)(2), or the requirements of the local and jurisdictional regulations.

Each employer shall within 24 hours following its occurrence notify the Assistant Secretary of Labor or his duly authorized representative for workers not protected by the Nuclear Regulatory Commission by means of 10 CFR 1910.1096 part 20; paragraph (p)(2) or the requirements of the local and jurisdictional regulations.

Records

Every employer shall maintain records of the radiation exposure of all employees for whom personnel monitoring is required under paragraph (d) of this section and advise each of his employees of his individual exposure on at least an annual basis.

PURPOSE

This Respirable Crystalline Silica Program was developed to prevent worker exposure to hazardous levels of Respirable Crystalline Silica that could result through construction activities or nearby construction activities occurring on worksites pertaining to the service provided by ALLEN MECHANICAL SERVICES-AMS; hereafter referred to as "AMS". Respirable Crystalline Silica exposure at hazardous levels can lead to lung cancer, silicosis, chronic obstructive pulmonary disease, and kidney disease. It is intended to meet the requirements of the Respirable Crystalline Silica Construction Standard (29 CFR 1926.1153) established by the Occupational Safety and Health Administration (OSHA).

All work involving chipping, cutting, drilling, grinding, or similar activities on materials containing Crystalline Silica can lead to the release of respirable-sized particles of Crystalline Silica (i.e., Respirable Crystalline Silica). Crystalline Silica is a basic component of soil, sand, granite, and many other minerals. Quartz is the most common form of Crystalline Silica. Many materials found on constructions sites include Crystalline Silica; including but not limited to – cement, concrete, asphalt, pre-formed structures (inlets, pipe, etc.) and others. Consequently, this program has been developed to address and control these potential exposures to prevent our workers from experiencing the effects of occupational illnesses related to Respirable Crystalline Silica exposure.

SCOPE

This Respirable Crystalline Silica Program applies to all workers who have the potential to be exposed to Respirable Crystalline Silica when covered by the OSHA Standard. The OSHA Respirable Crystalline Silica Construction Standard applies to all occupational exposures to Respirable Crystalline Silica in construction work, except where worker exposure will remain below 25 micrograms of Respirable Crystalline Silica per cubic meter of air (25 $\mu g/m^3$) as an 8-hour time-weighted average (TWA) under any foreseeable conditions.

RESPONSIBILITIES

AMS firmly believes protecting the health and safety of our workers is everyone's responsibility. This responsibility begins with upper management providing the necessary support to properly implement this program. However, all levels of the organization assume some level of responsibility for this program including the following positions.

Safety Department

- Conduct job site assessments for Silica containing materials and perform worker Respirable Crystalline Silica hazard assessments to determine if a worker's exposure will be above 25 $\mu g/m^3$ as an 8-hour TWA under any foreseeable conditions

- Select and implement into the project's Exposure Control Plan (ECP) the appropriate control measures in accordance with the Construction Tasks identified in OSHA's Construction Standard Table 1; and potentially including (but not limited to) - a written ECP, exposure monitoring, Hazard Communication training, medical surveillance, housekeeping, and others.
- Ensure that the materials, tools, equipment, personal protective equipment (PPE), and other resources (such as worker training) required to fully implement and maintain this Respirable Crystalline Silica Program are in place and readily available if needed.
- Ensure that Project Managers, Site Managers, Competent Persons, and workers are educated in the hazards of Silica exposure and trained to work safely with Silica in accordance with OSHA's Respirable Crystalline Silica Construction Standard and OSHA's Hazard Communication Standard. Managers and Competent Persons may receive more advanced training than other workers.
- Maintain written records of training (for example, proper use of respirators), ECPs, inspections (for equipment, PPE, and work methods/practices), medical surveillance (under lock and key), respirator medical clearances (under lock and key) and fit-test results.
- Conduct an annual review (or more often if conditions change) of the effectiveness of this program and any active project ECP's that extend beyond a year. This includes a review of available dust control technologies to ensure these are selected and used when practical.
- Coordinate work with other employers and contractors to ensure a safe work environment relative to Silica exposure.

Project Manager

- Ensure all applicable elements of this Respirable Crystalline Silica Program are implemented on the project including the selection of a Competent Person.
- Assist the Safety Department in conduct job site assessments for Silica containing materials and perform worker Respirable Crystalline Silica hazard assessments to determine if an ECP, exposure monitoring, and medical surveillance is necessary.
- Assist in the selection and implementation of the appropriate control measures in accordance with the Construction Tasks identified in OSHA's Construction Standard Table 1; and potentially including (but not limited to) - a written ECP, exposure monitoring, Hazard Communication training, medical surveillance, housekeeping, and others.
- Ensure that workers using respirators have been properly trained, medically cleared, and fit- tested in accordance with AMS's Respiratory Protection Program. This process will be documented.
- Ensure that work is conducted in a manner that minimizes and adequately controls the risk to workers and others. This includes ensuring that workers use appropriate engineering controls, work practices, and wear the necessary PPE.

- Where there is risk of exposure to Silica dust, verify workers are properly trained on the applicable contents of this program, the project specific ECP, and the applicable OSHA Standards (such as Hazard Communication). Ensure workers are provided appropriate PPE when conducting such work.
- Competent Person and/or Site Manager (Superintendent, Foreman, etc.)
- Make frequent and regular inspections of job sites, materials, and equipment to implement the written ECP.
- Identify existing and foreseeable Respirable Crystalline Silica hazards in the workplace and take prompt corrective measures to eliminate or minimize them.
- Notify the Project Manager and/or Safety Department of any deficiencies identified during inspections to coordinate and facilitate prompt corrective action.
- Assist the Project Manager and Safety Department in conducting job site assessments for Silica containing materials and perform worker Respirable Crystalline Silica hazard assessments to determine if an ECP, exposure monitoring, and medical surveillance is necessary.

Workers:

- Follow recognized work procedures (such as the Construction Tasks identified in OSHA's Construction Standard Table 1) as established in the project's ECP and this program.
- Use the assigned PPE in an effective and safe manner.
- Participate in Respirable Crystalline Silica exposure monitoring and the medical surveillance program.
- Report any unsafe conditions or acts to the Site Manager and/or Competent Person.
- Report any exposure incidents or any signs or symptoms of Silica illness.

DEFINITIONS

If a definition is not listed in this section, please contact your supervisor. If your supervisor is unaware of what the term means, please contact the Competent Person or your Safety Department.
Action Level -a concentration of airborne Respirable Crystalline Silica of 25 µg/m^3, calculated as an 8-hour TWA.
Competent Person -an individual who can identify existing and foreseeable Respirable Crystalline Silica hazards in the workplace and who has authorization to take prompt corrective measures to eliminate or minimize them.
Worker Exposure - the exposure to airborne Respirable Crystalline Silica that would occur if the worker were not using a respirator.
High-Efficiency Particulate Air (HEPA) Filter -a filter that is at least 99.97 percent efficient in removing monodispersed particles of 0.3 micrometers in diameter.
Objective Data -information, such as air monitoring data from industry-wide surveys or calculations based on the composition of a substance, demonstrating worker exposure to Respirable Crystalline Silica associated with a particular product or material or a specific process, task, or activity. The data must reflect workplace conditions closely resembling or with a higher exposure potential than the processes, types of material, control methods, work practices, and environmental conditions in the employer's current operations.

Permissible Exposure Limit (PEL) - the employer shall ensure that no worker is exposed to an airborne concentration of Respirable Crystalline Silica in excess of 50 µg/m^3, calculated as an 8- hour TWA.
Physician or Other Licensed Health Care Professional (PLHCP) - an individual whose legally permitted scope of practice (i.e., license, registration, or certification) allows him or her to independently provide or be delegated the responsibility to provide some or all the health care services required by the Medical Surveillance Section of the OSHA Respirable Crystalline Silica Standard.
Respirable Crystalline Silica - Quartz, Cristobalite, and/or Tridymite contained in airborne particles that are determined to be respirable by a sampling device designed to meet the characteristics for respirable-particle size- selective samplers specified in the International Organization for Standardization (ISO) 7708:1995: Air Quality-Particle Size Fraction Definitions for Health-Related Sampling.
Specialist - American Board-Certified Specialist in Pulmonary Disease or an American Board-Certified Specialist in Occupational Medicine.

PROCEDURES

Specified Exposure Control Methods

When possible and applicable, AMS will conduct activities with potential Silica exposure to be consistent with OSHA's Construction Standard Table 1. Supervisors will ensure each worker under their supervision and engaged in a task identified on OSHA's Construction Standard Table 1 have fully and properly implemented the engineering controls, work practices, and respiratory protection specified for the task on Table 1 (unless AMS has assessed and limited the exposure of the worker to Respirable Crystalline Silica in accordance with the Alternative Exposure Control Methods Section of this program).

