

# TRIAD MECHANICAL CONTRACTORS

The TRIAD MECHANICAL CONTRACTORS safety manual should be available to all TRIAD MECHANICAL CONTRACTORS personnel at all times. It is a reference for employees to use during all TRIAD MECHANICAL CONTRACTORS operations. It should be distributed to all TRIAD MECHANICAL CONTRACTORS offices, job sites & other locations where employees are working.



**TRIAD  
MECHANICAL  
CONTRACTORS**

*Safety  
Manual*

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## POLICY STATEMENT ON SAFETY

The management of TRIAD MECHANICAL CONTRACTORS is very interested in & committed to working with you to provide a safe place in which to work. The prevention of accidents and injuries to our employees is the prime objective.

All TRIAD MECHANICAL CONTRACTORS personnel are expected to take an active and constant interest in the prevention of accidents. We call upon all employees to use good common sense and in all their actions, take a second to think of the consequences to your fellow employees. We cannot overemphasize that all employees must do their part to minimize accidents.

Please show your support by demonstrating the following:

1. FOLLOWING TRIAD MECHANICAL CONTRACTORS SAFETY RULES.
2. KEEPING WORK AREAS FREE OF UNSAFE CONDITIONS.
3. AVOIDING AND ELIMINATING UNSAFE ACTS.
4. PROMPTLY REPORTING UNSAFE ACTS AND CONDITIONS.
5. REPORTING ALL INCIDENTS IMMEDIATELY.

Accidents cause suffering and pain. We value each of you as individuals and hope you will cooperate with us in this important endeavor.

Any constructive criticism or suggestions toward improving safety on any of our jobs will be given prompt and careful consideration.

Sincerely,

*Del Laquiere*  
*Safety Manager*

## Duties and Responsibilities

A successful Safety Management System can only be achieved and maintained when there is active interest, participation, and accountability at all levels of the organization. To ensure this, TRIAD MECHANICAL CONTRACTORS, delegates the following safety duties to all management personnel. In some cases employees will need to perform safety duties outside their regular responsibilities to prevent accidents.

The Safety Manager must plan, organize, and administer the program by establishing policy, setting goals and objectives, assigning responsibility, motivating subordinates, and monitoring results. TRIAD MECHANICAL CONTRACTORS management will support and maintain an ongoing Safety and Injury and Illness Prevention Program through the following:

1. Providing clear understanding and direction to all management and employees regarding the importance of safety through the development, implementation, monitoring and revision of policy and procedures.
2. Providing financial support for the Safety / Injury and Illness Prevention Program through the provision of adequate funds for the purchase of necessary safety materials, safety equipment, proper personal protective equipment, adequate time for employee safety training, and maintenance of tools and equipment.
3. Overseeing development, implementation, and maintenance of the safety manual, IIPP, and other required safety programs.
4. Maintaining the TRIAD MECHANICAL CONTRACTORS commitment to accident prevention by expecting safe conduct on the part of all managers, supervisors, and employees.
5. Holding all levels of management and employees accountable for accident prevention and safety.
6. Reviewing all accident investigations to determine corrective action.

Managers and Supervisors play a key role in the prevention of accidents on the job. They have direct contact with the employees and know the safety requirements for various jobs. Safety responsibilities for these individuals include:

1. Enforce all safety program content and ensure safe work procedures.
2. Verifying corrective action has been taken regarding safety hazards and accident investigations.
3. Conducting periodic documented inspections of the work sites to identify and correct unsafe actions and conditions that could cause accidents.
4. Act as a leader in TRIAD MECHANICAL CONTRACTORS safety policy and setting a good example by following all safety rules.
5. Becoming familiar with local, state, and federal safety regulations. The EHS Manager is available for assistance.
6. Train all new and existing employees in proper safety procedures and the hazards of the job.
7. Instruct all employees, under their supervision, in safe work practices and job safety requirements.
8. Hold weekly safety meetings with employees.
9. Ensure employee proficiency when assigning work requiring specific knowledge, special operations or equipment.
10. Ascertain that all machinery, equipment, and workstations are maintained in safe working condition and operate properly.
11. Correct unsafe acts and conditions that could cause accidents.
12. Communicate with all employees about safety and accident prevention activities.
13. Correct the cause of any accident as soon as possible.
14. Ascertain that proper first aid and firefighting equipment is maintained and used when conditions warrant its use.
15. Maintain good housekeeping conditions at all times.
16. Investigate all injuries and accidents to determine their cause and potential corrective action.

17. Ascertain that all injuries involving our employees that require medical attention are properly treated and promptly reported to the office.

The Safety Manager acts as a safety resource for TRIAD MECHANICAL CONTRACTORS and is responsible for maintaining program records. They will also be our primary person to deal with outside agencies regarding the safety program and its contents. Additional duties include:

1. Coordination of all loss prevention activities as a representative of management. Acting as a consultant to management in the implementation and administration of the Safety Program.
2. Develop and implement loss prevention policies and procedures designed to insure compliance with the applicable rules and regulations of all federal, state, and local agencies.
3. Review all accident reports to determine cause and preventability.
4. Conduct periodic reviews of the program and job sites to evaluate performance, discuss problems and help solve them.
5. Consult with representatives of our insurance companies in order that their loss control services will support the Safety Program.
6. Review Workers' Compensation Claims. Help supply the insurance carrier with information about injured employees in order to keep loss reserves as low as possible.

Every employee is responsible for working safely, both for self-protection and for protection of fellow workers. Employees must also support all TRIAD MECHANICAL CONTRACTORS safety efforts. Specific employee safety responsibilities include:

1. If you are unsure how to do any task safely, ask your supervisor.
2. Read and abide by all requirements of the Safety Manual.
3. Know and follow the Code of Safe Practices and all TRIAD MECHANICAL CONTRACTORS safety policies and rules.
4. Wear all required personal protective equipment.
5. Report all accidents and injuries, no matter how minor, to your supervisor immediately.
6. Do not operate any equipment you have not been trained and authorized to use.
7. Report any safety hazards or defective equipment immediately to your supervisor.
8. Do not remove, tamper with or defeat any guard, safety device or interlock.
9. Never use any equipment with inoperative or missing guards, safety devices or interlocks.
10. Never possess, or be under the influence of, alcohol or controlled substances while on the premises.
11. Never engage in horseplay or fighting.
12. Participate in, and actively support, TRIAD MECHANICAL CONTRACTORS safety program.

# Asbestos Awareness

## Purpose

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The purpose of this program is to establish rules around the safe use and handling of materials that potentially expose employees to asbestos. Employees who work in areas where asbestos is suspected should be aware of the properties of asbestos, and the dangers of working around it. In addition, this program contains general guidelines and training requirements to prepare and protect employees from asbestos exposure.

## Scope

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This plan applies to TRIAD MECHANICAL CONTRACTORS employees and contractors who work near asbestos containing materials. It is to be used at all times on TRIAD MECHANICAL CONTRACTORS worksite. If a TRIAD MECHANICAL CONTRACTORS employee performs work on a site other than TRIAD MECHANICAL CONTRACTORS's site, the facility owner's plan should be used if it exists and is as strict (or more strict) than this plan. In cases where the other facility's plan does not exist or is less strict than this plan, TRIAD MECHANICAL CONTRACTORS employees will operate under this plan. Prior to working at a site, TRIAD MECHANICAL CONTRACTORS employees must be aware of site specific contingency/emergency plans that apply.

## Key Responsibilities

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### Managers/Supervisors

- If a presumed asbestos containing material (PACM) is discovered, ensure owners are notified.
- Do not allow TRIAD MECHANICAL CONTRACTORS employees to work with PACM until it is confirmed that it does not contain asbestos, or the risk is diminished.
- Ensure all employees complete asbestos awareness training.

### All Employees

- Strictly comply with this program. If there is an unresolved concern about exposure to asbestos, the employee should delay or discontinue work.
- If you suspect that a material contains asbestos, report it immediately to your supervisor.

## Awareness Level Requirements and Information

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### Asbestos Exposure Control

TRIAD MECHANICAL CONTRACTORS will train employees on an Asbestos Exposure Controls Plan depending of their exposure level.

### Background of Asbestos

Asbestos is a mineral that occurs naturally through the world. It has fibres that are very strong and flexible, as well as resistant to chemicals, heat and deterioration. It is also a good insulator. The fibres can be woven, spun, bound to other materials, or pressed. Asbestos is relatively inexpensive, and as such it has been used in many commercial products over the years.

There are serious health risks associated with exposure to asbestos fibres. The fibres are made up of microscopic filaments that can remain airborne for several hours after it is disturbed. The filaments can penetrate human tissue, and prolonged exposure can disable a person and cause fatal diseases.

Even though asbestos exposure may be hazardous, you can minimize your health risk. Generally, asbestos fibres are released only if the material is disturbed. Asbestos containing materials (ACM) that are left undisturbed do not endanger the health of occupants. Proper handling of ACM prevents or minimizes the release of fibres into the air. This, in turn, reduces the risk of asbestos related diseases. But remember, asbestos materials are hazardous when they are damaged, disturbed or they deteriorate causing the release of fibres into the air.

In order to minimize exposure, employees should be able to recognize asbestos containing materials, and understand the conditions under which they are dangerous.

#### Health Effects of Asbestos

Inhaling airborne fibers is the most dangerous type of asbestos exposure. Even though the human body can rid itself of some of the fibers, the higher the asbestos exposure, the more fibres that become embedded in the lungs. It has been shown that asbestos exposure can lead to respiratory diseases such as asbestosis, lung cancer, mesothelioma and various cancers of the stomach and colon.

#### Possible Locations of Asbestos Exposure

Materials containing asbestos are used when manufacturing automotive brake and clutch linings, heat resistant clothing, and building materials such as insulation, floor tiles, ceiling tiles, soundproofing, and sheet and fire-resistant drywall. It is also found in pipe and boiler insulation, pipeline wrap and spray-on materials between walls, in crawlspaces and on beams.

At facilities that are client owned and/or operated, the employee must confirm the absence of asbestos in surfacing material or insulation before disturbing the material. If the material cannot be confirmed as non-asbestos, the client/owner must have the material tested, and if necessary abated, before TRIAD MECHANICAL CONTRACTORS employees may work on the site.

#### Types of Asbestos

There are two types of asbestos: friable and non-friable. Friable asbestos can be crumbled under hand pressure, and as a result, it is more likely to be disturbed. Sprayed on materials used for insulation, fireproofing or sound insulation are friable.

Non-friable materials include vinyl-asbestos floor tile or roofing felts, and do not emit fibres into the air unless they are subject to sanding or sawing. Other materials such as asbestos cement pipe or sheet can emit fibres into the air if they are sanded or sawed, or if they are broken during demolition.

#### Identifying Asbestos

Workers come into contact with many materials that may contain asbestos, and could potentially release fibres. A product is rarely labelled as containing asbestos, and generally the presence of asbestos cannot be identified visually. The only method of identification is through laboratory analysis of samples. If asbestos is suspected, always assume that it does contain asbestos, and have the material analyzed.

When working, employees will heed warning signs and labels on materials indicating asbestos. Employees will not disturb the asbestos containing material in any way.

TRIAD MECHANICAL CONTRACTORS shall affix signs and labels to identify the presence of asbestos. Appropriate work practices will ensure that materials containing asbestos will not be disturbed. TRIAD MECHANICAL CONTRACTORS will ensure that employees are aware of the warning signs.

#### General Safety Precautions

Following are some general precautions to reduce exposure, and help lower the risk of health problems associated with asbestos exposure:

- Avoid drilling, sawing, or piercing materials containing asbestos.

- Never sand floor tiles, ceiling tiles or adhesives that contain asbestos.
- When moving furniture, ladders, or other objects, be careful not to damage asbestos.
- Be aware of the location of asbestos in your work area. Be cautious when working around asbestos containing materials. Avoid disturbing asbestos materials.
- Periodically check asbestos containing materials for damage or deterioration. Report loose asbestos, damage or deterioration of asbestos materials to a supervisor.
- Remove of asbestos, or repair work involving asbestos must only be done by personnel specially trained in working with asbestos.
- Wetting asbestos helps to prevent fibers from being released into the air because the soaked fibres are too heavy to remain suspended.
- If asbestos dust measures above the PEL, employees must use a respirator that is approved for asbestos work. A dust mask is not sufficient protection.
- When vacuuming dry asbestos, you must use a vacuum cleaner with a special high efficiency filter (HEPA). Sweeping or dusting dry asbestos puts fibers back in the air.
- If you cannot use a HEPA vacuum for cleanup, you must use a wet cloth or mop unless the moisture presents a hazard in itself (e.g., near electricity).

As a reminder, the presence of asbestos is not a health hazard unless the material is disturbed. Be aware of the location of asbestos and the risks involved, and be sensible when working near ACM.

#### Multiple Worksites

If an employee is working on a multi-contractor worksite, they will be protected from exposure. If an employee is working next to a Class 1 asbestos job, and is exposed because the containment was insufficient, TRIAD MECHANICAL CONTRACTORS will remove the employee from the area until the breach is repaired, or will perform an exposure assessment.

#### Personnel Air Monitoring

If the exposure level warrants it, TRIAD MECHANICAL CONTRACTORS will perform air sampling.

#### Medical Surveillance Program

All employees exposed to asbestos levels that exceed the regulated level will receive medical supervision provided by TRIAD MECHANICAL CONTRACTORS as part of the medical supervision program.

#### Respiratory Protection

During the asbestos exposure assessment process, TRIAD MECHANICAL CONTRACTORS employees will use respirators as protection against asbestos only when confirming that engineering controls and work practices for the particular work activity are sufficient to maintain exposure levels below the PEL limit. Any work that requires respirators and exceeds the PEL will be done by a qualified contractor.

#### Waste Disposal

All waste, bags, containers, equipment and contaminated clothing will be disposed of in sealed, labeled impermeable containers or bags (>6 mm thick).

#### Training

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All employees who work in areas that contain, or potentially contain, asbestos must participate in asbestos awareness training, and that training must be documented.

In addition, training must occur for all employees whose work activities may contact Asbestos Containing Material (ACM) or Presumed Asbestos Containing Material (PACM) even though they do not disturb the ACM or PACM.

Training includes:



- Health effects of exposure to asbestos;
- Risk of lung cancer due to the relationship between smoking and asbestos exposure;
- Where asbestos is located, how much, how it is used, how it is released and how it is stored;
- Operations that may result in exposure to asbestos;
- Engineering controls and work practices required by the employee's job assignment;
- Procedures that have been implemented to protect employees from asbestos exposure (e.g., appropriate work practices, emergency and clean-up procedures and personal protective equipment)
- How to use respirators and protective clothing, and understanding their purpose and limitations;
- Understanding the purpose of the medical supervision program;
- The OSHA asbestos standard;
- The reasons for posting signs and labeling asbestos containing materials, and understanding the legends for these signs and labels.

Subcontractors shall follow this program, and abide by the requirements of all applicable regulatory and environmental regulatory requirements as well as this standard.

# Assured Equipment Grounding

## Purpose

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The purpose of this program is to eliminate potential hazards presented by the use of power equipment, power equipment cords, extension cords, receptacles and other related equipment.

## Scope

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This program applies to all TRIAD MECHANICAL CONTRACTORS employees, contractors and subcontractors who work with, on or near electrical tools or equipment. This program also applies to all TRIAD MECHANICAL CONTRACTORS work sites where TRIAD MECHANICAL CONTRACTORS employees, contractors and subcontractors are present.

## Responsibilities

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### Safety Manager

- Responsible for assured equipment grounding program execution.
- Keep abreast of current regulations and revise the program when necessary.
- Perform annual audits of this program to ensure adequacy.
- Serve as a competent person.

### Supervisors

- Serve as competent persons for this program.
- Execute this program entirely where applicable.
- Ensure that visual inspections are performed on electrical equipment and repair or replace removed, tagged or defective equipment as soon as possible.
- Enforce general compliance with this program.

### Employees

- Comply with all procedures in this program.
- Perform visual inspections of electrical tools, equipment and energy sources.
- Remove and tag defective electrical equipment and notify your supervisor of defects.

## Definitions

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Ground Fault Circuit Interrupter (GFCI) – a fast acting circuit breaker designed to shut off electric power in the event of a ground-fault within as little as 1/40 of a second. It works by comparing the amount of current going to and returning from the equipment along the circuit conductors. When the amount going differs from the amount returning by approximately 5 mill amperes, the GFCI interrupts the current.

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

## Procedures

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The following procedures and guidelines are designed to eliminate all injuries resulting from possible malfunctions, improper ground and/or defective tools. It is the responsibility of both supervisors and employees to ensure that these procedures are strictly adhered to.

#### Assured Equipment Grounding Conductor Program (AEGCP)

A site specific assured grounding conductor program shall be implemented on all TRIAD MECHANICAL CONTRACTORS work sites that covers all cords, plug-in electrical power tools, and receptacles which are not part of the permanent structure and are available for use by TRIAD MECHANICAL CONTRACTORS employees.

#### Ground Fault Circuit Interrupters (GFCI)

All 120 and 240-volt receptacles which are not part of the permanent structure and are used by TRIAD MECHANICAL CONTRACTORS employees must have approved ground fault circuit interrupters. All GFCI must be tested prior to each use.

#### Equipment Requirements

Equipment that does not meet the requirements of this program or is found to be defective shall not be used by TRIAD MECHANICAL CONTRACTORS employees and shall be repaired or replaced so that program requirements are satisfied.

#### Equipment Inspections

Visual equipment inspections shall occur daily and before each use in order to identify hazards presented by equipment defects. Possible defects include but are not limited to cuts, abrasions, burns, exposed wires and broken or missing pins of extension cords, equipment power cords and receptacles.

Any equipment or equipment parts, which are found to be defective or present a potential hazard, shall be repaired or replaced prior to use. All equipment that cannot be repaired must be tagged and discarded immediately.

#### Equipment Tests and Records Maintenance

Tests on all equipment grounding conductors must be conducted prior to each use, following any repairs and at 3 month intervals for non-fixed equipment or 6 month intervals for permanently fixed equipment which is not exposed to damage, in order to ensure continuous electrical continuity.

Equipment testing records shall indicate equipment identity such as cord, receptacle that is not part of the permanent structure or plug-in power equipment and the date it was last tested or interval test dates. Records shall be in the form of written logs or color-coding and shall be available at the work site at all times for TRIAD MECHANICAL CONTRACTORS review.

All extension cords and power equipment cords shall be marked on either end of the cord with color tape that corresponds with the month represented in the table below to ensure that the monthly test schedule is maintained.

Test Month	Corresponding Tape Color
January	White
February	White/Yellow
March	White/Blue
April	Green
May	Green/Yellow
June	Green/Blue
July	Red
August	Red/Yellow
September	Red/Blue
October	Orange
November	Orange/Yellow
December	Orange/Blue
OUT OF SERVICE	Brown

# Bloodborne Pathogens

## Purpose

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The purpose of this program is to establish and maintain a written exposure control plan that protects employees who may have contact with blood or any other potentially infectious material. This program is also designed to meet the requirements of OSHA 29 CFR 1910.1030; which requires employers who can reasonably anticipate exposure to prepare and implement a written exposure control plan.

## Scope

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This program applies to all occupational exposure to blood or other potentially infectious materials and covers all TRIAD MECHANICAL CONTRACTORS employees. Employees whose responsibilities include cleaning up after a workplace injury, rendering first aid, providing life support or some other task that involves directly working with biohazards are more likely to have occupational exposure. However, any employee could be at risk as a result of blood from an injury that occurred in the past or a historical presence of bodily fluids that was not adequately decontaminated.

## Responsibilities

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### Safety Manager (Exposure Control Officer)

- Serve as the designated “Exposure Control Officer”, which is responsible for the overall development and implementation of the exposure control procedure for all TRIAD MECHANICAL CONTRACTORS worksites.
- Ensure that TRIAD MECHANICAL CONTRACTORS fully complies with this program.

### Supervisors

- Serve as the responsible person for all exposure control activities within their area of responsibility.
- Ensure that all employees comply with this program and report all non-compliance matters to the exposure control officer.

### Employees

- Be aware of specific job tasks, situations and environments that may present biohazards.
- Comply with all parts of this program and report all non-compliance matters to the exposure control officer or your direct supervisor.
- Help TRIAD MECHANICAL CONTRACTORS prevent blood or potentially infectious material exposure by working safely and practicing good personal hygiene.

## Procedure

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### Exposure Control Plan Access

Employees shall have access to a copy of the exposure control plan by request from their supervisor or the safety manager who will supply it in a reasonable time, place and manner.

### Procedure Reviews and Updates

The exposure control procedure must be reviewed on an annual basis and updated whenever a new procedure, activity or function with the potential to expose employees to biohazards is introduced into a worksite.

### Universal Precautions

TRIAD MECHANICAL CONTRACTORS and its employees shall observe universal precautions by treating all human blood and certain human body fluids as if they are known to be infectious for HIV, HBV and other pathogens even under circumstances where exposure is highly unlikely.

### Exposure Controls

Exposure controls are designed to reduce or eliminate employee exposure to blood or potentially infectious materials and should be re-evaluated and revised if necessary on a regular basis to maximize their effectiveness in controlling employee exposure. Therefore:

- Hand washing facilities are readily available at all work locations except those that cannot support or simply do not have such facilities. In these cases, appropriate antiseptic solutions and / or towelettes are available for use.
- All sharps containers shall have a biohazard-warning label or a specific color to identify it as a biohazard, shall be resistant to punctures and shall be leak proof. The same characteristics shall apply to all secondary sharps containers.

### Safe Work Practices

Safe work practices are designed to support exposure controls and further minimize or eliminate occupational exposure. Therefore:

- Employees must wash hands and other applicable body parts as soon as potentially contaminated gloves or other PPE are removed to further prevent contamination.
- If any part of the body has contact with blood or any other infectious material, employees must wash hands and other exposed body parts with soap and water immediately.
- Only trained and authorized personnel are allowed to handle sharps, sharps containers and any other potentially sharp and infectious needles or equipment.
- Activities such as applying make-up, handling contact lenses, smoking or any other hand and eye, mouth, nose, ear or other body part contact is prohibited in areas where exposure to biohazards is possible.
- Storage areas such as pantries, freezers, refrigerators and others that may contain potentially infectious materials shall not contain food or drink.
- All equipment and surfaces that have had contact with blood or other infectious materials must be properly cleaned and decontaminated.
- All biological specimens must be contained in leak proof containers for handling, storage and transport to minimize potential contact with other surfaces and employees.
- In cases where the exterior surface of the specimen container is contaminated; the container must be placed into another leak proof container, which shall be labeled as "for handling and storage".
- All emergency responder, first aid or other potentially infectious supplies must be disposed of immediately and appropriately after contamination.

### Personal Protective Equipment (PPE)

PPE shall be provided by TRIAD MECHANICAL CONTRACTORS at no cost to the employee and must be of proper fit, adequate for the task at hand and readily available. Defective or damaged PPE must be discarded / replaced or repaired in order to ensure maximum effectiveness.

The following safe work practices shall be followed with regard to biohazards and PPE:

- Protective garments that are penetrated by blood or other infectious materials must be removed and properly disposed of immediately.
- PPE that may be contaminated must be removed and properly stored / contained before leaving the work area.
- PPE such as protective gloves must be worn whenever contact with potentially infectious material exposure is anticipated.

- Disposable PPE such as rubber gloves must be replaced as soon as practical when contamination has occurred or when they are rendered ineffective by a tear, puncture or other occurrence.
- Masks and eye protection (such as goggles, face shields, etc.) are used whenever splashes or sprays may generate droplets of infectious materials.
- Whenever infectious material splashes, sprays or other similar occurrences are possible, PPE such as face shields, goggles, head garments or other appropriate PPE shall be used to protect face, eyes etc.
- Adequate PPE must be used unless temporarily declined by the employee and approved by the safety manager.
- PPE should be cleaned, laundered & properly disposed of if contaminated.
- All PPE must be cleaned, maintained, used, stored and disposed of properly when applicable.

#### Post-Exposure Requirements

All potential blood or infectious material exposure incidents shall be investigated by TRIAD MECHANICAL CONTRACTORS thoroughly to ensure that hazards are abated and that affected employees receive the necessary treatment needed to minimize the impact of potential or actual exposure.

All reported exposure incidents shall be formally investigated by the exposure control officer / safety manager or supervisor when the safety manager cannot be present. A detailed report of the incident outlining root cause, corrective actions and the current status of affected employees is then completed and reviewed by TRIAD MECHANICAL CONTRACTORS to help prevent re-occurrence. Additionally, the following confidential information shall be provided to exposed employees:

- All documentary reports and information of the exposure incident and its circumstances.
- The identity of the exposure source individual unless applicable laws prevent such identification.

Upon completion of the above procedures, the exposed employee shall be appointed to a qualified healthcare professional who will evaluate the exposed employee, provide information to the employee about his or her medical status and initiate treatment where applicable.

TRIAD MECHANICAL CONTRACTORS provides the following information to the healthcare professional:

- A copy of the biohazards standard.
- A detailed description of the exposure incident.
- Additional information that is relevant to the healthcare professional.

The following information will be provided to TRIAD MECHANICAL CONTRACTORS by the healthcare professional as a “written report” and copied to the exposed employee upon completion of the healthcare professional’s evaluation of exposed employee:

- If a Hepatitis B vaccination is recommended for the exposed employee.
- If the exposed employee has received the Hepatitis B vaccination since the incident.
- Verification that the exposed employee has received results information of the medical evaluation.
- Verification that the exposed employee was made aware of medical conditions caused by the exposure incident that require additional medical evaluation or treatment.

\* All other medical information remains confidential and will not be a part of the written report.

\* The Hepatitis B vaccine will be made available to all employees with occupational exposure at no cost.

## Training

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All employees with occupational exposure shall receive bloodborne pathogens training before initial assignment and within 1 year of previous training. The training includes but is not limited to:

- A detailed explanation of bloodborne pathogens and their causes / effects.
- OSHA's bloodborne pathogens standard and requirements.
- How to protect yourself from occupational exposure.
- Common warning methods such as signs, labels, etc.
- Availability of the Hepatitis B vaccine.

## Recordkeeping

TRIAD MECHANICAL CONTRACTORS shall meet OSHA 29 CFR 1920.1020(h) transfer of records standards in order to ensure regulatory compliance. Applicable records related to this standard and program shall be available to TRIAD MECHANICAL CONTRACTORS employees and regulatory authorities upon request except for medical records, which are kept confidential and require the employee's written consent unless otherwise specified in 29 CFR 1910.1030 or other applicable laws.

Medical records shall be maintained in a safe and secure location for the duration of each employee's employment plus 30 years. The following information must be included for each employee's medical record:

- Full Name
- Social Security Number
- Hepatitis B vaccination status
- Hepatitis B vaccination date(s)
- Hepatitis B declination(s)
- All records, notes, evaluations, etc. to and from the healthcare professional
- All TRIAD MECHANICAL CONTRACTORS documentary records, notes, letters and other forms of communications

All training records must be kept for no less than 3 years from the date of training. Training records shall include the following:

- All training materials and content used at time of training.
- Training instructor name and title.
- Training student names, titles and training dates.

## Labelling

Labels depicting the universal biohazard warning shall be used on all containers used to dispose of contaminated or potentially contaminated materials. Defacing or modifying these labels is prohibited. Labels that are found to be defective or inadequate shall be replaced with new and effective labels.

EXPOSURE INCIDENT CHECKLIST

This checklist must be completed and maintained in the event that occupational exposure occurs.

	ACTION TO BE TAKEN BY EMPLOYER	COMPLETION DATE
<input type="checkbox"/>	Required incident documentation has been provided to affected employee(s)	
<input type="checkbox"/>	Exposure source individual has been identified	
<input type="checkbox"/>	Arranged for affected employee to see healthcare professional	
<input type="checkbox"/>	Required documentary information has been sent to the healthcare professional	

**\* Post-Exposure Requirements**

All potential blood or infectious material exposure incidents shall be investigated by TRIAD MECHANICAL CONTRACTORS thoroughly to ensure that hazards are abated and that affected employees receive the necessary treatment needed to minimize the impact of potential or actual exposure.

All reported exposure incidents shall be formally investigated by the exposure control officer / safety manager or supervisor when the safety manager cannot be present. A detailed report of the incident outlining root cause, corrective actions and the current status of affected employees is then completed and reviewed by TRIAD MECHANICAL CONTRACTORS to help prevent re-occurrence. Additionally, the following confidential information shall be provided to exposed employees:

- All documentary reports and information of the exposure incident and its circumstances.
- The identity of the exposure source individual unless applicable laws prevent such identification.

Upon completion of the above procedures, the exposed employee shall be appointed to a qualified healthcare professional who will evaluate the exposed employee, provide information to the employee about his or her medical status and initiate treatment where applicable.

TRIAD MECHANICAL CONTRACTORS provides the following information to the healthcare professional:

- A copy of the biohazards standard.
- A detailed description of the exposure incident.
- Additional information that is relevant to the healthcare professional.

The following information will be provided to TRIAD MECHANICAL CONTRACTORS by the healthcare professional as a “written report” and copied to the exposed employee upon completion of the healthcare professional’s evaluation of exposed employee:

- If a Hepatitis B vaccination is recommended for the exposed employee.
- If the exposed employee has received the Hepatitis B vaccination since the incident.
- Verification that the exposed employee has received results information of the medical evaluation.
- Verification that the exposed employee was made aware of medical conditions caused by the exposure incident that require additional medical evaluation or treatment.

\* All other medical information remains confidential and will not be a part of the written report.

\* The Hepatitis B vaccine will be made available to all employees with occupational exposure at no cost.



# Confined Spaces Program

## Purpose

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The purpose of this program is to establish safe guidelines and procedures for TRIAD MECHANICAL CONTRACTORS employees and contractors entering permit-required and non-permit confined spaces and to ensure compliance with regulatory confined space standards.

## Scope

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This program applies to all TRIAD MECHANICAL CONTRACTORS employees and TRIAD MECHANICAL CONTRACTORS who enter confined spaces, which are owned by TRIAD MECHANICAL CONTRACTORS. In cases where the site owner is not TRIAD MECHANICAL CONTRACTORS, the site owner's confined space program shall take precedence. If the site owner does not have an adequate confined space program, this program shall be used.

## Definitions

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"Acceptable entry conditions" means the conditions that must exist in a permit space to allow entry and to ensure that employees involved with a permit-required confined space entry can safely enter into and work within the space.

"Atmosphere-controlled confined space" means a permit-required confined space in which potential or actual atmospheric hazards can be eliminated prior to entry or can be controlled with continuous forced mechanical ventilation.

"Attendant" means an individual stationed outside the permit spaces who monitors the authorized entrants and who performs attendant's duties as required by this program.

"Confined space" is any space that is large enough and so configured that an employee can bodily enter and perform assigned work, has limited or restricted means for entry or exit, and is not designed for continuous employee occupancy.

- Confined spaces include, but are not limited to: storage tanks, pits, vats, vessels, environmental chambers, sewer manholes, electrical manholes, vaults, pump or lift stations, septic tanks, boilers, pipelines, tunnels, ventilation and exhaust ducts, trenches, and excavations.
- Common hazards associated with confined space entry include: oxygen deficient atmospheres, flammable/explosive atmospheres, toxic atmospheres, engulfment/ entrapment hazards, and/or chemical, electrical or mechanical hazards.

"Control Measures" means a system or device used, or action taken, to control or prevent the introduction of physical hazards into a confined space. Control measures include:

"Blanking or blinding" means the absolute closure of a pipe, line, or duct by the fastening of a solid plate (such as a spectacle blind or a skillet blind) that completely covers the bore and that is capable of withstanding the maximum pressure of the pipe, line, or duct with no leakage beyond the plate.

"Double block and bleed" means 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.

"Inerting" means the displacement of the atmosphere in a permit space by a noncombustible gas (such as nitrogen) to such an extent that the resulting atmosphere is noncombustible. *Note that this procedure produces an IDLH oxygen-deficient atmosphere that can only be entered using self-contained breathing apparatus (SCBA).*

“Isolation” means the process by which a permit space is removed from service and completely protected against the release of energy and material into the space by such means as: blanking or blinding; misaligning or removing sections of lines, pipes, or ducts; a double block and bleed system; lockout or tagout of all sources of energy; or blocking or disconnecting all mechanical linkages.

“Line breaking” means 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.

“Lockout-tagout” means placing locks or tags on the energy-isolating device (e.g. breaker boxes, control switches, valves, etc.) to prevent the unauthorized reenergization of the device or circuit while personnel are performing work. Tags shall indicate that the energy-isolated device shall not be operated until the tag is removed by the individual(s) that installed the tag.