The task(s) being performed by AMS identified on OSHA's Construction Standard Table 1 is/are: Select any/all the following that apply:

Table 1: Specified Exposure Control Methods When Working With Materials Containing Silica

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	**Required Respiratory Protection**	
			≤ 4 hours/shift	**>4 hours/shift**
1	Stationary masonry saws	• Use saw equipped with integrated water delivery system that continuously feeds water to the blade. • Operate and maintain tool in accordance with manufacturer's	None	None

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	**>4 hours/shift**
		• Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism.		
10d	Jackhammers and handheld powered chipping tools when used indoors or in an enclosed area	• Use tool equipped with commercially available shroud and dust collection system. • Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. • Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism.	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask
11	Handheld grinders for mortar removal (i.e., tuckpointing)	• Use grinder equipped with commercially available shroud and dust collection system. • Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. • Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism.	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask	Powered Air-Purifying Respirator (PAPR) with P100 Filters
12a	Handheld grinders for uses other than mortar removal for tasks	• Use grinder equipped with integrated water delivery system that continuously feeds water to the grinding surface. • Operate and maintain tool in accordance with manufacturer's	None	None

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	**>4 hours/shift**
	performed outdoors only	instructions to minimize dust emissions.		
12b	Handheld grinders for uses other than mortar removal when used outdoors	• Use grinder equipped with commercially available shroud and dust collection system. • Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. • Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism.	None	None
12c	Handheld grinders for uses other than mortar removal when used indoors or in an enclosed area	• Use grinder equipped with commercially available shroud and dust collection system. • Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. • Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism.	None	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask
13a	Walk-behind milling machines and floor grinders	• Use machine equipped with integrated water delivery system that continuously feeds water to the cutting surface. • Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	None

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	**Required Respiratory Protection**	
			≤ 4 hours/shift	**>4 hours/shift**
13b	Walk-behind milling machines and floor grinders	• Use machine equipped with dust collection system recommended by the manufacturer. • Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. • Dust collector must provide the air flow recommended by the manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism. • When used indoors or in an enclosed area, use a HEPA-filtered vacuum to remove loose dust in between passes.	None	None
14	Small drivable milling machines (less than half-lane)	• Use a machine equipped with supplemental water sprays designed to suppress dust. • Water must be combined with a surfactant. • Operate and maintain machine to minimize dust emissions.	None	None
15a	Large drivable milling machines (half-lane and larger) for cuts of any depth on asphalt only	• Use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust. • Operate and maintain machine to minimize dust emissions.	None	None
15b	Large drivable milling machines (half-lane and larger) for cuts of four inches in depth or less on any substrate	• Use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust. • Operate and maintain machine to minimize dust emissions.	None	None

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
15c	Large drivable milling machines (half-lane and larger) for cuts of four inches in depth or less on any substrate	• Use a machine equipped with supplemental water spray designed to suppress dust. • Water must be combined with a surfactant. • Operate and maintain machine to minimize dust emissions.	None	None
16	Crushing machines	• Use equipment designed to deliver water spray or mist for dust suppression at crusher and other points where dust is generated (e.g., hoppers, conveyers, sieves/sizing or vibrating components, and discharge points). • Operate and maintain machine in accordance with manufacturer's instructions to minimize dust emissions. • Use a ventilated booth that provides fresh, climate-controlled air to the operator, or a remote-control station.	None	None
17a	Heavy equipment and utility vehicles used to abrade or fracture silica-containing materials (e.g., hoe-ramming, rock ripping) or used during demolition activities involving silica-containing materials	• Operate equipment from within an enclosed cab.	None	None

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
17b	Heavy equipment and utility vehicles used to abrade or fracture silica-containing materials (e.g., hoe-ramming, rock ripping) or used during demolition activities involving silica-containing materials	• When workers outside of the cab are engaged in the task, apply water and/or dust suppressants as necessary to minimize dust emissions.	None	None
18a	Heavy equipment and utility vehicles for tasks such as grading and excavating but not including demolishing, abrading, or fracturing silica-containing materials	• Apply water and/or dust suppressants as necessary to minimize dust emissions.	None	None
18b	Heavy equipment and utility vehicles for tasks such as grading and excavating but not including demolishing, abrading, or fracturing silica-containing materials	• When the equipment operator is the only worker engaged in the task, operate equipment from within an enclosed cab.	None	None

When implementing the control measures specified in Table 1, AMS shall:

- For tasks performed indoors or in enclosed areas, provide a means of exhaust as needed to minimize the accumulation of visible airborne dust
- For tasks performed using wet methods, apply water at flow rates sufficient to minimize release of visible dust
- For measures implemented that include an enclosed cab or booth, ensure that the enclosed cab or booth:

    - Is maintained as free as practicable from settled dust
    - Has door seals and closing mechanisms that work properly
    - Has gaskets and seals that are in good condition and working properly
    - Is under positive pressure maintained through continuous delivery of fresh air
    - Has intake air that is filtered through a filter that is 95% efficient in the 0.3-10.0 µm range (e.g., MERV-16 or better)
    - Has heating and cooling capabilities

- Where a worker performs more than one task included on OSHA's Construction Standard Table 1 during a shift, and the total duration of all tasks combined is more than four hours, the required respiratory protection for each task is the respiratory protection specified for more than four hours per shift. If the total duration of all tasks on Table 1 combined is less than four hours, the required respiratory protection for each task is the respiratory protection specified for less than four hours per shift

Alternative Exposure Control Methods

Alternative Exposure Control Methods apply for tasks not listed in OSHA's Construction Standard Table 1, or where AMS cannot not fully and properly implement the engineering controls, work practices, and respiratory protection described in Table 1.

First, AMS will assess the exposure of each worker who is or may reasonably be expected to be exposed to Respirable Crystalline Silica at or above the Action Level in accordance with either the Performance Option or the Scheduled Monitoring Option.

- Performance Option – AMS will assess the 8-hour TWA exposure for each worker based on any combination of air monitoring data or objective data sufficient to accurately characterize workers exposures to Respirable Crystalline Silica.

- **Scheduled Monitoring Option:**

    - AMS will perform initial monitoring to assess the 8-hour TWA exposure for each worker based on one or more personal breathing zone air samples that reflect

the exposures of workers on each shift, for each job classification, and in each work area. Where several workers perform the same tasks on the same shift and in the same work area, AMS will plan to monitor a representative fraction of these workers. When using representative monitoring, AMS will sample the worker(s) who are expected to have the highest exposure to Respirable Crystalline Silica.

- If initial monitoring indicates that worker exposures are below the Action Level, AMS will assess discontinuance of monitoring for those workers whose exposures are represented by such monitoring.
- Where the most recent exposure monitoring indicates that worker exposures are at or above the Action Level but at or below the PEL, AMS will repeat such monitoring within six months of the most recent monitoring.
- Where the most recent exposure monitoring indicates that worker exposures are above the PEL, AMS will repeat such monitoring within three months of the most recent monitoring.
- Where the most recent (non-initial) exposure monitoring indicates that worker exposures are below the Action Level, AMS will repeat such monitoring within six months of the most recent monitoring until two consecutive measurements, taken seven or more days apart, are below the Action Level, at which time AMS will assess discontinuance of monitoring for those workers whose exposures are represented by such monitoring, except when a reassessment is required. AMS will reassess exposures whenever a change in the production, process, control equipment, personnel, or work practices may reasonably be expected to result in new or additional exposures at or above the Action Level, or when AMS has any reason to believe that new or additional exposures at or above the Action Level have occurred.

AMS will ensure that all Respirable Crystalline Silica samples taken to satisfy the monitoring requirements of this program and OSHA are collected by a qualified individual (i.e., a Certified Industrial Hygienist) and the samples are evaluated by a qualified laboratory (i.e., accredited to ANS/ISO/IEC Standard 17025:2005 with respect to Crystalline Silica analyses by a body that is compliant with ISO/IEC Standard 17011:2004 for implementation of quality assessment programs).

Within five working days after completing an exposure assessment, AMS will individually notify each affected worker in writing of the results of that assessment or post the results in an appropriate location accessible to all affected workers.

Whenever an exposure assessment indicates that worker exposure is above the PEL, AMS will describe in the written notification the corrective action being taken to reduce worker exposure to or below the PEL.

Where air monitoring is performed, AMS will provide affected workers or their designated representatives an opportunity to observe any monitoring of worker exposure to Respirable Crystalline Silica. When observation of monitoring requires entry into an area where the use of protective clothing or equipment is required for any workplace hazard, AMS will provide the observer with protective clothing and equipment at no cost and shall ensure that the observer uses such clothing and equipment.

Once air monitoring has been performed, AMS will determine its method of compliance based on the monitoring data and the hierarchy of controls. AMS will use engineering and work practice controls to reduce and maintain worker exposure to Respirable Crystalline Silica to or below the PEL, unless AMS can demonstrate that such controls are not feasible. Wherever such feasible engineering and work practice controls are not sufficient to reduce worker exposure to or below the PEL, AMS will nonetheless use them to reduce worker exposure to the lowest feasible level and shall supplement them with the use of respiratory protection.

In addition to the requirements of this program, AMS will comply with other programs and OSHA standards (such as 29 CFR 1926.57 [Ventilation]), when applicable where abrasive blasting is conducted using Crystalline Silica-containing blasting agents, or where abrasive blasting is conducted on substrates that contain Crystalline Silica.

Control Methods

AMS will provide control methods that are either consistent with Table 1 or otherwise minimize worker exposures to Silica. These exposure control methods can include engineering controls, work practices, and respiratory protection. Listed below are control methods to be used when Table 1 is not followed:

List and discuss control methods

Respiratory Protection

Where respiratory protection is required by this program, AMS will provide each worker an appropriate respirator that complies with the requirements of AMS's Respiratory Protection Program and the OSHA Respiratory Protection Standard (29 CFR 1910.134).

Respiratory protection is required where specified by the OSHA Construction Standard Table 1, for tasks not listed in Table 1, or where AMS has not fully and properly implemented the engineering controls, work practices, and respiratory protection described in Table 1. Situations requiring respiratory protection include:

- Where exposures exceed the PEL during periods necessary to install or implement feasible engineering and work practice controls
- Where exposures exceed the PEL during tasks, such as certain maintenance and repair tasks, for which engineering, and work practice controls are not feasible

- During tasks for which an employer has implemented all feasible engineering and work practice controls and such controls are not sufficient to reduce exposures to or below the PEL.

Housekeeping

AMS does not allow dry sweeping or dry brushing where such activity could contribute to worker exposure to Respirable Crystalline Silica unless wet sweeping, HEPA-filtered vacuuming, or other methods that minimize the likelihood of exposure are not feasible.