“Zero Mechanical State” means that the mechanical potential energy of all portions of the machine or equipment is set so that the opening of the pipe(s), tube(s), hose(s) or actuation of any valve, lever, or button will not produce a movement which could cause injury.

“Emergency” means any occurrence or event inside or outside of the permit space that could endanger entrants.

“Engulfment” means the surrounding of a person by finely divided solids or a liquid. A worker in a storage tank filled with sawdust, for example, could fall into an air pocket, be completely surrounded by sawdust, and suffocate to death.

“Entrant” means any person who enters a confined space.

“Entry” means any action resulting in any part of the employees’ body breaking the plane of any opening of the permit-required confined space, and includes any work activities inside the confined space.

“Entry Permit” means the employers’ written authorization for employee entry into a confined space under defined conditions for a stated purpose during a specified time.

“Entry Supervisor” or “Supervisor” means the departmental person responsible for determining if acceptable entry conditions are present in a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required by this document.

“Hazardous Atmosphere” means an atmosphere presenting a potential for death, disablement, injury, or acute illness from one or more of the following causes:

- A flammable gas, vapor or mist in excess of 10% of its’ lower flammable limit (LFL)
- An oxygen deficient atmosphere containing less than 19.5% oxygen by volume or an oxygen enriched atmosphere containing more than 23.5% oxygen by volume
- Airborne combustible dust at a concentration that meets or exceeds its LFL (airborne combustible dust which obscures vision at five feet or less)
- An atmospheric concentration of any substance for which a dose is published in Group 14 for Radiation and Radioactivity, or a permissible exposure limit is published in Section 5155 for Airborne Contaminants which could result in an employee exposure in excess of its dose or permissible exposure limit, and that could cause death, incapacitation, impairment of ability to self-rescue, injury or acute illness.
- Any other atmospheric condition that is immediately dangerous to life or health (IDLH).

“Hot work permit” means the employer’s written authorization to perform operations (for example, welding, cutting, burning or heating) capable of providing a source of ignition.

“Immediately dangerous to life or health (IDLH)” means any condition that poses an immediate or delayed threat to life, or that would cause irreversible adverse health effects or that would interfere with an individual’s ability to escape unaided from a permit space.

“Non-permit confined space” means a confined space that does not contain or have the potential to contain any hazard capable of causing death or serious physical harm.

“Permit-required confined space” means a confined space that has one or more of the following characteristics:

- Contains or has the potential to contain a hazardous atmosphere;
- Contains a 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, or,
- Contains any other recognized serious safety or health hazard (such as noise, welding, electricity, radiation, or moving parts of machinery).

“Permit-required confined space program” means the TRIAD MECHANICAL CONTRACTORS overall program for controlling and, where appropriate, for protecting employees from, permit space hazards and for regulating employee entry into permit spaces.

“Permit system” means TRIAD MECHANICAL CONTRACTORS written procedures for preparing and issuing permits for entry and for returning the permit space to service following termination of entry.

“Prohibited condition” means any condition in a permit space that is not allowed by the permit during the period when entry is authorized.

“Qualified person” means an entry supervisor who is trained to recognize and evaluate the anticipated hazard(s) of the confined space and who shall be capable of specifying necessary control measures to assure employee safety.

- The supervisor shall designate an employee(s) as qualified person for the purposes of assuring safe confined space entry procedures and practices at a specific site. The qualified person may also be an entrant when permissible according to this standard.
- Where the supervisor is unable to designate a qualified person, then the supervisor shall coordinate work activities with the Safety Manager or their designee.

“Rescue Team” mean those persons whom the employer has designated prior to any permit-required confined space entry to perform rescues from confined spaces.

“Retrieval System” means the equipment used for non-entry rescue of persons from permit spaces, and includes retrieval lines, chest or full body harness, and a lifting device or anchor. A retrieval line is primarily of use in vertical confined spaces, and shall not be used in confined spaces consisting of horizontal tunnels or spaces where obstructions could increase the hazard to the entrant during emergency non-entry removal.

“Testing,” means the process by which the hazards that may confront entrants to a permit space are identified and evaluated. Testing includes specifying the tests that are to be performed in the permit space.

## Responsibilities

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### Safety Manager

- Is responsible for the overall implementation of this program into all TRIAD MECHANICAL CONTRACTORS confined space operations.

- Shall ensure that all supervisors and employees are adequately trained to meet confined space training requirements.
- Shall apply appropriate disciplinary action if applicable parts of this program are not complied with.

#### Entry Supervisors

- Know the hazard(s) that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure. This information will be contained on the Permit-Required Confined Space Evaluation Form for the space in question.
- Verify, by checking that the appropriate entries have been made on the permit, that all tests specified by the permit have been conducted and that all procedures and equipment specified by the permit are in place before endorsing the permit and allowing entry to begin.
- Terminate the entry and cancel the permit when either the entry operations covered by the entry permit have been completed or a condition that is not allowed under the entry permit arises in or near the permit space.
- Verify that rescue services are available and that the means for summoning them are operable.
- Remove unauthorized entrants.
- Determine, whenever responsibility for a permit space entry operation is transferred and at intervals dictated by the hazards and operations performed within the space that entry operations remain consistent with terms of the entry permit and that acceptable entry conditions are maintained.

#### Attendants

- Continuously maintain an accurate count of authorized entrants in the permit space and ensure that the means used to identify authorized entrants accurately identifies who is in the permit space;
- Remain outside the permit space during entry operations until relieved by another attendant;
- Communicate with authorized entrants as necessary to monitor entrant status and to alert entrants of the need to evacuate the space;
- Monitors activities inside and outside the space to determine if it is safe for entrants to remain in the space and orders the authorized entrants to evacuate the permit space immediately under any of the following conditions:
  - If the attendant detects a prohibited condition;
  - If the attendant detects behavioral effects of hazard exposure in the authorized entrants;
  - If the attendant detects a situation outside the space that could endanger the authorized entrant; or,
  - If the attendant cannot effectively and safely perform the requirements of this section.
- Summon rescue and other emergency services as soon as the attendant determines that authorized entrants may need assistance to escape from permit space hazards.
- Warns unauthorized persons to stay away from the permit space, advises the unauthorized persons that they must exit immediately if they have entered the permit space, and informs the authorized entrants and the entry supervisor if unauthorized persons have entered the permit space.
- Performs non-entry rescues as specified herein.
- Performs no duties that might interfere with the attendant's primary duty to monitor and protect the authorized entrants.

#### Entrants

- Be aware of all potential hazards that could be presented as a result of the entry.
- Ensure that you are using proper personal protective equipment such as respirators, protective gloves and other forms of PPE that are adequate for the task you are performing.
- Be aware of behavioral signs and symptoms caused by known hazards and their potential effects on other entrants and attendants.
- Be aware that you may request additional monitoring at any time.

- Have continuous communication with the attendant at all times to ensure that you can effectively receive notification and exit the space if the attendant becomes aware of a hazardous condition.

## Procedure

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### Non-Permit Confined Spaces

Level I confined space entry requirements may be followed if the atmosphere is within acceptable limits without using forced air ventilation and if the space is effectively isolated.

- Entrants or their representatives are given an opportunity to participate in the monitoring procedure and review calibrated air-monitoring data before entry.
- Air shall be tested periodically while continuous ventilation is applied.
- Employees or their representatives are entitled to request additional monitoring at any time.
- Entrants must review and sign the permit.
- If the confined space toxicity, O<sub>2</sub> and LEL levels remain below safe limits; employees may enter and work in the space.
- Entrants must complete the confined space entry permit and make it available to all personnel entering the confined space even if no hazards exist.
- An attendant must be present throughout the duration of the confined space operation and must remain outside of the confined space at all times.

\* Level I attendant requirements may be exempt if the most recent hazard assessment finds that no hazards are present within the confined space. However, there are special requirements for single person entry, which must be met and approved by the safety manager.

### Permit-Required Confined Spaces

If air-monitoring results of the isolated confined space are above acceptable limits without forced air ventilation in use; the space requires a permit and should be classified as a permit-required confined space.

- Entrants or their representatives are given an opportunity to participate in the monitoring procedure and review calibrated air-monitoring data before entry.
- Air shall be tested periodically while continuous ventilation is applied.
- Employees or their representatives are entitled to request additional monitoring at any time.
- A confined space permit must be completed prior to working in a permit required confined space.
- All entrants must review and sign the confined space permit.
- A minimum of 1 attendant shall be outside of the permit-required confined space while entrants are present.
- Attendants shall maintain communication with entrants for the entire duration of the operation.
- Entrants must be authorized to enter a permit-required confined space.
- Each entrant must individually sign in and sign out of the permit-required space using the required permit.
- All permit-required confined spaces must display effective warning signs, barricades or other effective means to prevent unauthorized entry.
- Monitoring must be continuous in order to ensure safe levels are maintained throughout the entire operation.
- All permits must be terminated when the operations are completed, paused or when space conditions have changed.
- 

If a hazardous atmosphere or condition is detected:

- Entrants must immediately evacuate the confined space.
- Entry supervisor must cancel the entry permit.

- Re-evaluate the space to determine how the hazardous atmosphere developed.
- Entry supervisor must perform a new hazard assessment to determine the cause and corrective actions that need to be taken.
- Entry supervisor must assure that corrective actions are taken and hazards are abated.
- Entry supervisor shall re-issue the permit once all hazards have been abated and upon completion of a new hazard assessment.

#### Pre-Entry Preparation

The entry supervisor shall conduct a pre-entry safety meeting with all entrants and attendants to discuss confined space emergency procedures; known and potential hazards, communication methods, individual duties and other relevant subject matter. The entry supervisor shall also:

- Ensure that the confined space is effectively isolated before entry occurs.
- Take precautionary measures to ensure that entering the confined space itself does not present a hazard.
- Ensure that external objects or debris cannot enter the confined space.
- Whenever possible; clean and ventilate the confined space to minimize the impact of contaminants, vapors, dusts, etc.
- Ensure that confined space entrances or exits are labeled, guarded or barricaded in order to minimize the possibility of unauthorized entry.
- Prepare hot work permit and implement applicable precautionary measures when welding, cutting or hot work is planned.
- Effectively communicate to attendants and entrants when the confined space is ready for entry and when the permit will terminate.

#### Air Monitoring

- Calibrated direct-reading instruments must be used to test the atmosphere for oxygen content, flammable gasses and vapors and for potential toxic air contaminants before entry to the confined space. The results of these tests are designed to inform all applicable parties of the potential hazards. Therefore, entrants must review and sign the confined space permit to acknowledge that they been informed.
- Confined space atmospheres must be tested periodically with continuous ventilation applied to ensure that hazards have not been introduced into the operation.
- Entrants or their representatives shall be provided with an opportunity to observe air monitoring test results for the confined space.
- Employees or their representatives are entitled to request additional monitoring at any time.

#### Air Ventilation

- Continuous forced air ventilation shall be applied to the confined space to eliminate atmospheric hazards.
- The supply of ventilation air must be clean and free of hazardous vapors, dusts, mists, gasses and other hazardous material.
- Periodic tests of the confined space atmosphere shall be performed to prevent accumulation of hazardous vapors, dusts, mists, gasses and other hazardous material.
- If atmospheric hazards accumulate while ventilation is applied, the ventilation system is inadequate and shall be re-designed to adequately maintain safe levels while under continuous forced ventilation.

#### External Hazards

Proper provisions and procedures for external hazard control including pedestrians & vehicles shall be implemented. Examples of such controls include high visibility barriers, hazard tape, signage or other means which effectively control external hazards.

#### Multiple Employers

In order to eliminate confusion and prevent endangering employees of other entities, the entry supervisor must:

- Inform other employers and their employees of all permit-required confined spaces.
- Supply all relevant confined space specific documentation to employers who may have personnel enter or work near confined spaces.
- Inform the employer that compliance with this program or one that is more stringent is mandatory before confined space entry is permitted.
- Debrief the contractor at the conclusion of the entry operations regarding the permit space program followed and regarding any hazards confronted or created in confined spaces during entry operations.
- Keep employers informed on the status of each confined space such as when the permits are terminated or re-issued.
- Additional employers who are responsible for performing confined space operations shall:
  - Verify that all documented information regarding all confined spaces has been received before entry is permitted.
  - Coordinate all confined space operations with TRIAD MECHANICAL CONTRACTORS entry supervisor when employees of both entities will be working in or near permit-required confined spaces.
  - Inform TRIAD MECHANICAL CONTRACTORS of the confined space program that the contractor will follow and of any hazards confronted or created in the confined space, either through a debriefing or during the entry operation.
  - Provide copies of all confined space documentation to TRIAD MECHANICAL CONTRACTORS entry supervisor.

#### Rescue Services

Rescue services vary depending on the specific circumstances of the confined space or work site. Therefore, coordination between the safety manager and the entry supervisor shall occur in order to determine which service is best suited for the specific circumstances of each confined space. Rescue services shall be provided by:

- The host facility;
- An outside service which is given an opportunity to examine the entry site, practice rescue and decline as appropriate, or
- TRIAD MECHANICAL CONTRACTORS by selecting a rescue team that is equipped and trained to perform the needed rescue services.

#### Permit-Required Confined Space Rescue Procedures:

- The attendant shall immediately summon rescue by the designated communication method such as radio, verbal, alarm or other effective means upon becoming aware of the need for rescue.
- The attendant shall not leave the immediate vicinity of the confined space while summoning rescue unless the hazard is putting the attendant's own personal health and safety at risk.
- The attendant shall prevent unauthorized personnel from entering the confined space.
- The attendant shall effectively communicate the emergency to the entry supervisor as per the agreed upon communication method immediately after summoning rescue.
- If the designated rescue service is an outside rescue service, they must be:
  - Informed of all hazards that may be presented as a result of rescue;
  - Provided with access to the confined space.
- If the designated rescue service is an equipped and trained team of TRIAD MECHANICAL CONTRACTORS employees, they must be:
  - Provided with the appropriate personal protective equipment that is necessary to effectively execute the rescue.
  - Properly trained to use the personal protective equipment effectively.
  - Properly trained to perform rescue operations.
  - Required to perform annual rescue drills.
  - Properly trained in first aid and CPR.

- At least one rescue team member must hold current certifications in first aid and CPR.

#### Non-entry Rescue Procedures:

- Non-entry rescue requires a “retrieval” system, which must be attached to the entrant upon entering a permit-required confined space, which exceeds a vertical depth of 5 feet.
- If the “retrieval” system or its components increases the overall risk of the entry or rescue then it is not required.
- All rescue entrants must use a full body harness with a “D” ring located between the shoulders or above the head during the rescue.
- If the use of a full body harness creates more risk or is not feasible for the rescue operation, wristlets may be used as an alternative.

\* Rescue service must be on-site for immediately dangerous to life and health (IDLH) conditions while work is being performed.

\* Attendants are NOT ALLOWED to monitor multiple confined spaces during an emergency.

#### Permit Issuance

Confined space permits are valid for one shift and must expire upon the date and time specified by the permit. Permits shall not be completed, signed or issued until all pre-entry requirements are fulfilled.

If an injury, incident, reported hazard or unauthorized entry occurs at the confined space, the permit shall be terminated. A new hazard assessment shall also be performed and followed by corrective actions to address the issue that caused permit termination.

#### Permit Termination, Closure and Cancellation

Permit termination, closure and cancellation have the same definition with regard to this program. Terminating, closing or cancelling a permit with regard to this program is defined as an action that makes the confined space permit invalid. An invalid permit requires the issuance of a new permit if confined space operations are to continue.

#### Permits shall be terminated when:

- The confined space operation is complete.
- Concluding a regular or irregular shift.
- When a hazard or potential hazard is identified in or near the confined space.
- When conditions have changed in or near the confined space.

All confined space entry documentation and permits shall be maintained for at least 1 year from the date of entry.

#### Program Review

Annual reviews and necessary revisions of this program shall be performed if confined space permits were issued within 1 year leading up to the annual review date. If no permits were issued within 1 year leading up to the annual review date, then no program review is required. All confined space entry records and permits must be retained and made available for at least 1 year from the date the entry was performed.

#### Training

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Training must be provided to all affected employees prior to initial assignment, prior to a change in assigned duties, if a new hazard has been created and /or if special deviations have occurred. Should the training become outdated or otherwise inadequate, revisions to the training program subject matter shall be conducted until the program meets the requirements of this program and applicable regulatory standards.



Supervisors are responsible for certifying that training has been conducted for each affected employee by:

- Ensuring the certification includes employee names, signatures of the trainers and the training dates.
- Ensuring that certificates are maintained and available for review by employees, their representatives and other applicable parties.

Employees shall be retrained when:

- A new hazard that the employee has not received training on is presented.
- The entry supervisor perceives deviations from permitted confined space procedures, when the employees' actions or potential actions could endanger his or herself or other employees or when the entrant supervisor sees the need for re-training due to some other factor.

# CONFINED SPACE EVALUATION CHECKLIST

NEW Evaluation

Re-evaluation of existing space

Confined Space# \_\_\_\_\_

## SPACE LOCATION / PHYSICAL CHARACTERISTICS

- 1) Confined spaces are identified by location: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
Location / Building / Room / # Within Room
- 2) Identify Space Owner: \_\_\_\_\_ Department: \_\_\_\_\_
- 3) Opening Type: Portal Size \_\_\_\_\_ Configuration \_\_\_\_\_ Accessibility \_\_\_\_\_  
(inches) (round; oval; square; rectangle) (vertical top or bottom; horizontal)
- 4) Identify Type of Space: \_\_\_\_\_ (boiler, bunker, degreaser, equipment housing, furnace, hopper, manhole, pipeline, pit, stack, tank, test chamber, trench, tunnel, vat, vault, vessel, etc.)

## HAZARD IDENTIFICATION and EVALUATION

Describe Past and Current Uses: \_\_\_\_\_

Space is large enough and so configured that an employee can bodily enter and perform assigned work: \_ (Y/N)

Space has limited or restricted means of entry or exit: \_\_\_\_ (Y/N)

Space is not designed for continuous employee occupancy: \_\_\_\_ (Y/N)

NOTE: If answer to questions 1,2, and 3, is "yes", complete the remainder of section II; otherwise go to section III.

Space contains or has potential to contain "Hazardous Atmosphere" (<19.5 ->23.5 oxygen; >10% LEL; Toxics > PEL/TLV; combustible dust > or = to LFL; IDLH): \_\_\_\_ (Y/N)

Space has 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: \_\_\_\_ (Y/N)

Space contains material that can engulf entrant: \_\_\_\_ (Y/N)

Welding/burning will take place in confined space: \_\_\_\_ (Y/N)

Biological hazards are associated with the confined space: \_\_\_\_ (Y/N)

Space contains mechanical hazards: \_\_\_\_ (Y/N)

Space contains physical agents (electrical; thermal; radiological; compression; etc.): \_\_\_\_ (Y/N)

Identify any other recognized serious safety and health hazard(s): \_\_\_\_\_

## CONCLUSION / SUMMARY:

CS Classification: \_\_\_\_\_ Select: (PRCS =Permit-Required CS / NPCC= Non-Permit CS / NC= Not a CS)

Evaluator: \_\_\_\_\_

Date: \_\_\_\_\_

# CONFINED SPACE ENTRY PERMIT

Space to be entered		Purpose of Entry				
Space Address		Authorized Duration of Permit From: _____ To: _____				
<p><b>PERMIT SPACE HAZARDS</b></p> <input type="checkbox"/> Oxygen Deficiency (less than 19.5%) <input type="checkbox"/> Oxygen Enrichment (greater than 23.5%) <input type="checkbox"/> Flammable gases or vapors (must be less than 10% of LFL) <input type="checkbox"/> Airborne combustible dust (meets or exceeds LFL) <input type="checkbox"/> Toxic gases or vapors (greater than PEL) <input type="checkbox"/> Mechanical hazards <input type="checkbox"/> Electric shock <input type="checkbox"/> Materials harmful to skin <input type="checkbox"/> Engulfment <input type="checkbox"/> Other: _____		<p><b>EQUIPMENT REQUIRED FOR ENTRY AND WORK</b> Specify as required:</p> Personal Protective Equipment: _____ Respiratory Protection: _____ Atmospheric Testing/Monitoring: _____ Communication: <input type="checkbox"/> Visual <input type="checkbox"/> Voice <input type="checkbox"/> Radio/Cell Tripod Retrieval System: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Other: _____				
<p><b>PREPARATION FOR ENTRY</b></p> <input type="checkbox"/> Notification of affected departments of service interruption Isolation Methods: <input type="checkbox"/> Ventilate: Continuous forced air ventilation must be utilized in instances where there is the likelihood of atmospheric hazards. <input type="checkbox"/> Atmospheric Test <input type="checkbox"/> Inert <input type="checkbox"/> Purge/clean <input type="checkbox"/> Blank/Blind <input type="checkbox"/> LOTO <input type="checkbox"/> Barriers Additional Permits required and/or attached: <input type="checkbox"/> Hotwork <input type="checkbox"/> Line Breaking <input type="checkbox"/> Other: _____		<p><b>AUTHORIZED ATTENDANTS</b> List by name or attach roster:</p>    Personal Awareness: <input type="checkbox"/> Pre-entry briefing on specific hazards and control methods <input type="checkbox"/> Notify contractors of permit and hazard conditions <input type="checkbox"/> Other: _____				
Test For:	Acceptable Values	Pre-Entry* Time/Results	Break Time/Results	Break Time/Results	Break Time/Results	
Oxygen	19.5% <sub>min</sub> - 23% <sub>max</sub>					
Flammability	Less than 10%					
Hydrogen Sulfide (H <sub>2</sub> S)	Less than 10 ppm					
Carbon Monoxide (CO)	Less than 35 ppm					
Other						
Sampling Equipment and Date Last Calibrated:		*Pre-Entry Measurements performed by Entry Supervisor				
Note: Determination of unacceptable conditions requires notification the safety manager for additional guidance.						
AUTHORIZED ENTRANTS (List by name or attach roster)			Time In	Time Out	Time In	Time Out
1						
2						
3						
4						

\*\*\* THIS IS A TWO PAGE FORM - PLEASE BE SURE TO FILL OUT BOTH PAGES \*\*\*



AUTHORIZATION BY ENTRY SUPERVISOR

*I certify that all required precautions have been taken and necessary equipment is provided for safe entry and work in this confined space.*

SIGNATURE: \_\_\_\_\_

PRINT NAME: \_\_\_\_\_

# Disciplinary Program

## Purpose

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The purpose of this program is to establish disciplinary action procedures that encourage compliance with TRIAD MECHANICAL CONTRACTORS safety programs and other safety & health efforts made by TRIAD MECHANICAL CONTRACTORS.

## Scope

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This program applies to all TRIAD MECHANICAL CONTRACTORS work sites and employees regardless of employment duration or position within TRIAD MECHANICAL CONTRACTORS.

## Responsibilities

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### Safety Manager

- Responsible for the implementation and enforcement of this program.
- Ensure that disciplinary actions are adequate enough to ensure program effectiveness.
- To conduct disciplinary action procedures in accordance with this program.

### Supervisors

- Assist the safety manager in enforcing this program.
- Ensure that employees are aware of what constitutes a safety violation and follow on actions.
- Report all safety violations to the safety manager who will determine what action items should follow the violation.
- Support the safety manager in disciplinary action procedures.

### Employees

- Comply with all parts of this program.
- Help prevent incidents by reporting safety violations to your supervisor.
- Formally report any disciplinary / corrective actions that you believe are unfair or discriminatory to your supervisor immediately.

\* Physical inspections of work areas will be performed regularly by TRIAD MECHANICAL CONTRACTORS officials who will report suspected safety violations where applicable.

## Requirements

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Employee safety is extremely important to the owners and management of TRIAD MECHANICAL CONTRACTORS. Not following safety rules or procedures is considered unacceptable and complying with TRIAD MECHANICAL CONTRACTORS safety programs, rules and procedures is mandatory. Safety violations include but are not limited to:

- Intentional disregard of safety rules, procedures or guidelines required by TRIAD MECHANICAL CONTRACTORS or its clients
- Horseplay or other actions that compromise safety and health
- Non-compliance with PPE program requirements or other written TRIAD MECHANICAL CONTRACTORS requirements
- Using or possessing alcohol or illegal drugs during work hours or on TRIAD MECHANICAL CONTRACTORS premises
- Possessing firearms or other weapons while on TRIAD MECHANICAL CONTRACTORS premises
- Not reporting incidents as required by TRIAD MECHANICAL CONTRACTORS

- Attempted or actual physical force to cause injury, threatening statements or other actions to cause an employee to feel they are at risk of injury.
- Harassing, threatening or otherwise putting the health and safety of other employees at risk.

#### Procedure

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The following disciplinary action procedures shall be applied after a safety violation notice has been issued:

- 1<sup>st</sup> Safety Violation: The first safety violation will result in a verbal warning. However, a copy of the safety violation notice shall be issued and kept on record for the duration of the employee's employment. The supervisor or safety manager shall inform the employee of which safety rules or procedures were violated and recommend corrective actions or actions to prevent re-occurrence. The employee's direct supervisor and or other applicable persons shall also be notified of the violation and shall receive a copy of the safety violation notice.
- 2<sup>nd</sup> Safety Violation: The second safety violation shall result in a written disciplinary action form and possible training on the safety violation subject matter. The disciplinary action form shall include the issue date, name and signature of employee, name and signature of supervisor, violation number, violation description and disciplinary / corrective actions which were taken or are to be taken.
- 3<sup>rd</sup> Safety Violation: The third safety violation shall result in another disciplinary action form but must include temporary layoff for a duration which shall be determined in collaboration between the safety manager, supervisor and / or other applicable personnel. The severity of the violation is to be considered when disciplinary action is applied.
- 4<sup>th</sup> Safety Violation: The fourth safety violation shall result in termination of employment unless there is a compelling reason to retain the employee which is to be determined by the safety manager, supervisor and other applicable personnel.

\* The affected employee may submit a written rebuttal at any time before, during or after the disciplinary period.

\* Safety violations shall expire 12 months after the date of occurrence.

\* All disciplinary actions are subject to change based on the severity or degree of negligence. For example, if an employee physically harms another employee, intentionally commits an unsafe act that results in harm, potential harm, damage or potential damage that places TRIAD MECHANICAL CONTRACTORS or its employees at significantly higher level of risk or results in losses that are considered serious; the employee could be terminated without having multiple safety violations. Therefore, the degree of disciplinary action will often be determined on a case-by-case basis and will vary depending on the violation severity or effects of the violation.

#### Recordkeeping

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All safety violation documentation shall be kept on file for 2 years after his or her employment is terminated. In cases where the disciplined or terminated employee claims discriminatory or unfair disciplinary / corrective action or termination; the employee's entire employee file (including all safety violation documentation) shall be kept for 3 years after his or her employment is terminated.



## EMPLOYEE WARNING REPORT

### Employee information

Employee name

Date

Employee ID

Job Title

Manager

Department

Type of Warning

Type of Offense

### Description of Infraction

### Plan for Improvement

### Consequences of Further Infractions

### Acknowledgement of Receipt of Warning

*By signing this form, you confirm that you understand the information in this warning. You also confirm that you and your manager have discussed the warning and a plan for improvement. Signing this form does not necessarily indicate that you agree with this warning.*

Employee Signature

Date

Safety Officer Signature

Date

Witness Signature (if employee understands warning but refuses to sign)

Date

# Electrical Safety Awareness

## Purpose

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The purpose of this program is to establish TRIAD MECHANICAL CONTRACTORS safe work practices for electrical tools, equipment and their related components.

## Scope

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The scope of this program covers all permanent and temporary TRIAD MECHANICAL CONTRACTORS employees and TRIAD MECHANICAL CONTRACTORS while working on TRIAD MECHANICAL CONTRACTORS owned sites. If TRIAD MECHANICAL CONTRACTORS does not own a particular site; the site owner's program shall be used on that site unless the site owners' program is less stringent.

## Responsibilities

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### Safety Manager

- Develop electrical safety programs & procedures in accordance with regulatory standards and as required by each individual site.
- Ensure that TRIAD MECHANICAL CONTRACTORS employees fully comply with this program.
- Ensure that no unqualified employees work on energized electrical circuit equipment or their parts.

### Supervisors

- Ensure that only qualified employees and / or qualified contractors perform electrical repairs and installations.
- Ensure that electrical programs and procedures address site specific hazards or hazards that are presented by unique circumstances at their respective areas of responsibility.
- Ensure that no unqualified employees work on energized electrical circuit equipment or their parts.

### Qualified Employees

- Ensure that no unqualified employees work on energized electrical circuit equipment or their parts.
- Ensure individual familiarity with the use of special precautionary techniques, personal protective equipment, insulated tools, insulating materials and shielding materials.

### Employees

- Ensure that only qualified employees work on energized electrical circuit equipment or other related parts.
- Report all potential electrical hazards to supervisors immediately.

## Definitions

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Class I hazardous locations - areas having the presence of *flammable gases or vapors* in the air, such as natural gas or gasoline vapor. When these materials are found in the atmosphere, a potential for explosion exists, which could be ignited if an electrical or other source of ignition is present. The Code writers have referred to this first type of hazard as *Class I*. So, a *Class I Hazardous Location* is one in which *flammable gases or vapors* may be present in the air in sufficient quantities to be explosive or ignitable. Some typical Class I locations are:

- Petroleum refineries, and gasoline storage and dispensing areas;



- Dry cleaning plants where vapors from cleaning fluids can be present;
- Spray finishing areas;
- Aircraft hangars and fuel servicing areas; and
- Utility gas plants, and operations involving storage and handling of liquified petroleum gas or natural gas.
- All of these are Class I . . . gas or vapor . . . hazardous locations. All require special Class I hazardous location equipment.

Class II hazardous locations - areas made hazardous by the presence of combustible *dust*. These are referred to in the Code as "Class II Locations." Finely pulverized material, suspended in the atmosphere, can cause as powerful an explosion as one occurring at a petroleum refinery. Some typical Class II locations are:

- Grain elevators;
- Flour and feed mills;
- Plants that manufacture, use or store magnesium or aluminum powders;
- Producers of plastics, medicines and fireworks;
- Producers of starch or candies;
- Spice-grinding plants, sugar plants and cocoa plants; and
- Coal preparation plants and other carbon handling or processing areas.

Class III hazardous locations - areas where there are *easily-ignitable fibers or flying* present, due to the types of materials being handled, stored, or processed. The fibers and flying are not likely to be suspended in the air, but can collect around machinery or on lighting fixtures and where heat, a spark or hot metal can ignite them. Some typical Class III locations are:

- Textile mills, cotton gins;
- Cotton seed mills, flax processing plants; and
- Plants that shape, pulverize or cut wood and create sawdust or flying.

Qualified Person - A person who currently trained in the operation, repair, maintenance, construction and implementation of electrical equipment and electrical hazards.

Circuit Breaker – An automatic switch that stops the flow of electric current in a suddenly overloaded or otherwise abnormally stressed electric circuit.

Disconnecting Means - A device or other means by which circuit conductors can be disconnected from a power supply.

Disconnecting Switch – A device, which is used to isolate a circuit or equipment from a power source.

Double Insulated Tool - Tools which are constructed using non-conductive materials that do not require grounded, 3 wire plugs.

Grounded Conductor - A conductor that is used to connect equipment or the grounding circuit of a wiring system to a grounding electrode or several grounding electrodes.

Ground Fault Circuit Interrupter (GFCI) - A device that interrupts the electrical circuit to the load when a fault current to the ground exceeds a predetermined value that is less than what is required to operate the over current protective device of the supply circuit.

## Safe Work Practices

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### General

- All electrical equipment, tools and related components must be inspected prior to each use.
- Equipment, tools and related components, which are unserviceable or faulty, shall be removed from service and tagged appropriately with the date of inspection, the name of the inspecting employee and signature of inspecting employee.
- Only qualified personnel may repair electrical tools, cords and other related equipment.
- Only certified electricians may repair or conduct maintenance on electrical equipment and wiring systems.
- The site supervisor shall verify contract electrician credentials before work begins.
- Employees shall not wear conductive apparel such as rings, watches, etc. unless they are rendered non-conductive by covering, wrapping or other insulating means.
- When working on or near exposed de-energized parts, those parts shall be treated as live.
- 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 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 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.
- Only approved, certified, electrical contractors may perform construction and service work on TRIAD MECHANICAL CONTRACTORS or client property.
- It is the Manager/Supervisors responsibility to verify the contractor's certification.
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### Extension 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 both 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 wires, 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 or 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 remove from service and repaired or replaced.
- Extension cords shall not be used on compressor skid to operated 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.

#### Illumination

- Employees shall not enter spaces containing exposed energized parts unless qualified and proper illumination exists to enable employees to work safely.

#### 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 labelled with the voltage rating.
- Each breaker within a breaker panel must be labelled for the service it provides.
- Disconnect switches providing power for individual equipment must be labelled accordingly.

#### Ladders

- Portable ladders must have non-conductive side rails.
- Ladders must be manufactured using non-conductive materials such as fiberglass or wood.
- Aluminum or metal ladders are strictly prohibited.
- Ladders shall be free of defects and defective components.
- Ladders shall be used per the manufacturer's recommendations only.

#### 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.
- Minimum approach distance to energized high power voltages lines for unqualified employees is 10 feet.
- Minimum approach distance for qualified employees shall be followed per 29 CFR 1910.333(c)(3)(i) Qualified – Table S5 Selection and Use of Work Practices - Approach Distances for Qualified Employees – Alternating Current). Approach distances are 10' for 50kV plus 4" for every additional 10kV.

#### Confined or Enclosed Work Spaces

- When an employee works in a confined or enclosed space that contains exposed energized parts, the employee 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 shall 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 a safe operation and to permit access for maintenance and alteration.
- A minimum two-foot working floor space in front of panels and enclosures shall be painted yellow.
- Employees may not enter spaces containing exposed energized parts unless illumination is provided that enables the employees 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 employees 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 employee is exposed to contact with parts of fixed electric equipment or circuits which have been deenergized, the circuits energizing the parts shall be locked out or tagged or both.
- Conductors and parts of electrical equipment that have been de-energized but not been locked or tagged out shall be treated as live parts.
- Per TRIAD MECHANICAL CONTRACTORS 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 TRIAD MECHANICAL CONTRACTORS’s Control of Hazardous Energy – Lock Out/Tag Out Program. Lockouts are performed by the Safety Manager, Shop Foreman or Branch Manager. Designated employees 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 TRIAD MECHANICAL CONTRACTORS’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.

#### 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.

#### Assured Grounding

OSHA requires that employers shall use either ground fault circuit interrupters (GFCI) or assured equipment grounding conductor program to protect personnel from electrical shock while working.

- TRIAD MECHANICAL CONTRACTORS shall use GFCI's in lieu of an assured grounding program.

#### Ground Fault Circuit Interrupters

All 120-volt, single-phase 15 and 20 ampere receptacle outlets on construction or maintenance sites, which are not part of the permanent wiring of the building or structure and which are in use by employees, shall have approved ground fault circuit interrupters for personnel protection.

- All hand portable electric tools and extension cords shall use a GFCI.
- Additionally, approved GFCI's shall be used for 240-Volt circuits in the same service as described above.
- GFCI's must be used on all 120 volt, single-phase 15 amp and 20 amp receptacles within 6 feet of a sink, damp areas or on installed outdoor equipment.
- The GFCI must be the first device plugged into a permanent receptacle.
- The GFCI must be tested before each use.

#### Training

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- All TRIAD MECHANICAL CONTRACTORS employees both temporary and full time shall be trained in electrical safety practices and procedures to minimize the risk of electrical shock.
- Unqualified employees who may be exposed to electric shock shall receive training and acquire familiarity with electric safety work practices.
- All TRIAD MECHANICAL CONTRACTORS employees both temporary and full time shall be trained in safety related work practices that pertain to their respective job assignments.
- Safe work practices shall be used to prevent electric shock or other related incidents as a result of energy source contact while working near or on energized equipment or circuits.
- In the event that TRIAD MECHANICAL CONTRACTORS employees qualified employees, those employees must adhere to the approach distances in Table S5 of CFR 1910.333.

Voltage Range (phase to phase)	Minimum Approach Distance
Over 300V, not over 750V	1 ft. 0 in. (30.5 cm)
Over 750V, not over 2kV	1 ft. 6 in. (46 cm)
Over 2kV, not over 15kV	2 ft. 0 in. (61 cm)
Over 15kV, not over 37kV	3 ft. 0 in. (91 cm)
Over 37kV, not over 87.5kV	3 ft. 6 in. (107 cm)
Over 87.5kV, not over 121kV	4 ft. 0 in. (122 cm)
Over 121kV, not over 140kV	4 ft. 6 in. (137 cm)

# Fall Protection

## Purpose

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The purpose of this program is to provide fall protection procedures to prevent injury to employees while performing work assignments at elevated levels.

Any changes to this Fall Protection Program or development of site specific plan must be approved by the SAFETY Manager, who is designated as the Qualified Person. This is based on training received in fall protection planning and has demonstrated skills and knowledge in the preparation of fall programs, plans and the hazards involved.

## Scope

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Applies to all TRIAD MECHANICAL CONTRACTORS employees who have work assignments at work levels that exceed 6 feet in height where guardrails or nets are not utilized. This includes work near and around excavations. Guardrails, safety nets, or personal fall arrest systems shall be used where feasible. When work is performed on a non-owned or operated site, the operator's program shall take precedence, however, this document covers TRIAD MECHANICAL CONTRACTORS employees and shall be used on owned premises, or when an operator's program doesn't exist or is less stringent.

## Definitions

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"Anchorage" means a secure point of attachment for lifelines, lanyards or deceleration devices.

"Body belt (safety belt)" means a strap with means both for securing it about the waist and for attaching it to a lanyard, lifeline, or deceleration device. These will be used as a last resort as they are known to cause back injuries.

"Body harness" means straps which may be secured about the employee in a manner that will distribute the fall arrest forces over at least the thighs, pelvis, waist, chest and shoulders with means for attaching it to other components of a personal fall arrest system.

"Buckle" means any device for holding the body belt or body harness closed around the employee's body.

"Carabineer" - see Snap hook

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

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

"Deceleration distance" means the additional vertical distance a falling employee travels, excluding lifeline elongation and free fall distance, before stopping, from the point at which the deceleration device begins to operate. It is measured as the distance between the location of an employee's body belt or body harness

attachment point at the moment of activation (at the onset of fall arrest forces) of the deceleration device during a fall, and the location of that attachment point after the employee comes to a full stop.

"Equivalent" means alternative designs, materials, or methods to protect against a hazard which the employer can demonstrate will provide an equal or greater degree of safety for employees than the methods, materials or designs specified in the standard.

"Failure" means load refusal, breakage, or separation of component parts. Load refusal is the point where the ultimate strength is exceeded.

"Free fall" means the act of falling before a personal fall arrest system begins to apply force to arrest the fall.

"Free fall distance" means the vertical displacement of the fall arrest attachment point on the employee's body belt or body harness between onset of the fall and just before the system begins to apply force to arrest the fall. This distance excludes deceleration distance, and lifeline/lanyard elongation, but includes any deceleration device slide distance or self-retracting lifeline/lanyard extension before they operate and fall arrest forces occur.

"Guardrail system" means a barrier erected to prevent employees from falling to lower levels.

"Infeasible" means that it is impossible to perform the inspection work using a conventional fall protection system (i.e., guardrail system, safety net system, or personal fall arrest system) or that it is technologically impossible to use any one of these systems to provide fall protection.

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

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

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

"Lower levels" means those areas or surfaces to which an employee can fall. Such areas or surfaces include, but are not limited to, ground levels, floors, platforms, ramps, runways, excavations, pits, tanks, material, water, equipment, structures, or portions thereof.

"Personal fall arrest system" means a system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, a body belt or body harness and may include a lanyard, deceleration device, lifeline, or suitable combinations of these.

"Positioning device system" means a body belt or body harness system rigged to allow an employee to be supported on an elevated vertical surface, such as a wall, and work with both hands free while leaning.

"Rope grab" means a deceleration device which travels on a lifeline and automatically, by friction, engages the lifeline and locks so as to arrest the fall of an employee. A rope grab usually employs the principle of inertial locking, cam/level locking, or both.

"Safety Nets...Safety nets shall be provided when workplaces are higher than 25 feet above ground or water surfaces or other surfaces where the use of ladders, scaffolds, catch platforms, temporary floors, safety lines or safety belts are impractical.

Nets shall extend 8 feet beyond the edge of the work surface where employees are exposed and shall be installed as close under the work surface as practical but in no case more than 25 feet below the work surface. Nets shall be positioned in a manner to prevent the user from coming into contact with below surfaces or structures. Proper clearance positioning of nets shall be determined by impact load testing. Work procedures shall not begin until nets are in place and have been properly tested.

New nets shall meet accepted performance standards of 17,500 foot pounds minimum impact resistance as determined and certified by the manufacturers and shall bear a label of proof test. Edge ropes shall provide a minimum breaking strength of 5000 pounds.

"Self-retracting lifeline/lanyard" means a deceleration device containing a drum-wound line which can be slowly extracted from, or retracted onto, the drum under slight tension during normal employee movement, and which, after onset of a fall, automatically locks the drum and arrests the fall.

"Snap hook" means a connector comprised of a hook-shaped member with a normally closed keeper, or similar arrangement, which may be opened to permit the hook to receive an object and, when released, automatically closes to retain the object. Snap hooks are generally one of two types: (1) The locking type with a self-closing, self-locking keeper which remains closed and locked until unlocked and pressed open for connection or disconnection; or (2) The non-locking type with a self-closing keeper which remains closed until pressed open for connection or disconnection. As of January 1, 1998, the use of a non-locking snap hook as part of personal fall arrest systems and positioning device systems is prohibited.

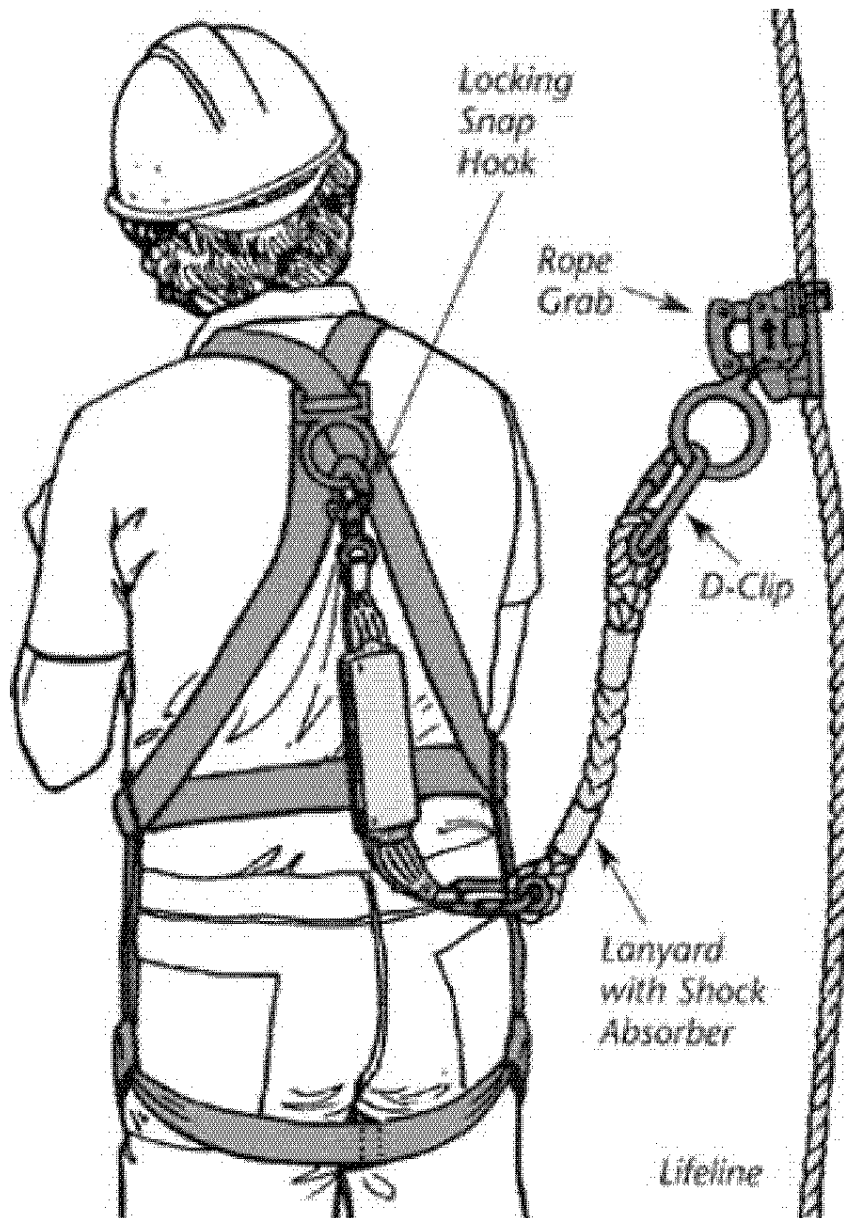
"Unprotected sides and edges" means any side or edge (except at entrances to points of access) of a walking/working surface, e.g., floor, roof, ramp, or runway where there is no wall or guardrail system at least 39 inches (1.0 m) high.

"Walking/working surface" means any surface, whether horizontal or vertical on which an employee walks or works, including, but not limited to, floors, roofs, ramps, bridges, runways, formwork and concrete reinforcing steel but not including ladders, vehicles, or trailers, on which employees must be located in order to perform their job duties.

"Work area" means that portion of a walking/working surface where job duties are being performed.



Diagram of Components



## Responsibilities

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### Operations Manager

It is the responsibility of the local operations manager (designated competent person) to implement this Fall Protection Program. Continual observational safety checks of work operations and the enforcement of the safety policy and procedures shall be regularly enforced. All jobs shall be pre-planned prior to the start of work.

### Supervisor

The Supervisor shall ensure that all persons assigned to work at elevated levels, exceeding 6 feet in height or more above lower level and where guardrails or nets are not utilized, be protected by personal fall protection equipment.

- Supervisors shall make exposure determinations and shall discuss with their employees the extent to which scaffolds, ladders or vehicle mounted work platforms can be used.
- Ensure that fall protection equipment is available and in safe working condition.
- Provide for emergency rescue in the event of a fall. Pre-plan the job to ensure that employees have been properly trained in the use, limitations, inspections and rescue procedures and that training records are on file.

### Employees

Employees shall ensure they have and use the fall protection equipment as required by this program and:

- Understand the potential hazards of working at elevated levels as well as gaining access to and from the work location.
- Understand the use and limitations of such equipment.
- Pre-plan the job with his/her supervisor to agree that the job can be done safely.
- Inspect such equipment before each use and to report defective equipment immediately to their supervisor.

## Procedure

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Fall protection is required whenever employees are potentially exposed to falls from heights of six feet or greater to lower levels. This includes work near and around excavations. Use of guard rails, safety net, or personal fall arrest systems should be used when the standard methods of protection are not feasible or a greater hazard would be created.

When purchasing equipment and raw materials for use in fall protection systems applicable ANSI, ASTM or OSHA approved equipment shall be used.

### Minimum Standards

The following are minimum standards for TRIAD MECHANICAL CONTRACTORS employee personal fall protection systems:

- All D-rings must be a minimum of 2¼ inches (inside diameter).
- All snap hooks shall not allow pressure to be applied to the gate in the opening direction.
- No pelican hooks on lanyards should be used as a primary connection.
- Connectors shall be drop forged, pressed or formed steel, or made of equivalent materials.
- Connectors shall have a corrosion-resistant finish, and all surfaces and edges shall be smooth to prevent damage to interfacing parts of the system.
- D-rings and snap hooks shall have a minimum tensile strength of 5,000 pounds.

- D-rings and snap hooks shall be proof-tested to a minimum tensile load of 3,600 pounds without cracking, breaking, or taking permanent deformation.
- Snap hooks shall be sized to be compatible with the member to which they are connected to prevent unintentional disengagement of the snap hook. Only a locking type snap hook designed and used to prevent disengagement of the snap hook by the contact of the snap hook keeper by the connected member shall be used.
- Horizontal lifelines shall be designed, installed, and used, under the supervision of a qualified person, as part of a complete personal fall arrest system, which maintains a safety factor of at least two.
- Lanyards and vertical lifelines shall have a minimum breaking strength of 5,000 pounds. Where vertical lifelines are used, each employee shall be attached to a separate lifeline.
- Lifelines shall be protected against being cut or abraded.
- Self-retracting lifelines and lanyards which automatically limit free fall distance to 2 feet or less shall be capable of sustaining a minimum tensile load of 3,000 pounds applied to the device with the lifeline or lanyard in the fully extended position.
- Self-retracting lifelines and lanyards which do not limit free fall distance to 2 feet or less, rip stitch lanyards, and tearing and deforming lanyards shall be capable of sustaining a minimum tensile load of 5,000 pounds applied to the device with the lifeline or lanyard in the fully extended position.
- Anchorages used for attachment of personal fall arrest equipment shall be independent of any anchorage being used to support or suspend platforms and capable of supporting at least 5,000 pounds per employee attached, or shall be designed, installed, and used as part of a complete personal fall arrest system which maintains a safety factor of at least two and under the supervision of a qualified person.
- Systems used by an employee having a combined person and tool weight in excess of 310 pounds shall be modified to provide proper protection for such heavier loads.
- The attachment point of the body harness shall be located in the center of the wearer's back near shoulder level, or above the wearer's head, except when climbing.
- Body harnesses and components shall be used only for employee protection and not to hoist materials.
- Personal fall arrest systems and components subjected to impact loading shall be immediately removed from service and shall not be used again for employee protection until inspected and determined by a competent person to be undamaged and suitable for reuse.
- Provide for prompt rescue of employees in the event of a fall or assure that employees are able to rescue themselves.
- Personal fall arrest systems shall be inspected prior to each use for wear, damage and other deterioration, and defective components shall be removed from service.
- Personal fall arrest systems shall not be attached to guardrail systems, nor shall they be attached to hoists unless prior approval is obtained from a competent person.
- If and when a personal fall arrest system is used at hoist areas, it shall be rigged to allow the movement of the employee only as far as the edge of the walking/working surface.

#### Stopping a fall

The arresting force on an employee stopped by a fall shall be limited to a maximum arresting force of 1,800 pounds when wearing a body harness.

The fall arrest system shall be rigged such that an employee can neither free fall more than 6 feet, nor contact any lower level.

The fall arrest system shall bring an employee to a complete stop and limit maximum deceleration distance an employee travels to 3.5 feet.

The fall arrest system shall have sufficient strength to withstand twice the potential impact energy of an employee free falling a distance of 6 feet, or the free fall distance permitted by the system, whichever is less.

#### Protection from Falling Objects

When employees are required to work in the near vicinity of others working with materials, tools, or equipment at elevated levels, Barricades around the immediate area of the overhead work shall be erected to prohibit employees from entering the barricaded area.

Employees performing work at elevated levels shall keep tools, materials, and equipment away from the edge to keep potential objects from falling over the side. Where practical, tools, etc. shall be secured with rope, wire, etc. to keep them from falling.

#### Portable Ladders

Three point climbing is required while ascending/descending ladders. While on ladders, both hands and one foot, or both feet and one hand shall always be in contact with the ladder.

Tools required to perform a task shall be transported by a mechanical carrier such as a tag line, suspended bucket or tool belt.

- Tools shall not be carried by hand while climbing.
- Hands must be free to grip the ladder.
- Tools shall not be carried in clothing pockets.
- Tools shall be pulled up to the job site only after reaching the area of work.

When work is to be performed from straight/extension ladders, fall protection shall be utilized when heights exceed 6 feet.

Straight ladders shall be tied off at the top to prevent them from moving. A second person shall steady the ladder at the base while it is being tied off at the top by another employee. Do not tie off fall protection equipment to the ladder.

#### Storage

A dedicated storage area shall be provided for the storage of fall protection equipment and all components. The storage area shall keep the equipment clean, dry, and free from oils, chemicals, paints, and excessive heat.

#### Inspections

Fall protection equipment shall be inspected before each use for wear, damage, other deterioration, or other defects.

#### Elevated Personnel Platforms

Work performed, regardless of the nature of the work, from personnel platforms raised by forklifts, cranes, scissor lifts, etc., shall require the use of a full body harness and shall be connected to the platform.

## Rescue

Prompt rescue of employees shall be provided in the event of a fall or shall assure the employees are able to rescue themselves. The pre-planning stage prior to the beginning of each elevated work assignment shall be evaluated by the supervisor to provide rescue of employees involved in a fall.

## Fall Protection Plan

This option is available only to employees engaged in leading edge work who can demonstrate that it is infeasible or it creates a greater hazard to use conventional fall protection equipment. The fall protection plan shall conform to the following provisions:

- The fall protection plan shall be prepared by a qualified supervisor and developed specifically for the site where the leading edge work is being performed.
- The fall protection plan shall document the reasons why the use of conventional fall protection systems (guardrail systems, personal fall arrest systems, or safety net systems) are infeasible or why their use would create a greater hazard.
- The fall protection plan shall identify each location where conventional fall Protection methods cannot be used.
- These locations shall then be classified as controlled access zones.

## Controlled Access Zones

When used to control access to areas where leading edge or other operations are taking place the controlled access zone shall be defined by a control line or by any other means that restricts access.

When control lines are used, they shall be erected not less than 6 feet (1.8 m) nor more than 25 feet (7.7 m) from the unprotected or leading edge.

The control line shall extend along the entire length of the unprotected or leading edge and shall be approximately parallel to the unprotected or leading edge.

The control line shall be connected on each side to a guardrail system or wall.

- Control lines shall consist of ropes, wires, tapes, or equivalent materials.
- Each line shall be flagged or otherwise clearly marked at not more than 6-foot (1.8 m) intervals with high-visibility material.
- Each line shall be rigged and supported in such a way that its lowest point (including sag) is not less than 39 inches (1 m) from the walking/working surface and its highest point is not more than 45 inches (1.3 m).
- Each line shall have a minimum breaking strength of 200 pounds.

Only employees engaged in the related work shall be permitted in the controlled access zone.

### Safety Monitoring System

When the use of conventional fall protection equipment is deemed infeasible or the use of this equipment creates a greater hazard a Fall Protection Plan which includes a safety monitoring system shall be implemented by the supervisor.

Supervisors shall designate a competent person to monitor the safety of other employees. The competent person shall be assigned to:

- Recognize fall hazards;
- Warn employees if they are unaware of fall hazard or are acting in an unsafe manner;
- Be on the same working surface and in visual contact of working employees;
- Stay close enough for verbal communication; and
- Not have other assignments that would take his/her attention from the monitoring function.

### Incident Investigations

All incidents and near misses must be investigated according to TRIAD MECHANICAL CONTRACTORS's incident investigation procedure. Changes to the fall protection program shall be implemented if deemed appropriate from incident corrective actions.

### Training

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Employees who might be exposed to fall hazards shall be trained to enable each employee to recognize the hazards of falling and in the procedures to follow to minimize these hazards.

The employee will be trained in the use and operation of fall arrest systems, inspections, and maintenance procedures.

Training must be conducted initially and refresher training conducted annually or as needed due to deficiencies in training, changes in the workplace, changes in fall protection systems or procedures that render previous training obsolete or inadequacies in an employee's understanding of previous training.

Training must be documented in writing. Written certification shall include:

- Who was trained
- When and dates of training
- Signature of person providing training
- Date training was deemed adequate by TRIAD MECHANICAL CONTRACTORS

Training records shall be retained in the corporate office.

# Fire Extinguishers

## Purpose

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This program is designed to provide procedures to ensure that fire extinguishers work properly and employees know how to operate the extinguishers safely in the event of a fire.

## Scope

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This program's scope encompasses all employees at all locations.

## Responsibilities

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### Safety Manager

- Develops procedures for the use and maintenance of fire extinguishers,
- Devises training programs that teach the proper use of these devices.

### Manager

- Implements fire extinguisher training at the manager's designated location.

### Shop Foremen

- Enforce the provisions of the fire extinguisher section of the training manual.

### All Employees

- Follow the provisions of the training manual.

## Procedure

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### Selection and Distribution

Portable fire extinguishers are provided for use by employees. These fire extinguishers vary in class based on the type of fire they are made to extinguish, the size of the fire, and the degree of hazard that affects the use of the extinguisher.

The four classes of fire extinguishers used by TRIAD MECHANICAL CONTRACTORS are as follows:

- Class A Fire Extinguishers: Used on common combustibles or fibrous materials such as wood, cloth, paper, rubber and some plastics. The distance from employees to any fire extinguisher must not exceed 75 feet (22.9 m),
- Class B Fire Extinguishers: Used on flammable or combustible liquids such as gasoline, kerosene, paint, paint thinners and propane. The distance of the extinguisher from an area with Class B hazardous materials must not exceed 50 feet (15.2 m),
- Class C Fire Extinguishers: Used on electrical equipment that has been energized, such as appliances, panel boxes and power tools. The distance from an area with Class C hazards to an extinguisher is no more than 50 feet (15.2m),
- Class D Fire Extinguishers: Used on combustible metals such as magnesium, titanium, potassium and sodium. The distance from a Class D working area to an extinguisher is no greater than 75 feet (22.9 m).

### Fire Extinguisher Labels

- Fire extinguishers are mounted in locations that can be easily accessed by employees, are no more than 75 feet from any employee, and are identified by a sign reading, "Fire Extinguisher",
- Fire extinguishers will not be blocked, even on a temporary basis, by equipment, boxes or products,
- A unique number will be assigned to each fire extinguisher.

## Maintenance

- All fire extinguishers must be mounted no higher and no lower than four feet from the floor,
- Must be numbered to identify their designated location,
- Must be fully charged and operable,
- Must be clean and free of defects,
- Must be accessible at all times.

## Inspection, Maintenance and Testing

- All fire extinguishers shall be inspected on a monthly basis,
- Certified staff from a fire extinguisher dealer will perform an annual maintenance check on all fire extinguishers,
- Certified staff will inspect and recharge fire extinguishers after use,
- In the event a fire extinguisher shows a loss of pressure during the monthly inspection, certified staff will inspect and recharge the fire extinguisher,
- Completed fire inspection logs are to be maintained in the safety files for five years.

## Use

- In the event of a fire, an employee will get the nearest appropriate fire extinguisher for use on the burning materials and will attempt to put out the fire,
- All other employees in the area will prepare to evacuate the area of the fire, if necessary,
- Other employees in the building will be notified of the fire,
- A standard fire extinguisher empties in 10-15 seconds. All employees must leave the area at this time, even if the fire is not out.

## Training and Education

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This section establishes the training procedures required for understanding fire extinguishers, their proper use and incipient-stage firefighting. Training is required prior to initial assignment and on an annual basis thereafter.

- Even Numbered Years: A member of the local fire department will conduct training, which will include hands on use of a fire extinguisher in a “live fire” situation,
- Odd Numbered Years: The safety manager will conduct training involving a demonstration of the use of a fire extinguisher, without the actual discharge of the unit.

New employees will undergo the odd numbered year training upon hire.

### *Initial Training Outline*

- General fire principles and fire extinguishers,
- Hazards of fires in the beginning stages,
- When to evacuate the area of a fire,
- Hazards of fire extinguisher use,
- Proper use of a fire extinguisher.

### *Retraining*

- Establishes employee proficiency and provides updated information on control procedures,
- Is provided for all authorized and affected employees on an annual basis, in the event of a change in job assignment, when knowledge of policies is found to be insufficient or when TRIAD MECHANICAL CONTRACTORS determines that there have been deviations from established policies.

### *Training Documentation*

- All training will be documented with the results of each employee’s performance on a hands-on test,



- Documentation shall include the name of the employee, name of the trainer, date of training and an outline of the training provided.

# First Aid

## Purpose

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The program outlined in this document has been implemented to ensure adequate amounts of first aid equipment and supplies are available for employees and to put in place proper procedures for situations requiring first aid.

## Scope

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This program specifically applies to all of our employees regardless of where they are performing work unless otherwise notified by the safety manager and documented on the site-specific plan.

## Responsibilities

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### Safety Manager

- Implement and ensure the requirements of this program are followed at all times,
- Will work in conjunction with The Red Cross or other applicable entities to make sure employees are up-to-date on applicable training requirements,
- Keep all records pertaining to this program in order and current.

### Supervisors

- Ensure that first aid kits are made available and adequately stocked for each work site,
- Will make sure that provisions for prompt medical attention, including transportation in case of a serious injury, are in place before a project begins,
- Will provide adequate first aid supplies and equipment within easy reach when required,
- Ensure that access to emergency and medical phone numbers is available in a conspicuous place to all employees.

### Employees

- Will follow the requirements of this program where applicable,
- Will use first aid supplies and equipment responsibly,
- Immediately notify the supervisor of any low first aid kit supplies,
- Know the location of emergency telephone numbers.

## Requirements

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### First Aid Supplies and Equipment

First aid supplies and equipment must be available and easily accessible to employees at all times.

First aid kits will contain all appropriate items determined to be adequate for the environment in which they will be used.

First aid kits will be assessed periodically to ensure adequate amounts of first aid supplies are always available. Inadequate first aid kits must be reported to your immediate supervisor who will then have the kits restocked with adequate supplies prior to the start of the work shift.

The site supervisor shall perform an inspection of the first aid supplies on a weekly basis. Kits shall be replenished as needed by the site supervisor.

A safety shower, eye wash, and/or other suitable facilities for quick drenching or flushing shall be provided within the work area of any facility where the eyes or body of any person may be exposed to injurious corrosive

materials. Ensure expiration dates are checked for safety reasons and that the water used in storage devices is sanitized.

An assessment of the material or materials used shall be performed to determine the type of flushing/drenching equipment will be required at the job site. Portable or temporary stations must be set up prior to the use of corrosive materials on all client job sites.

#### Medical Response

All minor first aid is to be self-rendered. Because of the risks associated with certain blood-borne pathogens, no one is allowed to tend the minor injuries of another person.

A person who has a valid certificate in first-aid shall be available to render first aid, in the absence of an infirmary, clinic, hospital, or physician that is reasonably accessible in terms of time and distance to the worksite. It is mandatory that a valid certificate in first-aid training must be obtained from the U.S. Bureau of Mines, The American Red Cross or an equivalent training authority which can be verified by documentary evidence.

Universal precautions must always be observed when first aid is rendered by authorized employees with the proper training. (Universal Precautions means that the aid giver treats all bodily fluids as if they were contaminated).

If 911 is not available refer to the list of posted phone numbers for prearranged medical response providers. All authorized first responders of TRIAD MECHANICAL CONTRACTORS should have a cell phone as a means of communications; otherwise hand held radios or telephones shall be used as a means of communication.

#### Transportation

Based on the first responders' assessment of the injuries involved, decide what type of treatment will be performed and the location of the treatment (emergency room, occupational medicine provider, or on-site first aid).

Examples of serious injuries requiring transport to a medical provider are those resulting in severe blood loss, possible permanent disfigurement, head trauma, spinal injuries, internal injuries and loss of consciousness. Keep in mind that the needs and well-being of the injured are the first priority.

Proper equipment for prompt transportation of the injured person to a physician or hospital or a communication system for contacting necessary ambulance service should be available at all times.

Choices to consider for proper transport include: private automobile, TRIAD MECHANICAL CONTRACTORS vehicle, helicopter, crew boat, EMS vehicles including medevac helicopters, or any other transportation that can provide safe transportation to the hospital or doctor's office in order to provide medical attention to the injured in the quickest manner without the injured employee incurring any additional complications or injuries.

Transportation needs must be preplanned and coordinated with the transportation provider prior to an incident requiring such service.

#### Training

Volunteers or selected employees are trained by the American Red Cross or equivalent in CPR and first aid. Each of these trained and certified employees are equipped with protective gloves and other required paraphernalia. CPR training must be re-certified annually and first aid training must be re-certified every three years.

# Hand and Power Tools

## Purpose

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The purpose of the Hand and Power Tools Program is to establish policies and procedures for the safe operation of hand tools, power tools and other portable tools, including guarding. All hand and power tools shall be maintained in a safe working condition.

## Scope

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This program applies to all employees who use hand and power tools while engaged in work at TRIAD MECHANICAL CONTRACTORS facilities and/or offsite facilities.

## Responsibilities

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### Managers and Supervisors

Make sure that operation, maintenance and proper use of tools are fully understood by all employees,

- Train employees and provide them with all personal protective equipment (PPE) needed to safely operate portable tools.

### Employees

- Will use the proper tool for each task,
- Will follow the manufacturer's recommendations on the safety and operation for the tool.

## Requirements

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### General

All tools must be an approved type and in good condition in order to be used.

Any tool which is not in compliance with any applicable requirement of this part is prohibited and shall be identified as unsafe by tagging or locking the controls to render them inoperable.

Tools may be inspected at any time,

Any employee has the authority, and is responsibility, to remove unsafe tools from use, no matter who they belong to

Tools deemed unsafe by any employee must be labeled with a "DO NOT USE OR OPERATE" tag to prevent use of the tool.

Employees are required to always use the appropriate tool for the task at hand. Substitute tools are not allowed. Makeshift tools are strictly prohibited.