AMS does not allow compressed air to be used to clean clothing or surfaces where such activity could contribute to worker exposure to Respirable Crystalline Silica unless:

- The compressed air is used in conjunction with a ventilation system that effectively captures the dust cloud created by the compressed air
- No alternative method is feasible
- Written Exposure Control Plan

When worker exposure on a construction project is expected to be at or above the Action Level, a Written ECP will be established and implemented. This ECP will contain at least the following elements:

- A description of the tasks in the workplace that involve exposure to Respirable Crystalline Silica
- A description of the engineering controls, work practices, and respiratory protection used to limit worker exposure to Respirable Crystalline Silica for each task
- A description of the housekeeping measures used to limit worker exposure to Respirable Crystalline Silica
- A description of the procedures used to restrict access to work areas, when necessary, to minimize the number of workers exposed to Respirable Crystalline Silica and their level of exposure, including exposures generated by other employers or sole proprietors

The written ECP will designate a Competent Person to make frequent and regular inspections of job sites, materials, and equipment to ensure the ECP is implemented.

The written ECP will be reviewed at least annually to evaluate the effectiveness of it and update it as necessary. Having said this, ECP's are project specific, and most project durations do not exceed a year. The written ECP will be readily available for examination and copying, upon request, to each worker covered by this program and/or ECP, their designated representatives, and OSHA.

Medical Surveillance

Medical surveillance will be made available for each worker who will be required to use a respirator for 30 or more days per year due to their Respirable Crystalline Silica exposure. Medical surveillance (i.e., medical examinations and procedures) will be performed by a PLHCP and provided at no cost to the worker at a reasonable time and place.

AMS will make available an initial (baseline) medical examination within 30 days after initial assignment, unless the worker has received a medical examination that meets the requirements of the OSHA Respirable Crystalline Silica Construction Standard within the last three years. The examination shall consist of:

- A medical and work history, with emphasis on past, present, and anticipated exposure to Respirable Crystalline Silica, dust, and other agents affecting the respiratory system in addition to any history of respiratory system dysfunction, including signs and symptoms of respiratory disease (e.g., shortness of breath, cough, wheezing), history of tuberculosis, and smoking status and history
- A physical examination with special emphasis on the respiratory system
- A chest X-ray (a single postero-anterior radiographic projection or radiograph of the chest at full inspiration recorded on either film [no less than 14 x 17 inches and no more than 16 x 17 inches] or digital radiography systems) interpreted and classified according to the International Labor Office (ILO) International Classification of Radiographs of Pneumoconiosis by a NIOSH-certified B Reader
- A pulmonary function test to include forced vital capacity (FVC) and forced expiratory volume in one second (FEV1) and FEV1/FVC ratio, administered by a spirometry technician with a current certificate from a NIOSH-approved spirometry course
- Testing for latent tuberculosis infection
- Any other tests deemed appropriate by the PLHCP

AMS will make available medical examinations that include the aforementioned procedures (except testing for latent tuberculosis infection) at least every three years. If recommended by the PLHCP, periodic examinations can be more frequently than every three years.

AMS will ensure that the examining PLHCP has a copy of the OSHA Respirable Crystalline Silica Construction Standard, this program, and the following information:

- A description of the worker's former, current, and anticipated duties as they relate to the worker's occupational exposure to Respirable Crystalline Silica
- The worker's former, current, and anticipated levels of occupational exposure to Respirable Crystalline Silica
- A description of any PPE used or to be used by the worker, including when and for how long the worker has used or will use that equipment
- Information from records of employment-related medical examinations previously provided to the worker and currently within the control of AMS

AMS will ensure that the PLHCP explains to the worker the results of the medical examination and provides each worker with a written medical report within 30 days of each medical examination performed. The written report shall contain:

- A statement indicating the results of the medical examination, including any medical condition(s) that would place the worker at increased risk of material impairment to health from exposure to Respirable Crystalline Silica and any medical conditions that require further evaluation or treatment
- Any recommended limitations on the worker's use of respirators
- Any recommended limitations on the worker's exposure to Respirable Crystalline Silica
- A statement that the worker should be examined by a Specialist if the chest X-ray is classified as 1/0 or higher by the B Reader, or if referral to a Specialist is otherwise deemed appropriate by the PLHCP

AMS will also obtain a written medical opinion from the PLHCP within 30 days of the medical examination. The written opinion shall contain only the following in order to protect the worker's privacy:

- The date of the examination
- A statement that the examination has met the requirements of the OSHA Respirable Crystalline Silica Construction Standard
- Any recommended limitations on the worker's use of respirators

If the worker provides written authorization, the written opinion shall also contain either or both of the following:

- Any recommended limitations on the worker's exposure to Respirable Crystalline Silica
- A statement that the worker should be examined by a Specialist if the chest X-ray is classified as 1/0 or higher by the B Reader, or if referral to a Specialist is otherwise deemed appropriate by the PLHCP

If the PLHCP's written medical opinion indicates that a worker should be examined by a Specialist, AMS will make available a medical examination by a Specialist within 30 days after receiving the PLHCP's written opinion. AMS will ensure that the examining Specialist is provided with all the information that the employer is obligated to provide to the PLHCP.

AMS will ensure that the Specialist explains to the worker the results of the medical examination and provides each worker with a written medical report within 30 days of the examination. The written report will contain:

- A statement indicating the results of the medical examination, including any medical condition(s) that would place the worker at increased risk of material impairment to health from exposure to Respirable Crystalline Silica and any medical conditions that require further evaluation or treatment

- Any recommended limitations on the worker's use of respirators
- Any recommended limitations on the worker's exposure to respirable crystalline Silica

In addition, AMS will obtain a written opinion from the Specialist within 30 days of the medical examination. The written opinion shall contain the following:

- The date of the examination
- Any recommended limitations on the worker's use of respirators
- If the worker provides written authorization, the written opinion shall also contain any recommended limitations on the worker's exposure to Respirable Crystalline Silica

Hazard Communication

AMS will include Respirable Crystalline Silica in AMS's Hazard Communication Program established to comply with the OSHA Hazard Communication Standard (29 CFR 1910.1200).

AMS will ensure that each worker has access to labels on containers of Crystalline Silica and those containers respective Safety Data Sheets (SDS's).

All workers will be trained in accordance with the provisions of the OSHA Hazard Communication Standard and the Training Section of this program. This training will cover concerns relating to cancer, lung effects, immune system effects, and kidney effects.

AMS will ensure that each worker with the potential to be exposed at or above the Action Level for Respirable Crystalline Silica can demonstrate knowledge and understanding of at least the following:

- The health hazards associated with exposure to Respirable Crystalline Silica
- Specific tasks in the workplace that could result in exposure to Respirable Crystalline Silica
- Specific measures AMS has implemented to protect workers from exposure to Respirable Crystalline Silica, including engineering controls, work practices, and respirators to be used
- The contents of the OSHA Respirable Crystalline Silica Construction Standard
- The identity of the Competent Person designated by AMS
- The purpose and a description of AMS's Medical Surveillance Program

AMS will make a copy of the OSHA Respirable Crystalline Silica Construction Standard readily available without cost to any worker who requests it.

Recordkeeping

AMS will make and maintain an accurate record of all exposure measurements taken to assess worker exposure to Respirable Crystalline Silica. This record will include at least the following information:

- The date of measurement for each sample taken
- The task monitored
- Sampling and analytical methods used
- Number, duration, and results of samples taken
- Identity of the laboratory that performed the analysis
- Type of personal protective equipment (PPE), such as respirators, worn by the workers monitored
- Name, social security number, and job classification of all workers represented by the monitoring, indicating which workers were monitored

AMS will ensure that exposure records are maintained and made available in accordance with 29 CFR 1910.1020. Exposure records will be kept for at least 30 years.

The employer shall make and maintain an accurate record of all objective data relied upon to comply with the requirements of the OSHA Respirable Crystalline Silica Construction Standard. This record shall include at least the following information:

- The Crystalline Silica-containing material in question
- The source of the objective data
- The testing protocol and results of testing
- A description of the process, task, or activity on which the objective data were based
- Other data relevant to the process, task, activity, material, or exposures on which the objective data were based

AMS will ensure that objective data are maintained and made available in accordance with 29 CFR 1910.1020. Objective data records will be kept for at least 30 years.

AMS will make and maintain an accurate record for each worker enrolled in the Medical Surveillance portion of this program. The record shall include the following information about the worker:

- Name and social security number
- A copy of the PLHCPs' and/or Specialists' written medical opinions
- A copy of the information provided to the PLHCPs and Specialists

AMS will ensure that medical records are maintained and made available in accordance with 29 CFR 1910.1020. Medical records will be kept under lock and key for at least the duration of employment plus 30 years. It is necessary to keep these records for extended periods because Silica-related diseases such as cancer

often cannot be detected until several decades after exposure. However, if a worker works for an employer for less than one year, the employer does not have to keep the medical records after employment ends if the employer gives those records to the worker.

PROGRAM EVALUATION

This program will be reviewed and evaluated on an annual basis by the Safety Department unless changes to operations, the OSHA Respirable Crystalline Silica Construction Standard (29 CFR 1926.1153), or another applicable OSHA Standard require an immediate re-validation of this program.

PURPOSE

The purpose of this program is to set forth procedures for the safe use of electrical equipment, tools, and to comply with NFPA 70E requirements. Qualified workers who perform electrical activities in or around arc flash must adhere to the requirements of this program.

SCOPE

This program applies to all ALLEN MECHANICAL SERVICES-AMS, hereafter referred to as "AMS", workers. When work is performed on a non-owned or operated site, the operator's program shall take precedence, however, this document covers AMS workers and contractors and shall be used on owned premises, or when an operator's program doesn't exist or is less stringent.

AMS shall advise the host employer of:

- Any unique hazards presented by the contract employer's work,
- Any unanticipated hazards found during work by AMS that the host employer did not mention, and
- The measures the company took to correct any hazards reported by the host employer to prevent such hazards from recurring in the future.

RESPONSIBILITIES

Managers/Supervisor

The HSE Manager or delegate will develop electrical safety programs and procedures in accordance with OSHA requirements and/or as indicated by events and circumstances.

Operations Managers and Supervisors are responsible for ensuring that only qualified workers and or qualified contractors perform electrical repairs or installations. Unqualified persons shall not be permitted to enter spaces that are required to be accessible to qualified workers only unless the electric conductors and equipment involved are in a safe working condition.