Avoid using tools containing metal around energized electrical circuits or equipment (e.g., hammers with metal handles, screwdrivers with metal in the handle, metal measuring tapes).

Throwing tools from one place to another or one person to another is prohibited. Tools must be safely carried and, if lowered from one elevation to another, must be secured in tool bags or buckets and firmly attached to hand

lines.

Tools must never be placed on unsecure, elevated surfaces.

Impact tools (e.g., chisels and punches) that become cracked or mushroomed must be dressed, repaired or replaced prior to further use.

Pipes, ground rods, drills, chisels and punches must be held with applicable holders or tongs while being struck by another employee. These must never be held with the hands.

Employees are not permitted to use shims to make a wrench fit. Wrenches with damaged or sprung jaws will not be used.

Employees may only use tools for the purposes for which they are intended.

Sharp-edged tools must be safely handled and stored to prevent injury or damage to the tool or other property. These tools will not be carried in pockets without the use of appropriate protectors to preserve the edge.

Splintered, loose or cracked wooden handles must be replaced. Taping or lashing the handle with wire is unacceptable.

Employees must not leave tools lying around where they may cause other persons to trip or fall.

Employees working on or above open grating must cover the grating with a canvas or other covering to prevent tools and parts from dropping through the grate where others are present. Alternately, the danger area below the grating may be guarded or barricaded.

The insulation on hand tools is primarily for comfort and must not be depended on to protect employees from high voltage shock. Exceptions to this are approved live line tools.

#### Portable Electric Tools

Metal portable electric tool parts that do not carry current (e.g. drills and saws) must be effectively grounded when connected to a source of power unless:

- The tool has approved double insulation, or
- The tool is connected to an isolated transformer or power supply.

Power tools must be inspected before each use to ensure the device is in proper working order and has all of its applicable safety devices.

Power tools may only be used as they were designed and intended to be used, according to the manufacturer's instructions. Using the tool's electrical cords for raising or lowering tools is prohibited.

Tools should be well-maintained. Power tools should be safely disconnected from the power source before adjustments or repairs are made.

Employees without a valid Hot Work Permit are prohibited from using electrical tools in hazard areas exposed to flammable vapors, gases or dusts

When using portable electric tools, ground fault circuit interrupters or an Assured Grounding Program must be in place. This requirement does not apply to equipment that runs off of portable or vehicle mounted generators at 5 kilowatts or less, those that are isolated from ground or to equipment running directly off of secondaries.

#### Pneumatic Tools

- Pneumatic tools must never be pointed toward another person,
- Pneumatic power tools must be secured to the hose or whip in such a way to prevent accidental disconnection of the tool from the hose,
- Pneumatic impact tools (percussion tools) must have safety clips or retainers installed and maintained to prevent accidental discharge of their attachments.

#### Compressed Air Tools

- Must be reduced to less than 30 psi when used for cleaning purposes and then only used with personal protective equipment (PPE) and effective chip guarding,
- Cannot be used to blow dust or dirt off clothing,
- May not be left unattended while under pressure,
- Are only to be operated by competent persons trained in the appropriate use of the tool.

Safe operating pressure, as recommended by the manufacturer, must be maintained for hoses, valves, pipes, filters and other fittings. The manufacturer recommended limits must not be exceeded.

Use of hoses for lifting or lowering tools is strictly prohibited.

Adjusting or changing air tools requires that the air is shut off at the air supply valve, ahead of the hose. Before breaking the connection, bleed the hose at the tool. This is not necessary for tools equipped with quick-change connectors.

Secure air tool connections before turning on the air pressure. The tool should be properly under control by the operator before the air is turned on.

Clamps and couplings on pressurized air hoses must be pinned with appropriate fasteners. Only approved end-fitting clamps may be used. Screw type heater hose clamps are unacceptable.

Hoses and their connections used in the conduction of compressed air to equipment must be designed for the pressure and service they are being used for. Never point a hose toward someone while blowing it down. Conductive hoses should not be used near energized equipment.

Employees are required to wear foot protection when operating impact tools (e.g., paving breakers, rotary drills, tampers, clay spades, etc.) and any other time as required by the supervisor.

Pneumatic nailer, staplers and other equipment with automatic fastener feeds that operate at 100 psi or higher pressure at the tool are required to have a safety device on the muzzle to prevent against the ejection of fasteners, unless this muzzle would be in contact with the work surface.

Airless spray guns that atomize paint and fluids at high pressures of 1,000 lbs. or more per square inch must be equipped with safety devices (automatic or manual) to prevent accidental pulling of the trigger and to prevent the release of paint or fluid before the safety device is manually released. Alternately, a diffuser nut, high velocity release and a nozzle tip guard or other equivalent protection is acceptable.

#### Powder Actuated Tools

Powder actuated tools are those that are activated by an explosive charge, and:

- Only qualified employees certified in the use of these tools may operate them,
- Explosive charges for these tools must be transported and carried in approved containers,
- Employees using these tools will be provided with face, eye and hearing protection.

Tools are to be maintained and serviced regularly by qualified persons. Prior to using these tools, the materials on

which the tools are to be used must be inspected to eliminate hazards and to determine the tool's suitability for the task at hand.

#### Prior to Use

- The operator will make sure the protective shield is securely attached to the tool,
- The operator will inspect the tool to determine that:
  - It is clean,
  - Its moving parts operate smoothly,
  - Guards and safety devices are in place,
  - The barrel is free of obstructions.
- Only qualified employees certified in the use of these tools may operate them,
- The operator must read and familiarize himself/herself with the operating guidelines and procedures as recommended by the manufacturer.

When a tool sustains damage or develops a defect during use, the employee will stop using the tool and remove it from service, as noted in this program.

Tools are not to be loaded until just before the intended firing time. Unattended tools should not be left loaded. Tools, whether loaded or unloaded, should never be pointed at another person. Tools must never be left unattended in a place where unauthorized persons may have access to the tool.

If the tool misfires, the operator will hold the tool in the operating position for at least 30 seconds. The operator will then try the tool a second time. If the tool misfires again, the operator will hold the tool in position for another 30 seconds. The operator must then remove the explosive charge with strict adherence to the manufacturer's instructions.

Fasteners must not be driven into unusually hard or brittle materials including, but not limited to, surface hardened steel, live rock, hollow tile, glazed tile, cast iron, glass block, live rock or face brick.

On the other hand, driving into easily penetrable materials should be avoided unless the materials are backed in such a way that will prevent the pin or fastener from passing completely through the material and creating a flying missile hazard on the other side.

Tools must not be used in flammable or explosive atmospheres.

#### Hydraulic Power Tools

Hydraulic powered tools must use fire-resistant fluids approved according to Schedule 30 of the U.S. Bureau of Mines, Department of the Interior, which will retain its operating properties at the most extreme temperatures to which it is exposed.

The manufacturer's safe operating pressures must be adhered to for hoses, pipes, valves, filters and other fittings.

When using hydraulic tools on or around energized lines or equipment, non-conducting hoses of adequate strength for the normal operating pressure must be used.

#### Hydraulic Jacks

##### *Loading and Marking*

- The operator must ensure that the jack being used is rated sufficiently to lift and sustain the load to which it is subjected,
- The rated load must be marked in a legible and permanent manner in a prominent location on the jack via stamping, casting or other means.

### *Operation and Maintenance*

- If a firm foundation is not available, the base of the jack must be blocked. If there is a possibility that the cap will slip, a block must be placed between the load and the cap,
- The operator must keep an eye on the stop indicator, which must be kept clean, in order to determine the travel limit. The indicated limit must not be exceeded.
- After the load is raised, it must be secured at once,
- Antifreeze will be supplied in adequate quantities for hydraulic jacks that are exposed to freezing temperatures,
- Jacks must be well-lubricated according to the manufacturer's recommendations at regular intervals.

The operator must inspect the jack before each use. Jacks that are deemed unsafe must be tagged accordingly and taken out of use until repairs are made.

### *Abrasive Blast Cleaning Nozzles*

Blast cleaning nozzles will have an operating valve that must be held open manually. A support will be provided to mount the nozzle on when it is not in use.

### *Fuel Powered Tools*

Fuel-powered tools must be stopped during refueling, servicing or maintenance. Fuel must be handled, stored and transported according to the Flammable and Combustible Liquids Program.

When using fuel powered tools in enclosed spaces, the requirements for concentrations of toxic gases apply. The use of protective equipment must be adhered to.

### *Guarding Portable Tools*

Guarding must be in place and in operating condition at all times when the tool is in use. The operator is prohibited from manipulating the guard in a manner that will compromise the integrity of the guard or the protection for which it is intended. Guarding on portable tools will meet ANSI B15.1 requirements.

### *Portable Circular Saws*

- Portable, powered circular saws that have a blade diameter greater than 2 in. must have guards in place above and below the base plate or shoe,
- The upper guard must cover the depth of the saw's upper teeth, except for the minimum arc required to allow retraction of the guard and contact with the work surface,
- The lower guard must cover the depth of the saw's lower teeth, except for the minimum arc required to allow the retraction of the guard and contact with the work surface,
- When the tool is pulled back from the work surface, the lower guard automatically returns to the covering position
- Cracked or damaged saw blades must be removed from service.

### *Switches and Controls*

- All hand held power tools are required to have a constant pressure switch or control and may be provided with a lock-on control that allows turnoff by a single motion of the same finger or fingers that turn it on,
- A constant pressure switch or a control that will shut off the power when the pressure is released must be in place on all hand-held powered circular saws with blade diameters of 2 inches or more, hydraulic, electric, or pneumatic chain saw, and percussion tools without positive accessory holding,
- Hand-held gasoline powered chain saw must have a constant pressure throttle control to shut off the power to the chain when the pressure is released,
- Operating controls on hand-held power tools will be placed to minimize the possibility of accident operation, if accidental operation would be a potential hazard to employees,
- Portable electric powered tools will be grounded according to the requirements set forth in the Electrical Safety Program. All electric power tools must have a three-prong plug.



## Portable Abrasive Wheels

### *Safety Guards Exceptions*

- Mounted wheels used in portable operations 2 inches or less in diameter,
- Wheels used for internal work while within the work being ground,
- Types 16, 17, 18, 18R, and 19 cones, plugs and threaded-hole pot balls where the work offers protection,
- Guards must be made of steel or other material of suitable strength,
- A safety guard must cover the spindle end, nut and flanges. The guard must be mounted in a way that maintains its proper alignment with the wheel. The strength of the fasteners must exceed the strength of the guard,
  - Exception: Safety guards may be constructed so that the spindle end, nut, and outer flange are exposed if the work provides adequate protection to the operator. These may also be exposed when the portable machine is designed for and used with type 6, 11, 27 and 28 abrasive wheels, cutting off wheels, and tuck pointing wheels,
- When the work provides cover for the entire side of the wheel, the guard's side covers can be omitted.

### *Mounting and Inspection of Abrasive Wheels*

- All wheels must be examined before mounting. A ring test must be conducted to ensure they have not been damaged during transit, storage, etc.,
- To conduct the ring test, "tap" the wheels about 45 degrees each side of the vertical midline and about 1-2 inches from the periphery. Then, rotate the wheel 45 degrees and repeat the test. Undamaged wheels will have a clear metallic sound. If the wheel is cracked, there will not be a clear "ring",
- The machine's spindle speed must be checked before mounting wheels to ensure that it doesn't exceed the maximum operating speed as marked on the wheel,
- Grinding wheels must fit freely and remain free on the spindle under all grinding conditions,
- To avoid excessive pressure from spindle expansion and mounting, a controlled clearance must be maintained between the wheel hole and spindle,
- The machine's spindle must be manufactured to nominal (standard) size plus zero minus .002 inch. The wheel hole must be suitably oversized to ensure safety clearance under the conditions of operating heat and pressure,
- All surfaces in contact with wheels, flanges and blotters must be flat and free of aberrant objects,
- When the use of a bushing is required in a wheel hole, it must not exceed the width of the wheel and must not come into contact with the flanges.

## Portable Grinders

"Revolving cup guards" that mount behind and turn with the wheel will be used. These will be made of steel or other adequate materials and will enclose the wheel sides up from the back for one third (1/3) of the thickness of the wheel. A clearance of no more than one-sixteenth inch must be maintained between the guard and wheel side.

Right angle grinders, or vertical portable grinders, will have a maximum angle of exposure of 180 degrees. The guard will be placed between the wheel and the operator during use. The guard may be adjusted to ensure that, in case of an accident, pieces of the broken wheel will be deflected away from the worker.

### *Other Portable Grinders*

The maximum allowable angular exposure for the periphery of the grinding wheel and the sides for safety guards must not exceed 180 degrees. The top half of the wheel must be enclosed at all times.

## Personal Protective Equipment

Employees will be provided with personal protective equipment (PPE) if they may be exposed to any of these possible hazards:

- Falling, flying, abrasive or splashing objects,
- Harmful dust, vapors, gases, fumes or mists.

# HAZCOM Program

## Purpose

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The purpose of this program is to ensure that the hazards of all chemicals and substances identified and evaluated, and that the information concerning their hazards is communicated to employees, emergency response organizations, state and federal agencies, and other employers and contractors, as necessary. This hazard information will be clearly communicated, and displayed in accordance with this Hazard Communication Program.

TRIAD MECHANICAL CONTRACTORS is firmly committed to providing each of its employees a safe and healthy work environment. It is recognized that workers may use chemicals or substances that have potentially hazardous properties. When using these substances, workers must be aware of the identity, toxicity or hazardous properties of a chemical or substance. We believe an informed employee is more likely to be a safe employee. To this end, we have established and implemented a written Hazard Communication Program.

## Scope

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This program is applicable to all employees who may come in contact with hazardous chemicals while working for TRIAD MECHANICAL CONTRACTORS. This document is to be followed by all TRIAD MECHANICAL CONTRACTORS employees and contractors on TRIAD MECHANICAL CONTRACTORS owned premises. In addition, this program is to be used in the event an operator program does not exist or is less stringent than our own.

## Definitions

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Chemical - any element, chemical compound, or mixture of elements and/or compounds.

Chemical Inventory List - a list of chemicals used at this facility, or by personnel that report to this facility.

Electronic Access – using electronic media (telephone, fax, internet, etc.) to obtain Material Safety Data Sheets or health information.

Facility - an establishment at one geographical location containing one or more work areas.

Hazardous Chemical - any chemical that is a physical hazard, a health hazard, or has a Permissible Exposure Limit established for it.

Hazardous Substance - see hazardous chemical.

Hazard Communication Program Coordinator - the person who has overall responsibility at a facility for that facility's Hazard Communication Program.

Health Hazard - a substance for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic adverse health effects may occur in exposed employees.

IDLH - immediately dangerous to life and health.

Immediate Use - the chemical will be under the control of and used only by the person who transfers it from a labeled container and only within the work shift in which it is transferred.

Job Site - an area remote from a facility where hazardous chemicals are stored or used and employees are present for the purpose of business.

(SDS) Safety Data Sheet - a written or printed document containing chemical hazard and safe handling information, prepared in accordance with the OSHA Occupational Safety & Health Standards, Section 1910.1200, paragraph (g).

(NFPA) National Fire Protection Association Labeling - a common industry labeling method developed by the National Fire Protection Association to identify the hazards associated with a particular chemical.

(PEL) Permissible Exposure Limit - the maximum eight-hour time weighted average of any airborne contaminant to which an employee may be exposed.

Readily Available - when an employee has access during the course of his/her normal work shift.

Substance - see Chemical.

(TLV) Threshold Limit Value - the airborne concentration of a substance that represents conditions under which it is believed that nearly all normal workers may be repeatedly exposed day after day without adverse effect.

Work Area - a room or defined space in a facility where hazardous chemicals are stored or used and where one or more employees are present.

Workplace - see Facility.

Workplace Chemical List - see Facility Chemical List.

## Responsibilities

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A written hazard communication program shall be developed, implemented and maintained at each TRIAD MECHANICAL CONTRACTORS workplace. The program will describe how labels and other forms of warning, material safety data sheets and employee information will be kept, maintained, and disseminated.

The Safety Manager is responsible for developing and implementing the Hazard Communications Program. Managers are responsible for maintaining Safety Data Sheets and the Chemical Inventory List for their respective locations. The Safety Manager reviews the SDS files and Chemical Inventory List at each location at least annually to ensure they are current and complete.

Employees are responsible for following the requirements set forth in the Hazard Communication Program, to use proper personal protective equipment, to report containers without labels immediately to their supervisor and to never deface any label.

Any employee who transfers any material from one container to another is responsible for labeling the new container with all required information.

All employees are responsible for learning the requirements of this section and for applying them to their daily work routine.

## Requirements

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### Introduction

This Hazard Communication Program was prepared for use by TRIAD MECHANICAL CONTRACTORS to explain how we meet the requirements of the federal Occupational Safety and Health Administration's (OSHA's) Hazard

Communication Standard (29 CFR 1910.1200). It spells out how we inventory chemicals stored and used, how we obtain and use material safety data sheets, how we maintain labels on chemical substances, and how we train employees about the hazards of chemicals they are likely to come in contact with on the job.

Preparation of this program indicates our continuing commitment to safety among our employees in all of our locations.

- Each facility is expected to follow this program and maintain its work areas in accordance with these requirements.
- Employees, their designated representatives, and government officials must be provided copies of this program upon request.
- As part of our ongoing hazard communication effort, we will make available other information in addition to the program to any worker requesting it.
- Asking to see this information is an employee's right,
- Using this information is part of our shared commitment to a safe, healthy workplace.

#### List of Hazardous Chemicals

TRIAD MECHANICAL CONTRACTORS maintains a listing of all known hazardous chemicals known to be present at each job site by using the identity it is referenced by on the appropriate safety data sheet (SDS). This identity is often a common name, such as the product or trade name (i.e., Lime-A-Way).

The Chemical Inventory List is updated annually by the Hazard Communication Program Coordinator or their designee with additional updates being made when necessary.

The facility Chemical Inventory List must be available for review upon request. Additionally, a written hazard communication program must be developed, implemented & maintained at each workplace.

#### Safety Data Sheets

Chemical manufacturers are responsible for developing SDS's. TRIAD MECHANICAL CONTRACTORS shall have a SDS for each chemical used with the exception of consumer products. SDS's must be obtained for each required chemical from the chemical manufacturer, supplier, or vendor. The purchasing of any potentially hazardous chemical products from any supplier that does not provide an appropriate Safety Data Sheet in a timely fashion is strictly prohibited.

SDS's shall be maintained and readily accessible in each workplace. SDS's can be maintained at the primary work site, however, they should be immediately available in case of emergency. SDS's must be made available upon request to employees, their designated representatives, the Assistant Secretary of Labor, and to the Director of OSHA.

Safety Data Sheets are filed alphabetically, and by material classification, in the SDS Book. A Chemical Inventory List is provided in the front of the SDS Book, listing all SDS' contained therein. This inventory serves as the index of the SDS Book. The SDS Book shall be displayed in a prominent location in the work area where it is accessible to all employees.

A copy of a SDS request form is located in the first section of the SDS Book. An employee may use a copy of this form to request an SDS or he may ask the Manager for one. In either case, the requested SDS must be given to the employee within 24 hours of being requested.

The Safety Data Sheet must be kept in the SDS library for as long as the chemical is used by the facility. Electronic access (telephone, fax, Internet, etc.) may be used in the acquisition of any needed SDS and to maintain SDS libraries and archives.

The Manager is responsible for seeing that the Chemical Inventory List inventory is maintained, is current, and is complete. He will review and update the inventory and the SDS Book at least annually. When a hazardous material has been permanently removed from the work place, its SDS is to be removed from the SDS Book and the Chemical Inventory List. The SDS is then placed in a "dead file" in case it is needed in the future.

SDS's for hazardous materials to which employees have been exposed must be maintained after the employee leaves the employment of TRIAD MECHANICAL CONTRACTORS.

Employees will be advised of all special instructions, PPE, and the hazards associated with chemicals-including chemicals contained in unlabeled pipes-in their work areas. The Manager will inform employees of the hazards of non-routine tasks by presenting a copy of the site specific hazardous materials list, ensuring that the employee is aware of their presence should a non-routine task with unfamiliar materials present itself.

Employees have the right to request SDS on any chemical which must then be provided without any issues.

Labels, Labeling and Warnings:

The Manager will ensure that all hazardous chemicals used or stored in the facility are properly labeled.

- Damaged labels or labels with incomplete information shall be reported immediately,
- Damaged labels on incoming containers of chemicals will not be removed,
- New labels shall be provided as needed so that all containers are labeled correctly,
- Only containers into which an employee transfers a chemical for their own immediate use will not require labeling,
- Employees who are unsure of the contents of any container, vessel, or piping must contact their supervisor for information regarding the substance including:
  - The name of the substance,
  - The hazards associated with the substance,
  - The safety precautions required for working with the substance.

Labels, tags, or markings on containers shall list as a minimum:

- Identity of the hazardous chemical,
- Name and address of the chemical manufacturer, importer, or other responsible party,
- Words, pictures, symbols, or combinations thereof may be used for identification,
- The trade name of the product as listed on the Safety Data Sheet,
- Appropriate hazard warnings to help employees protect themselves from the hazards of the substance,
- Labels shall be legible, in English, with additional labels being presented in the native language of each foreign national employed by TRIAD MECHANICAL CONTRACTORS,
- TRIAD MECHANICAL CONTRACTORS or its employees must not remove or deface labels on incoming containers of any hazardous chemicals.

All containers must be labeled correctly. Upon transferring the content of one container to another, the employee must label the new container with all required information. This information can be obtained from the labeling of the original container or from the material's MSDS. Any container of a potentially hazardous material that will not be emptied during one shift must be labeled, without exception.

Personnel in the Shipping and Receiving Departments are responsible for the proper labeling of all containers shipped by TRIAD MECHANICAL CONTRACTORS and for the inspection of all incoming materials for correct labeling. Chemicals received from vendors that are improperly labeled must be rejected.

NFPA Standard 704 labels shall be the preferred hazard identification method used in TRIAD MECHANICAL CONTRACTORS facilities and on materials containers used on client sites. All employees, clients, subcontractors, and visitors who may come in contact with a hazardous substance must be briefed to ensure understanding of the NFPA 704 labeling system.

#### Training

Employees shall be provided with appropriate, effective information and training on the hazardous chemicals in their work area at the time of their initial assignment, and upon the introduction of a new physical or health hazard into their work area. Information and training may be designed to cover categories of hazards (e.g., flammability, carcinogenic) or specific chemicals. However, chemical-specific information must always be available through labels and safety data sheets.

Additional training will be provided whenever a new chemical hazard is introduced into the work area. Supervisors will conduct supplementary training when deemed necessary in order to reinforce the importance of the proper use and handling of chemicals.

Only facility employees and individuals knowledgeable with TRIAD MECHANICAL CONTRACTORS Hazard Communication program will conduct training sessions.

The Manager shall ensure records of employee training are maintained properly.

When an outside contractor, such as a pest control worker or a carpenter, enters a TRIAD MECHANICAL CONTRACTORS site in order to perform a service for TRIAD MECHANICAL CONTRACTORS, they must first present SDS' for any and all hazardous chemicals which will be used. These SDS' will be treated with the same training requirements as the SDS' kept on site for regularly used chemicals and materials. The Manager will be responsible for contacting each contractor prior to work commencing, in order to gather and disseminate any information concerning chemical hazards the contractor is bringing into the work place.

The Hazard Communication Program documented training shall, as a minimum, include:

- Requirements, details, and rights of the employee as contained in the Hazard Communication regulation,
- Operations and work areas where hazardous chemicals are present,
- Location of the written Hazard Communication Program, SDS' and the Chemical Inventory List,
- How to access SDS' or SDS information,
- How to read labels and Safety Data Sheets for pertinent hazard information,
- How employees can obtain and use the appropriate hazard information,
- Methods and observations that may be used to detect the presence or release of hazardous chemicals by use of monitoring devices, visual appearance or odor,
- The physical & health hazards of chemicals in the immediate work area,
- Protection measures utilized for the prevention of hazards related to exposure,
- Appropriate work practices,
- Emergency procedures,
- The use of proper PPE.

#### Multiple Work Sites

Where employees must travel between work places during a work shift, the written HAZCOM Program shall be kept at a primary job site. If there is no primary job site, then the program shall be sent with employees.

The program shall be made available, upon request, to employees, their designated representatives, the Assistant Secretary, and the Director in accordance with requirements of 29 CFR 1910.1020(e).

### Multiple Employer Job Sites

A pre-job briefing shall be conducted with the contractor before work commences on site.

- During this pre-job briefing, contractors shall provide to TRIAD MECHANICAL CONTRACTORS current copies of all Safety Data Sheets along with the label information for every hazardous substance brought on-site.
- TRIAD MECHANICAL CONTRACTORS must notify and provide required SDS and label information for all hazardous materials the contractor may encounter on the job,
- Labeling systems and precautionary measures to be taken by the contractor during both normal conditions and emergencies shall be addressed,
- By providing such information to other employers, TRIAD MECHANICAL CONTRACTORS does not assume any obligations that other employers have for the safety of their employees,
- In this regard, other employers working on TRIAD MECHANICAL CONTRACTORS property, or for TRIAD MECHANICAL CONTRACTORS on client's property, remain fully responsible for developing and implementing their own compliant hazard communication programs.

### Hazard Warnings / NFPA 704

The NFPA 704 Diamond is a means of disseminating hazard warning and information for a specific material. The diamond is divided into four sections. Each of the first three colored sections has a number in it associated with a particular hazard. The higher the number is, the more hazardous a material is for that particular characteristic. The fourth section includes special hazard information. The four sections and an explanation of the numbers in them are provided as a reference below:

NFPA Rating Explanation Guide					
RATING NUMBER	HEALTH HAZARD	FLAMMABILITY HAZARD	INSTABILITY HAZARD	RATING SYMBOL	SPECIAL HAZARD
4	Can be lethal	Will vaporize and readily burn at normal temperatures	May explode at normal temperatures and pressures	ALK	Alkaline
3	Can cause serious or permanent injury	Can be ignited under almost all ambient temperatures	May explode at high temperature or shock	ACID	Acidic
2	Can cause temporary incapacitation or residual injury	Must be heated or high ambient temperature to burn	Violent chemical change at high temperatures or pressures	COR	Corrosive
1	Can cause significant irritation	Must be preheated before ignition can occur	Normally stable. High temperatures make unstable	OX	Oxidizing
0	No hazard	Will not burn	Stable	☼	Radioactive
				W	Reacts violently or explosively with water
				W OX	Reacts violently or explosively with water and oxidizing

The words Material Safety Data Sheet and MSDS have been revised to Safety Data Sheet and SDS to reflect the change to OSHA 1926.59 in regards to Global Harmonization. Done 7/2019

# Ladder Safety Program

## Purpose

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This program is designed to establish rules and requirements for the construction, maintenance and utilization of common ladder types.

All ladders installed on TRIAD MECHANICAL CONTRACTORS equipment, whether purchased or engineered, are subject to this program's requirements.

## Scope

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Procedures outlined in this program apply to all employees who use ladders. This document covers TRIAD MECHANICAL CONTRACTORS employees and contractors and shall be used on all TRIAD MECHANICAL CONTRACTORS owned and operated premises. When work is performed off-site, the agent's program has precedence unless it is less stringent than TRIAD MECHANICAL CONTRACTORS program.

## Definitions

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Ladder – a device consisting of side rails joined at regular intervals by rungs, steps or cleats, on which a worker may step in an ascending or descending motion.

Step ladder - a portable ladder that is self-supporting and nonadjustable length-wise. Steps are flat; the back is hinged. The size of a step ladder is designated by the length of the ladder when measured along the front edge of the side rails.

Single ladder – a portable, nonadjustable ladder with only one section. This ladder requires support. The length of the side rail denotes its size.

Extension ladder – a portable ladder consisting of two or more sections that can be adjusted length-wise by moving the sections along brackets. Its size is denoted by the sum of the lengths of all sections measured along the side rails.

Fixed ladder – a ladder that is permanently attached to equipment or a structure.

Individual-rung ladder - a fixed ladder with no side rails. Each rung is individually attached to a building, structure, or equipment.

Cage – an enclosure surrounding a fixed ladder designed to encircle the climbing space of the ladder to keep the climber safe.

## Key Responsibilities

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### Managers and Supervisors

- It is the responsibility of all managers and supervisors to ensure that all employees and contractors are trained to use and inspect ladders according to the manufacturer's guidelines,
- It is the responsibility of all managers and supervisors to ensure that all employees and contractors are aware that any inspected ladder found to have a defect may not be used and must be taken out of service.

### Employees



- Employees are responsible for inspecting ladders before, during and after each use to make certain the condition of the ladder is safe for its occupants,
- Employees are responsible for following the procedures outlined in this program,
- Employees are responsible for reporting damage or needed repairs to the supervisor.

## Procedure

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### Inspection, Care and Safe Work Practices of Ladders

#### Inspection

Ladders must be inspected for visible defects by a qualified person periodically and after any incidents that may affect the safe use of the ladder.

- Ladders must have uniformly spaced rungs or meet OSHA/ANSI specifications for rungs. These rungs, steps or cleats must be parallel and level while the ladder is positioned for use,
- Any portable or fixed ladder that is found to have structural defects must immediately be marked in such a way that identifies the ladder as defective, or tagged with a “Do Not Use” sign and removed from service until repaired. These structural defects include, but are not limited to: broken rails, corrosion, broken or missing rungs or other faulty parts,
- Ladders that are tipped over must be inspected by a qualified person for dents and bends in the side rails or unusually dented rungs. Hardware connections, rivets and connections between rungs and side rails shall also be inspected at this time,
- Use of ladders with broken side rails, broken or missing steps, or other defective equipment is strictly prohibited. Employees are not permitted to make improvised repairs to these ladders,
- Wooden ladder parts must be free from splinters and sharp edges, free from shake and free from other irregularities.

#### Care

Ladders must be well-maintained at all times.

- The joints between steps and side rails must be tight with all hardware and fittings attached securely,
- Movable parts must operate freely without play or binding in the movement,
- Metal bearings in locks, pulleys, wheels, etc. must be lubricated frequently,
- Rope must be replaced when it is frayed or badly worn,
- Auxiliary equipment and safety feet must be kept in good condition,
- Rungs must be clean of grease and oil,
- Ladders must be stored in areas that are well-ventilated to avoid sagging and warping.

#### Ladder Safe Work Practices

Ladders must only be used for their intended purposes.

Ladders are required to be secured at the top or held in place by a person standing at the base.

Ladder footing must be placed on a level, stable surface.

Extension ladders are to be placed in a 4:1 ratio. Non-self-supporting ladders are to be used at an angle to ensure that the horizontal distance from the top support to the foot of the ladder is one-quarter of the working length of the ladder (the distance between the foot and top support).

If a ladder cannot be extended, the ladder must be secured at the top to a strong support that will not allow the ladder to bend or veer.

Ladders must never be placed on unstable bases, such as boxes or barrels, in order to get additional height.

Ladders may not be placed in a horizontal position to be used as runways, scaffolds or platforms.

Only one person shall occupy a ladder at any given time.

Ladders must not be placed in a doorway wherein the door opens toward the ladder unless the door is locked, guarded, or blocked open.

Ladders used in high traffic areas must be barricaded to avoid accidents and collisions.

Ladder occupants are not permitted to stand on the top two rungs of a ladder or on the top of a step ladder.

The minimum overlap during the use of two-section extension ladders is as follows:

Size of Ladder (feet)	Overlap (feet)
Up to and including 36'	3
Over 36' up to and including 48'	4
Over 48' up to and including 60'	5

Ladders must extend at least three (3) feet above the top of the upper landing surface. Side rails must extend a minimum of three (3) feet above the upper landing surface. When ladders cannot be extended, the top of the ladder must be secured to a rigid support to prevent movement.

Employees must keep a three (3) point grip on the ladder at all times. Tools and equipment must be carried up on a hoist or belt. Employees are prohibited from carrying anything in the hands that could result in a fall or injury.

Employees must face the ladder when going up or down the ladder.

Employees shall not climb on the back legs of stepladders; these are designed for increased stability, not climbing.

No person may move a ladder while it is occupied.

#### Portable Ladders

Length of stepladders shall not exceed 20 feet. Single ladder length shall not exceed 30 feet.

Two-section extension ladders shall not exceed 60 feet in length. All two-section ladders are designed with sections that fit together and are arranged to enable the upper section to be raised and lowered.

Ladders must be kept a minimum of 10 feet away from power lines.

Ladders must have the appropriate load capacity for the task at hand. Ladders may not be loaded beyond the maximum recommended load for that ladder, nor in excess of the capacity as rated by the manufacturer. Weight consists of the combined weight of the climber and his equipment:

- I (250 lbs capacity)
- I-A (300 lbs capacity)
- II (225 lbs capacity)
- III (200 lbs capacity)

#### Fixed Metal Ladders

Ladders must be made to withstand a minimum of 200 pounds.

Metal rungs must have a diameter of at least  $\frac{3}{4}$  inches; wooden rungs must have a diameter of at least 1  $\frac{1}{8}$  inches.

The distance between rungs shall not be more than 12 inches (1 ft.) apart and must be uniform along the length of the ladder.

Rungs must be at least 16 inches long and provide protection to prevent a foot from slipping off the end.

A rung must have at least seven (7) inches between itself and the structure behind it.

Employees must use fall restraint systems when on fixed ladders exceeding six (6) feet in length,

- A cage is required if the ladder is 20 feet tall or greater,
- Cages on fixed ladders must be positioned at least seven (7) feet but no more than eight (8) feet from the walking surface below the cage,
- Cage widths must clear 15 inches on either side of the centerline of the rung,
- Cages must not extend less than 27 inches or greater than 28 inches from the rung's centerline,
- Fall restraint systems may be used in place of ladder cages.

# Lead Safety Program

## Purpose

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This program is to identify the controls and actions necessary to mitigate and prevent adverse health effects to employees from occupational exposure to lead, ensuring the implementation of TRIAD MECHANICAL CONTRACTORS's lead exposure management practices meets all regulatory requirements.

## Scope

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This procedure applies to all TRIAD MECHANICAL CONTRACTORS operations where employees may be exposed to lead while working with lead containing materials during routine maintenance or emergency situations. The implantation of this program affects all regular employees, temporary employees, and any contractors working on TRIAD MECHANICAL CONTRACTORS premises. In addition, for any off-site work, these guidelines are to be followed in the event an operator's program is either not in place, or is less stringent.

## Responsibilities

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### Managers and Supervisors

- In conjunction with the Safety Manager, will develop and implement written project/task specific lead exposure management procedures prior to the start of activities to reduce exposure to or bring exposure to negligible levels,
- All work with the potential of lead exposure will be identified to personnel,
- Make sure individuals responsible for monitoring areas of exposure have received the proper training,
- Ensure personnel receive documented medical surveillance,
- Ensure all employees will receive lead management training when initially employed with TRIAD MECHANICAL CONTRACTORS, and on an annual basis thereafter,
- Will notify the Safety Manager of any upcoming work involving lead-containing materials in order to allow the Safety Manager to put in place arrangements for necessary monitoring,
- Make sure all employees receive the appropriate personal protective equipment (PPE) and have been properly trained in its use and care, including respiratory protection, full body disposable clothing and gloves, when the Action Level is expected to be met or exceeded,
- Ensure the lead exposure management procedure is followed by all employees.

### Safety Manager

- Will coordinate air sampling and monitoring activities,
- will make sure monitoring equipment is in proper working order,
- will make modifications to the lead exposure management procedures to reflect exposure monitoring data, as necessary,
- will maintain the lead exposure management procedure, notifying management of any changes in regulations and ensuring compliance with federal and state requirements at all times,
- coordinates all initial and annual refresher training activities,
- coordinates the medical surveillance program for all employees exposed to lead above the Action Level for more than 30 days per year,
- ensures all waste with lead containing materials is disposed of only at an approved facility.

#### Affected Employees

- Are required to comply with TRIAD MECHANICAL CONTRACTORS lead exposure management procedure by consulting with the supervisor or Safety Manager to ensure the necessary PPE is used,
- will comply with the medical surveillance program,
- will attend initial and annual refresher training,
- respiratory protection equipment and other specified PPE will be worn according to each project/task as needed,
- will make sure respiratory protection equipment is maintained in good working order and notifying the supervisor or Safety Manager of any problems with their equipment prior to starting work,
- will review material safety data sheets or consult the supervisor to identify any container or materials containing lead,
- must leave the work area to wash if skin irritation is noted or if their PPE has been compromised.

#### Procedure

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##### Written Compliance Program

- Each worksite will develop and implement written project/task specific lead exposure management procedures applicable to their site specific location prior to the start of all activities to reduce exposure to or below the permissible limits if exposure is at all possible,
- The procedure must include engineering controls, work practices, PPE and documentation of air sampling, including the source of lead. A description of each lead related task in which lead is emitted is to be outlined with all employees receiving the proper training before work commences.
- The program will be reviewed, revised, and updated at least every 6 months to ensure compliance with current state and federal regulations.

##### Permissible Exposure Limits

Per OSHA regulation, employees shall not be exposed to greater than 50 micrograms per cubic meter of air (50  $\mu\text{g}/\text{m}^3$ ), time-weighted average, during an 8-hour workday. This permissible exposure limit (PEL) includes the use of respiratory protection. If an employee is exposed more than 8 hours in any one workday, the maximum PEL ( $\mu\text{g}/\text{m}^3$ ) shall be calculated by using the following formula:

$400/\text{hours worked in the day}$

For example:  $400/12 \text{ hours} = 33.33 \mu\text{g}/\text{m}^3$

If respirators are used to supplement engineering and/or work practice controls, the respirator's protection factor may be used to determine compliance with the PEL. Note: Respirators must be used during the time period necessary to install or implement engineering or work practice controls, where engineering and work practice controls are insufficient and in emergencies.

##### Exposure (Air) Monitoring

Exposure is defined as any employee who is not wearing a respirator in order to meet the Action Level and monitoring requirements in this section

Initial air samples will be representative of the employee's regular, daily activities.

Initial breathing air sampling results:

- If the initial monitoring is less than the Action Level, monitoring need not be repeated unless there has been a production, process, control, or personnel change which may result in new or additional exposure to lead,

- If the initial determination or subsequent monitoring reveals employee exposure to be at or above the Action Level but below the PEL, monitoring must be performed at least every six (6) months, with the cycle continuing until two (2) samples taken at least seven (7) days apart are below the action level,
- If the initial results exceeds the PEL, monitoring will be performed on a quarterly basis until two (2) samples taken at least seven (7) days apart are below the PEL but above the Action Level, using the monitoring frequency outlined above,
- Within 15 working days after the receipt of the results of any monitoring, TRIAD MECHANICAL CONTRACTORS shall notify all affected employees of these results either in writing or by posting the results in an appropriate location accessible to all affected employees,
- Whenever the results indicate that the exposure, regardless of the use of respirators, exceeds the permissible exposure limit, TRIAD MECHANICAL CONTRACTORS shall include in the written notice a statement that the permissible exposure limit was exceeded along with a description of the corrective action taken or to be taken to bring exposure to or below the permissible exposure levels.

## Control Measures

### *Engineering Controls*

- If an employee is exposed to lead above the PEL for 30 or more days in a year, engineering and administrative controls must be implemented to reduce the exposure to or below permissible exposure levels. If such controls are not feasible, TRIAD MECHANICAL CONTRACTORS must demonstrate and document the reasons.
- Respiratory protection must be used if engineering and administrative controls are not effective in reducing the exposure to or below the PEL,
- If air is re-circulated back into the workplace, the system must be equipped with HEPA (high efficiency particulate air) and backup filters, with a system to monitor lead levels installed,
- When using mechanical means to remove lead-containing paints or coatings, equipment with a HEPA collection system must be used,
- A wet system to reduce airborne dust should be used whenever possible,
- Non-lead material should be used in place of lead material when able to do so.

### *Administrative Controls*

- Administrative controls will include job rotation schedules to reduce employee PEL exposure,
- When exposure to lead is at or above the PEL, TRIAD MECHANICAL CONTRACTORS shall provide lunch rooms, decontamination rooms, as well as appropriate facilities for changing, showers, and hygiene,
- Regulated access signs will mark the locations of all lead exposure regulated work areas. Signs should NEVER be removed or defaced. The signs will read as follows:

WARNING LEAD  
WORK AREA  
POISON  
NO SMOKING OR EATING

### *Personal Protective Equipment*

- Respirators shall be used during the time period required to install or implement control if engineering and work practices are insufficient as well as for emergency use,
- PPE will be selected on the basis of its ability to prevent absorption, inhalation and ingestion and will be provided to employees at no cost,
- PPE used must be carefully selected according to the needs of employees based on their work conditions, amount and duration of exposure, and other known environmental factors,
- If respirators are required, they will be NIOSH certified and all employees will use them in accordance with TRIAD MECHANICAL CONTRACTORS's Respiratory Protection Program,

- An employee may choose a NIOSH certified powered, air purifying respirator (PAPR) at no extra cost to the employee. The respirator shall be used during the time period necessary to install or implement engineering or work practice controls,
- Gloves, hats, vented goggles, shoes or disposable shoe covers shall also be provided at no cost. All protective clothing shall be clean and dry. Protective clothing shall be cleaned, laundered, repaired, and replaced as necessary. If protective clothing is of the disposable variety, it shall be identified, and handled, and disposed of properly.

#### Medical Surveillance

- A baseline blood sample shall be obtained prior to any lead exposure,
- Employees who are or may be exposed above the Action Level for more than 30 days per year will be included in a medical surveillance program performed and monitored by or under the direct supervision of a licensed physician at no cost to the employee,
- Any employee with elevated blood levels of lead shall be temporarily removed from lead exposure work,
- Blood sampling and monitoring will occur at a minimum of every 6 months to each affected employee until two consecutive blood samples and analysis fall within acceptable levels,
- Employees shall be notified in writing within 5 days of blood sampling results when lead levels are not acceptable,
- Blood sampling shall occur on a monthly basis during the period of time each employee is removed from work due to an elevated blood lead level following lead exposure,
- Whenever the results of a lead blood level test indicate that an employee's blood lead level exceeds the level for medical removal, TRIAD MECHANICAL CONTRACTORS shall provide a second (follow-up) blood sampling test within two weeks of TRIAD MECHANICAL CONTRACTORS receiving results of the first blood sampling test.

#### Medical Removal

- Employees will be removed from exposure to lead when an exposure meets or exceeds the Action Level on each occasion that a periodic and follow-up blood sampling test indicates that blood lead level is at or above 60 µg/100 g of whole blood,
- An employee will be removed from exposure to lead when the average of the last three (3) blood sampling tests indicates the employee's blood level is at or above 50 µg/100 g of whole blood (the employee need not be removed if the last blood sampling test shows blood lead level to be at or below 40 µg/100 g of whole blood),
- If the employee's blood lead level does not decline adequately within 18 months of removal, the employee will be offered a medical examination to determine if the employee may be returned to his or her former job status,
- Medical Removal Protection guidelines of 1910.1025(k)(2) shall be followed.

#### Recordkeeping

- Medical surveillance records shall be maintained on file for 30 years after termination of employment,
- Exposure monitoring records shall also be kept on file for 30 years after completion of each project,
- Exposure and medical monitoring records shall be made available to affected employees, their representatives, and to regulatory agencies upon request.

#### Training

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Training shall be provided to employees who may be exposed to lead prior to initial assignment and annually thereafter. All affected employees are required to attend mandatory training programs. Training will include the following:

- a copy of the content of the lead standard, Appendices A and B of the regulation, will be distributed and made readily available for all employees who may come in contact with lead-containing materials,
- Content of TRIAD MECHANICAL CONTRACTORS's compliance plan currently in effect,
- Immediate access to information and training records,
- Making employees aware of specific operations where lead exposure is or could result in being above the action level,
- Engineering controls and work practices associated with the job,
- Purpose, proper selection, fitting, use, and limitations of the respirators they may be using,
- Purpose and description of the medical surveillance program,
  
- potential health effects, including adverse effects on reproductive systems,
- purpose and description of the medical removal program,
- Instructions and warnings to employees about chelating agents not being routinely used to remove lead from their bodies, and being used at all, except under the direction of a licensed physician.

Training records must be produced upon request along with all materials relating to the employee information and training program to regulatory agencies.



# Lock Out Tag Out Program

## Purpose

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This program establishes policies and procedures for attaching suitable lockout/tagout equipment to energy isolated devices. Procedures will also be established to disable equipment to prevent unintended start up, energizing or release of stored energy that may cause accidents or injury.

## Scope

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The procedures outlined in this program cover the maintenance and servicing of equipment and machines where unintentional energizing or start-up of said equipment, or the release of stored energy, could result in an accident. Minimum performance standards for the control of hazardous energy shall be established. Work performed offsite is regulated by the site operator's program unless it is less stringent than TRIAD MECHANICAL CONTRACTORS program. This document covers all TRIAD MECHANICAL CONTRACTORS and employees and must be used on TRIAD MECHANICAL CONTRACTORS owned premises.

## Definitions

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Affected employees – Employees who operate or use machines and equipment that require maintenance and service under the lockout/tagout program, or employees who work in areas where maintenance and servicing of such equipment is performed.

Authorized employees – Employees that conduct lockout/tagout operations on machines and equipment so as to service or perform maintenance on that equipment. Affected employees become authorized employees when their duties include performing service or maintenance as prescribed in this program.

Energy source – Any source of electrical, chemical, thermal, gas, mechanical, pneumatic, hydraulic, tension, gravitational, electrical or other energy source.

Energized – Having connection to a source of energy or containing stored or residual energy.

Energy isolating devices – Mechanical devices that prevent energy from being transmitted or released. Energy isolating devices include, but are not limited to:

- Manually operated electrical circuit breakers, manually operated switches that prevent conductors and poles from being independently operated, disconnect switches, line valves, blocks and any other devices used to isolate or block energy,
- The following are not isolating devices: selector switches, push buttons and other control circuit type devices.

Hot tap – Welding on equipment under pressure (pipelines, tanks or vessels) to install connections or other accessories. This procedure is used in maintenance, service and repair of said equipment.

Lockout – Placing a lockout device on an energy isolating device to make sure that the device and controlled equipment is inoperable until the lockout device is removed.

Lockout device – A device that uses a key or combination lock to fix an energy isolating device in a safe position to prevent start up and energizing of the equipment. This includes bolted slip blinds and blank flanges.

Capable of being locked out – Energy isolating devices are able to be locked out if that particular device has a hasp or other attachment for attachment of a lock, or if the device has a locking mechanism built in. Other energy

isolating devices can be locked out if lockout can be performed without dismantling, rebuilding or replacing the device or permanently altering its energy control capabilities.

Tagout: - Using established procedures to place a tagout device on an energy isolating device. This is used to indicate that the energy isolating device and the controlled equipment cannot be used until the tagout device is safely removed.

Tagout device – A warning device, such as a tag and a means of attaching it, located in a prominent area and securely attached to an energy isolating device according to these established procedures. This is used to indicate that the energy isolating device and the controlled equipment cannot be used until the tagout device is safely removed.

Normal operation – Using a machine or piece of equipment as it is intended.

Servicing and/or maintenance – Activities such as setting up, constructing, inspecting, adjusting, modifying, maintaining, or servicing machines and equipment in environments where the employee is potentially exposed to release of hazardous energy sources or accidental start up or energization of equipment.

Setting up - Any work performed to prepare a machine or equipment for performing its normal operation.

#### Key Responsibilities

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##### Managers/Supervisors

- Responsible for maintaining and enforcing this program,
- Ensure that all employees and contractors affected by the lockout/tagout program have the required training and competency to ensure the safe installation, utilization and removal of all energy controls and devices,
- Ensure employees are in compliance with the requirements set forth in this program.

##### Employees

- Affected employees are required to attend annual training for the lockout/tagout program,
- Responsible for following all requirements and provisions of the program.

## Procedure

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### General

Only employees authorized to perform service or maintenance under this program are permitted to perform lockout or tagout.

### Devices

**Lockout Device** – If it is possible for an energy source to be locked out to hold an energy isolating device in a safe position, a device that utilizes a lock will be used. TRIAD MECHANICAL CONTRACTORS will specify the type of lock and will provide them to each site.

**Tagout Device** – If an energy source cannot be locked out, a tagout device must be used. Tagout devices are only warnings and must be resistant to chemicals and weather, of the standardized color with a clear written warning of hazardous energy. Examples of tags include: Do Not Start, Do Not Operate, Do Not Energize, etc. TRIAD MECHANICAL CONTRACTORS will provide each site with the same standardized style of tags.

### Specific Energy Control Procedures

Each supervisor or manager is responsible for the development of site specific step-by-step startup and shutdown procedures for each type of machine and piece of equipment in their respective areas. Periodic inspections of the energy control procedure will be conducted and documented annually to ensure procedures and requirements are being followed.

- Written, step-by-step isolation procedures detailing shutdown and startup will be put together for each type of equipment or machine,
- These procedures will include the following:
  - Assigned equipment number, if applicable,
  - Location of equipment,
  - Source of energy (e.g., hydraulic, electrical, gas, etc.),
  - Isolating controls location (e.g., valves, breaker switches, etc.),
  - Number of isolating controls
  - Number of locks required to isolate the piece of equipment
  - Hardware required to isolate the equipment (e.g., blocks, valve covers, chains, etc.),
  - Information regarding any residual energy that must be expended prior to beginning work.

### Specific Sequence for Application of Energy Control

- *Notification* – Authorized employees are required to notify affected employees when lockout/tagout devices are put on or removed prior to the controls being implemented.
- *Preparation for Shutdown* – Prior to an authorized or affected employee shutting down a piece of equipment or machinery, the authorized employee must know the energy's type and magnitude, the potential hazards of the energy to be controlled, and the method or device required to control the energy source.
- *Shutdown of Machines and/or Equipment* – Machinery and equipment must be shut down using the established procedures in this program for that particular type of machine or equipment. Shutdown must be conducted in a safe and orderly fashion to prevent additional hazards to employees as a result of the shutdown.

- *Isolation of Machines or Equipment* – When energy isolating devices are required to control energy, the device will be placed and used in such a manner as to isolate the machine or piece of equipment from the energy source.
- *Lockout/Tagout Devices and Application*
  - Authorized employees will have the appropriate number of locks and devices to enable them to perform lockout/tagout procedures for machines or equipment they are working on,
  - Lockout/tagout devices will be attached to energy isolating devices by authorized employees,
  - Each lockout/tagout device will include the name of the person who placed the device,
  - Lockout devices will be placed in such a way as to hold the energy isolating device in a safe or off position,
  - Tagout devices will be placed in such a way that will clearly indicate that operating or moving the isolating device from the safe or off position is not permitted,
  - When using tagout devices on energy isolating devices that could be locked out, the tagout device shall be attached at the same point the lock would have been attached. If a tag cannot be attached directly to the energy isolating device, it will be placed as closely as possible to the device in a safe position that will immediately alert anyone who attempts to operate the device,
  - Each source of energy must be locked out, completely isolating the equipment,
  - Isolating machines or equipment include, but are not limited to:
    - Pumps, generators, compressors, storage tanks, electric distribution, etc.,
    - Each type of isolated equipment will have its own specific procedures for isolation. For example, to isolate compressors: suction, discharge, power, starting, fuel and dumps must be closed, locked and tagged out properly. The blow-down valve must be opened, locked, and tagged out. NOTE: If the compressor has a side stream, the side stream must also be closed, locked and tagged out properly.
- *Stored Energy and the Possibility of Re-accumulation* – After lockout/tagout devices are affixed to energy isolating devices, all potentially hazardous stored or residual energy must be restrained, relieved or disconnected and rendered safe in some manner. If re-accumulation of stored energy is a possibility, isolation will be verified until the equipment receives service or maintenance or until the possibility of re-accumulation does not exist.
- *Verification of Isolation* – The authorized employee who performs the lockout procedure must verify that the equipment is disconnected or isolated from the source of energy by:
  - Checking that no personnel are exposed,
  - Verifying the isolation of the equipment by operating the controls, or
  - Testing to ensure the equipment is inoperable.

#### Multiple Workers & Group Lockout

Crews of authorized employees can use group lockout/tagout devices, which will provide the same level of protection as a personal lockout or tagout device. The authorized employee has primary responsibility for all employees working under the protection of a group lockout or tagout device.

- A short tailgate meeting will be held to go over the lockout procedures and other information needed to continue to work safely. All affected departments are required to participate,
- Isolation of the equipment will be performed by an authorized employee who must also determine the exposure status of the individuals in the group,
- All individual members will put their individual locks on the group's lockout or tagout device after they have verified the procedure,
- The crew leader or other designated authorized employee will be responsible for ensuring consistency of the lockout procedures including documenting lockout information to be passed along during shift or personnel changes.

### Release from Lockout/Tagout

Upon completion of service or maintenance, or when lockout/tagout devices are removed temporarily, the equipment must be tested to determine whether the equipment is ready to return to its normal operations. The following steps must be taken, in this order, to assess and prepare the equipment:

- Check the piece of equipment and its surrounding area to make sure that all extraneous items have been removed and that the components of the equipment are intact for operation,
- Ensure that all personnel in the work area have been removed from or safely positioned in the area,
- Remove the lockout/tagout device,
- Energize and begin testing,
- De-energize and reapply controls and lockout/tagout devices,
- Use the completed isolation log to document the procedure. Provide this documentation to the supervisor to be filed.

### Lock Removal

The authorized employee who puts the lock on should be the one to remove the lock. Certain conditions may be encountered which prohibit this person from being present to remove the lock after the work is completed. The following procedures must be adhered to when removing the lock that another person has applied:

- Try to contact the authorized employee who put the lock on in order to obtain the key(s),
- If the key cannot be obtained, the employee who requires the lock to be removed must contact their supervisor,
- The supervisor must confirm that every effort was made to contact the employee who applied the lock,
- It shall be noted on the Service Report that the lock(s) were taken off with the permission of the supervisor,
- The supervisor will make a reasonable effort to notify the employee that their lock has been removed to ensure the worker has knowledge of the same before returning to work,
- If the equipment is owned by a client, the supervisor or employee requiring the lock's removal must contact the client to have the lock removed,
- Clients must remove their own lock(s). NOTE: TRIAD MECHANICAL CONTRACTORS employees are not permitted to remove any client locks.

### Personnel or Shift Changes

When personnel or shifts change during the maintenance or repair of equipment, the designated person in charge is responsible for ensuring the continuity of the lockout/tagout procedures. This includes ensuring that all procedures are strictly followed and that the required transfers of lockout/tagout devices between authorized personnel is achieved.

### Contractors

Contractors who perform lockout procedures on TRIAD MECHANICAL CONTRACTORS owned or leased property must comply with these procedures. Contractors are responsible for supplying their own locks.

TRIAD MECHANICAL CONTRACTORS will initially lock out its own equipment. The contractor's lock will be used in addition to the lock provided by TRIAD MECHANICAL CONTRACTORS.

### Annual Audits

The manager, supervisor, or designee will perform an annual evaluation of the Lockout Program in their respective areas to assess the program's effectiveness. An authorized employee (other than the person performing the energy control procedure) will conduct the audit and confirm that:

- All affected and authorized employees have received the required training,

- Specific lockout procedures have been developed and documented in writing for each new piece of equipment,
- Procedures currently in place adequately address completely isolating equipment in order to obtain a zero energy state,
- Annual audits must be certified in writing. A copy of the audit will be filed and maintained in the supervisor's office.

## TRAINING

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Training will be provided by TRIAD MECHANICAL CONTRACTORS to verify that the purpose and implementation of the energy control program are understood by employees and that they have acquired the knowledge and skills necessary to safely apply, use, and remove the energy controls. Training will include the following:

- Identification of relevant hazardous energy sources, the magnitude and type of energy present in the workplace and the procedures necessary for the isolation and control of energy,
- The purpose and utilization of procedures to control energy,
- When using tagout systems, authorized employees will be trained in these tag limitations:
  - Tags are warning devices attached to energy isolating devices. Tags do not provide the same physical hold that is provided by a lock,
  - Tags attached to energy isolating devices are not to be removed without prior authorization of the person responsible for it,
  - Tags must be legibly written and easily understood by all authorized and affected employees and other personnel in the work area,
  - Tags and tag attachments must be constructed of materials that can withstand the environmental conditions in which they will be placed,
  - Tags will be securely affixed to the energy isolating devices to prevent against accidental detachment,
  - The meaning of tags should be understood to avoid evoking a false sense of security regarding their effectiveness in the overall energy program.

Other personnel whose work operations are in or near areas where energy control procedures are necessary must be instructed about this procedure. They must also be informed about the prohibitions regarding restarting or re-energizing locked out or tagged out equipment.

### *Retraining*

Retraining will be conducted when:

- An inspection reveals deviations from the use of or inadequacies in the employees' knowledge of the energy control procedures,
- TRIAD MECHANICAL CONTRACTORS has reason to believe there are deviations from the use of or inadequacies in the employee's knowledge of the energy control procedures,
- There is a change in machines, energy control procedures or in job assignments,
- A new hazard is introduced.

Retraining will validate the proficiency of the employees and introduce new or revised control procedures when necessary.

### *Training Documentation*

TRIAD MECHANICAL CONTRACTORS will verify that the required employee training has been completed and is kept up to date. All training and retraining must be documented, signed, certified and kept on file.

# Noise Exposure & Hearing Conservation

## Purpose

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The purpose of this program is to provide a process to minimize employee-hearing loss caused by excessive occupational exposure to noise.

## Scope

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This program is applicable to all employees who may be exposed to noise in excess of 85 decibels (decibels). When work is performed on a non-owned or operated site, the operator's program shall take precedence, however, this document covers TRIAD MECHANICAL CONTRACTORS employees and contractors and shall be used on owned premises, or when an operator's program doesn't exist or is less stringent.

## Definitions

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Audiometric testing - means detection by the person being tested of a series of pure tones. For each tone, the person indicates the lowest level of intensity that they are able to perceive.

Decibels – means the sound energy measured by a sound level meter using the “A” scale. The “A” scale is electronically weighted to simulate the response of the human ear to high and low frequency noise.

Slow Response – means the setting on the sound level meter that averages out impulses of brief duration that would cause wide fluctuation in the sound level meter reading.

Standard Threshold Shift – means a change in hearing threshold relative to the baseline audiogram of an average of 10 dB (corrected for age) at 2000, 3000 and 4000 Hz in either ear.

## Key Responsibilities

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### Managers and Supervisors

- Ensure requirements of this program are established and maintained.
- Ensure employees are trained and comply with the requirements of this program.

### Employees

- Wear hearing protection when required, attend the training, and cooperate with testing and sampling.

## Procedure

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Occupational hearing loss is a cumulative result of repeated or continued absorption of sound energy by the ear; employee protection is based on reduction of the noise level at the ear or limiting the employee's exposure time. TRIAD MECHANICAL CONTRACTORS shall offer hearing protection to all employees exposed to potential high noise levels in working areas and to those employees requesting hearing protection.

### Hearing Conservation Program

TRIAD MECHANICAL CONTRACTORS shall administer a continuing effective hearing conservation program when employees, who work in areas where the exposure to noise levels are 85 decibels or greater for the 8 hour time-weighted average of 85 decibels, must wear hearing protection and TRIAD MECHANICAL CONTRACTORS shall implement a monitoring program to identify employees to be included in the hearing conservation program. Employees will wear hearing protection in signed areas while on an owner client facility.

## Surveys

Surveys will be conducted by a qualified employee or third party.

To evaluate noise exposure in terms of possible hearing damage, it is necessary to know the overall sound level ("A" scale measurement), the exposure time of the individual in hours per day and the length of time the individual has worked in the area being surveyed. This data shall be supplemented by the following:

- Name of area and location
- Date and time of survey
- Name of person conducting survey
- Description of instrument used, model and serial number
- Environmental conditions
- Description of people exposed

TRIAD MECHANICAL CONTRACTORS shall notify each employee of their monitoring results, or, if their job is exposed to noise 85 decibels or greater.

A plot of noise levels must be made for owned facilities. The plot must be filed or posted at the facility.

TRIAD MECHANICAL CONTRACTORS shall evaluate hearing protector attenuation for the specific noise environments in which the protector will be used. The adequacy of hearing PPE shall be reevaluated whenever noise exposures increase to the point that the PPE provided may no longer provide adequate protection. TRIAD MECHANICAL CONTRACTORS shall then provide more effective PPE where necessary.

All sound measuring equipment must be calibrated before and after each survey. Records of sound measuring equipment calibration and noise level surveys shall be kept for 20 years.

Noise Surveys must be repeated whenever changes in the workplace may expose additional personnel to high noise or hearing protection being used by employees may not be adequate to reduce the noise exposure to a level below 85 decibels.

### Sound Level Surveys

- All owned facilities that are suspected of having noise levels exceeding 85 decibels must be screened.

### Exposure Surveys:

- A representative sampling of employees shall be conducted to determine the exposure to noise over a period of time.
- Noise dosimeters must be capable of integrating all continuous, intermittent and impulsive sound levels from 80 dB to 130 dB and must be calibrated so a dose of 50% corresponds to a time weighted average of 85 dB.



### Signage

Clearly worded signs shall be posted at entrances to, or on the periphery of, areas where employees may be exposed to noise levels in excess of 85 decibels. These signs shall describe the hazards involved and the required protective actions.

### Audiometric Testing

TRIAD MECHANICAL CONTRACTORS shall establish and maintain an audiometric testing program and monitoring procedures when exposure limits exceed the established level by making audiometric testing available to all employees whose exposure to noise 85 decibels (8 hr TWA) or greater and employees should take an audiogram annually. The program shall be provided at no cost to employees.

- TRIAD MECHANICAL CONTRACTORS shall establish a valid baseline audiogram against which future audiograms can be compared. An employee must receive a baseline audiogram within 6 months of their first exposure to 85 decibels or greater for an eight hour period.
- When a mobile van is used the baseline shall be established within one year.
- An employee shall receive an annual audiogram every year they work in a position that is exposed to noise 85 decibels or greater.
- A qualified third party shall perform all audiometric testing, evaluation, reporting and retesting.
- Audiometric testing shall be preceded by a period of at least 14 hours during which there is no exposure to workplace sound levels in excess of 80 decibels. This requirement may be met by the use of hearing protectors that reduce the employee noise exposure level below 80 decibels and employees shall also be notified to avoid high levels of noise.
- An orthoscopic exam is required before an audiogram is initiated. A qualified person shall examine the ear canal for any ear infections or canal irregularities that might affect the audiogram or rule out the use of earplugs.

At least annually after obtaining the baseline audiogram, TRIAD MECHANICAL CONTRACTORS shall obtain a new audiogram for each employee exposed at or above an 8-hour time-weighted average of 85 decibels. Annual audiograms shall be evaluated as follows:

- Each audiogram shall be compared to the employees' baseline audiogram to ensure the test was valid and to determine if a standard threshold shift has occurred.
- If a comparison of the annual audiogram to the baseline audiogram indicates a standard threshold shift, the employee shall be informed of this fact in writing, within 21 days of the determination.
- If a standard threshold shift is determined, the employee will be retested within 30 days.
- The retest results will be considered as the annual audiogram.
- Employees shall be informed of their audiometric test results in writing within 21 days of determination.

- If the employee has sustained a standard threshold shift, after retesting, that employee shall be retrained and refitted for appropriate hearing protection.
- The employee shall be referred for additional medical evaluation if indicated.

#### Recordkeeping

TRIAD MECHANICAL CONTRACTORS shall maintain accurate record of all employee exposure measurements and that all records are maintained as required by CFR 1910.95 (Occupational Noise Exposure).

Employee audiograms are considered medical/exposure records. These records must be kept for the length of employment plus 30 years.

#### Hearing Protection Devices

Earmuffs and earplugs shall be made available to employees in sizes and configurations that will be comfortable to the employee. Hearing protection devices shall be made available to all employees exposed to an 8 hour time-weighted average of 85 db or greater at no cost to employees. Hearing protectors shall be replaced as necessary. Employees shall be instructed how to obtain the proper fit. TRIAD MECHANICAL CONTRACTORS shall ensure that hearing protectors are worn.

Employees will be given an opportunity to select their hearing protection from TRIAD MECHANICAL CONTRACTORS provided selection. Employees shall be given the opportunity to select their hearing protectors from a variety of suitable hearing protectors provided by TRIAD MECHANICAL CONTRACTORS.

#### TRAINING

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A training program shall be instituted for all employees who are exposed to a noise action level or work in high noise areas. Noise awareness training for employees shall be provided before initial assignment and on an annual basis. The training shall be repeated annually for each employee and shall be updated to be consistent with changes in the PPE and work processes.

The training shall address the effect of noise on hearing; the purpose of hearing protectors, including the advantages, disadvantages and alternatives of various types, including instructions on selection, fitting, use and care of and the purpose of audiometric testing and an explanation of test procedures.

Training shall be updated to be consistent with changes in the work process, PPE requirements and the proper techniques of wearing hearing protection.