Operations Managers and Supervisors shall ensure a documented job briefing is held before starting each job and will include all workers involved. The briefing will cover hazards associated with the job, work procedures involved, special precautions, energy source controls and Personal Protective Equipment (PPE) requirements.

Operations Managers are also responsible for ensuring all applicable electrical safety programs are implemented and maintained at their locations.

Workers are responsible to use electrical equipment, tools, and appliances according to this program, for attending required training sessions when directed to do so and to report unsafe conditions to their supervisor immediately.

Only qualified workers may work on electric circuit parts or equipment that has not been de-energized. Such workers shall be made familiar with the use of special precautionary techniques, PPE, insulating and shielding materials and insulated tools. Prior to any work being done within the Limited Approach Boundary a hazard risk analysis shall be performed. The analysis shall contain event severity, frequency, probability, and avoidance to determine the level of safe practices employed.

PROCEDURES

Limited Approach Boundary

The limited approach boundary is the distance from an exposed live part within which a shock hazard exists. It is a shock protection boundary intended to define the approach limit for unqualified employees and to eliminate the risk of contact with an exposed energized electrical conductor.

When workers are closer than this minimum distance, special considerations are necessary for protection. Any worker within the limited approach boundary of exposed energized circuit conductors or circuit parts can do so only if an energized work permit has been completed and authorized. If an unqualified employee is required to work within the limited approach boundary, the employee must be directly and continuously supervised by a qualified person.

Prior to any work being done within the Limited Approach Boundary a hazard risk analysis shall be performed. The analysis shall contain event severity, frequency, probability, and avoidance to determine the level of safe practices employed. See Appendix I

Restricted Approach Boundary

An approach limit at a distance from an exposed energized electrical conductor or circuit part within which there is an increased likelihood of electric shock, due to electrical arc-over combined with inadvertent movement, for personnel working near the energized electrical conductor or circuit part.

The restricted approach boundary is a shock protection boundary that is not related to arc flash or incident energy. It is the approach limit for qualified employees. Qualified employees should have the knowledge and ability to avoid unexpected contact with an exposed energized conductor. If it is necessary for a qualified employee to cross the restricted approach boundary, the employee must be protected from unexpected contact with the conductors that are energized and exposed.

No qualified person shall approach or take any conductive object closer to exposed energized electrical conductors or circuit parts than the restricted approach boundary set forth in Table 130.4(E)(a) and Table 130.4(E)(b), unless one of the following conditions applies:

(1) The qualified person is insulated or guarded from energized electrical conductors or circuit parts operating at 50 volts or more. Insulating gloves and sleeves are considered insulation only with regard to the energized parts upon which work is performed.
(2) The energized electrical conductors or circuit parts are insulated from the qualified person and from any other conductive object at a different potential.

Arc Flash Boundary

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

- Use PPE appropriate for working near exposed live parts and rated for the voltage and energy level involved.
- For systems of 600 volts and less, the flash protection boundary is 4 feet, based on an available bolted fault current of 50 kA and a clearing time of 6 cycles for the circuit breaker to act, or any combination of fault currents and clearing times not exceeding 300 kA cycles.
- When working on de-energized parts and inside the flash protection boundary for nearby live exposed parts - If the parts cannot be de-energized, use barriers such as insulted blankets to protect against accidental contact or wear proper PPE.

See Appendix II – Arc Flash PPE Categories in

NFPA 70E Arc Flash Hazard Analysis

An arc flash hazard analysis includes the following:

- Collect data on the facility's power distribution system.
    - Arrangement of components on a one-line drawing with nameplate specifications of every device.
    - Lengths and cross-section area of all cables.
- Contact the electric utility for information including the minimum and maximum fault currents that can be expected at the entrance to the facility.
- Conduct a short circuit analysis followed by a coordination study is performed.
- Feed the resultant data into the NFPA 70E equations.

- These equations produce the necessary flash protection boundary distances and incident energy to determine the minimum PPE requirement.
- The flash protection boundary is the distance at which PPE is needed to prevent incurable burns (2nd degree or worse) if an arc flash occurs. (It is still possible to suffer 1st or 2nd degree burns.)

    - For systems of 600 volts and less, the flash protection boundary is 4 feet, based on an available bolted fault current of 50 kA (kiloamps) and a clearing time of 6 cycles (0.1 seconds) for the circuit breaker to act, or any combination of fault currents and clearing times not exceeding 300 kA cycles (5000 ampere seconds).

When working on de-energized the parts, but still inside the flash protection boundary for nearby live exposed parts:

- If the parts cannot be de-energized, barriers such as insulated blankets must be used to protect against accidental contact or PPE must be worn.
- Workers shall not reach blindly into areas that might contain exposed live parts.
- Workers shall not enter spaces containing live parts unless illumination is provided that allows the work to be performed safely.
- Conductive articles of jewelry and clothing (such as watchbands, bracelets, rings, key chains, necklaces, metalized aprons, cloth with conductive thread, metal headgear, or metal frame glasses) shall not be worn where they present an electrical contact hazard with exposed live parts.
- Conductive materials, tools, and equipment that are in contact with any part of a worker's body shall be handled in a manner that prevents accidental contact with live parts. Such materials and equipment include but are not limited to long conductive objects such as ducts, pipes, tubes, conductive hose and rope, metal-lined rules and scales, steel tapes, pulling lines, metal scaffold parts, structural members, and chains.
- When a worker works in a confined space or enclosed spaces (such as a manhole or vault) that contains exposed live parts, the worker shall use protective shields, barriers or insulating materials as necessary to avoid contact with these parts. Doors, hinged panels, and the like shall be secured to prevent them from swinging into workers. Refer to the confined space entry program.

Inspections

- Electrical equipment, tools, and appliances must be inspected prior to each use.
- The use of a hard fixed GFCI or a portable GFCI adapter shall be used with all portable electric hand tools and electric extension cords.

- Faulty equipment, tools, or appliances shall be removed from service immediately and tagged “Out of Service”, dated, and signed by the worker applying the tag. When test instruments are used for the testing for the absence of voltage on conductors or circuit parts operating at 50 volts or more, the operation of the test instrument shall be verified before and after an absence of voltage test is performed.

Equipment

Test instruments, equipment, and their accessories shall meet the requirements of ANSI/ISA-61010-1-Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use Part 1 General Requirements, for rating and design requirements for voltage measurement and test instruments intended for use on electrical systems 1000 Volts and below.
When test instruments are used for the testing for the absence of voltage on conductors or circuit parts operating at 50 volts or more, the operation of the test instrument shall be verified before and after an absence of voltage test is performed.

Personal Protective Equipment

All insulating PPE must be inspected before each day's use and immediately following any incident that can reasonably be suspected of having caused damage. Insulating gloves shall be given an air test, along with the inspection. Maximum test intervals for rubber insulating personal protective equipment shall include:

- Blankets-before first issue/every 12 months thereafter
- Gloves-before first issue and every 6 months
- Sleeves before first issue and every 12 months
- Covers and line hose shall be testing if insulating value is suspect.

Energized Electrical Work Permit

Work on energized electrical conductors or circuit parts that are not placed in an electrically safe work condition shall be considered energized electrical work and shall be performed by written permit only.

Lighting

Workers shall not enter spaces containing electrical hazards unless illumination is provided that enables the workers to perform the work safely. Where lack of illumination or an obstruction precludes observation of the work to be performed workers shall not perform any task within the Limited Approach Boundary of energized electrical conductors or circuit parts operating at 50 volts or more or where an electrical hazard exists.

Extension Cords (Flexible Cords)

- Use only three-wire, grounded, extension cords and cables that conform to a hard service rating of 14 amperes or higher, and grounding of the tools or equipment being supplied.
- Only commercial or industrial rated-grounded extension cords may be used in shops and outdoors.
- Cords for use other than indoor appliances must have a rating of at least 14 amps.
- Cords must have suitable strain relief provisions at the plug the receptacle ends.
- Work lamps (drop light) used to power electrical tools must have a 3 wire, grounded outlet, unless powering insulated tools.
- Adapters that allow three wire, grounded prongs, connected to two wire non-grounded outlets are strictly prohibited.
- Cords must have a service rating for hard or extra-hard service and have S, AJ, ST, SO, SJO, SJT, STO, or SJTO printed on the cord.
- Cords may not be run through doorways, under mats or carpets, across walkways or aisles, concealed behind walls, ceilings, floors, or run through holes in walls, or anywhere where they can become a tripping hazard.
- High current equipment or appliances should be plugged directly into a wall outlet whenever possible.
- All extension cords shall be plugged into one of the following:

    - A GFCI outlet.
    - A GFCI built into the cord.
    - A GFCI adapter used between the wall outlet and cord plug.

- All extension cords and or electrical cords shall be inspected daily or before each use, for breaks, plug condition and ground lugs, possible internal breaks, and any other damage. If damage is found, the extension cord or electrical cord shall be removed from service and repaired or replaced.
- Extension cords shall not be used on compressor skid to operate heat tapes or any other type of equipment on a temporary basis. Heat tapes or other equipment shall be hard wired per applicable electrical codes.

Outlets

- Outlets connected to circuits with different voltages must use a design such that the attachment plugs on the circuits are not interchangeable.

Multiple Outlet Boxes

- Multiple outlet boxes must be plugged into a wall receptacle.

- Multiple outlet boxes must not be used to provide power to microwave ovens, toasters, space heaters, hot plates, coffeepots, or other high-current loads.

Double Insulated Tools

- Double insulated tools must have the factory label intact indicating the tool has been approved to be used without a three-wire grounded supply cord connection.
- Double insulated tools must not be altered in any way, which would negate the factory rating.

Switches, circuit breakers, and disconnects

- All electrical equipment and tools must have an on and off switch and may not be turned on or off by plugging or unplugging the supply cord at the power outlet.
- Circuit breaker panel boxes and disconnects must be labeled with the voltage rating.
- Each breaker within a breaker panel must be labeled for the service it provides.
- Disconnect switches providing power for individual equipment must be labelled accordingly.