All staff shall have a copy of this program, noise exposure procedures and it shall be posted at the worksite and a copy made available to all employees, their representatives and regulatory agencies (Assistant Secretary and the Director will have access to records).

The training must be documented.

# PPE Program

## Purpose

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The purpose of the Personal Protective Equipment program is to establish procedures for using and maintaining personal protective equipment that must be used by employees in order to prevent injuries.

## Scope

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This program applies to all TRIAD MECHANICAL CONTRACTORS employees. It is to be used at all times on TRIAD MECHANICAL CONTRACTORS worksite. If an TRIAD MECHANICAL CONTRACTORS employee performs work on a site other than TRIAD MECHANICAL CONTRACTORS's site, the facility owner's plan should be used if it exists and is as strict (or more strict) than this plan. In cases where the other facility's plan does not exist or is less strict than this plan, TRIAD MECHANICAL CONTRACTORS employees will operate under this plan.

## Key Responsibilities

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### SAFETY Manager

- Helps to select appropriate PPE. Some work tasks expose employees to hazards that cannot be eliminated by means of engineering or administrative controls. In these cases, the SAFETY Manager assists the supervisor and project manager in identifying and selecting suitable PPE based on the task being performed, the work conditions, and the frequency and duration of the exposure. TRIAD MECHANICAL CONTRACTORS employees provide feedback to the supervisor regarding the fit, comfort, and suitability of the PPE to be used. The reasons for the PPE selected are provided to the employees.
- Assists the supervisor and site manager to ensure the PPE obtained meets the requirements of this program and applicable regulations
- Conducts Worksite Hazard Assessments - This assessment must determine whether hazards exist or are likely to exist, that require the use of PPE. Hazards may include those related to: high/low temperatures, impact/motion, sharp objects, falling objects, rolling or pinching objects, chemicals, materials, radiation, electrical hazards, and general workplace layout. The SAFETY Manager documents the tasks that were evaluated, hazards that were discovered and the PPE required to protect employees. They also ensure that affected employees are aware of hazards and the required PPE prior to being assigned to the hazardous task. The documents are certified and include the certifier's name, signature, and dates, and identifies the assessment documents.

### Managers and Supervisors

- Managers and supervisors regularly monitor employees to ensure PPE is being properly used and cared for. They also ensure employees receive follow-up training if required so they have the adequate knowledge, skill, and ability to use PPE.
- Managers and supervisors will use TRIAD MECHANICAL CONTRACTORS progressive discipline to enforce PPE safety rules and ensure that the Required PPE Poster is properly posted.

### Employees

- Properly use and care for PPE.
- Report any changes in exposure that may necessitate a re-assessment of the task for PPE.
- Report and replace defective or damaged PPE. Never use defective or damaged PPE.
- You must wear the required PPE. Failure to do so could result in termination of employment.

## Procedure

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### General

TRIAD MECHANICAL CONTRACTORS will provide protective equipment, including personal protective equipment (for head, eyes, face, and extremities), respiratory devices, protective clothing, and protective shields and barriers. This protective equipment must be used wherever injury or impairment of function of any body part (through absorption, inhalation or physical contact) is likely that because of process or environmental hazards, radiological hazards, chemical hazards, or mechanical irritants. All PPE shall be provided, used and maintained in a sanitary and reliable condition.

Employees are NOT allowed to use employee-owned equipment, except prescription safety glasses and safety footwear. TRIAD MECHANICAL CONTRACTORS must ensure that employee-owned safety glasses and footwear are adequate, and TRIAD MECHANICAL CONTRACTORS will maintain and clean them.

Defective or damaged equipment shall not be used and must be tagged or destroyed and replaced.

All issued personal protective equipment will be cost-free to the employee. All employees must understand and follow the procedures identified in this program.

### Eye Protection

When exposed to facial or eye hazards from flying fragments, chemicals, acids or caustic liquids, melted metal, or chemical gases or vapors, employees must use the required eye or face protection. PPE used to protect the eyes and face must be in compliance with ANSI Standard Z87.1-2003 (Z87+), *Occupational and Educational Personal Eye and Face Protective Devices*.

### Safety Glasses

While on TRIAD MECHANICAL CONTRACTORS property, employees, subcontractors, and visitors must at all times wear safety glasses with side shields that meet ANSI Z-87.1-2003 standards with "high impact lenses". Requirements as described below:

- In shops and warehouses, and at field locations, except in striped safety zones that have been designated and approved.
- In all yard work zones. Everyone in the vicinity of loading or unloading equipment. All employees who perform mechanic or maintenance work, operate equipment (e.g., forklift and welding), test stand operations, or do any work that may potentially cause an eye injury.
- In a restroom, office, or any other building when performing work that may potentially cause an eye injury.
- TRIAD MECHANICAL CONTRACTORS will provide with visitor glasses. If approved prescription safety glasses are not available for an individual, they must wear "Over the glass" type safety goggles or glasses over their regular prescription glasses until they obtain approved prescription safety glasses.
- When assisting welders, employees must wear absorbent safety glasses to protect the assistant from ultra-violet (UV) and/or infrared rays (IR).
- No employee is allowed to wear dark shaded lens (sunglasses) darker than # 1 shade unless welding or assisting a welder.
- The requirement to wear safety eyewear will be exempt only based on a written "exceptions for medical reasons" from a doctor.
- Employees are not required to wear safety glasses:
  - Inside an office.
  - In parking lots when traveling to and from vehicles, or office buildings using main doors that do not enter shops.

### Goggles

- When handling or mixing liquid chemicals, solvents, paints, etc., employees must wear chemical splash proof goggles as recommended on the Material Safety Data Sheet for the material being handled.
- When blowing equipment down with air the employee must wear dust proof goggles. They must also be worn when the employee is performing a job task where safety glasses do not do an adequate job of preventing airborne particles from entering the openings around the lenses and side shields.

#### Face Shields

- When operating a hand held or immobile grinder with a wire or abrasive wheel the employee must wear a full face shield over safety glasses. The full face shield must also be used when chipping paint or concrete. Also, when performing job tasks where flying objects may potentially strike the face, if safety glasses or goggles do not provide adequate protection, the employee must wear a full face shield over safety glasses.

#### Head Protection

When working in areas where a head injury is possible due to employee initiated impact, or impact from falling or other moving objects, employees must wear protective helmets. Helmets must be in compliance with ANSI Standard Z89.1-1997 Class E, *American National Standard for Industrial Head Protection* for Type II head protection, or must be equally effective. In the shop the wearing of hard hats will be at the supervisors discretion.

- Hardhats must be worn when working in areas where head injury is possible from falling objects.
- Hardhats must be worn at all warehouse, field, and shop locations, or any location where it is determined to be necessary as per the location's PPE Hazard Assessment.
- Never alter hardhats in any way.
- Never paint or apply unauthorized stickers, name plates, etc. on hardhats.
- Never drill, cut, bend, or apply heat to a hardhat.
- Never alter the suspension system of a hardhat.
- Employees must inspect hardhat regularly for chips, scratches, cracks, signs of heat exposure (sun cracks), etc.
- Immediate replace any defective hardhats.
- Never place a hardhat in the rear window of a vehicle (they will be exposed to the sun or may become a projectile in a vehicle accident).
- Hardhats must be made available to visitors.
- TRIAD MECHANICAL CONTRACTORS must provide hardhats.
- TRIAD MECHANICAL CONTRACTORS will train employees in the use, care and maintenance of head protection equipment.

#### Hearing Protection

While in posted "High Noise" areas, all employees, subcontractors, and visitors must wear hearing protection. See TRIAD MECHANICAL CONTRACTORS Hearing Conservation Program for additional information.

All areas that are known, or suspected to have, noise levels in excess of 85 dBA (constantly or intermittently) must have warning signs posted.

When noise caused by machinery, tools, etc., prevents normal conversations to be clearly heard, employees shall wear hearing protection even if warning signs are not posted.

General rule of thumb: If you must yell to be heard, you require hearing protection.

#### Types

- Preformed Inserts (ear plugs)
- Canal Caps (head band type)
- Muff, either headband or hard hat mounted

- TRIAD MECHANICAL CONTRACTORS will supply ear muffs and ear plugs employees in sizes and configurations that are comfortable for the employee.

#### Care and Maintenance

- Employees must inspect hearing protection before each use.
- Keep hearing protection clean to prevent ear infections.
- Discard disposable ear plugs when they become dirty, greasy, or cracked.
- Replace any ear muffs that have cracked seals, deteriorated foam inserts, or are defective.

#### Fit

- Because everyone is different, hearing protection must be selected for the individual. The employee must try a variety of styles to find one that is comfortable and provides adequate protection.
- TRIAD MECHANICAL CONTRACTORS will instruct employees in how to obtain the proper fit.

### Hand Protection

#### Gloves

- When performing work tasks that may expose the hands to extreme temperatures, cuts and abrasions, or exposure to chemicals, employees must wear gloves.
- Welding: When performing arc welding or oxy/gas cutting, employees must wear welding gloves made of leather or other heat resistant materials.
- Chemical: When handling chemicals that specify gloves as PPE, the employee must impervious (chemical resistant) gloves.
- To select the correct glove type, refer to the specific chemical's Material Safety Data Sheet.
- Employees who work with chemicals, i.e., solvent vats, will be issued their own gloves for hygienic purposes.
- Leather: When working with sharp materials, or when handling rigging equipment, employees must wear leather gloves.
- Cloth: When handling objects or materials that could cause blisters, splinters, cuts, etc., the employee must wear cloth gloves.
- Heat Resistant: When handling hot bearings, races, or other materials or objects (heated beyond room temperature), employees must wear heat resistant gloves.
- Insulated: To prevent frostbite in extreme cold climates, employees must wear insulated gloves.
- Glove Inspections
  - Prior to each use, inspect gloves for holes, tears, and worn areas.
  - Periodically air test chemical gloves for pinholes by tightly twisting the cuff, expand the glove by applying low air pressure, and submersing the glove in water to check for bubbles.
  - Immediately discard any defective gloves.
- Exception: While working with rotating machinery, machinists are exempt from wearing gloves.

### Foot Protection

All employees with regular duties at field locations, in shops and warehouses must wear safety footwear.

- Visitors and office workers entering these areas infrequently are not required to wear foot protection as long as they stay away from the work being performed.
- If visitors or office workers must be in the close proximity to the work, the work must be stopped while in the area or safety footwear must be worn.
- When in shops, warehouses, field locations and parts departments, employees must wear leather or equivalent boots (lace up or pull up).
- Boots must provide ankle protection, and have must have soles that are designed to protect the feet from punctures, and must have defined heels for climbing ladders.
- When job tasks there is a risk of equipment or material crushing the foot, toe guards must be worn.
- Safety footwear must comply with ANSI Z41-1999 standards.

- Some client locations may require everyone to wear safety footwear. Before visiting field locations, check with the local supervisor for client requirements.

#### Fall Protection

When performing certain elevated jobs (over six feet), employees must use personal fall protection. Refer to TRIAD MECHANICAL CONTRACTORS Fall Protection Program.

#### Electrical Protection

Refer to TRIAD MECHANICAL CONTRACTORS Electrical Safety Program.

#### Worksite Hazard Assessment

Hazard assessments must be performed, signed and documented. If it is determined that a hazard exists or is likely to exist, a PPE must be used. Following are some hazard sources that may be identified:

- High or low temperatures
- Chemical exposure (see MSDS for guidance)
- Flying fragments, melted metal or other face, eye, or skin hazards
- Falling objects, or the possibility of dropping an object
- Employee falling from a height in excess of 6'
- Sharp objects
- Rolling or pinching that could crush hands or feet
- Electrical hazards

Anytime that these hazards may cause injury to employees, PPE must be selected to eliminate or substantially reduce the potential for injury. Employees will be notified for the selection and reason.

Each affected employee will be apprised of the results of this assessment, and a copy of the assessment will be kept at the local office.

Each affected employee must be fitted with the selected/identified PPE. The Training section of this program addresses fitting (including proper donning, and doffing), cleaning and maintenance of PPE. All PPE use exemptions must be supported by the PPE hazard assessment.

#### Monitoring

Site managers and supervisors must monitor worksite tasks to identify changes in hazards, or the introduction of new hazards. If the site manager or supervisor discovers a new hazard, they must advise the SAFETY Manager. The SAFETY Manager conducts a hazard assessment for appropriate PPE for the new hazard.

The SAFETY Manager monitors how effective the PPE Procedure is, and recommends improvements to management.

#### Training

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TRIAD MECHANICAL CONTRACTORS will train all employees who may need to wear PPE. Each affected employee must be fitted for PPE as required. Training will include:

- When it is required to use PPE.
- What type of PPE is required.
- How to put PPE on, take it off, adjust it and wear it.
- PPE limitations.
- How long PPE is useful, and how to dispose of it.
- How to clean and maintain PPE in to ensure it is sanitary and in reliable condition.
- How to report and replace defective or damaged PPE. Never use defective or damaged PPE.

## Retraining

Retraining is necessary when:

- There are changes to workplace the workplace that makes the previous training obsolete.
- There are changes in the type of PPE.
- The employee shows improper use, a lack of use, or insufficient skill or understanding in selecting PPE, the necessity of PPE, the use of PPE and its limitations.

## Documentation

Records of training will be kept at the local office. The training record will include:

- The name of the employee(s) trained;
- The training dates; and
- The subject of the training.



# Respiratory Protection Program

## Purpose

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This document shall serve as TRIAD MECHANICAL CONTRACTORS's respiratory protection program which is designed to meet or exceed federal safety standards. TRIAD MECHANICAL CONTRACTORS will make every attempt to remove potentially harmful vapors and exposure to oxygen deficient hazards from the workplace environment. Respiratory equipment shall be provided at no cost to all employees that may be exposed to harmful vapors and oxygen deficient atmospheres. Respirators will be provided during emergencies with high risk of exposure and whenever engineering controls do not effectively eliminate respiratory hazards.

## Scope

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This program is applicable to all TRIAD MECHANICAL CONTRACTORS projects, operations, employees and contractors.

## Respiratory Program Administrator

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Responsibility for the respiratory protection program falls to the Safety Manager who must make sure that the requirements are followed.

The Administrator must have appropriate training, a thorough knowledge of the program and be able to conduct evaluations.

TRIAD MECHANICAL CONTRACTORS recognizes that individual supervisors will need to implement and enforce most of this program. Performance problems will be reported by the Program Administrator to the appropriate manager. The manager is responsible for implementing a plan to resolve performance problems. The Project Manager or their designee carries the responsibility of administering all aspects of the Respiratory Protection Program.

Program Administrator responsibilities include, but are not limited to:

- Administering an annual written evaluation of the Respiratory Protection Program. This evaluation must be completed by December 31<sup>st</sup> of each year,
- Making certain that respirators and their required parts are in sufficient supply. This duty may be delegated to a designee, but the Program Administrator maintains overall responsibility. The title of the designee to whom this duty is assigned is the Project Manager or Field Supervisor,
- Determining hazards and providing only those respirators certified by NIOSH based on those hazards,
- Ensuring that all workers who may need to use a respirator have been trained in how to use, select and know the limitations of the respirators that may be used. This must be done before the first time the respirator is used. The training may be delegated to another person, but the Program Administrator has the overall responsibility of ensuring that all employees are suitably trained,
- Ensuring that those who use respirators have been evaluated by a medical professional and deemed fit to use the type of respirator required for their job. Medical evaluations are to be completed before an employee is assigned to a task that involves the use of a respirator,
- Establishing that all workers who use respirators are tested at least annually for fit or more often if other federal requirements stipulate it,
- Making certain that each individual has their own respirator, and ensuring that all respirators are cleaned regularly and stored in a clean, easily accessible area. If this duty is delegated, the Program Administrator still maintains final responsibility over the task,
- Selecting respirators based on the hazards that are encountered. This program details basic types of respirators used at this site and which tasks they are used for. In certain circumstances, the Program

Administrator may consult with health and safety staff for assistance in selecting the appropriate respirators,

- Ensuring that employee exposure is monitored to assure correct respirator type is used. Exposure monitoring may be delegated to others; however, the Program Administrator has final responsibility of monitoring completion and to request assistance when necessary,
- Monitoring employees who wear respirators to ensure the employees leave the area to wash, change respirator cartridges or if break through or resistance is detected,
- Enforcing the program requirements for the selection, use, storage, maintenance and fit are followed.
- Seeing to it that there is no exchange of parts between brands of respirators,
- Guaranteeing that respirators, required training for respirators and medical evaluations are provided to the employees at no cost to them.

## Medical Requirements

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### General

A medical evaluation will be provided by TRIAD MECHANICAL CONTRACTORS to evaluate the employee's ability to safely use a respirator before the employee is fitted or uses a respirator in the workplace. Should the employee be no longer required to use a respirator, TRIAD MECHANICAL CONTRACTORS may suspend medical evaluations for that employee.

### Procedures for Medical Evaluations

Medical evaluations will be performed by a physician or other licensed health care professional selected by TRIAD MECHANICAL CONTRACTORS. These evaluations will be conducted using a medical questionnaire or an equivalent measure. See Medical Questionnaire form.

This medical evaluation will be conducted prior to fit-testing, will be confidential, conducted during normal business hours, at a convenient location and time. The results of the evaluation must be understandable; the employee is provided the opportunity to discuss the results with a physician or PLHCP.

### Supplemental Information for the PLHCP

In order to make an informed recommendation, the following information will be provided to the PLHCP to help determine whether an employee is able to use a respirator:

- Type and weight of the respirator to be used by the employee,
- Extent and frequency of respirator use, including emergency use,
- Physical work effort expected of the employee,
- Protective equipment and clothing to be worn in addition to the respirator, and
- Extreme variations in temperature and humidity that may be encountered by the employee.

The PLHCP will be given a copy of TRIAD MECHANICAL CONTRACTORS's Respiratory Protection Program.

Note: When a PLHCP is replaced, TRIAD MECHANICAL CONTRACTORS is responsible for ensuring that the new PLHCP is provided with this information either by providing the documents directly or by transfer of documents from the former PLHCP. Employees will not be re-evaluated just because a new PLHCP is selected.

### Medical Determination

To aid TRIAD MECHANICAL CONTRACTORS in determining an employee's ability to safely use a respirator, TRIAD MECHANICAL CONTRACTORS will get a written recommendation from the PLHCP. The PLHCP's recommendation will contain the following information:

- Whether or not the employee is subject to any medical conditions or workplace conditions that may prevent the employee from being medically able to use the respirator,

- Recommendations for follow-up evaluations if needed, and
- A signed statement that the employee has received a copy of the PLHCP's written recommendations.

The Safety Manager will receive a copy of all recommendations.

#### Additional Medical Evaluations

TRIAD MECHANICAL CONTRACTORS will provide additional medical evaluations according to the program requirements if:

- An employee discloses medical symptoms or signs that may affect the employee's ability to use a respirator,
- A supervisor, the Program Administrator or a PLHCP recommends that an employee should be re-evaluated,
- Information from the procedures set forth in this program, including observations during fitting, indicates that the employee needs to be re-evaluated, or
- Changes in workplace conditions (e.g., an increase in physical work effort or changes in protective clothing or temperature) that may create increased physiological burden on the employee.

#### Work Site Respirator Procedures

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Each work site that employs the use of respirators shall have site procedures that adhere to the guidelines set forth in this program. Additional procedures may be enforced by the client, which will be followed. The following site specific information must be included:

- Identification of site specific hazards that require respiratory protection,
- Selection of respiratory equipment that shall be appropriate to the particular hazards, characteristics and concentration levels at the site. Identification of particular brand and models of recommended respiratory equipment shall be included in the procedures,
- Confirmation that all users of respiratory protection are qualified, trained and competent according to the guidelines set forth in this program (i.e., approved medical evaluation, fit tested and trained annually).

#### Criteria for the Selection of Respirators

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Respiratory equipment is selected based on the hazards the employee is exposed to. TRIAD MECHANICAL CONTRACTORS will:

- Identify hazards,
- Provide respirators according to those hazards and factors that affect performance,
- Identify specific brands and models to be used, and
- Provide information on estimated exposures and contaminants.

#### Hazard Identification

Due to the variety of work locations, TRIAD MECHANICAL CONTRACTORS will identify respiratory hazards according to specific work site safety plans. Common respiratory hazards that employees may be exposed to include:

- Chemical particles
- Gases
- Oxygen deficient conditions
- Fumes
- Dust

#### Characteristics of Hazardous Operations or Processes

Shaping operations to include cutting, filing, sawing, grinding, drilling and milling,

- Solid operations to include pouring, mixing, separating, conveying, crushing, loading, extracting, bagging and demolishing,
- Liquid operations to include degreasing, spraying, painting, dipping, etching, cleaning, brushing, coating, plating, mixing, pickling, galvanizing and other chemical reactions,
- Hot operations including soldering, melting, burning, melding, welding and other chemical reactions,
- Pressurized spraying to include applying pesticides, cleaning parts, sand blasting, degreasing and painting.

#### Gaseous Contaminants

- Inert gases (neon, argon, helium, etc.), which displace air to create oxygen deficiencies but do not metabolize in the body,
- Alkaline gases (NH<sub>3</sub>, etc.) which are alkalis or create alkalis when they react with water,
- Acidic gases (HCL, SO<sub>2</sub>, H<sub>2</sub>S, etc.), which are acids or create acids when they react with water,
- Organic gases (acetone, butane, etc.), which exist as true gases or vapors from organic liquids,
- Organometallic gases (organo-phosphates, tetraethyl lead, etc.), which have metals attached to organic groups.

#### Particulate contaminants

- Smoke is a combination of chemically generated gases and airborne particles (solid and liquid) of organic origins (0.01 to 0.3 μm),
- Fumes are particles of solid condensation (0.1 to 1.0 μm diameter),
- Dusts are solid particles, (0.5 to 10μm diameter), generated by mechanical means,
- Mists are liquid particulate matter (5 to 100 μm diameter).

#### Selection of Respirator

When selecting a respirator, the following factors should be considered:

#### Contaminant Type and Concentration

The model and type of respirator selected, and their affiliated parts such as cartridges and filters, is determined based on the type and concentration of the contaminant. The concentration is obtained by taking a sample from the atmosphere.

#### Identification of the Location of Hazardous Areas

Hazardous areas may include confined spaces, those exposed to nearby contaminants, etc.

#### Worker Activity

Worker activities include being exposed to extreme heat or cold, wearing a welding hood, etc.

#### Types of Respirators

*Air-purifying respirators* are either half masks or full-faced masks that filter dusts, fumes, gases, mists or vapors through mechanical or chemical cartridges.

*Powered air-purifying respirators* are those that pass contaminated air through a filter using a blower. Like regular air-purifying respirators, they filter dusts, fumes, gases, mists or vapors. The purified air goes into a mask or hood.

Air-purifying respirators are not suitable for environments that are oxygen-deficient. This can result when another gas displaces the oxygen in the atmosphere or by a chemical reaction that consumes the oxygen. When oxygen levels drop below 19.5%, a source of supplied air or supplied-air respirators are required. Oxygen levels below 16% are considered very dangerous and could result in death. Contact the Safety Manager or qualified safety representative of the client to help determine the appropriate cartridge for air-purifying respirators. Take into consideration the information on the Material Safety Data Sheet regarding the substance that requires filtering.

All cartridges are assigned a color designating the type of contaminant they will filter:

White:	Acid gas
Black:	Organic vapors
Green:	Ammonia gas
Yellow:	Acid gases and organic vapors
Purple:	Radioactive materials
Orange:	Dust, fumes and mists
Olive:	Other gases and vapors (multi-contaminants)

As soon as the respirator's user can detect an odor, irritation, or taste the contaminant, the cartridge should be immediately replaced. At the beginning of the shift, all cartridges and filters should be changed.

*Supplied-air respirators* provide the best protection against potentially highly toxic materials. Supplied air respirators are air-line respirators or self-contained breathing apparatuses (SCBAs). SCBAs allow a limited amount of air to be carried by the user, providing fewer restrictions and more mobility than air-line respirators.

*Air-line respirators* are connected to a central supply of fresh air via a hose. Fresh air can be obtained from a compressed air cylinder or an air compressor with a minimum of Grade D breathing air.

*Emergency Escape Breathing Apparatuses (EEBAs)* provided oxygen in 5, 10 or 15 minutes depending on the apparatus. EEBAs are to be used in emergencies when an employee needs to escape a situation that is immediately dangerous to life or health (IDLH).

SCBA (Self Contained Breathing Apparatus)

NOTE: TRIAD MECHANICAL CONTRACTORS does NOT permit employees to work in environments that are Immediately Dangerous to Life and Health (IDLH).

To maintain NIOSH and MSHA approval of respirators, mixing parts (e.g., valves, cartridges, airline hoses, gaskets, etc.) between respirator manufacturers is strictly prohibited. For example, do not use MSA cartridges or gaskets with a North product.

#### Brand and Models

North Safety brand NIOSH-certified respirators have been selected for use by TRIAD MECHANICAL CONTRACTORS. Only North Safety brand may be used to be in compliance with the policies and conditions of this Respiratory Protection Program. Additionally, NIOSH certified respirators are selected based on the hazards that the worker is exposed to.

The specific model to be used will be based on the type of hazard encountered, oxygen levels, concentration of the contaminant, type of work being performed, and work environment. Selections shall be made by identifying the appropriate North respiratory equipment for the work performed and the encountered hazard using the following guides.

- NIOSH Pocket Guide to Chemicals
- North Respirator Selection Guide
- North Cartridge Selection Guide

#### Estimate of Exposures and Contaminant Information

- Employees are not permitted to enter IDLH environments,
- Oxygen levels shall be maintained at a normal level,
- Employees will not be exposed to atmospheric conditions that contain concentrations exceeding the STEL or PEL for a particular hazard.

## Respirator Fit Testing

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Prior to an employee using a respirator with negative or positive pressure tight-fitting face pieces, the employee must be fitted with the same make, model, size, and style of respirator that will be used when situations require it. This portion of the document lays out the types of fit tests allowed, how to conduct them, and how the results of the tests are to be used.

Employees using respirators must be fit-tested annually, at a minimum, and more frequently if federal requirements dictate. Supplied air respirators must also be tested for fit.

Qualitative fit tests (QLFTs) or quantitative fit tests (QNFTs) are required for all employees using tight-fitting face piece respirators. Fit tests for tight-fitting face piece respirators must be conducted prior to an employee using the respirator, when the employee uses a different respirator or face piece (make, model, size or style) and at least annually after that.

Additional fit tests are required if the employee reports, or a TRIAD MECHANICAL CONTRACTORS supervisor, PHLCP or Program Administrator observes changes in the physical condition of the employee that could affect fit. These physical conditions include, but are not limited to: obvious changes in body weight, cosmetic surgery, facial scarring or dental changes.

If an employee passes a QLFT or QNFT and later notifies TRIAD MECHANICAL CONTRACTORS, supervisor, PLHCP or Program Administrator that the fit is not suitable, the employee will be given opportunity to choose a different respirator face piece to be retested.

Fit tests are conducted according to OSHA-accepted QLFT or QNFT protocol. The accepted procedures and protocols are outlined in this section.

QLFT is only to be used for fit-testing negative pressure air-purifying respirators that are required to have a fit factor of 100 or less. Half face air filtering respirators are fit tested with a smoke irritant. Full face respirators must be fit tested using Portacount.

If protocol determines that the fit factor is 100 or greater for tight-fitting half face pieces, or 500 or greater for tight-fitting full face pieces, the quantitative fit test has been passed with that particular respirator.

The negative pressure mode will be performed during the QLFT or QNFT to fit test tight-fitting atmosphere-supplying respirators and tight-fitting powered air-purifying respirators. The negative pressure mode will be used for the fit test regardless of whether the usual mode of operation for that respirator is positive or negative.

To conduct a qualitative fit test for these respirators, the respirator user's face piece will be converted into a negative pressure respirator with appropriate filters. Alternately, an identical negative pressure air-purifying face piece with the same sealing surfaces may be substituted.

To conduct a quantitative fit test for these respirators, the face piece will be modified to allow sampling inside the face piece's breathing zone, halfway between the nose and mouth. This will be accomplished by installing a fixed sampling probe onto a substitute face piece or by using a sampling adapter which provides a temporary means of sampling the air.

Any face pieces that are modified for the purposes of fit testing will be completely restored to their NIOSH-approved configurations before they are used by employees in the workplace.

### Fit Test Procedures

The requirements in this section apply to all QLFT and QNFT OSHA-accepted fit test methods.

The test subject will be provided with a sufficient variety of respirator sizes to select the most acceptable respirator that correctly fits the subject.

Before beginning the selection process, the subject will be shown how to put a respirator on, how to position it on the face, how to set strap tension and how to evaluate acceptable fit. A mirror will be provided to aid the test subject in determining the position and fit of the respirator. The instruction provided during fit testing does not substitute for the formal training on respirator use; it is only a review.

The test subject will be informed that a respirator is to be selected that provides the best fit. Each respirator presented is of a different size and shape. If fitted and used properly by the subject, the respirator will provide sufficient protection.

Test subjects will be instructed to hold up each chosen face piece to the face to quickly eliminate those that are obviously a poor fit.

The acceptable face pieces are noted. The most comfortable mask must be put on and worn for five minutes or more to evaluate comfort. To assess comfort, the following points should be considered:

- If the subject is not familiar with how to use a respirator, he or she will be instructed to put the mask on several times and to adjust the straps each time so the subject becomes well-versed in setting the proper tension on the straps,
- Position of the mask on the cheeks and face,
- Room to talk,
- Position of the mask on the nose,
- Room for eye protection.

The following criteria will be used to evaluate the suitability of the respirator's fit:

- Proper placement of the chin,
- Sufficient, but not overly tight, strap tension,
- Proper fit across the bridge of the nose
- Respirator's tendency to slip,
- Respirator sized appropriately to span the distance of the subject's nose to chin,
- Subject's self-evaluation in mirror to assess the respirator's fit and position.

Evaluations should incorporate use of the Fit Test form.

#### User Seal Check

Prior to beginning the negative and positive pressure checks, subjects will be instructed to place the mask on the face and move the head up and down and from side to side while taking slow, deep breaths. The subject will perform a user seal check by using either the positive or negative pressure seal checks outlined below:

##### Positive Pressure Check

Remove the exhalation valve cover and close off the exhalation valve. Exhale gently into the face piece. If a slight positive pressure builds up inside the face piece with no outward leaks of air at the seal, the face fit is sufficient. Carefully replace the exhalation valve cover after conducting the pressure check.

##### Negative Pressure Check

Replace the filter seal over the opening of the canister or cartridge. If the filter seal is not available, cover the inlet opening with the palm of the hand. If the hand does not sufficiently cover the inlet opening, cover it with a thin latex or nitrile glove. Inhale gently. The face piece should collapse slightly. Hold the breath for ten (10) seconds. If the face piece remains slightly collapsed, and no air leaks inward, the tightness of the respirator is sufficient.

The test cannot be conducted if the subject has hair growth at the areas with the skin seals with the surface of the respirator. This includes a beard, moustache, sideburns, or stubble. Any apparel or accessories (including glasses) that interfere with fit should be removed.

If the subject determines that the fit of the respirator is unsatisfactory, the subject will be allowed to select a different respirator and will be retested. The fit test will be terminated immediately if the subject has difficulty breathing during the tests. The subject will be referred to a physician or other health care profession for evaluation regarding whether the subject can wear a respirator in the performance of his or her job duties.

Subjects will be given a description of the fit test and the subject's responsibilities during testing prior to beginning the test. This will include a description of the exercises to be performed by the test subject. The respirator must be worn for at least five minutes prior to beginning a test.

The subject must wear any safety equipment that may be required during actual respirator use while the fit test is performed.

#### Test Exercises

Each test exercise lasts one minute except the grimace test, which lasts 15 seconds. The test conductor will ask the subject questions about the comfort of the respirator upon completion of the procedures. If the respirator has been deemed unacceptable during or after completion of the tests, another model will be tested. If the subject cannot perform the test exercises due to medical or health conditions, the fit test will not be performed. In this case, the subject is prohibited from using a respirator until all elements of the fit test can be completed.

The subject will not be permitted to adjust the respirator once the exercises begin. Any adjustment made voids the test, and the test must be repeated.

All fit-testing methods will require the following exercises to be performed:

- Normal breathing. The subject will be required to breathe normally while in a standing position without talking,
- Deep breathing. The subject will be asked to stand in a normal position and take slow, deep breaths, taking care not to hyperventilate,
- Turning head side to side. While standing in place, the subject will be required to turn the head from side to side, to the farthest position at each side. At the farthest position, the subject will be asked to hold and inhale,
- Moving head up and down. While standing in place, the subject will be asked to move the head in an up and down motion. The subject will be asked to inhale when the head is in the up position,
- Talking. The subject will be asked to speak slowly and loud enough for the voice to be heard by the test conductor. For this exercise, the subject will read from the Rainbow Passage below for one minute.

#### 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 man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow.” Continue to read for one minute.

- Grimacing. The test subject will be asked to grimace by smiling or frowning. (This exercise is only performed during QNFT tests),



- Jogging in place. The subject will be required to jog in place for one minute while taking care to be aware of their surroundings.
- Normal breathing. Repeat the first exercise.

#### Qualitative Fit Test (QLFT) Protocols

##### General

TRIAD MECHANICAL CONTRACTORS requires that persons conducting QLFT are able to calibrate equipment, ensure that equipment is in proper working order, prepare test solutions, properly perform tests and recognize invalid tests. TRIAD MECHANICAL CONTRACTORS is responsible for ensuring that QLFT equipment is clean, well-maintained and operational within its intended parameters.

##### Irritant Smoke (Stannic Chloride) Protocol

This QLFT tests for leakage into the respirator by using the subject's reaction to chemical irritants released in "smoke" produced by a stannic chloride ventilation smoke tube.

##### General Requirements and Precautions for the Irritant Smoke Protocol:

Respirators will be equipped with high efficiency particulate air (HEPA) or P100 series filters for this test.

The test shall not be performed in an enclosure. The test subject shall not use a hood. Only stannic chloride smoke tubes are permitted for use during this protocol.

The smoke from this test may be irritating to the eyes, nasal passages and lungs. The test conductor will take precautionary measures to minimize the smoke irritant the subject is exposed to. Sensitivity varies according to the individual; some may experience greater irritation to the smoke. Precautions will be taken when performing the screening to use only the minimum amount of smoke necessary to elicit an olfactory response from the test subject.

This fit test will be conducted in an adequately ventilated area to prevent build-up of irritant smoke and to avoid exposing the test conductor to smoke.

The subject must be able to demonstrate that he or she can detect a weak concentration of the irritant smoke.

- The test conductor will break both ends of the stannic chloride ventilation smoke tube. One end of the smoke tube will be attached to a low flow air pump to administer 200 milliliters per minute, or an aspirator squeeze bulb. The conductor will cover the opposite end of the smoke tube with a short piece of tubing to guard against potential injury from the jagged end.
- The test conductor will inform the test subject that smoke can irritate the eyes, nasal passages, and lungs and will instruct the test subject to keep the eyes closed while the test is performed.
- The test subject will be permitted to smell a weak concentration of the smoke before putting the respirator on in order to become familiar with its irritating properties and to determine if the subject can detect the smoke's irritating properties. The test conductor will carefully administer a small amount of the smoke directed toward the test subject to determine if he or she can detect it.

##### Irritant Smoke Fit Test Procedure

- The test subject will put the respirator on without assistance and will perform the required user seal checks,
- The test subject will be instructed to keep the eyes closed if he or she is wearing a half face respirator,
- The test conductor will direct the stream of smoke from the tube toward the face seal area of the subject by using a low flow pump or squeeze bulb. The test conductor will be 12 inches or more from the face

piece and will move the smoke stream around the entire perimeter of the mask. Gradually, the test conductor will make two more passes (for a total of three times) around the perimeter of the mask, moving closer each time. The test conductor will not move the smoke tube closer than six inches,

- If the irritant smoke does not elicit a response from the test subject, proceed with the test exercises,
- The exercises in the Test Exercises will be performed by the test subject. The respirator seal will continue to be challenged by directing smoke around the perimeter at a distance of six inches,
- If the test subject reports detection of the irritant, this is a failed test. The test subject must repeat the entire sensitivity check and fit test procedure before being retested,
- If the test subject passes the irritant smoke test (with no evidence of a response such as irritation or involuntary cough), the subject will be screened for sensitivity again after the respirator is removed, using smoke from the same tube used during the fit test. If he or she still reacts to the smoke, the fit test is valid. If there is no response to the irritant smoke, the results of the fit test are invalid,
- The glass tube will be properly disposed of after conducting the screenings and fit test.

#### Quantitative Fit Test (QNFT) Protocols

OSHA has deemed it acceptable to use controlled negative pressure and suitable instrumentation to measure a face piece's leak rate by volume in order to quantify the respirator.

TRIAD MECHANICAL CONTRACTORS requires that all persons administering quantitative fit tests (QNFT) are capable of calibrating equipment, ensuring that equipment is in proper working order, performing tests properly, calculating fit factors properly, and recognizing invalid tests.

TRIAD MECHANICAL CONTRACTORS is responsible for ensuring that equipment for GNFT is clean, well maintained and calibrated according to the manufacturer's recommendations in order to operate as it was designed to.

#### Portacount Fit Test Requirements

- Examine the respirator to ensure it is fitted with a high efficiency filter. Make sure the sampling probe and line are attached to the face piece according to established standards,
- Instruct the subject to put the respirator on five minutes prior to the beginning of the test to rid the respirator of ambient particles trapped inside and allow the subject to make sure the respirator is comfortable. The subject must already have been trained on proper use of the respirator,
- Check the following to ensure the respirator fits the subject sufficiently: Proper placement of chin, sufficient strap tension, correct placement on the nose, appropriate distance from nose to chin, tendency of the respirator to slip and subject's self-evaluation (in a mirror) of fit and position,
- Instruct the subject to perform a user seal check. If a leak is detected, examine the cause. If it is determined to be caused by an inadequately fitting face piece, instruct the subject to select a different size of the same model, or a different model of respirator,
- Proceed with the test ensuring the Portacount is operated according to the manufacturer's instructions.
- Instruct the test subject to perform the exercises according to the Test Exercises section of this procedure,
- After the subject has completed the test exercises, question the subject about the comfort of the respirator. If the fit has become unacceptable, instruct the subject to select another respirator model.

#### Portacount Test Instrument

The Portacount automatically stops and calculates the overall fit factor for all of the exercises completed. The overall fit factor is the one that counts; this is determined by a Pass or Fail message. If the test reads Pass, the test is over. Because the criteria for Pass or Fail are programmable by the user, the test conductor will make sure that the programmed criteria meet the requirements for the respirator's minimum performance.

Test results for passing tests will be sent to the Safety Manager and kept on file. This record must contain the subject's name; overall fit factor; make, model, style and size of respirator; and test date.

## Use, Maintenance and Care of Respirators

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TRIAD MECHANICAL CONTRACTORS is required to provide for the use, inspect, repair, storage, cleaning and disinfecting of respirators used by TRIAD MECHANICAL CONTRACTORS employees. All respiratory protective equipment shall be properly stored and inspected by TRIAD MECHANICAL CONTRACTORS.

### Use

- Factors that can affect the mask to face seal are not permitted. This includes, but is not limited to, glasses, clothing and facial hair,
- A positive and negative pressure check must be conducted each time a respirator is worn.

### Cleaning and Disinfecting Requirements

TRIAD MECHANICAL CONTRACTORS will provide each employee who requires a respirator one that is clean, sanitary, and in proper working order. The responsible person for the maintenance and care of respiratory equipment is the respiratory program administrator and safety manager. TRIAD MECHANICAL CONTRACTORS will make sure that respirators are cleaned and sanitized according to the procedures in the Respiratory Protection Program, or procedures recommended by the manufacturer if they are equivalently effective. Respirators are required to be cleaned and disinfected:

- When issued to an employee who will use the respirator exclusively, the respirator will be cleaned as often as necessary by the employee to maintain sanitary condition,
- When used in training and fit testing, the respirator must be cleaned by the Safety Manager or his/her designee after each use,
- Employees who are assigned cartridge respirators are responsible for the cleaning, inspection and proper storage of the respirator.

### Cleaning Procedures

- Remove the respirator's filters, cartridges or canisters. Face pieces should be disassembled by removing speaking diaphragms, valve assemblies, hoses and any other components as recommended by the manufacturer. Defective parts should either be discarded or repaired,
- Wash all parts in a solution of warm water and mild detergent or with a manufacturer recommended cleaner. A non-wire, stiff bristled brush may be used to help remove dirt,
- Rinse all the washed components in clean, warm, running water. Drain after rinsing,
- If the cleaner does not contain a disinfectant, parts should be submerged for two minutes in a disinfectant. Alternatively, alcohol wipes may be used, so long as they are intended for use with respirators,
- Rinse parts in clean, warm, running water. It is important to rinse thoroughly because dried detergents or disinfectants on face pieces may cause dermatitis. These cleansing agents may also deteriorate or corrode rubber and metal parts if they are not completely removed,
- Drain the parts after rinsing,
- 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.

### Storage and Inspection

- Respirators and respiratory equipment must be stored properly to protect them from contamination, temperature extremes and other damaging conditions,
- Respiratory equipment that is intended for use in emergencies will be stored in an easily accessible area that is clearly marked.

Respirators must be inspected as outlined:

- Respirators used routinely must be inspected by its assigned employee before and after each use and during cleaning,
- The employee must also check the respirator for proper function, tightness of connections and the condition of its parts (e.g., the face piece, valves, head straps, connecting tubes, and cartridges, canisters or filters), and
- Elastomeric parts must be checked for pliability and possible signs of deterioration,
- Emergency respiratory equipment must be inspected monthly, at a minimum, and before and after each use,
- Respiratory equipment used for escape only must be inspected before carrying into the workplace.

#### Breathing Air Quality and Use

TRIAD MECHANICAL CONTRACTORS will make certain that compressed air complies with the following specifications:

- Compressed breathing air shall meet at least the requirements for Type 1-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%,
  - Carbon monoxide (CO) content equal to or less than 10 ppm,
  - Hydrocarbon (condensed) content of 5 mg per cubic meter of air or less,
  - Carbon dioxide content equal to or less than 1,000 ppm, and
  - Lack of noticeable odor.
- TRIAD MECHANICAL CONTRACTORS will make sure that oxygen is not used in compressed air units,
- TRIAD MECHANICAL CONTRACTORS will make sure that only equipment designed for oxygen service or oxygen distribution will use oxygen concentrations greater than 23.5%,
- TRIAD MECHANICAL CONTRACTORS will make sure that cylinders used in supplying breathing air to respirators meet Department of Transportation requirements and:
  - Cylinders of purchased breathing air have a certificate of analysis from the supplier stating that the breathing air meets the requirements for Type 1 Grade D breathing air, and
  - The moisture content of a cylinder does not exceed a dew point of -50 deg. F (045.6 deg. C) at 1 atmosphere pressure,
  - Cylinders are tested and maintained as recommended in the Shipping Container Specification Regulations of the DOT (49 CFR part 173 and part 178).
- TRIAD MECHANICAL CONTRACTORS will make sure that compressors used in supplying breathing air to respirators are constructed and placed in a manner that:
  - Prevents entry of contaminated air into the air-supply system,
  - Minimizes moisture content to keep the dew point at 1 atmosphere pressure to 10 deg. F (5.56 deg. C) below the ambient temperature,
  - Have appropriate in-line air-purifying sorbent beds and filters to protect the quality of the breathing air. Sorbent beds and filters must be maintained regularly and refurbished or replaced periodically according to the manufacturer's recommendations.
- Have a tag maintained at the compressor that contains the most recent change date and the signature of the authorized person who performed the change,
- For compressors that are not oil-lubricated, TRIAD MECHANICAL CONTRACTORS will make sure that carbon monoxide levels of the breathing air do not exceed 10 ppm,
- For oil-lubricated compressors, TRIAD MECHANICAL CONTRACTORS will use a carbon monoxide alarm and/or high temperature alarm to monitor levels of carbon monoxide. If using only high-temperature alarms, the air supply must be monitored at regular intervals to sufficiently prevent carbon monoxide in the breathing air from exceeding 10 ppm.

- TRIAD MECHANICAL CONTRACTORS will make sure that breathing air couplings are incompatible with outlets for non-breathable worksite air and other gas systems so as to prevent asphyxiating substances from being introduced into the breathing air lines.

#### Repairs

TRIAD MECHANICAL CONTRACTORS will make sure that respirators that fail inspection or are otherwise deemed defective are immediately removed from service. The defective respirators will be discarded, repaired or adjusted according to the following procedures:

- Adjustments and repairs are to be made only by authorized persons trained to perform those operations. Only the respirator manufacturer's NIOSH-approved parts designed for the respirator may be used,
- Repairs will be made according to the manufacturer's instructions, according to the type and extent of repairs needed to be performed.

#### Voluntary Use

If an employee elects to voluntarily wear a respirator when not required by this Program, they will be advised of the following during their training:

When properly selected and worn, respirators are an effective form of protection against designated hazards. Use of respirators is encouraged, even if exposures are below the exposure limit, to provide additional protection and comfort for employees.

If a respirator is not used properly, not maintained and not kept clean, the respirator may become a hazard to the employee. Certain precautions should be taken when employees are provided with respirators for voluntary use to include the following:

- Read thoroughly and follow all instructions as set forth by the manufacturer on the use, cleaning, care, maintenance, warnings and limitations of the respirator,
- Select respirators certified by NIOSH (National Institute for Occupational Safety and Health) to protect against the contaminant of concern. A label or statement of certification should be on the respirator or its packaging. This certification details what the respirator is designed for and how much protection it provides,
- Do not wear respirators into contaminated areas for which your respirator is not designed and certified to protect against. For example, a respirator designed to filter dust particles does not protect against vapors, gases, or very small solid particles of fumes or smoke,
- Keep track of your respirator to avoid mistakenly using someone else's respirator and vice versa.

## Workplace Monitoring

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The corporate health department has implemented a program to monitor potential employee exposures. Project personnel may be assigned to the task of air monitoring. Direct-reading instruments will be utilized to aid in characterizing potential exposures. The data collected will be used to determine the respiratory equipment's appropriateness.

## Recordkeeping

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TRIAD MECHANICAL CONTRACTORS will establish and maintain written records regarding medical evaluations, fit testing and the respirator program. Medical evaluation records will be retained and made available according to 29 CFR 1910.1020. TRIAD MECHANICAL CONTRACTORS will give the employee an opportunity to discuss the questionnaire and the results of the employee's examination with the PLHCP.

Records will be treated in a confidential manner and maintained in the files of the Safety Manager in the corporate office.

## Program Evaluation

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TRIAD MECHANICAL CONTRACTORS will conduct evaluations of the workplace and environment whenever necessary to make sure that the policies and procedures of the current program are being implemented and continue to be effective.

TRIAD MECHANICAL CONTRACTORS will, on a regular basis, consult employees who use respirators to evaluate the employee's opinions on the effectiveness of the program and to identify any problems with said program. Identified problems will be corrected. Factors to be evaluated include, but are not limited to:

- Respirator fit,
- Ability to use the respirator without interfering with work duties and performance,
- Proper usage of the respirator under the usual conditions the employee encounters, and
- Proper maintenance of the respirator.

## Training

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Every employee will participate in respirator training initially and at least annually thereafter, if their job classification requires it. Training will be provided prior to requiring the employee to use the respirator and shall address employee knowledge of the following:

- Respirators and fit,
- Wearing, use, and limitations,
- Emergency situations,
- Fit Checks,
- Maintenance and storage,
- Medical signs and symptoms of effective use,
- General OSHA standards and requirements.

## Retraining

Employees must be retrained annually and when the following circumstances apply:

- Changes in the workplace or the type of respirator make the previous training obsolete,
- The employee's knowledge is found to be inadequate, or
- Other situations that arise that make retraining necessary to ensure employee safety.

# Rigging/ Material Handling Program

## Purpose

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This program ensures onshore and offshore lifting operations are safe and incident free.

## Scope

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This program applies to all TRIAD MECHANICAL CONTRACTORS employees that work onshore, or in the Outer Continental Shelf (OCS). It is to be used at all times on TRIAD MECHANICAL CONTRACTORS worksite. If a TRIAD MECHANICAL CONTRACTORS employee performs work on a site other than TRIAD MECHANICAL CONTRACTORS's site, the facility owner's plan should be used if it exists and is as strict (or more strict) than this plan. In cases where the other facility's plan does not exist or is less strict than this plan, TRIAD MECHANICAL CONTRACTORS employees will operate under this plan.

## Definitions

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Rigging - the process of safely lifting a load by attaching it to a hook using appropriate slings and related hardware.

Qualified Rigger – anyone who has successfully completed training that meets the requirements set forth by American Petroleum Institute's Recommended Practice 2D 5th Edition (API RP-2D 5th Edition) and attaches or detaches lifting equipment.

Outer Continental Shelf – all submerged lands, subsoil, and seabed that belong to the United States (federal) and lie seaward and outside of the individual states' jurisdiction (land beneath navigable waters are in the jurisdiction of the individual states).

## Key Responsibilities

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Management determines whether this program is necessary to comply with regulations within their region. If the program is necessary, management determines which employees are required to take this training. Management may select a training facility, or may use an in-house qualified trainer to conduct the training.

Supervisors assist the managers in completing the above tasks. The supervisor must verify that each employee has the appropriate training before reporting for duty onshore, or on an OCS facility.

Employees must follow safe rigging practices, and will assist their supervisor in tracking required training. Employees will be aware of expiration dates of required training, and will notify their supervisor in advance of expiry.

Attaching or detaching lifting equipment to loads (or lifting loads) must only be performed by qualified, trained rigger employees. TRIAD MECHANICAL CONTRACTORS employees never operate nor inspect offshore cranes.

## Procedure

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### General

"Qualified riggers" are the only employees allowed to attach loads to a lifting hook. "Qualified operators" are the only employees allowed to operate a crane while involved in lifting operations onshore or on the OCS.

API RP-2D has developed a classification system with three-tiers. Before starting any job assignment requiring rigging and lift operations offshore, employees must be certified in the required classifications:

- Qualified rigger.
- Qualified inspector.
- Qualified operator. (TRIAD MECHANICAL CONTRACTORS employees DO NOT operate offshore cranes.)

#### Material Handling

- Rigging equipment must be inspected to ensure its safety. Prior to using rigging equipment for material handling, the equipment must be inspected. In addition, it must be inspected on each shift and as necessary during its use.
- Rigging equipment that is determined to be defective must be removed from service, and must never be used.
- Rigging equipment must have load identification information attached to it. Never load rigging equipment in excess of its recommended safe working load.
- All rigging equipment that is not currently being used must be removed from the work area to prevent it from being a hazard to employees.
- Tag lines shall be used at all times unless their usage presents hazards.
- All hooks (e.g., those on overhaul ball assemblies, lower load blocks, or other attachment assemblies) must be able to be closed and locked, without a hook throat opening. Or, you may use an alloy anchor shackle with bolt, nut and retaining pin.
- Employees must stay clear of loads that are about to be lifted, and those that are suspended. Never allow an employee under a suspended load.

#### Training and Education

“Qualified Offshore Riggers” must successfully complete an approved “API2D Rigger” course. This requires TRIAD MECHANICAL CONTRACTORS employee to verify that the knowledge they have gained by participating in classroom lectures, hands-on training and then they must pass a written exam. Upon successful completion of the course, the employee will be issued a “Rigger” card. During the training TRIAD MECHANICAL CONTRACTORS employee must display competency in the following topics:

- Selecting the proper hardware (hooks, wire rope products, eye bolts, shackles, synthetic slings, chain slings, etc) to apply correctly to the load (hitches, angles, weight, temperatures, center of gravity, etc.).
- Inspecting the selected hardware before, during and after the lift.
- Properly securing the load, attaching it to the hook, lifting it, handling it during the movement, and lowering and placing the load.
- Properly storing rigging equipment.
- TRIAD MECHANICAL CONTRACTORS “qualified riggers” must re-certify their training every four (4) years.



# Scaffolds Program

## Purpose

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This program helps to prevent injuries caused by falls from raised work areas, and ensures that affected employees and contractors are trained to inspect scaffolding materials and erected scaffolds.

## Scope

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This program applies to every work area where scaffolding is erected. It is to be used at all times on TRIAD MECHANICAL CONTRACTORS worksite. If a TRIAD MECHANICAL CONTRACTORS employee performs work on a site other than TRIAD MECHANICAL CONTRACTORS's site, the facility owner's plan should be used if it exists and is as strict (or more strict) than this plan. In cases where the other facility's plan does not exist or is less strict than this plan, TRIAD MECHANICAL CONTRACTORS employees will operate under this plan.

## Definitions

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**Bearer** - A horizontal scaffold member that the platform rests on, and that may be supported by ledgers.

**Brace** - A tie that keeps scaffold members in a fixed position with respect to each other.

**Coupler** - A device that locks the components of a tubular metal scaffold together. It must be used to support loads that are below the maximum intended loads for which it was designed.

**Double pole or independent pole scaffold** - A scaffold system that is supported by a double row of uprights at the base, is not supported from the walls, and is constructed of uprights, horizontal platform bearers, ledgers, and diagonal bracing.

**Guardrail** - A rail that is attached to the uprights, and is placed along the open sides and ends of platforms.

**Heavy Duty Scaffold** - A scaffold that is designed and built to carry a working load that is not more than 75 pounds per square foot.

**Ledger (stringer)** - A horizontal scaffold member that goes from post to post, and supports the bearer or putlog that forms a tie between the posts.

**Light Duty Scaffold** - A scaffold that is designed and built to carry a working load that is not more than 25 pounds per square foot.

**Manually Propelled Mobile Scaffold** – A mobile scaffold that is moved manually (not motorized).

**Maximum intended load** - The total weight of all loads on the scaffold including the working load, the weight of the scaffold itself, and other anticipated loads.

**Medium duty scaffold** - A scaffold that is designed and built to carry a working load that is not more than 50 pounds per square foot.

**Mid-Rail** - A rail that is placed approximately halfway between the guardrail and the platform, and is attached to the uprights along the open sides and ends of platforms. Mid-rails are used when required.

**Putlog** – A scaffold member that the platform rests on.

Runner - The bracing that runs lengthwise horizontally, or the bearing members, or both.

Scaffold - A temporary raised platform and its support structure that is used to support workmen or materials or both.

Toe board - A barrier that is attached along the sides and ends of a platform that helps to stop material from falling off the scaffold platform.

Tube and coupler scaffold - An scaffold assembly that consists of tubing (serves as posts, braces, bearers, ties, and runners), a base that supports the posts, and special couplers that connect the uprights and join the members together.

Tubular welded frame scaffold - A panel, sectional, or frame metal scaffold that is mostly assembled using prefabricated welded sections (consists of posts and horizontal bearer with intermediate members). Panels or frames must be braced with diagonal (cross) braces.

Working Load – The weight load attributed to men, materials, and equipment.

#### Key Responsibilities

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##### Managers and Supervisors

- Ensures that a qualified person erects scaffolds, set up inspections are conducted, and daily inspections are conducted before the work day begins.
- Ensures that all employees, and/or contractors have received training in the use of scaffolds and inspection methods for scaffolds.
- Ensures that all employees and contractors are informed that if a defect is discovered during an inspection, the scaffold must not be used until repairs are complete.

##### Employees

- Follows this program by conducting daily scaffold inspections, and reports any damages or necessary repairs to their supervisor.

#### Procedure

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##### General Requirements

When work cannot be performed safely from the ground, or from solid construction, scaffolds must be supplied and erected according to the applicable standards for the employees involved. In the case that ladders are used, the work must conform to ladder safety standards.

Scaffolds must be erected by a qualified individual (someone who can certify that the scaffolding is safe to use).

Scaffolds must be set on footings or anchored to material that is sound, rigid, and able to support the maximum intended load without settling or shifting. Never use unstable objects such as loose boards, barrels, or boxes to support scaffolds or planks.

Only use scaffolds (and components) that are capable supporting (without failure) at least four times the maximum intended load. All scaffold components must comply with OSHA requirements 29 CFR 1910.28 and 29 CFR 1926.451.

If using wood scaffold planks, they must be cross-supported every 8 feet. Cleat, wire or nail scaffold deck boards into place.

You must completely floor all working levels of scaffolds except where space is required for openings for internal ladders.

Maintenance of scaffolds and other components described in this program is required to keep them in safe condition. Never alter or move (horizontally) a scaffold that is occupied.

Immediately repair any damaged or weakened scaffold. Never use a damaged or weakened scaffold until repairs have been completed.

Never load a scaffold in excess of the working load that it is intended for.

Always use properly sized bolts in the construction of scaffolds, and use sufficient number at each connection to create the designed strength of the scaffold.

Always overlap platforms (minimum of 12 inches) and secure them from any movement.

Always provide an access ladder or equivalent safe access.

Always extend scaffold planks over their end supports by not less than 6 inches and not more than 18 inches.

Ensure that poles, legs, and uprights of scaffolds are plumb, and are rigidly braced and secured to prevent swaying and shifting.

Always apply a tag line to materials being hoisted onto a scaffold.

Always provide overhead protection workers on a scaffold if they are exposed to overhead hazards.

If a scaffold or platform is erected over 6 feet off the ground, always install toe boards and guardrails. Where workers are required to work or pass under the scaffold, always install a screen between the toe board and the guardrail (along the entire opening), consisting of No. 18 gauge wire one-half inch mesh or the equivalent.

Never perform work on a scaffold during storms or high winds.

Never perform work on a scaffold that is covered with snow or ice, unless all the snow and ice is removed and planking is sanded to prevent slipping.

Do not accumulate tools, material, and debris on a scaffold such that it presents a hazard.

#### Inspections

Scaffolding must be inspected by a qualified individual as per the manufacturer's recommendations. The qualified individual must also conduct inspections prior to each use and periodically throughout each shift.

- A qualified individual inspects the scaffold after it is erected, prior to the start of the work day, and at the beginning of a shift change to ensure the scaffold is safe prior to and during use. At a minimum, the following shall be inspected:
  - Ensure there is no settling in the ground or surface footing.
  - Check for any signs of damage, missing pins, bolts and any locks and/or safety keepers on all main supports and cross braces.
  - Check for damage, proper placement and any possible movement of all walking surfaces and/or planks.
  - Check that all walkways and planks are secure to prevent movement.
- The inspection will ensure that the scaffold is stable, and movement is prevented.

- If a defect or damage to the scaffold is discovered during the inspection, the scaffold must be tagged out by the qualified individual. Use of the scaffold will be prohibited until the necessary repairs are made.

#### Mandatory Signs and Tags

Signs and tags must be visible at all times when performing work, and must be promptly removed or covered when the hazard are abated. Tags shall also be used when defective equipment or unsafe conditions are found.

The qualified individual will tag out any defective or unsafe equipment or conditions (e.g., improper footings) shall using a weather resistant tag that is secured to the scaffolding structure on all four sides.

Only use danger signs where an immediate hazard exists. To alert other workers of possible danger from falling objects, post danger signs in the immediate area of the scaffold.

Caution - To mark off a larger area around scaffolding and warn other workers to use caution, use signs and/or barricade tape.

#### Modifications

A qualified person must perform all modifications and repairs. This qualified person must be able to certify that the scaffolding is safe to use to ensure that non-qualified personnel do not create additional hazards.

Only employees who are trained and certified shall perform modifications or repairs. Unqualified employees who fail to comply may receive disciplinary action and or termination.

#### Training Requirements

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All employees that work on scaffolds must be trained by "qualified" persons regarding hazards. The supervisor must ensure that each employee who works on a scaffold is trained by a qualified person. Training will include recognizing the hazards associated with the type of scaffold being used, and understanding the control procedures or how to minimize those hazards. Training must occur before use of the scaffold and will include:

- Information about basic safety.
- Hazards including falls, electrical, and falling objects, and how to protect from them.
- Tags – the types of tags and the requirement to comply with them.
- Correct use of the scaffold, and handling of materials on the scaffold.
- Correct procedures when dealing with electrical hazards, and when erecting, maintaining, and disassembling fall protection systems and falling object protection systems that are used.
- Maximum intended load capacity of the scaffolds that are used.

The supervisor must ensure that each employee who is involved in erecting, disassembling, operating, moving, maintaining, repairing, or inspecting a scaffold is trained by a qualified person. The training will include how to recognize hazards associated with the work. The training will include the following topics, as applicable:

- The nature of scaffold hazards.
- Correct procedures for erecting, disassembling, operating, moving, maintaining, repairing, and inspecting the type of scaffold that is used.
- Maximum intended load capacity and the intended use of the scaffolds that are used.

TRIAD MECHANICAL CONTRACTORS will re-train employees if TRIAD MECHANICAL CONTRACTORS has reason to believe that the employee lacks the skill or understanding needed to work safely while erecting, or disassembling scaffolds. TRIAD MECHANICAL CONTRACTORS will also require retraining where:

- Changes in worksite scaffolding presents a hazard that an employee has not been previously trained about.

- Changes in the types of scaffolds, falling object protection, fall protection, or other equipment presents a hazard that an employee has not been previously trained about.
- Inadequacies in an affected employee's work involving scaffolds would indicate that the employee has not reached the required proficiency.

Tube And Coupler Scaffolds - Light Duty

Uniformly distributed load		Not to exceed 25 p.s.f.
Post Spacing (longitudinal)		10 ft. 0 in.
Post Spacing (transverse)		6 ft. 0 in.
Working Levels	Additional Planked Levels	Maximum Height
1	8	125 ft.
2	4	125 ft.
3	0	91 ft. 0 in.

Tube And Coupler Scaffolds - Medium Duty

Uniformly distributed load		Not to exceed 50 p.s.f
Post spacing (longitudinal)		8 ft. 0 in.
Post spacing (transverse)		6 ft. 0 in.
Working Levels	Additional Planked Levels	Maximum Height
1	6	125 ft.
2	0	78 ft. 0 in.

# Subcontractor Management Plan

## Purpose

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The purpose of this program is to continue to better subcontractor health, safety and environmental achievement and to create a standard for pre-qualification, assessment/selection and improvement of our subcontractors.

## Scope

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This program applies to all TRIAD MECHANICAL CONTRACTORS subcontractors and locations.

## General Requirements

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TRIAD MECHANICAL CONTRACTORS manages all subcontractors according to this program.

TRIAD MECHANICAL CONTRACTORS must pre-approve the use of subcontractors. Requirements for this approval include:

- TRIAD MECHANICAL CONTRACTORS safety department performs a formal safety review of the subcontractor.
- The scope of this safety review was appropriate based on the hazards and risk exposure.
- The subcontractor is (or will be) trained in Triad Mechanical Contractor's safety policies, expectations and requirements.
- The subcontractor consents that they will follow Triad Mechanical Contractor's Drug and Alcohol policy and onsite safety rules through the work term.

TRIAD MECHANICAL CONTRACTORS will not use any subcontractor with a "Non-Approved" safety status any TRIAD MECHANICAL CONTRACTORS site.

## Procedure

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### Pre-Qualification of Subcontractors

TRIAD MECHANICAL CONTRACTORS will review the subcontractor's safety programs, safety training documents and safety statistics to pre-qualify them.

### How Acceptable Safety Metrics Will be Used as a Criteria for Selecting Subcontractors

Subcontractors will be pre-qualified using a criteria of safety metrics. The metrics and scoring considers:

- A review of responses to TRIAD MECHANICAL CONTRACTORS Subcontractor Safety Pre-Qualification Form and subcontractor safety program documents - 60% (Rated from 0-60 total points)
- A review of subcontractor safety training documents - 20% (Rated from 0-20 total points)
- A review of subcontractor safety statistics (ie TRIR, EMR, DART, Fatality Rate - 20% (Rated from 0-20 total points)

## Evaluation Rating and Acceptance

The rating system of subcontractors has five designations:

- 90 points or greater = A – no restrictions.
- 85 to 89 points = B – A documented mitigation plan must be approved by TRIAD MECHANICAL CONTRACTORS Safety.
- 81 to 84 points = C – A documented mitigation plan must be approved by TRIAD MECHANICAL CONTRACTORS Safety; requires written management approval.
- 71 to 80 points = D – Must have a commitment meeting with subcontractor senior management present; documented mitigation plan must be approved by TRIAD MECHANICAL CONTRACTORS Safety; requires written management approval; regardless of number of workers, trained subcontractor safety personnel must on site during work.
- 70 points or less = F – do not use.

After evaluating and scoring subcontractors, TRIAD MECHANICAL CONTRACTORS safety provides the scores/ranking to management.

If the subcontractor does not progress sufficiently towards an acceptable mitigation plan (or other agreed upon criteria), TRIAD MECHANICAL CONTRACTORS has the right to change their status to “Non-Approved”.