Ladders

- Only approved, non-conductive ladders may be used when working near or with electrical equipment, which includes changing light bulbs.
- Ladders must be either constructed of wood, fiberglass, or have non-conductive side rails.
- Wood ladders should not be painted, which can hide defects, except with clear lacquer.
- When using ladders, they shall be free from any moisture, oils, and grease.
- Confined or Enclosed Workspaces

Energized and Overhead High Voltage Power Lines & Equipment

- A minimum clearance of 10 feet from high voltage lines must be maintained when operating vehicular and mechanical equipment such as forklifts, cranes, winch trucks, and other similar equipment.
- When possible, power lines shall be de-energized and grounded or other protective measures shall be provided before work is started.
- The minimum approach distance to energized high power voltage lines for unqualified workers is 10 feet.

Minimum approach distance for qualified workers shall be followed per 29 CFR 1910.333(c)(3)(i) Qualified – Table S5 Selection and Use of Work Practices - Approach Distances for Qualified Workers – Alternating Current).

Confined or Enclosed Workspaces

- When a worker works in a confined or enclosed space that contains exposed energized parts, the worker shall isolate the energy source and turn off the source and lock and tag out the energy source (Only qualified electricians can work on an exposed energy source).
- Protective shields, protective barriers or insulating materials as necessary should be provided.

Enclosures, Breaker Panels, and Distribution Rooms

- A clear working space must be maintained in the front, back and on each side of all electrical enclosures and around electrical equipment for safe operation and to permit access for maintenance and alteration.
- A minimum of two-foot working floor space in front of panels and enclosures shall be painted yellow.
- Workers may not enter spaces containing exposed energized parts unless illumination is provided that enables the workers to work safely.
- Housekeeping in distribution rooms must receive high priority to provide a safe working and walking area in front of panels and to keep combustible materials to the minimum required to perform maintenance operations.
- All enclosures and distribution rooms must have “Danger: High Voltage – Authorized Personnel Only” posted on the front panel and on entrance doors.
- Flammable materials are strictly prohibited inside distribution rooms (Boxes, rags, cleaning fluids, etc.)

Lock Out/Tag Out

- No work shall be performed on (or near enough to them for workers to be exposed due to the dangers of tools or other equipment coming into contact with the live parts) live parts and the hazards they present.
- If any worker is exposed to contact with parts of fixed electric equipment or circuits which have been deenergized, the circuits energizing the parts shall be locked out or tagged or both.
- Conductors and parts of electrical equipment that have been de-energized but have not been locked or tagged out shall be treated as live parts.
- Per company policy all electrical will be outsourced and performed only by qualified and licensed electrical contractors who are familiar with the use of special precautionary techniques, PPE, insulating and shielding materials and insulated tools. Any equipment being made ready for maintenance will be locked out using AMS’s Control of Hazardous Energy – Lock Out/Tag Out Program. Lock outs are performed by the HSE Manager, Shop Foreman, or Branch Manager. Designated workers in some branches may be trained by local management to lock out

equipment. If live sources are to be worked, it will only be performed with the knowledge of local management. Only certified electricians may work on electric circuit parts or equipment.

- Only authorized personnel may perform lock out/tag out work on electrical equipment and will follow Company's Control of Hazardous Energy – Lock out/Tag Out Program.
- Authorized personnel will be trained in lock out/tag out procedures.
- Affected personnel will be notified when lock out/tag out activities are being performed in their work area.

Contractors

- Only approved, certified, electrical contractors may perform construction and service work on Company or client property.
- It is the Manager/Supervisors responsibility to verify the contractor's certification.

Fire Extinguishers

- Approved fire extinguishers must be provided near electrical breaker panels and distribution centers.
- Water type extinguishers shall not be located closer than 50 feet from electrical equipment.

Electric Shock-CPR:

- If someone is discovered that has received an electric shock and is unconscious, first check to see if their body is in contact with an electrical circuit. Do not touch a person until you are sure there is no contact with an electrical circuit.
- When it is safe to make contact with the victim, begin CPR if the person's heart has stopped or they are not breathing.
- Call for help immediately.

Electric Welders

- A disconnecting means shall be provided in the supply circuit for each motor-generator arc welder, and for each AC transformer and DC rectifier arc welder which is not equipped with a disconnect mounted as an integral part of the welder.
- A switch or circuit breaker shall be provided by which each resistance welder and its control equipment can be isolated from the supply circuit. The ampere rating of this disconnecting means may not be less than the supply conductor ampacity.

Equipment Grounding

- All gas compressors, air compressors, separators, vessels, etc. shall be grounded by means of using a lug and ground strap, nominal in size to a ½" bolt or larger, attached to a ground rod six feet or longer.
- Equipment bonding jumpers shall be of copper or other corrosion-resistance material.
- The transfer of hazardous or flammable material from a metal or plastic container with a flash point of 100 degrees F or less shall have a ground strap from the container and attached to the skid or a ground rod placed in the ground.

Training

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

Workers shall be trained in the skills and techniques to distinguish exposed energized electrical conductors and circuit parts from other parts of electrical equipment, to determine the nominal voltage of exposed energized electrical conductors and circuit parts, the approach distances specified in Table 130.2 (below), and the decision making process necessary to determine the degree and extent of the hazard and the personal protective equipment and job planning necessary to perform the task safely.

APPENDIX I
Limited Approach Boundary

Nominal system voltage range, phase to phase	Exposed movable conductor	Exposed fixed-circuit part	Restricted approach boundary (allowing for accidental movement)	Prohibited approach boundary
0 to 50 volts	Not specified	Not specified	Not specified	Not specified
51 to 300 volts	10 ft. 0 in.	3 ft. 6 in.	Avoid contact	Avoid contact
301 to 750 volts	10 ft. 0 in.	3 ft. 6 in.	1 ft. 0 in.	0 ft. 1 in.
751 volts to 15 KV	10 ft. 0 in.	5 ft. 0 in.	2 ft. 2 in.	0 ft. 7 in.
15.1 kV to 36 KV	10 ft. 0 in.	6 ft. 0 in	2 ft. 7 in.	0 ft. 10 in.
36.1 KV to 46 kV	10 ft. 0 in.	8 ft. 0 in	2 ft 9 in.	1 ft. 5 in.
46.1 KV to 72.5 KV	10 ft. 0 in.	8 ft. 0 in.	3 ft 2 in.	2 ft. 1 in.
72.6 KV to 121 KV	10 ft. 8 in.	8 ft. 0 in.	3 ft. 3 in.	2 ft. 8 in.
138 KV to 145 KV	11 ft 0 in	10 ft. 0 in.	3 ft. 7 in	3 ft. 1 in.
161 KV to 169 KV	11 ft 8 in.	11 ft. 8 in.	4 ft. 0 in.	3 ft. 6 in.
230 KV to 242 KV	13 ft. 0 in.	13 ft. 0 in.	5 ft. 3 in.	4 ft. 9 in.
345 KV to 262 KV	15 ft. 4 in	15 ft. 4 in.	8ft. 6 in.	8 ft. 0 in.

APPENDIX II

Arc Flash PPE Categories in NFPA 70E

PPE Category 1: Minimum Arc Rating 4 cal/cm2

- **Required clothing:** Long sleeve shirt (or jacket) and pants or AR coverall with minimum arc rating of 4 cal/cm2
- **Required face and head protection:** Face shield (with "wrap around" guarding…i.e., balaclava) or arc flash suit hood
- **As needed:** Arc rated jacket, rainwear, parka, hard hat liner

In addition to AR clothing, the following products are required or to be used as needed:

- **Required hand protection:** Heavy-duty leather gloves
- **Additional PPE:** Hard hat, eye protection (glasses, goggles), hearing protection
- **Footwear:** Leather footwear (as needed)

PPE Category 2: Minimum Arc Rating 8 cal/cm2 - **workers need the following clothing:**

- **Required clothing:** Arc rated long sleeve shirt and pants or arc rated coverall with minimum arc rating of 8 cal/cm2
- **Required AR face and head protection:** Arc rated arc flash suit hood or AR face shield, sock hood/balaclava with minimum arc rating of 8 cal/cm2
- **As needed:** Arc rated jacket, rainwear, parka, hard hat liner

In addition to AR clothing, the following products are required or to be used as needed:

- **Required hand protection:** Heavy-duty leather gloves
- **Additional PPE:** Hard hat, eye protection (glasses, goggles), hearing protection
- **Footwear:** Leather footwear (as needed)

PPE Category 3: Minimum Arc Rating 25 cal/cm2

PPE Category 3 and 4 require additional layers of PPE. Arc flash suit hoods are required and rubber insulating gloves & leather protectors or arc rated gloves are required. For PPE Category 3; workers need the following clothing:

- **Required clothing:** Arc rated flash suit jacket and AR pant or AR coverall with minimum arc rating of 25 cal/cm2
- **Required AR face and head protection:** Arc rated flash suit hood with minimum arc rating of 25 cal/cm2

- Required AR hand protection: Rubber insulating gloves & leather protectors or arc rated gloves
- **As needed:** Arc rated jacket, rainwear, parka, hard hat liner

In addition to AR clothing, the following PPE is required:

- **Additional PPE:** Hard hat, eye protection (glasses, goggles), hearing protection (inserts), leather footwear

PPE Category 4: Minimum Arc Rating 40 cal/cm2

The final PPE category requires AR clothing with a minimum rating of 40 cal/cm2.

- **Required clothing:** Arc rated flash suit jacket and AR pant or AR coverall with minimum arc rating of 40 cal/cm2
- **Required AR face and head protection:** Arc rated flash suit hood with minimum arc rating of 40 cal/cm2
- **Required AR hand protection:** Rubber insulating gloves & leather protectors or arc rated gloves
- **As needed:** Arc rated jacket, rainwear, parka, hard hat liner

In addition to AR clothing, the following PPE is required:

- **Additional NFPA 70E PPE requirements:** Hard hat, eye protection (glasses, goggles), hearing protection (inserts), leather footwear.

PURPOSE

ALLEN MECHANICAL SERVICES-AMS, hereafter referred to as "AMS", has developed and implemented this written safety and health program for workers involved in hazardous waste operations.

This program is established for the purposes of evaluation, identification, and control of safety and health hazards to workers when confronted with hazardous wastes, and to established procedures for emergency response to hazardous waste situations and operations.

The written safety and health program includes the organizational structure for

response. The plan also establishes requirements for:

- A site-specific comprehensive work plan
- Site-specific safety and health plan
- Confirmation that safety and health training program components are provided
- A medical surveillance program appropriate to work situations and potential exposures
- AMS standard operating procedures for safety and health; and
- Associations and coordination procedures as required between AMS safety and health programs and site-specific work and/or site situations

Safety requirements for Contractors and Subcontractors. When AMS uses a contractor or subcontractor(s) to perform work at a hazardous waste job site or to perform hazardous waste operations, such non-company personnel shall be told in advance of site emergency response procedures and any known hazards or potential hazards that could result in fire, explosion, health, safety, or other such exposures.

AMS written safety and health program, and any site-specific programs, work plans or support information relating to the work, shall be made available to any such contractor or subcontractor. This information also shall be made available to workers or their designated representative(s), and to OSHA other government personnel with regulatory authority over the job site or work operations.

RESPONSIBILITIES

This program shall be administered in accordance with the following specific chain of command, as well as the following designation of the program responsibilities to supervisors and workers.

- The site superintendent has the responsibility and authority to direct all hazardous waste operations.
- The safety coordinator or designated site safety representative has the responsibility and authority to develop and implement the site safety and health plan and verify compliance.

- Other workers and non-company personnel shall be assigned specific responsibilities and tasks to be performed as part of hazardous waste site and emergency response operations.

The site-specific organizational structure shall be reviewed and updated as required to ensure that waste site work and safety plans are kept current.

This program's comprehensive work plan will explain tasks and objectives, as well as resources required to complete the project in accordance with the goals and objectives.

The work plan will specifically list and explain planned clean-up activities and AMS standard operating procedures for performance of this kind of work. This includes defining specific tasks and objectives, and how these tasks and objectives will be accomplished.

The work plan will explain workers needs as anticipated through project planning and establish procedures and processes for training as required performing tasks safely and in accordance with regulatory requirements. This includes providing information programs as required for the work.

The work plan also shall establish and implement a medical surveillance program as required for the work being performed.

PROCEDURES

Site-specific safety and health plan

AMS has developed and implemented a written safety and health program for workers involved in hazardous waste operations that shall be available for inspection by workers, their representatives and OSHA personnel.

The program is designed to identify, evaluate, and control safety and health hazards in their facilities for the purpose of worker protection, to provide for emergency response meeting AMS and regulatory requirements and to address as appropriate site analysis, engineering controls, maximum exposure limits, hazardous waste handling procedures and uses of new technologies.

The site safety and health plan shall be maintained on the job site. It shall identify and establish procedures for protecting workers from safety and health hazards identified at each phase of site operations.

AMS written Hazard Communication Program shall be used to meet the requirements of 29 CFR 1910.1200 as part of AMS's overall safety and health program implementation.

AMS site-specific safety and health plan will include the following components, as well as others when required by the work:

- Hazard analysis for each site task and operation contained in the work plan.
- Worker training assignments in accordance with program and regulatory requirements.
- Designation of personal protective equipment required for use by workers based on job hazard analysis for specific tasks and operations.
- Requirements of the medical surveillance program.
- Information about frequency and types of air monitoring and personnel monitoring, as well as any environmental sampling techniques and instrumentation that will be utilized. This shall include methods of maintenance and protocols for the calibration of monitoring and sampling equipment.
- Site control measures as explained in the project's site control program.
- Requirements and procedures for decontamination.
- Emergency response plan and procedures, including specific personal protective equipment and other equipment anticipated to be needed for emergencies.
- Safety procedures for entering any confined spaces as authorized by the site superintendent. Any confined space entries shall be performed in accordance with AMS's Confined Space Entry Program.
- The site-specific plan and program components for spill containment at the job site.
- A pre-entry briefing shall be held prior to initiating any site activity, and at such other times as necessary to ensure that workers are kept informed about site safety and health plan components. This information shall be updated and communicated as needed to keep workers aware of current situations.
- Inspections shall be conducted by the safety coordinator or the designated site safety representative or site superintendent. AMS also may utilize qualified third parties to conduct these and/or confirmation inspections. Any hazards, unsafe situations or safety deficiencies discovered by inspection shall be reported to the site superintendent and corrected.

Training

General site workers engaged in hazardous substance removal or other activities which expose or potentially expose workers to hazardous substances and health hazards shall receive a minimum of 40 hours of instruction off the site, and a minimum of three days actual field experience under the direct supervision of a trained experienced supervisor.

First Responder Awareness Level

First responders at the awareness level are individuals who are likely to witness or discover a hazardous substance release and who have been trained to initiate an emergency response sequence by notifying the proper authorities of the release.

They would take no further action beyond notifying the authorities of the release. First responders at the awareness level shall have sufficient training or have had sufficient experience to objectively demonstrate competency in the following areas:

- An understanding of what hazardous substances are, and the risks associated with them in an incident.
- An understanding of the potential outcomes associated with an emergency created when hazardous substances are present.
- The ability to recognize the presence of hazardous substances in an emergency.
- The ability to identify hazardous substances, if possible.
- An understanding of the role of the first responder awareness individual in AMS's emergency response plan including site security and control and the
- U.S. Department of Transportation's Emergency Response Guidebook.
- The ability to realize the need for additional resources, and to make appropriate notifications to the communication center.

First Responder Operations Level

First responders at the operations level are individuals who respond to releases or potential releases of hazardous substances as part of the initial response to the site for the purpose of protecting nearby persons, property, or the environment from the effects of the release. They are trained to respond in a defensive fashion without trying to stop the release. Their function is to contain the release from a safe distance, keep it from spreading, and prevent exposures. First responders at the operational level shall have received at least eight hours of training or have had sufficient experience to objectively demonstrate competency in the following areas in addition to those listed for the awareness level and AMS shall so certify:

- Knowledge of the basic hazard and risk assessment techniques.
- Know how to select and use proper personal protective equipment provided to the first responder operational level.
- An understanding of basic hazardous materials terms.
- Know how to perform basic control, containment and/or confinement operations within the capabilities of the resources and personal protective equipment available with their unit.
- Know how to implement basic decontamination procedures.
- An understanding of the relevant standard operating procedures and termination procedures.

Hazardous Materials Technician

Hazardous materials technicians are individuals who respond to releases or potential releases for the purpose of stopping the release. They assume a more aggressive role than a first responder at the operations level in that they will approach the point of release in order to plug, patch or otherwise stop the release of a hazardous substance. Hazardous materials technicians shall have received at least 24 hours of training equal to the first responder operations level and in addition, have competency in the following areas and AMS shall so certify:

- Know how to implement AMS's emergency response plan.
- Know the classification, identification, and verification of known and unknown materials by using field survey instruments and equipment.
- Be able to function within an assigned role in the Incident Command System.
- Know how to select and use proper specialized chemical personal protective equipment provided to the hazardous materials technician.
- Understand hazard and risk assessment techniques.
- Be able to perform advance control, containment, and/or confinement operations within the capabilities of the resources and personal protective equipment available with the unit.
- Understand and implement decontamination procedures.
- Understand termination procedures.
- Understand basic chemical and toxicological terminology and behavior.

Hazardous Materials Specialist

Hazardous materials specialists are individuals who respond with and provide support to hazardous materials technicians. Their duties parallel those of the hazardous materials technician; however, those duties require a more directed or specific knowledge of the various substances they may be called upon to contain. The hazardous materials specialist would also act as the site liaison with Federal, state, local and other government authorities regarding site activities. Hazardous materials specialists shall have received at least 24 hours of training equal to the technician level and in addition have competency in the following areas and AMS shall so certify:

- Know how to implement the local emergency response plan.
- Understand classification, identification, and verification of known and unknown materials by using advanced survey instruments and equipment.
- Know the state emergency response plan.
- Be able to select and use proper specialized chemical personal protective equipment provided to the hazardous materials specialist.
- Understand in-depth hazard and risk techniques.
- Be able to perform specialized control, containment, and/or confinement operations within the capabilities of the resources and personal protective equipment available.
- Be able to determine and implement decontamination procedures.
- Have the ability to develop a site safety and control plan.
- Understand chemical, radiological, and toxicological terminology and behavior.

On Scene Incident Commander

Incident commanders, who will assume control of the incident scene beyond the first responder awareness level, shall receive at least 24 hours of training equal to the first responder operations level and in addition have competency in the following areas and AMS shall so certify:

- Know and be able to implement AMS's incident command system.
- Know how to implement AMS's emergency response plan.
- Know and understand the hazards and risks associated with workers working in chemical protective clothing.
- Know how to implement the local emergency response plan.
- Know of the state emergency response plan and of the Federal Regional Response Team.
- Know and understand the importance of decontamination procedures.

Workers who are trained in accordance with the plan shall receive an annual refresher on or before the initial training date of expiration. A record of methods used must be kept.

Engineering Controls

Engineering controls, work practices, personal protective equipment, or a combination of these shall be implemented as required to protect workers from exposure to hazardous substances and safety and health hazards.

Engineering controls and work practices shall be instituted to reduce and maintain worker exposure to or below the permissible exposure limits for substances regulated by 29 CFR Part 1910, to the extent required by Subpart Z, except to the extent that such controls and practices are not feasible.

Engineering controls which may be feasible include the use of pressurized cabs or control booths on equipment, and/or the use of remotely operated material handling equipment. Work practices which may be feasible are removing all non-essential workers from potential exposure during opening of drums, wetting down dusty operations and locating workers upwind of possible hazards.

Whenever engineering controls and work practices are not feasible, or not required, any reasonable combination of engineering controls, work practices and PPE shall be used to reduce and maintain to or below the permissible exposure limits or dose limits for substances regulated by 29 CFR Part 1910, Subpart Z.