## Subcontractor Involvement

While performing work at TRIAD MECHANICAL CONTRACTORS worksites, subcontractors must follow the work practices and systems described below:

- Prior to beginning any work, attend a safety orientation, pre-job or kick-off meeting provided by TRIAD MECHANICAL CONTRACTORS
- Observe employees for signs of substance abuse, reporting nonconformities to TRIAD MECHANICAL CONTRACTORS
- Ensure employees are adequately trained and competent to their work
- Take part in TRIAD MECHANICAL CONTRACTORS tailgate safety meetings, hazard assessments or job safety analysis and work-site safety inspections.
- Conduct a pre-job safety inspection including equipment
- Take part in the Behavior Based Safety hazard reporting system
- Report any spills, injuries, property damage incidents, as well as any near misses
- Follow worksite and Owner Client safety rules
- Utilize applicable TRIAD MECHANICAL CONTRACTORS safety practices and processes
- After the job is complete, clean up and restore the worksite
- Always comply with regulations
- TRIAD MECHANICAL CONTRACTORS will conduct post job safety performance reviews for subcontractors.

**SUBCONTRACTOR SAFETY PRE-QUALIFICATION FORM**

**GENERAL INFORMATION**

<b>1. Subcontractor Information:</b>			
Subcontractor Name:		Telephone Number:	
Street Address:		Fax Number:	
City:		Website Address:	
Province/State:		Postal Code/Zip:	
<b>2. Organization Officers</b>			
President:			
Vice President:			
Treasurer:			
<b>3. How many years has your organization been in business under your present firm's name?</b>			
<b>4. Parent Firm Name:</b>			
City:	Province/State:	Postal Code/Zip:	
Subsidiaries:			
<b>5. Under current management since (Date):</b> (please enter date as mm/dd/yyyy)			
<b>6. Contact for Insurance Information:</b>			
Title:	Telephone:	Fax:	Email:
<b>7. Insurance Carrier(s):</b>			
Name	Type of Coverage	Telephone	
<b>8. Worker's Compensation Account Status (Enclose a copy of your workers compensation insurance certificate)</b>			
Account Number:		Industry Code:	
<b>9. Contact for requesting bids:</b>			
Title:	Telephone:	Fax:	Email:
<b>10. Contractor Evaluation form completed by:</b>			
Title:	Telephone:	Fax:	Email:



**HEALTH, SAFETY AND ENVIRONMENTAL PERFORMANCE**

**Health, Safety and Environmental Performance**

Provide the following information for your TRIAD MECHANICAL CONTRACTORS using safety forms from the past three (3) years.

If the data is not available enter Not Available - N/A.

Safety Performance Definitions and Guidance

- a. Hours Worked Hours the employee worked in the last three years. Please report scheduled total hours worked and total overtime hours worked. If actual hours worked is unavailable for some individuals, you can estimate the hours worked. (You can use 2000 hours per individual per year as an estimate.)
- b. Recordable Incidents Recordable incidents include any work-related injury or illness, including death but do not include first-aid injuries.
- c. Lost Workday Cases These involve fatalities, days away from work, or restricted work activity cases.
  - Days Away from Work Case This includes cases where the employee is absent from a scheduled work day for one or more days after a work related injury or illness (not including the day of the incident). If the total days away reaches 180, or if employee leaves the firm, stop counting.
  - Restricted Work Activity Case This includes cases where, as a result of work-related injury or illness, the employee:
    - ◇ Is assigned to another job (temporarily or permanently)
    - ◇ Does their normal job but for less than a full day
    - ◇ Cannot perform regular functions associated with their normal job
 Do not count the day of the incident as a Restricted Duty day. If the total restricted work days reaches 180, or if employee leaves the firm, stop counting.
- d. Motor Vehicle Incident This includes incidents that involve a motor vehicle (owned, leased or rented by the firm) that results in injury, death or property damage except if the vehicle was properly parked. A motor vehicle includes any mechanically or electrically powered devices - excluding those that are moved by human power – that can transport a person or property on a land roadway.

Health and Safety Incidents	2011	2010	2009
a. Total Hours Worked			
b. Total Recordable Incidents			
# Fatalities			
# Medical Aids			
# Days Away from Work Cases			
# Restricted Work Activity Cases			
c. Total Recordable Incident Rate (TRIR)			
<u>Total # Recordable Incidents x 200,000</u>			
<u>Total # Hours worked</u>			
d. Lost Workday Cases (LWC)			
# Fatalities			
# Days Away from Work Case			
# Restricted Work Activity Case			
e. Lost Workday Incident Rate (LWDR)			
<u>Total # Lost Workday Incidents x 200,000</u>			
<u>Total # Hours Worked</u>			

HEALTH, SAFETY AND ENVIRONMENTAL PERFORMANCE			
Health and Safety Incidents - continued	2011	2010	2009
f. Motor Vehicle Incidents (MVI) # Motor Vehicles Incidents # Kilometers/Miles driven			
g. Motor Vehicle Incident Frequency Rate (MVIFR) <u>Total # of Firm's Motor Vehicle Incidents x 1,000,000</u> Total # Kilometers/Miles driven			
Environmental Incidents	2011	2010	2009
<u>Total # Spills to Water</u> a. Petroleum Spills # spills Sheen (est. volume as 0.1 bbl. To < 1bbl.) # spills 1 bbl. To < 100 bbls. # spills 100 bbls. or more b. Chemical Spills # spills 1 bbl./160 kg. to < 100 bbls./16,000 kg. # spills 100 bbls./16,000 or more			
<u>Total # Spills to Land</u> a. Petroleum spills # spills 1 bbl. To < 100 bbls. # spills 100 bbls. or more b. Chemical Spills # spills 1 bbl./160 kg. to < 50 bbls./8,000 kg # spills 50 bbls./8,000 kg. or more			
Enforcement Actions	2011	2010	2000
<u>Citations</u> # Health and Safety # Environmental Please provide details			
<u>Fines</u> Total # Fines Total \$\$ Paid Please provide details			

**HEALTH, SAFETY AND ENVIRONMENTAL MANAGEMENT**

Highest ranking HSE professional in the firm:			
Name/Title:	Email:	Telephone Numbers	
Do you have a documented Basic Safety / HSE Program?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Does your Basic Safety/HSE Program include the following?			
a. HSE Policy statement signed by management	Yes <input type="checkbox"/>	No	<input type="checkbox"/>
b. Management Commitment and Involvement	Yes <input type="checkbox"/>	No	<input type="checkbox"/>
c. Hazard Identification and Risk Control	Yes <input type="checkbox"/>	No	<input type="checkbox"/>
d. Rules and Work Procedures	Yes <input type="checkbox"/>	No	<input type="checkbox"/>
e. Training	Yes <input type="checkbox"/>	No	<input type="checkbox"/>
f. Communications	Yes <input type="checkbox"/>	No	<input type="checkbox"/>
g. Accident/Incident Reporting and Investigation	Yes <input type="checkbox"/>	No	<input type="checkbox"/>
Does the program include work practices and procedures such as?			
a. Permit to Work including Energy Isolation	Yes <input type="checkbox"/>	No	<input type="checkbox"/>
b. Confined Space Entry	Yes <input type="checkbox"/>	No	<input type="checkbox"/>
c. Injury and Illness Recording	Yes <input type="checkbox"/>	No	<input type="checkbox"/>
d. Fall Protection	Yes <input type="checkbox"/>	No	<input type="checkbox"/>
e. Personal Protective Equipment	Yes <input type="checkbox"/>	No	<input type="checkbox"/>
f. Portable Electrical/Power Tools	Yes <input type="checkbox"/>	No	<input type="checkbox"/>
g. Motor Vehicle/Driving Safety	Yes <input type="checkbox"/>	No	<input type="checkbox"/>
h. Compressed Gas Cylinders	Yes <input type="checkbox"/>	No	<input type="checkbox"/>
i. Electrical Equipment Grounding Assurance	Yes <input type="checkbox"/>	No	<input type="checkbox"/>
j. Powered Industrial Vehicles (Cranes, Forklifts, Etc.)	Yes <input type="checkbox"/>	No	<input type="checkbox"/>
k. Housekeeping	Yes <input type="checkbox"/>	No	<input type="checkbox"/>
l. Accident/Incident Reporting and Investigations	Yes <input type="checkbox"/>	No	<input type="checkbox"/>
m. Unsafe Condition Reporting	Yes <input type="checkbox"/>	No	<input type="checkbox"/>
n. Emergency Preparedness, Including Evacuation Plan	Yes <input type="checkbox"/>	No	<input type="checkbox"/>
o. Waste Disposal and Pollution Prevention	Yes <input type="checkbox"/>	No	<input type="checkbox"/>
p. Regular Workplace Inspection / Audits	Yes <input type="checkbox"/>	No	<input type="checkbox"/>
Do you have a Drug and Alcohol program?	Yes <input type="checkbox"/>	No	<input type="checkbox"/>
a. Pre-employment Testing	Yes <input type="checkbox"/>	No	<input type="checkbox"/>
b. Reasonable Cause Testing	Yes <input type="checkbox"/>	No	<input type="checkbox"/>
c. Post-rehabilitation/Return to Work Testing	Yes <input type="checkbox"/>	No	<input type="checkbox"/>

**HEALTH, SAFETY AND ENVIRONMENTAL MANAGEMENT**

Do you have a Job Safety Analysis (JSA) process in place?		Yes <input type="checkbox"/>	No <input type="checkbox"/>
Is there a Root Cause Analysis process used for environmental spills, near misses, and investigations?		Yes <input type="checkbox"/>	No <input type="checkbox"/>
Is there a Management of Change (MOC) Process in place?		Yes <input type="checkbox"/>	No <input type="checkbox"/>
Do you have programs for the following?			
a. Respiration Protection		Yes <input type="checkbox"/>	No <input type="checkbox"/>
b. Where applicable, have employees been:			
• Trained		Yes <input type="checkbox"/>	No <input type="checkbox"/>
• Fit tested		Yes <input type="checkbox"/>	No <input type="checkbox"/>
• Medically approved		Yes <input type="checkbox"/>	No <input type="checkbox"/>
c. Hazard communication/WHMIS		Yes <input type="checkbox"/>	No <input type="checkbox"/>
d. Potential high hazard work such as Highly Hazardous Chemicals, Explosives and Blasting Agents		Yes <input type="checkbox"/>	No <input type="checkbox"/>
Do you have a corrective action process to address individual/employee safety and health performance deficiencies?		Yes <input type="checkbox"/>	No <input type="checkbox"/>
Medical			
a. Do you conduct medical examinations for:			
• Pre-placement Job Capability		Yes <input type="checkbox"/>	No <input type="checkbox"/>
• Pulmonary		Yes <input type="checkbox"/>	No <input type="checkbox"/>
• Respiratory		Yes <input type="checkbox"/>	No <input type="checkbox"/>
b. Describe how you intend to provide first aid and other medical services while on-site.			
Do you have personnel trained to perform first aid and CPR?		Yes <input type="checkbox"/>	No <input type="checkbox"/>
Personal Protective Equipment (PPE)			
a. Is applicable PPE provided for employees?		Yes <input type="checkbox"/>	No <input type="checkbox"/>
b. Do you have a program to ensure that PPE is inspected and maintained?		Yes <input type="checkbox"/>	No <input type="checkbox"/>
HSE Meetings			Frequency
a. Do you hold site HSE meetings for?			
• Field Supervisors		Yes <input type="checkbox"/>	No <input type="checkbox"/>
• Employees		Yes <input type="checkbox"/>	No <input type="checkbox"/>
• New Hires		Yes <input type="checkbox"/>	No <input type="checkbox"/>
• Subcontractors		Yes <input type="checkbox"/>	No <input type="checkbox"/>

**HEALTH, SAFETY AND ENVIRONMENTAL MANAGEMENT**

Inspections and Audits			Frequency
a. Do you conduct internal HSE Inspections?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
b. Do you conduct internal HSE program audits?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
c. Are corrections or deficiencies to internal HSE program or equipment communicated and documented until closure?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Equipment and Materials:			
a. Do you own or lease Equipment and Materials? If yes, please complete the following questions:	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
b. Do you have a system for establishing applicable health, safety, and environmental specifications when acquiring materials and equipment?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
c. Do you conduct inspections on operating equipment (e.g., cranes, forklifts) to comply with regulatory requirements?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
d. Do you maintain operating equipment in compliance with regulatory requirements?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
e. Do you keep the applicable inspection and maintenance certification records for operating equipment?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
f. Do you document corrections or deficiencies from equipment inspections and maintenance?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Subcontractor Management			
a. Do you subcontract any work? If the answer is yes, please complete the following questions:	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
b. Do you have a written contractor safety management process?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
c. Do you use HSE performance criteria in selection of subcontractors?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
d. As part of the selection process, do you evaluate the ability of subcontractors to comply with applicable HSE requirements?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
e. Do your subcontractors have a written HSE Program?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
f. Do you include your subcontractors in:			
• HSE Orientation	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
• HSE Meetings	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
• HSE Equipment Inspections	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
• HSE Program Audits	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
• Are corrections or deficiencies documented	Yes <input type="checkbox"/>	No <input type="checkbox"/>	

**HEALTH, SAFETY AND ENVIRONMENTAL MANAGEMENT**

<b>Employee and Trades Training</b> a. Have employees been trained in appropriate job skills? b. Are employee job skills certified where required by regulatory or industry consensus standards? c. List trades/crafts which have been certified:	Yes <input type="checkbox"/>  Yes <input type="checkbox"/>	No <input type="checkbox"/>  No <input type="checkbox"/>
<b>Health, Safety and Environmental Orientation</b> a. Do you have an HSE Orientation Program for new hires and newly hired or promoted supervisors? b. Does the program provide instruction on the following: <ul style="list-style-type: none"> <li>• Orientation</li> <li>• Safe Work Practices</li> <li>• Safety Supervision</li> <li>• Toolbox meetings</li> <li>• Emergency Procedures</li> <li>• First Aid Procedures</li> <li>• Fire Protection and Prevention</li> <li>• Safety Intervention</li> <li>• Hazard Communication/WHMIS</li> </ul>	<b>New Hires</b>	<b>Supervisors</b>
<b>Health, Safety and Environmental Training</b> a. Do you know the regulatory HSE training requirements for your employees? b. Have your employees received the required HSE training and re-training? c. Do you have a specific HSE training program for supervisors?	Yes <input type="checkbox"/>  Yes <input type="checkbox"/>  Yes <input type="checkbox"/>	No <input type="checkbox"/>  No <input type="checkbox"/>  No <input type="checkbox"/>
<b>Training Records</b> a. Do you have HSE and training records for your employees? b. Do the training records include the following: <ul style="list-style-type: none"> <li>• Date of training</li> <li>• Name of trainer</li> <li>• Employee identification</li> <li>• Method used to verify understanding</li> </ul> c. How do you verify understanding of training? (Check all that apply)	Yes <input type="checkbox"/>  Yes <input type="checkbox"/> Yes <input type="checkbox"/> Yes <input type="checkbox"/> Yes <input type="checkbox"/>	No <input type="checkbox"/>  No <input type="checkbox"/> No <input type="checkbox"/> No <input type="checkbox"/> No <input type="checkbox"/>
<input type="checkbox"/> Written test <input type="checkbox"/> Oral test <input type="checkbox"/> Performance test <input type="checkbox"/> Job Monitoring <input type="checkbox"/> Other (List)		

# Welding, Cutting and Hotwork

## Purpose

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This program has been designed for the purpose of ensuring a safe work environment during the performance of welding, cutting and hot work operations.

## Scope

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The procedures set forth in this program apply to all employees who are directly involved, or assist in, welding, cutting and hot work tasks. This program covers TRIAD MECHANICAL CONTRACTORS employees and contractors and must be used on TRIAD MECHANICAL CONTRACTORS owned premises. When off site, the site operator's program takes precedence unless it is less stringent than TRIAD MECHANICAL CONTRACTORS program. Defective equipment or other safety hazards should be reported immediately. Defective equipment must be pulled from service until its safety has been validated. Repairs may only be made by qualified, authorized personnel.

If objects to be cut or welded are immovable and if all the present fire hazards cannot be cleared, the object must be removed or guards must be used to restrain the heat, slag and sparks, and to protect the immovable fire hazards.

## Definitions

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Welding and Hot Work Procedures – activities that have the potential to cause fires or explosions due to sparks, molten slag, fire or other hot material.

Hot Work Examples – welding, cutting, soldering, grinding, brazing, thawing pipes and using electric tools in hazardous areas.

Hazards – dangerous conditions that include, but are not limited to, the following: skin burns, fires, welding "blindness", explosions, fumes and smoke.

Special Hazard Occupancies – areas where the following potential fire hazards are present: gases, flammable liquids, accumulation of dust, rubber, plastics and paper products.

## Key Responsibilities

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### Managers and Supervisors

- Establish if the site is safe for cutting and welding operations,
- Determine the safe areas for performing cutting and welding operations,
- Supply training for all employees and contractors whose job duties include performing operations that produce heat, spark or flames, such as welding, grinding or brazing,
- Create and implement effective hot work procedures,
- Provide appropriate personal protective equipment (PPE) for hot work,
- Supply safe, properly working equipment for hot work,
- Make certain that all PPE and hot work equipment are in safe working order,
- Oversee all hot work operations,
- Inspect the hot work area before work begins,
- Permit only trained and authorized employees and contractors to conduct hot work,
- Make sure permits are obtained for all hot work performed outside of authorized work areas.

### Employees

- Inspect all hot work equipment before use,
- Use applicable hot work PPE,

- Follow all established hot work procedures,
- Report unsafe conditions or defective equipment immediately.

## Procedure

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### General

Equipment operators must report equipment defects and discontinue use until it has been repaired or replaced.

Written permits must be obtained before hot work is performed. The work area must be inspected and authorization obtained via written permit before proceeding with cutting or welding operations.

Whenever possible, combustibles should be placed a minimum of 35 feet from the work area. When relocation of combustibles is not practicable, they must be protected via the following means to prevent accidental ignition of the material: flameproof covers, wetting the material, shielding with met, guards or curtains.

Augers conveyor systems and ducts that have the potential to carry sparks to distant combustibles must be protected or turned off.

If welding or cutting is performed near ceilings, walls, partitions or openings in the floor (such as grating and manholes), fire-resistant guards or shields must be used to avoid ignition.

When welding is conducted on metal ceilings, walls, partitions or flooring, care must be taken to prevent the ignition of combustible materials on the other side due to radiation or conduction of heat. When combustibles on the opposite side cannot be moved, a fire watch person will be provided on the opposite side to monitor the work.

Welding on a metal partition, ceiling, wall, or flooring made of combustible sandwich panels is strictly prohibited.

Welding and cutting operations may not be conducted when pipes or other metal to be welded are in contact with combustible walls, floors, partitions, ceilings or roofs closely enough to cause ignition by combustion.

If welding cannot be conducted safely, the welding and cutting shall not be performed.

Cutting or welding must not be performed under the following circumstances:

- Unauthorized areas,
- In the presence of flammable or explosive atmospheres,
- In sprinkled buildings where the sprinklers are impaired,
- In areas in close proximity to large quantities of stored combustible materials,
- In locations where the accumulation of dust is more than 1/16<sup>th</sup> of an inch within a 35 feet perimeter of the area where hot work is to be conducted. All dust accumulation must be cleared before welding or hot work begins.

If welding or cutting is performed in an area where fires might develop, or if any of the conditions listed above cannot be satisfied, a fire watch will be provided.

- The fire watch must be present during welding procedures and for at least 30 minutes (an half hour) after welding is completed,
- The fire watch must be properly trained in the use of fire extinguishers and must have knowledge of the facility's alarm system,
- The fire watch will have the appropriate fire extinguishers at the ready during the procedure,
- Appropriate fire extinguishers will be supplied and available for immediate use,



- Hot work permits must be obtained for all welding or cutting procedures performed outside designated welding areas.

#### Fire Prevention Measures

Designated welding areas will be established according to the following specifications:

- Fire extinguishers shall be made readily available at all times during welding & cutting operations,
- Floors must be swept and cleared of combustible materials within 35 feet of the work area,
- Flammable and combustible materials must be placed 35 feet or more from the designated work area,
- Adequate ventilation must be provided to supply 20 air changes per hour,
- At least one 10 lb. dry chemical fire extinguisher must be within reach of the 35 feet of the work area,
- Welding curtains, noncombustible walls or other protective dividers will be supplied to confine slag and sparks to the combustible-free area.

Requirements for welding outside the designated area:

- A hot work permit must be obtained prior to beginning welding operations,
- Portable welding curtains or shield must be utilized for the protection of other workers in the welding area,
- Plastic materials must be protected by welding tarps during the welding operations,
- Respiratory protection must be used unless adequate airflow away from the welder and others present in the work area can be set up and maintained,
- A fire watch must be present during all hot work operations.

After the completion of welding operations, the welder must mark the metal as hot or warn other workers of the fact in some way.

#### Confined Space

- A space that is large enough that an employee can enter full-bodied into the area to perform the assigned work,
- Has limited means for entering and exiting the space (e.g., vessels, coolers, tanks, hoppers, storage bins, vaults and pits), and
- Is not intended for continuous occupancy.

Refer to TRIAD MECHANICAL CONTRACTORS's Confined Space Program before beginning any cutting, welding or brazing operations that meet the requirements of a confined space.

Adequate ventilation is required to work in a confined space.

When welding or cutting in a confined space, the gas cylinders and welding machines must be left outside the confined space. Prior to beginning work, heavy portable equipment on wheels must be stabilized to prevent accidental movement.

When welding operations are performed in a confined space that must be entered through a manhole or similar opening, a quick means of exit must be provided to protect the welder in case of an emergency.

- When using safety belts for this purpose, the belt must be attached to the welders body in such a way that it does not get jammed in the opening,
- An attendant will be stationed outside the opening to observe the welder and put the preplanned rescue procedures into effect, if needed.

When arc welding procedures cease for a substantial amount of time (e.g. during lunch or overnight), the electrodes must be removed from the holders. The holders must be carefully placed to avoid accident contact. The machine must be disconnected from its power source.

Improperly closed valves pose a risk of allowing the escape of gas through leaks. In order to eliminate this risk, when gas welding or capping ceases for a substantial period of time, torch valves must be closed; the torch's fuel-gas and oxygen supply must be shut off along some point outside the confined area. If possible, remove the torch and hose from the confined space.

When welding must be performed in an area with screens on all sides, the screens must be arranged to avoid restriction of ventilation. Preferably, screens should be mounted approximately two (2) feet above the floor unless the work is performed at a level so low that the screens must be lower in order to protect nearby workers. Fixed enclosures must have a top and at least two sides to surround the welding or cutting operations. A sufficient airflow must be in place to maintain a velocity away from the welder of 100 linear feet (30 m) per minute or greater.

When welding and cutting in confined spaces, adequate ventilation must be provided to avoid the accumulation of toxic materials and to avoid possible oxygen deficiencies. This is to protect the welder as well as helpers and other employees in the immediate area. When air is withdrawn, it will be replaced with clean air.

When circumstances will not allow for such ventilation, airline respirators or hose masks will be provided. These are approved for this purpose by the National Institute for Occupational Safety and Health (NIOSH). In areas where a threat to life is present, a positive pressure, full-face, self-contained breathing apparatus, or a combination of a full-face piece, positive pressure supplied-air respirator with an auxiliary, self-contained air supply approved by NIOSH must be used.

When welding operations are conducted in confined spaces where it is necessary for welders and their helpers to provide hose masks, hose masks with blowers or self-contained breathing apparatuses, an additional worker will be situated outside the confined space to monitor the safety of those in the confined work area.

#### Fumes, Gases and Dust

Toxic fumes may be produced during some welding procedures; these fumes may require extraction. An assessment of the work to be conducted must be completed before beginning the work. Fumes usually contain small particles of the material being welded; these fumes can have a severe effect on the respiratory system.

Welding of materials that have the potential to produce dangerous fumes require proper ventilation and/or the use of respiratory protection. This also applies when inert-gas metal-arc welding or oxygen-cutting stainless steel.

These materials include:

- Lead base metals
- Zinc
- Mercury
- Cadmium
- Fluorides
- Beryllium
- Exotic metals or paints not otherwise listed

Employees must refer to TRIAD MECHANICAL CONTRACTORS's Respiratory Protection Program to evaluate which type of respiratory protection should be used during welding procedures.

Welding and cutting operations must be adequately ventilated to avoid the accumulation of toxic materials for the safety of the welder, helpers, and other personnel in the work area.

## Personal Protection

Helmets and hand shields must be made of a material that insulates from heat and electricity. Helmets, goggles, and shields must be capable of withstanding sterilization and should not be easily flammable. Helmets and hand shields must be in place to protect the face, ears and neck from direct radiant energy from the arc.

Helmets must have filter plates and cover plates that allow for easy removal. All parts must be constructed of materials that are not easily susceptible to corrosion and do not discolor the skin.

Goggles must be ventilated so as to avoid fogging of the lenses. All glass for goggle lenses must be tempered, free from scratches, waves, air bubbles and other imperfections. The front and rear surfaces of lenses and windows must be parallel and smooth; lenses used to provide vision corrections are the only exception to this. Lenses are required to have a permanent, distinct marking to easily identify their shade and source.

### NOTE:

When high yellow light is produced in gas welding or oxygen cutting procedures, it is preferable to use a filter or lens capable of absorbing the yellow or sodium line in the visible light. All plates and filter lenses must meet the ANSI Z87.1 – 1968 – American National standard for eye and face protection for transmission of radiant energy. Where it is practicable, welders working in these conditions should be enclosed in a booth painted with a low reflectivity finish (such as zinc oxide) and lamp black. Alternately, the welder may be enclosed with noncombustible screens painted in a similar fashion. Both booths and screens must allow air circulation at floor level. Persons near the welding areas must be protected from radiant energy via noncombustible or flameproof shields or screens, or will be required to wear protective eyewear.

Appropriate clothing and hand protection must be worn to protect the skin from welding hazards.

## Cleaning Compounds

Because cleaning materials are often toxic or flammable, precautions must be taken and the manufacturer's instructions must be followed.

- Cleaning and degreasing that involves chlorinated hydrocarbons must be performed in locations where no vapors from these processes can reach or be drawn into the atmosphere surrounding the welding operations,
- Trichloroethylene and perchloroethylene must also be kept out of atmospheres that may be penetrated by UV radiation of gas-shielding welding procedures.

Mechanical ventilation must be used when oxygen cutting procedures using a chemical flux, iron powder or gas shielded arc cutting for stainless steel. This ventilation must adequately remove the fumes generated by these procedures.

## Cylinders

DOT-approved compressed gas cylinders are clearly marked near the cylinder's shoulder and identifies the chemical or trade name of the gas contained inside.

- Compressed gas cylinders must be ANSI B57.1-1965 compliant,
- Compressed gas cylinders must always be secured in an upright position except when it is not practicable, for short periods of time, when carrying or hoisting the cylinder.

Cylinders must be kept away from heat sources, radiators and piping systems used in grounding. Cylinders and their valves, including couplings and regulators, must be free from oily or greasy residue. Do not handle cylinders with gloves or rags that may contain oil or grease residue.

Stored oxygen cylinders must be located a minimum of 20 feet from fuel gas cylinders and other combustible materials, including grease and oil. Alternately, stored oxygen cylinders may be separated from these hazards by a noncombustible barrier that is at least five (5) feet high and has a fire safety rating of at least 30 minutes. Valves on

empty cylinders must be closed. Protective caps should always be placed on valves, hand-tight, except when the cylinder is connected for use.

Cylinders must never be kept in unventilated enclosures such as cupboards and lockers.

Storage of fuel gas cylinders inside buildings is limited to a total capacity of 2000 cubic feet (300 lbs.) of liquefied petroleum gas, except those cylinders in use or attached and ready for use.

Acetylene cylinders should be stored with the valve end up.

Appropriate storage spaces will be provided for cylinders to ensure they are not knocked over, damaged by falling objects or susceptible to tampering by unauthorized persons.

- Protection from back flow will be accomplished via an approved device that prevents fuel from flowing into the oxygen system and oxygen from flowing into the fuel-gas system,
- Flashback protection will be provided via an approved device that prevents flame from entering into the fuel-gas system,
- Backpressure protection will be provided via an approved pressure-relief device set at the recommended pressure.

The transportation of gas cylinders must follow these requirements:

- Valve caps must be installed,
- Cylinders must be secured,
- Cylinders must not be lifted by the valve protection caps. The regulators must be removed,
- Cylinders should not be dropped or otherwise allowed to strike each other,
- Regulators that are removed must be carried in the vehicle's cab,
- Cylinders are not to be tampered with, nor should any person attempt to repair a cylinder,
- Cylinders must be carefully handled at all times. Knocks, falls or rough handling may damage the cylinder, its valve or safety device, resulting in leakage.

Safety devices must never be tampered with.

#### Arc Welding and Cutting

Personnel are required to be qualified or trained prior to operating, maintaining or installing welding equipment.

- All workers instructed to operate or perform maintenance on equipment must be familiar with the following Requirement for Electric Arc Welding Standards:
  - 29 CFR 1910.254
  - 29 CFR 1910.252 (a) (b) (c)
  - American Welding Society Standard A6-1-1966 if gas shield arc welding is performed.
- Electrical welding equipment will be selected for safe operation that comply with the above standards,
- Arc welding equipment must be able to withstand exposure to corrosive fumes, excessive oil vapor and humidity, flammable gases, unusual vibration or shock, excessive dust and seacoast or shipboard conditions,
- Arc welding equipment must be operated at the voltage recommended in the manufacturer's recommendations,
- Leads must be inspected regularly and replaced if splices are unprotected or if insulation is broken,
- Electrical tape cannot be used to repair leads,
- When using an arc welder, all ground connections must be checked to ensure the mechanical strength and electrical capabilities are adequate for the required current.

A disconnecting switch or controller and an overcurrent protection will be provided near each welding machine.

Direct current machines are required to be connected with the same polarity. Alternating current machines must be connected to the same phase and polarity of the supply circuit.

- Electrode holders must be located to avoid contact with persons, conducting objects or fuel from compressed gas tanks,
- Cables with splices within 10 feet of the holder must not be used.

If objects to be cut or welded are immovable and if all the present fire hazards cannot be cleared, guards must be used to restrain the heat, slag and sparks, and to protect the immovable fire hazards.

#### Resistance Welding

Only personnel trained in the operation, maintenance and installation of welding equipment may do so.

- Shields, guarding, grounding, voltage and interlocks must conform to the manufacturer's recommendations,
- Protective measures such as ventilation, shields and flash guarding must be provided to control metal fumes, flashes and toxic elements.
- If the object to be welded or cut is immovable, all fire hazards should be moved.

#### Transmission Pipeline

Arc welding in wet or high humidity conditions requires special protection against electric shock and will be provided.

#### Pressure testing:

- Workers and the public must be protected against injury from the blowing out of closures or other pressure restraining devices when pipelines are being pressure tested,
- Protection will be provided against the discharge of loose dirt that may have become trapped in the pipe.

Welding construction of transmission pipelines must be performed according to the Standard for Welding Pipelines and Related Facilities, API St. 1104-1998.

#### Oxygen Fuel Gas Welding and Cutting:

Only approved implements such as regulators, torches, setting generators, pressure-reducing valves and manifolds will be used:

- Mixtures of oxygen or air and fuel gases may be explosive and should be avoided whenever possible,
- Hoses and their connections must adhere to the applicable standards of the Compressed Gas Association and Rubber Manufacturer's Association,
- Workers overseeing the oxygen or fuel-gas supply equipment and generators must be trained and deemed competent before left in a supervisory position.

If the object to be welded is immovable, all fire hazards must be removed from the work area.

#### Fire Watch Requirements

A fire watch will be provided under the following conditions when welding, soldering, cutting or brazing is conducted near combustible materials or locations where fire hazards may develop:

- Areas where fires that are not minor may develop,
- Combustible materials are within 35 feet or less to the area where hot work is conducted,

- Combustibles are 35 feet or more from the work area, but are easily set aflame,
- Wall or floor openings are present within 35 feet or less of exposed combustible materials,
- Combustible materials are next to the opposite side of metal roofs, ceilings or partitions.

Fire watch personnel must stay at least 30 minutes after welding or cutting operations have ceased. All fire watchers must have fire extinguishers at the ready.

#### First Aid Equipment

First aid equipment will be provided and available at all times. Injuries must be reported as soon possible in order to seek medical attention. First aid will be performed until medical attention can be provided.

#### Training

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Training for welders, supervisors & fire watch must include:

- Responsibilities of the employee's position,
- Safe operation of the equipment to be used in performance of their job duties,
- Fire watch responsibilities to include:
  - Knowing that fire watching is the ONLY duty of the fire watch,
  - When the watch may be terminated,
  - How to use fire extinguishers,
  - Familiarity with the facilities and how to activate the fire alarm, if needed,
  - Contractor responsibilities,
  - Operator responsibilities,
  - Requirements for documentation,
  - Requirements for the use of respiratory equipment.