AMS shall not implement a schedule of worker rotation as a means of compliance with permissible exposure limits or dose limits except when there are no other feasible ways of complying with the airborne or dermal dose limits for ionizing radiation.

Monitoring Requirements and Procedures

Monitoring shall be performed where there may be a question of worker exposure to hazardous concentrations of hazardous substances in order to assure proper selection of engineering controls, work practices and personal protective equipment so that workers are not exposed to levels which exceed permissible exposure limits, or published exposure levels if there are no permissible exposure limits, for hazardous substances.

Air monitoring shall be used to identify and quantify airborne levels of hazardous substances and safety and health hazards to determine the appropriate level of worker protection needed on site.

Upon initial entry, representative air monitoring shall be conducted to identify any IDLH condition, exposure over permissible exposure limits or published exposure levels, exposure over a radioactive material's dose limits or other dangerous condition such as the presence of flammable atmospheres, oxygen-deficient environments.

Periodic monitoring shall be conducted when the possibility of an IDLH condition or flammable atmosphere has developed or when there is indication that exposures may have risen over permissible exposure limits or published exposure levels since prior monitoring. Situations where it shall be considered whether the possibility that exposures have risen are as follows:

- When work begins on a different portion of the site.
- When contaminants other than those previously identified are being handled.
- When a different type of operation is initiated (e.g., drum opening as opposed to exploratory well drilling.)
- When workers are handling leaking drums or containers or working in areas with obvious liquid contamination (e.g., a spill or lagoon.)
- Following the start of the actual clean-up phase of any hazardous waste operation (for example, when soil, surface water or containers are moved or disturbed), AMS shall monitor workers who are likely to have the highest exposures to any hazardous substances and health hazards that may be present above permissible exposure limits, or published exposure levels.
- This monitoring shall be performed using personal sampling frequently enough to characterize worker exposures.
- AMS may utilize a representative sampling approach by documenting that the workers and chemicals chosen for monitoring are based on the criteria stated in Item v) immediately above. If the workers likely to have the highest exposure are over permissible exposure limits or published exposure limits, then monitoring shall continue to determine all workers likely to be above those limits. AMS may utilize a representative sampling approach by documenting that the workers and chemicals chosen for monitoring are based on the criteria stated above.
- AMS shall develop and implement a program component to inform workers, contractors, and subcontractors (or their representative) engaged in hazardous waste operations

of the nature, level, and degree of exposure likely as a result of participation in such hazardous waste operations.

- Workers, contractors, and subcontractors working outside of the operations part of a site are not covered by this program.

Policies and Procedures for Decontamination

Procedures for all phases of decontamination shall be developed and implemented by AMS for each hazardous waste work location.

Decontamination procedures for the job site shall be communicated to workers and implemented before personnel or equipment enters areas where there is a potential for exposure to hazardous substances.

Site-specific standard operating procedures shall be developed and utilized to minimize worker contact with hazardous substances, or with equipment that has contacted hazardous substances.

All workers and personnel leaving a contaminated area shall be decontaminated in accordance with AMS and regulatory safety and health requirements. All contaminated clothing and equipment leaving a contaminated area shall be appropriately disposed of or decontaminated.

Decontamination procedures shall be monitored by the designated site safety representative and/or site superintendent, with ongoing review by the safety coordinator. This monitoring is intended to determine the effectiveness of decontamination procedures and practices. When such procedures or practices are found to be ineffective, appropriate steps shall be taken to correct any deficiencies.

Decontamination operations shall be performed in one or more areas that have been selected to minimize the exposure of uncontaminated workers or equipment to contaminated workers or equipment.

All equipment and solvents used for decontamination shall be decontaminated or disposed of properly.

Protective clothing and equipment shall be decontaminated, cleaned, laundered, maintained, or replaced as needed to maintain their effectiveness.

Workers whose non-impermeable clothing becomes wetted with hazardous substances shall immediately remove that clothing and proceed to shower. The clothing shall be disposed of or decontaminated before it is removed from the work zone.

Unauthorized workers shall not remove protective clothing or equipment from change rooms.

Commercial laundries or cleaning establishments that decontaminate protective clothing or equipment shall be informed of the potentially harmful effects of exposure to hazardous substances.

Where the decontamination procedure indicates a need for regular showers and change rooms outside of a contaminated area, they shall be provided and meet the requirements of 29 CFR 1910.141. If temperature conditions prevent the effective use of water, then other effective means for cleansing shall be provided and used.

Sanitation at Temporary Workplace

An adequate supply of potable water shall be provided on the site.

Portable containers used to dispense drinking water shall be capable of being tightly closed and equipped with a tap. Water shall not be dipped from containers.

Any container used to distribute drinking water shall be clearly marked as to the nature of its contents and not used for any other purpose.

Where single service cups (to be used but once) are supplied, both a sanitary container for the unused cups and a receptacle for disposing of the used cups shall be provided.

Outlets for non-potable water, such as water for firefighting purposes shall be identified to indicate clearly that the water is unsafe and is not to be used for drinking, washing, or cooking purposes.

There shall be no cross-connection, open or potential, between a system furnishing potable water and a system furnishing non-potable water.

Toilets shall be provided for workers according to Table H-120.2 in 1910.120(n)(3).

Under temporary field conditions, provisions shall be made to ensure not less than one toilet facility is available.

Hazardous waste sites, not provided with a sanitary sewer, shall be provided with the following toilet facilities unless prohibited by local codes:

- Chemical toilets
- Recirculation toilets
- Combustion toilets
- Flush toilets

These requirements for sanitation facilities shall not apply to mobile crews having transportation readily available to nearby toilet facilities.

Doors entering toilet facilities shall be provided with entrance locks controlled from inside the facility.

All food service facilities and operations for workers shall meet the applicable laws, ordinances, and regulations of the jurisdictions in which they are located.

When temporary sleeping quarters are provided, they shall be heated, ventilated, and lighted.

AMS shall provide adequate washing facilities for workers engaged in operations where hazardous substances may be harmful to workers. Such facilities shall be in near proximity to the worksite; in areas where exposures are below permissible exposure limits, and which are under the control of AMS; and shall be so equipped as to enable workers to remove hazardous substances from themselves.

When hazardous waste clean-up or removal operations commence on a site and the duration of the work will require six months or greater time to complete, AMS shall provide showers and change rooms for all workers exposed to hazardous substances and health hazards involved in hazardous waste clean-up or removal operations.

Showers shall be provided and shall meet the requirements of 29 CFR 1910.141(d)(3).

SAFETY ORIENTATION

Management and supervision will ensure each new employee participates in AMS's Health and Safety Orientation process and reviews all necessary site and project specific health and safety information.

The safety orientation must, at a minimum, include the following elements:

- Review of AMS's Health and Safety Policy
- Overview of applicable health and safety legislation including employee right to refuse unsafe work
- Overview of AMS Health and Safety program including:

    - Health and Safety responsibilities
    - Hazard Assessment, Analysis & Control
    - Company Rules & Safe Work Procedures
    - Disciplinary Policy
    - Drug & Alcohol Policy
    - Workplace Violence Policy
    - Personal Protection Equipment
    - Fire Protection & Fire Extinguisher
    - Training Policy
    - Safety Meetings
    - Incident Reporting
    - Emergency Response
    - Modified work
    - Workplace Inspections

- Site specific health & safety requirements
- Any additional regional/divisional health and safety requirements as deemed necessary by local management

There will be a verification/evaluation process to ensure the information has been clearly understood by the worker. This can include a written evaluation, oral evaluation, or work practice evaluation. This is an important phase with monitoring and mentoring the employees.

To ensure that all employees remain familiar with AMS's health and safety requirements, including any legislative changes or safety program updates and revisions, all employees will be required to participate in an annual health and safety orientation. This annual update review must be performed by a supervisor or competent designate. All orientation records must be formally documented and filed in the employee file.

AMS will ensure to monitor and mentor any new employee, a temporary employee or an employee who has changed job roles.

Worker Orientation Checklist

Employee		**Supervisor**	
	Jobsite/Project		
	Date	**Employee initial**	**Supervisor initial**
1.	2. Review and provide copy of company safety policy and program		
3.	4. Review Health and Safety Responsibilities & Right to refuse unsafe work		
5.	6. Company Rules & Safe Work Practices		
7.	8. Disciplinary Policy, Drug & Alcohol Policy and Workplace Violence Policy		
9.	10. Fire Protection & Fire Extinguisher Use		
11.	12. Training Policy		
13.	14. Requirements for Personal Protective Equipment		
15.	16. Incident reporting and investigation procedures		
17.	18. Location of: ▪ First aid ▪ Fire extinguishers ▪ Telephones ▪ Emergency numbers		
19.	20. Emergency procedures details		
21.	22. Location and details of specific project hazards		
23.	24. Location of tools handling and storage areas		
25.	26. Location of parking, lunch area, and toilets		
27.	28. Project telephone number and absentee reporting procedure		
29.	30. Name of health and safety representative and/ or joint health and safety committee members		
31.	32. Location of any hazardous substances and their SDSs, and confirmation of WHMIS training		

PURPOSE

To ensure the safety of workers/employees who are working alone. There may be situations where personnel sometimes work alone. Examples include:

- Staying late to complete a job that must be done before the next day's work
- Completing a task where there is only room for one worker
- Servicing equipment in a remote area
- Cleaning up scrap and debris when work is done for the day.

SCOPE

A person is “working alone,” when:

- He or she is on their own at work
- When they cannot be seen or heard by another person
- When emergency assistance is not readily available

The greatest risk in working alone is that no one is available to help a worker who may be injured, trapped, or unconscious. Even if co-workers realize that someone is missing, it may be difficult to locate an injured worker.

RESPONSIBILITIES

The supervisor shall ensure that any worker working alone is aware of real and potential hazards in the area. The worker should be trained in hazard recognition and in the procedures and equipment required to do the job safely. The supervisor must also ensure that:

- A method of checking in with the worker has been established
- Check-in intervals are clearly understood
- The designated contact person is aware of the work schedule
- Any communication equipment used is in good working order
- No obstructions or interference may block phone or radio communications.

PROCEDURES

Planning

- Inspect the jobsite for real and potential hazards and take whatever steps are required to safeguard workers.
- If any personal protective equipment or clothing is required in addition to a hard hat and safety boots, it should be provided, along with instructions on its proper use.
- All safety and work-related procedures should be reviewed with workers to ensure that each procedure is clearly understood. The procedures should also be spelled out in AMS's health and safety policy.
- In some situations, like confined spaces, regulations under the *Occupational Health and Safety Act* prohibit entry or work without another person standing by outside the area.

Communication

- Communication is crucial in accounting for personnel working alone. A system must be established where, at regular intervals, someone checks on the worker or the worker reports to a designated person. A check at the end of the work shift must be done.
- A procedure to follow in case the worker cannot be contacted, including provisions for emergency rescue.
- Where hazard exposure is high, intervals should be kept short.
- If a site telephone is involved, it must be clearly identified, conveniently located, and working properly. The number of the individual to be contacted must be clearly posted near or on the phone.
- Cellular phones or two-way radios can also provide effective communication. Test the units on- site to ensure that reception is reliable.

Employees Who Perform Hazardous Work

Employees who perform hazardous work alone, without routine interaction with other employees and the public may be unable to get immediate help.

The strategy is to control the hazards associated with the work.

The following prevention strategies are essential in reducing the risks associated with this type of working alone situation:

- **Safe Work Procedure** – Having written safe work procedures for hazardous work is essential. They provide standard instructions to all employees to carry out the work safely.
- **Equipment Safety** – The employer must ensure that employees use equipment as intended and according to the manufacturer's specifications. All equipment used at a work site must be maintained in good working condition, whether or not it is being used in a "working alone"

situation. High hazard equipment should have a dead man switch to prevent continued activation of the equipment. The switch should always be in good working order.

- **Equipment and Supplies** – In addition to proper equipment, appropriate first aid and emergency supplies must be provided to employees who are working alone at a work site.
- **Travel Plan** – If employees are working alone in a remote location, the employer should establish a sign-out procedure to track their whereabouts. An "overdue employee" procedure should also be in place for locating employees who fail to report on time.

Employees Who Travel Alone

Some of the risks to employees who travel alone involve injuries from motor vehicle accidents. The risk is greater when employees cannot communicate in remote areas or are unable to summon help. Employees performing fieldwork by themselves, employees in the transportation industry and businesspeople in transit are exposed to the risk.

The prevention strategies for this situation focus on safety on the road. The following strategies should be addressed in the overall management of the risk:

- **Safe Work Procedures -** Employees must have full concentration on the road when travelling alone. An employer should allow sufficient rest time for employees who are travelling on long trips.
- **Equipment and Supplies -** Well-maintained vehicles prevent exposing employees to unnecessary risk. Appropriate first aid and emergency supplies must be provided.
- **Travel Plan -** An employer should consider a procedure appropriate to the hazards to track the whereabouts of their employees. The travel plan submitted by the employee can be used to assess the rest time available to the employee travelling alone.

Employees at Risk of Violence Because They Are Isolated

For employees who work in isolation away from routine contact with other persons, there is a risk of violent attacks by intruders. Employees in this category include custodians and security guards. Site security is therefore the most important control measure.

The following control measures should be taken by the employer to reduce the risk:

- **Safe Work Procedures -** The employer should have safe work procedures directing employees to check the security of the work site at the beginning and at the end of the shift. The procedures should also include how to behave when confronted with an intruder.

- **Site Security -** A secure facility with a proper security system is the primary defense against break-ins. A combination of remote and personal alarms and video surveillance may be used in the security system. Windows and doors should be secured with heavy duty locks and suitable barriers. Employers should consider improving the security of windows and doors.

In a working alone situation the employer must:

- **Conduct a hazard assessment**
    - Employers must closely examine and identify existing or potential safety hazards in the workplace. The assessment must be in writing and communicated to all affected staff. Employers must also involve affected employees in conducting the hazard assessment, and in the elimination, reduction, or control of the identified hazards.

- **Eliminate or reduce the risks**
    - Employers must take practical steps to eliminate the hazards identified. If it is not practicable to do so, employers must implement procedures to reduce or control the hazards.

- **Provide an effective communication system**
    - Employers must provide an effective communication system for employees to contact other people who can respond to the employees' need. The system must be appropriate to the hazards involved and include regular contact by the employer (or their designate) at intervals appropriate to the nature of the hazard associated with the worker's work.

- **Ensure employees are trained and educated**
    - Employers must ensure their employees are trained and educated so they can perform their job safely.
    - Employees must be made aware of the hazards of working alone and the preventative steps that can be taken to reduce or eliminate potential risks.
    - These rules consider a wide variety of situations where employees work alone. Their intent is to require employers to consider the hazards specific to their work sites and to adopt safety measures that address these hazards.

Checklist for Employees Who Perform Hazardous Work

(e.g., forestry workers, oil, and gas workers)

This checklist is intended to help employers implement best practices for employees working alone at hazardous jobs without routine interaction with the public. The questions in bold reflect mandatory requirements. Other questions suggest recommended practices that are highly desirable.

Yes	No	N/A	**EMPLOYEE TRAINING**
			Do you ensure employees are trained and competent to work alone safely?
			Are employees aware of the increased risk from carrying out the hazardous work alone?
Yes	No	N/A	**SAFE WORK PROCEDURE**
			Do you have a safe work procedure for the hazardous work?
			Did the employer develop the safe work procedure with the involvement of the affected employees?
			Is there a procedure requiring employees to sign out before a job, and to provide information on a travelling plan and an estimated time of return?
			Is there a procedure for the employee to check-in prior to and at the end of the planned activities at the site?
Yes	No	N/A	**EQUIPMENT SAFETY**
			Do you ensure equipment is in good working condition prior to being used on a work site?
			Does all equipment and machinery used by employees meet regulatory standards?
			Are equipment and machinery being used in accordance with the manufacturer's specifications?
			Is a dead-man switch used in high hazard machinery to prevent continued activation?
Yes	No	N/A	**EQUIPMENT AND SUPPLIES**
			Do you equip employees with the appropriate first aid supplies?
			Do employees carry the required first aid supplies?
			Do employees carry the necessary personal protective equipment?
			Do employees carry emergency supplies if they are to work in remote areas with inclement weather?
Yes	No	N/A	**COMMUNICATION**
			Do you have an effective means of communication for employees to contact persons capable of responding when employees need immediate assistance?
			Does the method of communication involve one or more of the following:
			Regular telephone, cell phone, or radio contact?
			Schedule check-in points with other employees?
			Others? Specify:
			Is there an "overdue employee" procedure to initiate searches for employees who fail to report?

Checklist for Employees Who Travel Alone

(e.g., truck drivers, field workers and businesspeople in transit)

This checklist is intended to help employers implement best practices for employees travelling alone while working, with no interaction with customers. The questions in bold reflect mandatory requirements. Other questions suggest recommended practices that are highly desirable.

Yes	No	N/A	**EMPLOYEE TRAINING**
			Do you ensure employees are trained and competent to work alone safely?
			Are employees informed of the hazards associated with working alone?
			For employees who must travel alone to remote locations, do they have some training in emergency survival?
Yes	No	N/A	**SAFE WORK PROCEDURE**
			Do you have a safe work procedure for employees travelling alone?
			Do employees have adequate rest periods between work periods when they are travelling alone?
Yes	No	N/A	**EQUIPMENT SAFETY**
			Do you ensure vehicles used by employees are in good working condition?
			Are all vehicles used by employees under regular maintenance programs?
Yes	No	N/A	**EQUIPMENT AND SUPPLIES**
			Do you provide employees with the appropriate first aid supplies?
			Do employees carry the required first aid supplies?
			Do employees carry emergency supplies when they travel in extreme cold or inclement weather conditions?
Yes	No	N/A	**COMMUNICATION**
			Do you have an effective means of communication for employees to contact persons capable of responding when employees need immediate assistance?
			Do you have a procedure for tracking “overdue” employees that is appropriate to the hazards?
			Does the method of communication involve one or more of the following: Regular telephone, cell phone, or radio contact?
			Reporting to designated locations according to the “travel plan”?
			Others? Specify:

Checklist for Employees at Risk of Violence because they Are isolated

(e.g., custodians, security guards)

This checklist is intended to help employers implement best practices for employees working in isolation away from public view. The questions in bold reflect mandatory requirements. Other questions suggest recommended practices that are highly desirable.

Yes	No	N/A	**EMPLOYEE TRAINING**
			Do you ensure employees are trained and competent to work alone safely?
			Are employees informed of the hazards associated with working in isolation?
			Are employees trained in non-violent responses to threatening situations?
			Are employees trained in the proper use of security systems to prevent / discourage intruders?
			Are employees trained in questioning strangers about the appropriateness of their presence?
Yes	No	N/A	**SAFE WORK PROCEDURE**
			Do you have a safe work procedure to secure the work site?
			Does the safe work procedure include appropriate behaviors when confronted with an intruder?
			Does the safe work procedure require a check for secure work site prior to the start and at the end of the shift?
Yes	No	N/A	**SITE SECURITY**
			Do you provide a safe work site for employees working alone
			Does the site have a security system?
			Does the security system include the following: Remote alarm?
			Personal alarm?
			Video surveillance camera?
			Others? Specify:
			Is the alarm system regularly checked for correct operation?
			Are all doors and windows secured with appropriate barriers?
			Is public access to the work site limited?
			Are there adequate lights at the site entrance and parking areas?
Yes	No	N/A	**COMMUNICATION**
			Does the method of communication involve the following: Regular telephone, cell phone, or radio contact with a designated person?
			Regular security patrol?
			Alarm system to security services?
			Regular visit by co-workers
			Others? Specify: