

# **AIR-SOURCE INTERNATIONAL CORPORATION SAFETYMANUAL**

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**34.0 Reserved**

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## **2.0 Introduction**

### **2.1 Purpose**

This manual is created with the intention of providing guidelines for field usage to aide in Incident Prevention. Air-Source International's most sincere desire is to provide our employees a workplace free from recognized hazards. This is accomplished by maintaining an aggressive approach to pre-task planning activities to discover otherwise unforeseen hazards.

This manual is not intended to reference all OSHA standards that may apply to your work, but to give a general overview of information that will assist projects in concluding injury free.

We value our relationship with our Union Crafts, and consider our employees to be our most valuable resource. When an employee is injured on the job there is not only moral, legal, and emotional impact, but also a loss of resources for Air-Source International. The indirect cost, associated with occupational injuries are vast, and often overlooked by many companies. Most management experts agree that the guiding principal of being successful in business is not the maximization of profits, but the avoidance of loss. Air-Source International shares this philosophy and believes that no Incident or injury is acceptable and fully believes that all Incidents are preventable. Operating errors lead to incidents, injuries, and economic loss. We must have the full commitment from all of our employees and possess a positive, proactive attitude towards safety performance to be successful.

### **2.2 Using This Manual**

This manual contains procedures and policies for day to day work activities. As previously mentioned, it is not our intention to duplicate OSHA regulations, or to include all of them in this manual, but to set in place corporate procedures that both meet the OSHA requirements, as well as providing employees with a simplified approach to incident prevention. In fact, throughout the reading of this manual, the reader will discover that many of our safe work practices actually exceed OSHA requirements. The unique features of each project will require some refinement and expansion of detail to meet the specific needs of individual projects. In the event we encounter a client that has procedures that differ from those contained in this manual, the more stringent procedures must be followed. If at anytime there is a need for clarification regarding any of the policies and procedures contained in this manual, or you encounter circumstances that this manual does not address, contact the Air-Source International Safety Department for assistance.

### **2.3 Manual Revisions**

This manual will be updated as needed, based on changes in federal regulations or as internal audits discover the need for change. Any suggestions to improve our safety process are always welcomed and encouraged. Suggestions should be submitted to the Murphy Company Corporate Safety office in Florida. Those that would require a change or an addition to company policies and procedures will first be viewed by the Director of Safety. Provided the Director feels the change or addition is needed, it will then be forwarded to the Corporate Safety Committee for final review and / or approval.

### **3.0 General Incident Prevention Planning**

The key to incident prevention is to have a proactive and aggressive approach in every phase of the project. Air-Source International truly believes that ALL incidents are preventable, and is committed to obtaining our goal of ZERO INJURY PERFORMANCE on each project. By combining the use of Safe Work Procedures with proper Pre-Task Planning, hazards can be identified and avoided all together. In this segment we will look at the three components that need to be addressed for the safe completion of a project.

#### **3.1 During The Estimating Process**

During the preparation of an estimate, incident prevention requirements necessary for the protection of employees, equipment, materials, and the general public must be carefully analyzed. The estimating phase is the first opportunity that Air-Source International has to initiate proper Pre-task Planning techniques. Adequate provision and financial resources must be planned into our estimates. During this process we have our first, and possibly most important, opportunity to prepare the project to conclude injury free. Estimators should consult the Safety Department on matters of clarification regarding policies and procedures prior to pricing activities which involve unique safety related situations or conditions.

Issues for estimators to take into consideration should include: methods of accessing the work, specialized confined space equipment and training, respiratory protection, time allotted for all required training, etc. Any of these items, as well as other important issues, could have a significant impact on the final outcome of a project.

#### **3.2 During Pre-Job Start Up**

The Air-Source International Safety Department will be given the client's safety policies and procedures to determine continuity with our program elements as well as specifications of Personal Protective Equipment. The client's requirements will be thoroughly reviewed for inconsistencies and/or deviations from our program, and this information will be forwarded to the assigned project manager. Project Managers and key supervisors assigned to the project will meet and confer as soon as possible after acceptance of the bid and

following review of the client's requirements, but prior to start-up. The intention of the meeting will be to address, among other items, the following safety considerations:

- (1) Review and clarify incident prevention policies, plans, procedures, and responsibilities, pertaining to the project, as well as what support will be needed from the Air-Source International Safety Department.
- (2) Determine that safety considerations, including training, have been given to every aspect of the project.
- (3) Conclude any changes that may need to be made to the program to satisfy the client. If changes are made, a written program change will be made and maintained at the job site.
- (4) Copies of the project safety rules and procedures must be forwarded to all subcontractors. Subcontractors will be required to follow the same procedures as Air-Source International personnel on the project and must be afforded the same right as Air-Source International to verify continuity with their program as well as clarification of any matters which may be unclear. Prior to mobilization an assessment of the work area and a review of information provided by the client should be performed to determine evacuation routes and the nearest emergency facility. This plan, as well as emergency assistance phone numbers, must be conspicuously displayed throughout the job site as well as at all phone locations. Further information regarding this topic may be found in section 6.0 titled "First Aid and Medical Service".

### **3.3 When Work Is In Progress**

Once work has begun, it is essential that program elements are relayed to All personnel and followed. It will be the Project Manager's responsibility to ensure that all procedures and policies are implemented and enforced with all employees on the project that fall under his or her direction. Following the program guidelines, Project Managers will direct supervision in a manner that will promote the desired results of ZERO injuries. Prompt corrective action must be taken to eliminate or control identified unsafe practices or conditions.

The Project Manager will be expected and be held accountable to ensure that administrative elements of the program such as audits and Daily Safety Meetings are being conducted as required by all individuals under their direction (including subcontractors).

Further guidance regarding job site responsibilities is found in the following section (4.0) titled, "Duties and Responsibilities"

### **3.4 Pre-Task Planning Safety**

The following form titled, "Safety Pre-Task Planning Card" (3.7), is used by supervisors to perform a Job Safety Analysis of each days work activities. Supervisors are expected to both anticipate potential hazards and request feedback from employees in order to establish safe work

procedures.

For tasks considered “Highly Hazardous” or “Unique” in nature, Murphy Company will utilize a more detailed Job Safety Analysis form. The form may be obtained by contacting the Safety Department.

Further information, along with the entire Supervisors Training Program, is contained in Section 21, Management Team Safety Training.

### **3.5 Job Site Audits**

Auditing is possibly the best method Air-Source International has to ensure compliance with the policies and procedures presented in this manual.

The supervisor’s audit used by Air-Source International (3.8) is based on five years of historical data. We evaluated five years of incidents (with and without injury) and developed an audit form to address those issues. Our intention is to develop a culture where supervisors are continually mindful of the items being audited, resulting in a reduction of incidents.

All supervisors from Foremen to Project Managers are responsible for completing at least one safety audit per week. The audits are submitted to the safety department for review and record retention. Deficiencies discovered during the audit process are expected to be immediately corrected.

### **3.6 Company Officer Audits**

Air-Source International’s expectation is that all members of management will be actively involved in the safety process. Following the chain of command, each Project Officer is ultimately responsible for the execution and performance of the Air-Source International Safety Program for each of their projects. To that end, we have developed the “Project Sponsor’s Audit Form” (3.9). The form consists of two pages, with the first focusing on the mechanics of safety performance and the second verifying that the administrative elements of the program are in compliance.

Company Officers are required to conduct one audit per month, submitting their report to the Safety Department. Like the Supervisor’s Field Audits, deficiencies are expected to be immediately corrected.

### **3.7 Project Safety Analysis**

At the discretion of the Project Sponsor, Project Director and Safety Department, certain projects may perform a more detailed pre-task planning exercise that will focus on the “key” tasks of the project.

The timing, participation and follow through of the PSA is critical.

#### **3.7.1 Definition**

An analysis of the “key” or “major” activities associated with a particular project. The identified tasks are analyzed to determine what hazards are associated with the task and Safe Work Procedures are developed to counter each hazard identified. (This is a Pre-job/Pre-Task Planning exercise that is separated from Daily Pre-Task Planning).

The PSA is a method of involving all levels of management to develop and

agree upon safe work procedures and therefore benefit from employee buyin. The PSA incorporates the Best Practices that have been created by our craft safety committees.

The PSA identifies “common” tasks that do not have a Best Practice. The PSA incorporates the Air-Source International Accident Prevention Manual by referencing the applicable sections.

### **3.7.2 Timing**

The participation and commitment from the craft level is critical to the success of the plan. Supervisors must be given a sufficient amount of time to become familiar with the project, but not so long as to be planning and discussing tasks already completed. Depending upon the scope of the project, this duration may vary, but typically two to three weeks is an adequate amount of time for all team members to familiarize themselves with the project and be adequately prepared to participate.

### **3.7.3 Participants**

- A Senior Member of Management
- The Project Manager
- All General Foremen on the project
- All Foremen on the project
- Superintendents on the project
- The Safety Director

### **3.7.4 Participants Responsibilities**

#### **Senior Management**

- Illustrate the Companies commitment by being an active participant.
- Support the Companies policies and procedures.
- Offer any additional knowledge that may be helpful to the planning effort such as contractual information, etc.

#### **Project Manager**

- Lead discussion by identifying tasks that he or she considers critical.
- Relay Owner or General Contractor requirements to the group for issues of clarification.

#### **General Foremen, Foremen, and Superintendents**

- Prepare for the meeting by analyzing the project for key tasks.
- Assess the hazards associated with each task.
- Come to the meeting with recommendations of safe work procedures.

#### **Safety Director**

- Promote the thought process by asking the right questions.
- Document the results of the planning session utilizing the PSA form and distribute a copy to all participants.

### **3.7.5 How Do We Use the Information?**

The information contained on the PSA may be used to assist management with numerous accident prevention activities. These include:

- Project Sponsor Audits
- Project Manager Audits
- Project Manager Weekly Safety Meetings
- Weekly Foreman's audits
- Daily Pre-Task Planning Cards

The PSA is also intended to measure processes and procedures in the event of a failure. The PSA is used in Accident Investigations to determine if management adequately Pre-Planned the project

### **3.7.6 Measurement**

Equally important to the development of the PSA is an effective method of ensuring that the PSA is followed. The plan will only be as effective as the subsequent implementation.

Supervisors, Project Managers, and Senior Management must utilize the PSA when conducting job-site audits or holding weekly meetings. The following questions must be answered:

- Are we doing what we agreed upon? If not, why?
- Has the information been relayed to all employees?
- Can we identify additional Best Practices?
- Do we need to add anything to the PSA?

### **3.7.7 Review Schedule**

- When a PSA is created, it will be dated indicating the date it was prepared.
- A revision date will be scheduled at the time of preparation, not to exceed 30 days.
- The PSA will continue to be revised by the Project Manager and on-site supervision each month for the duration of the project.

### 3.8

Job Name:

Job Number:

#### **Air-Source International**

##### **Project Sponsor's Audit Form**

**AUDITOR: PROJECT MANAGER: DATE:**

The following checklist will assist in performing a comprehensive audit of work conditions and practices on the jobsite.

##### **PERSONAL PROTECTIVE EQUIPMENT NO**

- 1) Are Air-Source International and Subcontractor employees wearing hardhats at all times?
  - a) With welding hoods?
  - b) If bump caps are being used, does the project meet the criteria for use of bump caps?
- 2) Are Air-Source International and Subcontractor employees wearing Safety Glasses with Sideshields?
  - a) Sideshields being used with prescription glasses?
- 3) Are Air-Source International and Subcontractor employees using face-shields when chipping or grinding?
- 4) Are Air-Source International and Subcontractor employees wearing hearing protection where required?
- 5) Are Air-Source International and Subcontractor employees using Safety Harnesses with Lanyards as required?

##### **WALKING / WORKING SURFACES NO**

- 1) Are all floor openings, holes and edges properly guarded?
- 2) Are stored materials properly stacked and clear of aisles?
- 3) Is there clear access to all work areas?

##### **LADDERS**

- 1) Are all ladders free of defects?
- 2) Are all stepladders being used only in the open and locked position?
- 3) Are all straight ladders equipped with safety feet?
- 4) Are all straight ladders tied off when in use?
- 5) Is access to ladders free of debris and / or obstruction?

##### **SCAFFOLDS AND MANLIFTS NO**

- 1) Are all Handrails and Toeboards in place?
- 2) Is there proper access to all Scaffolds?
- 3) Are wheels locked on rolling scaffolds when in use?
- 4) Is head protection and safety harness worn when using manlifts?
- 5) Are Scaffold boards and picks in good condition and properly secured?

##### **EXCAVATIONS NO**

- 1) Is there a "Competent Person" on the jobsite?
- 2) Do all excavations 5 feet or more in depth have adequate protective system in place?
- 3) Is there documentation on the jobsite to verify that the excavation(s) have been inspected and permitted daily by the "Competent Person"?

##### **POWER TOOLS NO**

- 1) Are power cords in good condition?
- 2) Are Ground Fault Circuit Interrupters in use?

##### **RIGGING**

- 1) Are all slings and chokers in good condition?
- 2) Are Shackles in use to protect slings and chokers?
- 3) Are chainfalls and come-alongs in good condition?

COMMENTS: (Explain any No's above)

#### **Proceed to Page 2 - Safety Activities Audit**

cc: Tom Skaggs

YES NA

YES NA

YES NO NA

YES NA

YES NA

YES NA

#### **Page 2 - SAFETY ACTIVITIES AUDIT**

##### **SAFETY AUDITS**

- 1) How many people with Safety Audit responsibilities are assigned to this project? (Project Manager(s), Superintendent(s), General Foremen, Foremen)
- 2) How many safety audits were performed in the most recent full calendar week?
- 3) Quality of Audits.

Mark the scale accordingly. DEFICIENT AVERAGE EXCELLENT

Discuss any deficiencies with auditors.

**FOREMAN'S DAILY SAFETY MEETINGS**

- 1) Number of meetings required? (Number of Foremen X Workdays in most recent full calendar week)
- 2) Number of meetings conducted?
- 3) Quality of Meetings.

Mark the scale accordingly. DEFICIENT AVERAGE EXCELLENT

Discuss any deficiencies with Foremen.

**ACCIDENT REPORTS (Where Applicable)**

NO

- 1) Are incident reports completed and submitted to Home Office within 24 hours as required?
- 2) Are incident reports complete with proper attention to Causes and Corrective Actions?
- 3) Have incident reports been signed by all appropriate parties?
- 4) Are thorough written investigations conducted on non-injury incidents? (property damage, near-miss)

**WEEKLY FOREMAN'S SAFETY MEETING**

NO

- 1) Does Project Manager conduct Weekly Foreman's Safety Meetings?
- 2) Is documentation on file to verify that meetings are conducted and action items are addressed?

**TRAINING**

NO

- 1) Is documentation on file to verify that all employees have received client and / or Air-Source International Safety Orientation and Hazard Communication Training?
- 2) Have all Project Managers, Superintendents, General Foremen, and Foremen completed Management Team Safety Training?
- 3) Where applicable, has other training been conducted and documented as required?  
(Confined Space Entry, Process Safety Management, Respiratory Protection, Fire Watch, etc.)

**HAZARD COMMUNICATION**

NO

- 1) Is our written Hazard Communication Program on site and available to all employees?
- 2) Are appropriate Material Safety Data Sheets on site and available to all employees?

**DISCIPLINARY ACTION PROCEDURE**

NO

- 1) Are written Safety Reprimands issued for violations of Safety Policy?
- 2) Have any Safety Reprimands been issued on this project?

**PROJECT SAFETY ANALYSIS**

- 1) Was a Project Safety Analysis (PSA) conducted for this project?
- 2) Are we performing our work in accordance with the Project Safety Analysis (PSA)?
- 1) Is there a copy of the Best Practic Manual on site?
- 2) Is the manual being used to assist in pre-task planning?

cc: Tom Skaggs

YES NO

**Best Practices**

YES NA

YES

YES

YES

YES NO NA

YES

JOB#:

JOB NAME:

**PROJECT MANAGERS WEEKLY SAFETY AUDIT**

AUDITOR: EMP #: DATE: PM:

The following checklist will assist in performing a comprehensive audit of work conditions and practices on the jobsite.

**PERSONAL PROTECTIVE EQUIPMENT ( BPM ALL ) SCAFFOLDS AND MANLIFTS ( BPM 2, 10 & 11 )**

Y N N/A # of scaffolds your crew is using \_\_\_\_\_

Hardhats worn at all times (SM 9.4) Designated competent person is \_\_\_\_\_.

Safety Glasses with Sideshields at all times (SM 9.5) Y N N/A

Faceshields when there is potential for flying debris (SM 9.5) Handrails and toeboards in place (SM 16.3)

Hearing protection where required (SM 9.12) Scaffolds have proper access and are tagged, dated and

Full Body Harness w/ Lanyard where needed (SM 9.10) inspected by competent person (SM 16.2,16.4,16.6)

Glove being used, where needed Fall Protection used in boomlifts ( SM 9.10 )

Fall Protection requirements for scissor lifts are being

**HOT WORK ( BPM 5, 7,10 & 28 )** met. ( SM 9.10 )

Y N N/A **EXCAVATIONS ( BPM 24 )**

Fire Protection (extinguishers / fire blanket) (SM 12.2) Excavation depth is \_\_\_\_\_ feet.

Fire extinguishers inspected and tagged (SM 12.3) Designated competent person is \_\_\_\_\_.

Welding shields in use

Cylinders secured and capped when not in use Y N N/A

Leads and Hoses in good condition (SM 12.6) 5 feet or more in depth - shored, sloped or benched (SM 7.14)

Spoil is a minimum of 2 ft. from edge of the excavation (SM 7.9)



**WALKING / WORKING SURFACES ( BPM 3 & 31 )** Excavations are inspected daily for any changes in Y N N/A working conditions ( SM 7.10 )  
 All floor openings and holes greater than 2" covered (SM 9.11.2) Entry permits are filled out and posted for excavations  
 Aisleways are clear of tripping hazards such as : greater than 5 ft. ( SM 7.10 )  
 ext. cords, welding leads and stored material Protective systems for excavations over 20 ft. in depth  
 All leading edges with falls greater than 6 feet protected (SM 9.11) have been designed by a professional engineer ( SM 7.14 )  
 Weld rod / all thread stubs are placed in buckets / trash Proper access / egress is provided ( SM 7.4 )  
 containers (SM 12.5)  
 Work area properly illuminated (SM 18.5) **LADDERS ( BPM 1 )**  
 Roof top work has proper fall protection system ( SM 9.11) Y N N/A  
**How often is clean-up being done?** \_\_\_\_\_ All ladders free of defects ( SM 10.3 )  
 Stepladders used only in the open position ( SM 10.4 )  
**MATERIAL LIFTING / HANDLING ( BPM 12, 14, 26 & 30)** Straight ladders are being used at proper angle ( SM 10.4 )  
 Y N N/A Straight ladders are equipped with safety feet and are  
 Employee's are using proper lifting techniques, etc. secured to avoid displacement ( SM 10.4 )  
 Slings and chokers in good condition Access to ladders free of debris and / or obstruction (SM 10.4)  
 Shackles are used on all multi-leg picks  
 Cranes, chainfalls, come-alongs and air tuggers  
 are properly sized and used correctly **ADMINISTRATIVE PERFORMANCE ( SM 3.0 & 4.0 )**  
 Porta Powers are properly sized and used in a safe Y N  
 manner. Was a project Safety Analysis performed on this site?  
**POWER TOOLS ( BPM 3, 4, 6, 8, 9, 23, 27, 34, 35 & 36 )** Next PSA revision date ? \_\_\_\_\_  
 Y N N/A Is the PSA being followed ?  
 Cords in good condition (SM 18.3) Is the Best Practices Manual on site?  
 Guards in place ( SM 11.5) Is the Best Practices Manual updated ?  
 Ground-fault interruption protection in use ( SM 18.4 )  
**APM = Accident Prevention Manual BPM = Best Practices Manual**  
**COMMENTS: (Explain any no's above)**

**3.9**

**PROJECT MANAGERS WEEKLY SAFETY MEETING REPORT**

**DATE: TIME: JOB#: JOB NAME:**

**LOCATION:**

**PROJECT MGR. EMPLOYEE NUMBER:**

**ATTENDEES:**

**(ADDITIONAL SHEETS SHOULD BE ATTACHED AS NECESSARY)**

**SITE SPECIFIC ISSUES DISCUSSED:**

**DISCUSS THE FOLLOWING TOPICS AND DOCUMENT:**

**BEST PRACTICE UTILIZATION:**

**DAILY PRE-TASK PLANNING REVIEW:**

**WEEKLY AUDIT REVIEW:**

**JOB#:** \_\_\_\_\_

**JOB NAME:** \_\_\_\_\_

**FOREMAN'S WEEKLY SAFETY AUDIT ( FOREMAN, GEN. FOREMAN & SUPT. )**

**AUDITOR: EMP #: DATE: PM:**

The following checklist will assist in performing a comprehensive audit of work conditions and practices on the jobsite.

**SCAFFOLDS AND MANLIFTS ( BPM 2, 20 & 11 )**

Y N N/A # of scaffolds your crew is using \_\_\_\_\_

Hardhats worn at all times ( SM 9.4 ) Y N N/A

Safety Glasses with Sideshields (SM 9.5 ) Handrails and toe-boards in place ( SM 16.3 )

Faceshields when there is potential for flying debris ( SM 9.5 ) Scaffolds have proper access and are tagged, dated and

Hearing protection where required ( SM 9.12 ) inspected by competent person ( SM 16.2, 16.4 ,16.6 )

Full Body Harness w/ Lanyard where needed ( SM 9.10 ) Fall Protection used in boomlifts ( SM 9.10 )

Fall Protection requirements for scissor lifts are being

met. ( SM 9.10 )

Y N N/A

Fire Protection (extinguishers / tarpaulins) ( SM 12.2 ) **EXCAVATIONS ( BPM 24 )**

Fire extinguishers inspected and tagged (SM 12.3 ) **Excavation depth is \_\_\_\_\_ feet.**

Welding shields in use **Designated competent person is \_\_\_\_\_.**

Cylinders secured and capped when not in use

Leads and Hoses in good condition ( SM 12.6 ) Y N N/A

5 feet or more in depth - shored, sloped or benched ( SM 7.14 )

**WALKING / WORKING SURFACES ( BPM 3 & 31 )** Spoil is a minimum of 2 ft. from edge of the excavation ( SM 7.9 )

Y N N/A Excavations are inspected daily for any changes in

All floor openings and holes greater than 2" covered (SM 9.11.2) working conditions ( SM 7.10 )

Aisleways are clear of tripping hazards such as : Entry permits are filled out and posted for excavations  
 ext. cords, welding leads and stored material greater than 5 ft. ( SM 7.10 )  
 All leading edges with falls greater than 6 feet protected (SM 9.11) Protective systems for excavations over 20 ft. in depth  
 Weld rod / all thread stubs are placed in buckets / trash have been designed by a professional engineer ( SM 7.14 )  
 containers ( SM 12.5 ) Proper access / egress is provided ( SM 7.4 )  
 Work area properly illuminated ( SM 18.5 )  
 Roof top work has proper fall protection system ( SM 9.11 ) **LADDERS ( BPM 1 )**  
**How often is clean-up being done?** \_\_\_\_\_ Y N N/A  
 All ladders free of defects ( SM 10.3 )  
 Stepladders used only in the open position ( SM 10.4 )  
 Y N N/A Straight ladders are being used at proper angle ( SM 10.4 )  
 Employee's are using proper lifting techniques, etc. Straight ladders are equipped with safety feet and are  
 Slings and chokers in good condition secured to avoid displacement ( SM 10.4 )  
 Shackles are used on all multi-leg picks Access to ladders free of debris and / or obstruction ( SM 10.4 )  
 Cranes, chainfalls, come-alongs and air tuggers  
 are properly sized and used correctly **POWER TOOLS ( BPM 3, 4, 6, 8, 9, 23, 27, 34, 35 & 36 )**  
 Porta Powers are properly sized and used in a safe Y N N/A  
 manner. Power cords in good condition (SM 18.3 )  
 Guards in place ( SM 11.5 )  
 Y N Ground-fault interruption protection in use ( SM 18.4 )  
**I am working with PM to resolve any of the above issues.**  
**Was a Project Safety Analysis performed on this project?**  
**SM = Accident Prevention Manual BPM= Best Practices Manual**  
**COMMENTS: (Explain any no's above)**  
**MATERIAL LIFTING / HANDLING ( BPM 12, 14, 26 & 30 )**  
**HOT WORK ( BPM 5, 7, 10 & 28 )**  
**PERSONAL PROTECTIVE EQUIPMENT ( BPM ALL )**

### 3.10

Rev 11/02

Indicate days of Foreman responsibility.

MON TUES WED THUR FRI SAT SUN

YES

NO

## Air-Source International

SINCE 1907

Safety Pre-Task Planning Card

Job #:

Date:

Project Manager:

Foreman: Emp.#

Circle Trade: PF PL SM

**Employees (Signature):** I acknowledge that I have participated in safety pre-task planning per back of form.

**Task being performed:**

Job Name:

Time:

Safety Checklist

Yes No N/A

1. Task Understood?
2. Proper Safety Equipment on site?
3. Oxygen/LEL Checked?
4. Is the work in a confined space?  
If so, have all entrants been trained?
5. All Lockout Tagout has been completed?
6. Communicated work with others in area?
7. Proper tools for the project?
8. MSDS are available for review?
9. **Do Any of the Following Hazards Exist?**

Yes No Yes No

Burns Trips/Slips  
 Ladder Work Fire  
 Particles in Eye Spills  
 Overexertion Lacerations  
 Falls (over 6') Cave-in  
 Sprains/Strains Loud Noise  
 Dropping Tools Heat/Cold  
 Respiratory Moving Parts  
 Defective tools Electrocutation  
 Flashburn Pinchpoints

Other:

**10. Identify Proper Hazard Elimination or Control?**

Yes No Yes No

Eye Protection Hearing Protection

Fall Protection Barricades

Face-shield Ground Fault

Mono-goggles Sloping/Shoring

Housekeeping Toe-boards

Fire Extinguisher Scaffolding

Gloves Man-lifts

Glove Type: Hard-hats

Weld Screens Secured Ladders

Other:

**Quality Planning - Customer Focus**

#### **4.0 Duties and Responsibilities**

Air-Source International will continuously endeavor to meet our goal of “ZERO Injury Performance” on each and every project. However, we cannot successfully protect our employees or satisfy the expectations of the client in regard to occupational safety and health unless we have the full commitment of **ALL** our employees. We must continue to remain proactive towards safety and health related issues.

Accountability is a very important component of a workable Safety Program. Air-Source International has a Safety Program that is top driven and is supported at all levels of management; therefore, it has a positive effect on each and every project.

The site Safety Engineers, where applicable, cannot and must not be expected to “do safety” or “police” a project. When assigned, they are there to support and monitor the effectiveness of the program as well as offer technical support. The Safety Engineer can be a helpful resource for controlling the safety program through evaluation and prescribed corrective actions, but we must realize that implementation of the program must take place concurrently at every level of the organization in order to be the most effective.

Air-Source International safety and health program is established to comply with OSHA Safety and Health regulations for construction, Air-Source International Company incident prevention techniques, and safety and health policies prescribed by the client.

By defining responsibilities, we are able to monitor the effectiveness of individuals and establish accountability on a project-to-project basis. Where areas of improvement are discovered, additional training is implemented in order to reach the desired performance level.

The responsibilities listed below for each position is not only expected, but is required, for employment at Air-Source International.

#### **4.1 Responsibilities**

#### **4.2 Project Sponsor**

Each project awarded to Air-Source International is assigned to a senior management member called the Project Sponsor.

The Project Sponsor is ultimately responsible for all aspects of the project, including safety. The Project Sponsor supports the Air-Source International safety program through continual communication with the Project Director and Project Manager.

Although we anticipate and expect Project Managers to manage the safety performance of their projects, the Project Sponsor will become involved when needed.

The Project Sponsor is responsible for fulfilling the following obligations:

A) Participate in on-site injury investigations for any level 3 or 4 injury under their area of responsibility.

- B) Participate in all corporate injury review teams under their area of responsibility.
- C) Perform and document at least one safety audit per month and forward a copy to the Safety Director.
- D) Attend and participate in at least one safety lunch meeting per month.

#### **4.2.1 Project Director**

Each Project Manager within the organization operates under the direction of a Project Director. The Director oversees all aspects of the project. Specific safety related responsibilities include:

- A) Assure that all safety rules and regulations are enforced in all areas under their direction.
- B) Perform & document at least one safety audit per week.
- C) Participate in injury investigation for all level 3 and level 4 injuries occurring under their area of responsibility.
- D) Participate in all corporate injury review teams under their area of responsibility.
- E) Attend and participate in all PSA pre-planning meetings for project under their area of responsibility.

#### **4.4 Project Manger**

Although the Air-Source International Safety Program starts at the highest levels of management, the project manager assumes a great deal of responsibility for ensuring compliance with all safety requirements related to the project. The degree of importance which Project Managers place on unsafe conditions or acts on the project will have a tremendous effect on direct line supervisors and ultimately the entire project.

History has proven that employees will adjust their behavior to meet the required standards and / or surroundings. Air-Source International must be consistent in both our attitude and application of the program, regardless of where we are working or who is directing the project.

The **Project Manager** is responsible for fulfilling the following obligations:

- F) Assure that all safety rules and regulations are enforced in all areas under their direction.
- B) Participate in all incident investigations.
- C) Review and approve all training activities.
- D) Chair the Weekly Foreman's Safety Meeting. Document the meeting and forward a copy to the home office.
- E) Perform a Weekly Safety Audit
- F) Administer the Safety Disciplinary Action Procedure.
- G) Ensure Subcontractor safety compliance.
- H) Complete Management Team Safety Training.
- I) Participate in, review and update on a monthly basis the project PSA when applicable.

J) Prepare for, attend, and participate in Injury Review Team meetings that are scheduled for injuries occurring in their area of responsibility.

#### **4.5 Craft Superintendent and General Foreman**

The Craft Superintendent and General Foreman are to carry out the expectations of the Company displayed by the Project Manager and documented in this manual.

In addition to directives from on site management, Superintendents and General Foreman should use their experience and knowledge to assist foreman in directing their crews in a safe manner. This includes monitoring the performance of the crews that fall under their direction and making immediate corrective action by means of instruction to the foreman, whenever there is need to do so.

The Superintendent and General Foreman will have the following on site safety responsibilities:

- A) Assure that safety rules and regulations are enforced in all areas under their direction.
- B) Participate in all incident investigations in their area of responsibility.
- C) Keep abreast of incident and injury trends in their area of responsibility and take necessary action to reverse the trends.
- D) Assist foreman, when needed, in the preparation of the Daily Pre-Task Planning utilizing the Pre-Task planning card.
- E) Coordinate the maintenance of a clean and orderly workplace.
- F) Perform a Weekly Safety Audit.
- G) Complete Management Team Safety Training.
- H) Participate in the creation of the Project Safety Analysis and monthly updates on projects where the PSA is performed.
- K) Participate in, review and update on a monthly basis the project PSA when applicable.
- L) Prepare for, attend and participate in Injury Review Team meetings that are scheduled for injuries occurring in their area of responsibility.

#### **4.6 Foreman**

Employees at the craftsman level of the organization put a substantial amount of trust in their foreman. They generally perceive this position to be the most credible and trustworthy position of anyone, as it relates to them on the project.

Foremen have the greatest opportunity to positively affect the safety process in that the foreman spends the greatest amount of time with the crew and makes more frequent observations.

With these thoughts in mind, it is imperative that the foreman be totally committed to providing both a workplace free from recognized hazards and enforcing compliance of Company policies by continual observation with immediate corrective action of any unsafe condition or act.

Project **Foreman** are expected to fulfill the following obligations:

- A) Complete Air-Source International Management Team Safety Training.
- B) Coordinate with the superintendent, general foreman and management staff to provide for safe working conditions and practices.
- C) Require craftsmen to comply with all project safety and health rules and regulations.
- D) Detect any safety violations and hazards and implement immediate corrective action.
- E) Participate in the investigation of all incidents occurring in their area of responsibility.
- F) Attend and participate in the Weekly Foreman's Safety Meeting.
- G) Conduct Daily Safety Talks utilizing the Pre-Task Planning card.
- H) Conduct a Weekly Safety Audit
- I) Participate in, review and update on a monthly basis the project PSA when applicable.
- J) Prepare for, attend and participate in Injury Review Team meetings that are scheduled for injuries occurring in their area of responsibility.

#### **4.7 Employees**

Employees are responsible for knowing and complying with all safe work practices, procedures and standards applicable to their job assignment. Training is provided by Air-Source International for all subject areas related to the required tasks. If employees are uncertain of the proper Safe Work Procedure, they are to consult their supervisor or safety representative prior to beginning the task.

Compliance with Air-Source International rules and regulations is viewed as a condition of employment. Unsafe acts or the creation of unsafe conditions will not be tolerated.

In the event of an incident involving injury or property damage, including "Near Miss" situations, employees are expected to cooperate fully with the investigation team.

#### **4.8 Site Safety Manager (where applicable)**

On certain projects, Safety Engineers are assigned. When a Safety Engineer is assigned to a project, they are responsible for providing any technical support to the project as well as monitoring program compliance. Any deficiencies in program compliance will be immediately corrected by communicating the condition and recommended corrective action to the Project Manager, Craft Superintendent and/or the General Foreman.

The Project Manager is ultimately responsible for making the final decision on any matter.

The Safety Engineer will also be expected to accomplish the following:

- A) Perform all employee safety orientations.
- B) Conduct Management Team Safety Training for all new management personnel.
- C) Coordinate all training required by OSHA and the client.

- D) Coordinate Substance Abuse Testing Program.
- E) Coordinate respirator physical examination, training and fit testing.
- F) Perform and document a Weekly Formal Safety Audit. Review submitted safety audits and follow up on items requiring corrective action.
- G) Perform necessary industrial hygiene monitoring and maintain a log of the results.
- H) Continuously monitor job site for unsafe conditions and behaviors.
- I) Participate in all incident investigations including first aid, injuries, near miss or property damage.
- J) Monitor sub-contractor safety performance.
- K) Maintain job-site safety records.

REV 1/03

### **5.0 Incident Investigation**

An effective incident investigation procedure should focus on identifying the causal factors that lead to incidents and injuries. Once those factors have been identified, corrective actions must be developed and implemented as soon as possible.

This type of incident investigation procedure will provide beneficial information for determining injury rates, identifying trends or problems throughout the company and assist in the further development of Safe Work Procedures to avoid a recurrence.

Incidents generally occur because something went wrong in the management system. Though it may be hindsight, there is often an oversight on the part of management that permitted the incident to occur. The investigation process must focus on identifying ALL the causal factors that contributed to the incident and point out any management deficiencies that may exist.

A thorough and honest investigation is the only way we will be able to avoid the incident being repeated. We must learn from our mistakes by facing our deficiencies and implementing appropriate corrective action, including standardized Safe Work Procedures.

All incidents should be investigated. Incidents that involve injuries requiring medical treatment will require an extensive investigation.

Investigators should exercise utmost discretion and care in avoiding any emphasis on identifying individuals who might be blamed for the incident. Placing blame at the personal level can seriously jeopardize the credibility and effectiveness of the investigators and deter from the ultimate goal of avoiding a recurrence.

After completing the investigation, a final report should be submitted to the Safety Department. Air-Source International Incident Investigation form must be used for this purpose (See 5.12)

The following steps should be taken in order to conclude an effective incident investigation:



### **5.1 Securing the Incident Site**

To prevent any alteration of the scene prior to completion of the investigation, the site must be secured immediately after the incident occurs. The site should be maintained as much as possible as it was at the time of the incident so that it may be thoroughly examined.

The methods used to secure the site will depend on the conditions and circumstances involved. Survey the area, you may need to do many of the following activities to prevent observers from disturbing the area:

- (1) Rope off the area using barricade tape, string or rope.
- (2) Close walkways or stairwells leading to the area.
- (3) Use company employees to prevent unauthorized people from accessing the area.

Whichever method chosen, the following procedures must be followed:

- (1) Nothing should be removed from the scene without the approval of the person in charge.
- (2) All personnel permitted into the area should be instructed not to touch, move or mark anything at the site unless instructed to do so by an investigator.
- (3) An entry point should be made to control access into the area.

### **5.2 Recording Physical Evidence**

An incident investigator must determine what happened, how it happened, and why it happened from the evidence at the incident scene. An incident investigation is, in fact, hazard recognition in reverse order. The items that can answer these questions must first be identified. The meaning of certain items being in certain positions at the scene may not be instantly understood. Recognition of which items and positions having significance may not come until later in the analysis. Therefore, it is better to look for and preserve all possible clues, even if many of them are discarded later, rather than disregard something as being a non-contributor to the event and find yourself looking for the information at a later date. No item at the scene should be ruled out as to having “no bearing” in the incident until it has been proven.

Some items that should be recorded by position are:

- (1) Machines, vehicles or any other equipment involved in the incident.
- (2) Parts broken off or detached from equipment or material.
- (3) Gouges, scratches, dents, dings, skid marks, paint smears, etc.
- (4) Spilled or contaminated material.
- (5) Areas of debris.
- (6) Safety devices and equipment.

### **5.3 Interviews Of Witnesses**

To determine all of the facts and circumstances surrounding an incident, witnesses must be interviewed and the information gained from them documented. This information will be essential for developing safe work procedures.

All employees who can contribute information about the incident should be interviewed. It is important to question witnesses as soon as possible before they have time to change their observations. Details are forgotten the longer the time span between the incident and the interview. Witnesses may see or hear things that revise their thinking; they may unconsciously adjust their observations to fit what they hear from coworkers.

Separate interviews should be held with all witnesses. It is usually most productive to interview the most knowledgeable of the initially identified witnesses first. Subsequent witnesses may be used to fill in details or gaps and substantiate facts and observations.

#### **5.4 Interview Location**

Interviews should be held either at the scene of the incident or in a private location. An interview at the scene of the incident is advantageous if the extent and nature of damages, noise level and degree of privacy will not interfere with the interview. "At the site" interviews usually result in a better recall of details as the witness has physical reminders to reference and stimulate their memory.

If interviewing at the scene is not practical or desirable, a location that is private and free from distractions, away from other witnesses should be chosen. The interview should be held in private with the witness with an explanation given to the other witnesses that each person will be interviewed separately to allow them the opportunity to relate how they "saw it happen." When conflicts of information are discovered, the witnesses should be interviewed again separately. Interviews in the presence of other witnesses should be done when it seems like the only remaining recourse to clarify conflicts of information.

#### **5.5 The Interview**

Before interviewing a witness, the interviewer should survey the scene of the incident to ensure they are familiar with the general lay out of the area. A brief visual orientation of the situation helps put the investigator on the same plane as the witness.

Several qualifications of a good interviewer are:

(1) **Be a good listener.**

All useful information will come from the witness. Let their story be told in full, without interruption, before specific question are asked.

(2) **Have an open mind.**

Even though the interviewer may have a preconceived idea about the case, there must be an attempt to erase these notions and not jump to conclusions during the interview.

(3) **Maintain self-control.**

Any loss of temper or visual displays of frustration during the investigation will have an immediate negative effect and destroy communication between the interviewer and the witness.

(4) **Be courteous.**

If the interviewer becomes antagonistic the effectiveness of the interview will in most cases end at that point. Address the witness respectfully.

(5) **Be thorough.**

When the witness has finished stating all of the details of the incident they can recall, the interviewer should then ask questions to clear up any “gray” areas that may remain. The success or failure of the interview is often determined at the opening point. The witness should be put at ease as much as possible by explaining that the objective of the interview is to obtain all accounts of the events related to the incident so that problems or deficiencies may be identified to avoid a future occurrence.

The witness should first be asked routine questions, such as his name, craft, badge number, etc. This allows the interviewer to both identify who the employee is, as well as give the witness confidence in their ability to answer questions from the interviewer.

The actual interview should be started by asking the witness to relate, in their own words, what they know about the incident. They should include what they saw, heard and felt during the incident and what they did after the incident. Allow the witness to relate events and observations as they are recalled. They should never be instructed to structure the story chronologically or in any other manner. The order in which the witness remembers things may be significant to the investigation.

Allow the witness periods of silence to gather their thoughts and explore their memory. Neutral questions may be occasionally asked to assist the employee in the thought process. However, care must be taken not to lead the witness, questions should remain general such as, “Then what did you see?” Only when the witness is completely finished should detailed questions be directed to them.

### **5.6 Interview Questions**

After a witness has exhausted their self-recall, the interviewer should ask predetermined questions to insure accuracy of the information given and permit subsequent evaluation of the reliability of the information provided by the witness. These control questions should include:

- (1) Time of the incident
- (2) Location of the incident
- (3) Environmental Factors, such as: lighting conditions, weather, noise, etc.
- (4) Position and location of people at the time of the incident.
- (5) Any other known witnesses.
- (6) Are they aware of anything being moved after the incident?
- (7) What attracted them to the incident if they did not see it unfold?

### **5.7 Ending the Interview**

Interviews should end by thanking the witness for their cooperation and an open invitation extended for the witness to contact the interviewer if they recall any additional information.

### **5.8 Recording the Interview**

Notes should be taken or a recording made of each witness interviewed. Do not attempt to conclude the incident investigation report during the interview process. Note taking should not be a distraction to the employee, but never hidden or concealed from the witness. In some cases it may be necessary to give a brief explanation to the employee as to what you are doing, so that cooperation and trust are not lost.

If a recorder is used, the interviewer should make introductory and closing comments for the recording of each witness. However, the use of recording devices has a tendency to make the witness uncomfortable and can have a negative effect on the overall quality of the interview. Care must be used to evaluate the employee's comfort level when recording interviews. If it is believed the recording of the interview is interfering with the witnesses' willingness to answer the questions, the technique should be discontinued.

### **5.9 Written Statements**

Written statements should be obtained from all key witnesses. These can help produce a clear, detailed description of the incident, as well as help the employee brainstorm the events of the incident one final time.

The preferable method of obtaining witness statements is to have the witness write the statement themselves, then sign and date it. If a witness has difficulty writing, the interviewer should use the information obtained from the interview with the employee to formulate a statement, and then review it with the employee. If they agree with the statement have them sign and date it. If not, make the necessary amendments and review it again with the employee.

### **5.10 Photographs**

Photographs are possibly the best type of supporting documentation. They can enhance credibility and present the individual examining the investigation with detailed information that might otherwise have been misunderstood.

When taking photographs always attempt to capture the scene from every angle. This it allows for a further evaluation of the incident at a later date. What may seem unimportant at the time may prove to be the very thing that assists the investigation team in discovering causal factors that contributed to the incident.

Photographs can be digested by many different people, including those that were not involved in the actual investigation. They may also be used for future training material as part of preventing the unwanted recurrence.

Depending on the location of the incident, permission from the client to take

pictures may be required. Generally clients are willing to allow the use of photographic equipment, provided they are given a copy of the pictures taken, or they are directly involved with the photographer.

### **5.11 Incident Investigation Responsibilities**

To clearly define the responsibility for participating in incident investigations, the following levels specify nature of injury and investigation participants. The Company President, at his discretion, may be involved at any level of investigation.

The Company President, Executive Vice President, Project Sponsor, and Project Director will be immediately notified by the safety department of all level 3 and level 4 incidents.

#### **Level Definition Investigation Participants**

1 On-site First Aid and/or Injured employee and Foreman Report Only Cases.

2 Off-site First Aid Employee, Foreman, Gen. Foreman Supt., and Project Manager

3 OSHA Recordable Employee, Foreman, Gen. Foreman Supt., Project Manager, Project Director, Safety Dept and the Project Sponsor.

4 Lost Time Employee, Foreman, Gen. Foreman Supt., Project Manager, Project Director, Safety Dept, Project Sponsor, and the Executive Vice President.

### **5.12 Injury Review Team**

#### **5.12.1 Team**

- President and/or Chief Operating Officer
- Project Sponsor
- Safety Director or Safety Manager
- Project Manager
- Project Director
- General Foreman
- Foreman
- Injured Employee
- Coworkers (if the investigation determines their involvement)

### **5.12.2 Purpose of the Meeting**

The injury review team is assembled in order to formally address the following issues. All members of the review team are encouraged to provide feedback that will help Air-Source International improve our processes and procedures. Air-Source International is committed to achieving our work activities with ZERO INJURY PERFORMANCE. Together we must determine what went wrong and how to avoid it in the future.

**How is the Employee Recovering?**

**Was the medical care satisfactory?**

**What Happened?**

**Did we follow our program?**

**How could it have been avoided?**

**Lessons Learned**

**Zero Injury Performance Expectations**

### **5.13 Incident Investigation Reminders**

**“The Six Key Reminders”**

#### **1. WHO:**

- Who was injured?
- Who witnessed the incident?
- Who was working with the injured employee?
- Who had instructed/assigned the employee?
- Who else was involved?
- Who can help prevent recurrence?

#### **2. WHAT:**

- What was the incident?
- What was the injury?
- What was the employee doing?
- What tool was the employee using?
- What machine was involved?
- What operation was the employee performing?
- What instructions had the employee been given?
- What specific precautions were given?
- What specific precautions were needed?
- What protective equipment was the employee using?
- What protective equipment should have been used?
- What had other persons done that contributed to the incident?
- What problem or question did the employee encounter?
- What did the employee or witness do when the incident occurred?
- What extenuating circumstances were involved?
- What did the employee or witness see?
- What will be done to prevent recurrence?
- What safety rules were violated?
- What new rules are needed?

### 3. WHEN:

- When did the incident occur?
- When did the employee start the task?
- When was the employee assigned the task?
- When were the hazards pointed out to the employee?
- When had the supervisor last checked the job in progress?
- When did the employee first sense something was wrong?

### 4. WHERE:

- Where did the incident occur?
- Where was the employee at the time?
- Where was the supervisor?
- Where were witness(es) or coworker(s)?

### 5. WHY:

- Why was the employee injured?
- Why did the employee do what he/she did?
- Why were specific instructions not given to the employee?
- Why was the employee in the position he/she was in?
- Why did the employee not check with his/her supervisor when he/she noticed abnormal circumstances?
- Why was the supervisor not present at the time of the incident?

### 6. HOW:

- How can we insure that this will not happen again?

#### 5.14

**AIR-SOURCE INTERNATIONAL** Date of Final Report:  
Mechanical Contractors and Engineers

**Job #: Job Name: Location:**

**Date of incident: Date of Report: Time of incident: AM PM**

**Name of Injured: SS #:**

**Home Address: Tel #:**

**Craft: Home Local: Date of Birth: Age: Sex:**

**Date of Hire: Years in Craft:**

**Nature of Injury and Body Part Affected:**

**Treatment Rendered:**

**Off Site Treatment Administered by:**

**Was pre-task planning conducted and documented?**

**Does a Best Practice exist for this task? If so, which one?**

**Corrective Action:**

**Anticipated Date For Completion of Corrective Action:**

**Foreman: Project Officer:**

**General Foreman: Project Director**

**Superintendent: Safety Rep.:**

**Project Manager: Safety Director:**

**Describe how the injury occurred. List the task that was being performed and the causes of the incident:**

### **INJURY INVESTIGATION REPORT**

Osha

Recordable

Lost

Time

Report

Only

On Site First

Aid

## **6.0 First Aid and Medical Service**

### **6.1 Introduction**

Air-Source International's goal for each project is to conclude the project injury free. In the event of an unanticipated injury to a Air-Source International employee, the focus will shift to providing the best possible care to the injured. The following guidelines are established to ensure Air-Source International employees, injured in the course of employment, receive that care:

### **6.2 Injury Reporting**

Employees are responsible for immediate reporting to their foreman all injuries and/or illnesses which arise out of, and in the course of, employment. ALL injuries and/or illnesses must be reported, regardless of severity. Late reports will be subject to denial and/or disciplinary action. Employees will be expected to cooperate with their foreman by providing the necessary information to complete the injury reports required by OSHA, State Workers Compensation, Air-Source International and the client. Preliminary Incident Investigation reports are to be submitted to the home office within 24 hours of the time of injury. Additional information obtained after the report is submitted may be added as needed.

### **6.3 Job-Site First Aid and First Aid Kits**

Each project will be provided a first aid kit to be maintained at the job site. In the event of minor injuries, which require minimum first aid, the injured will be cared for at the job site location. Supervisors are responsible for monitoring the contents of the first aid on a weekly basis to ensure first aids are being reported as they occur and to maintain the supply of first aid equipment at the site. In the event additional supplies are needed the supervisor will contact the Air-Source International warehouse. The warehouse, depending on the location of the jobsite, will send a newly stocked kit to the site, or have a vendor come directly to the site to inventory and restock the kit.

### **6.4 Off-Site Medical Services**

Air-Source International Safety Department will arrange all off-site medical care needed. Each project will be evaluated for its proximity to medical care providers and the nearest location providing the best possible service will be selected.

For emergency situations employees are to be transported to the nearest facility with emergency care and the home office is to be notified immediately.

### **6.5 Off-Site Medical Services (Out Of Town)**

Many of our projects will involve work away from the St. Louis and Denver areas where medical care providers have already been established. During the pre-job phase of the project, Project Management should consult



the Safety Department for historical data of medical services used in the area during previous projects.

If no historical data is available, the project manager and/or safety representative (where applicable), will need to research the local area for an Industrial Physician with the ability to meet the needs of the project. It is highly recommended that job-site management meet with the medical care provider in person prior to the beginning of the project to familiarize themselves with the medical care offered.

### **6.6 Posting of Emergency Information**

Once off-site medical facilities have been established for the project, they must be posted near all phone locations and/or other readily available areas throughout the project.

Posted information should include the name, address and telephone numbers of both the primary physician and the emergency facility chosen. If there are any specific dialing requirements associated with the project's phone system (such as dialing "9" first), that information must be included in the posted instructions.

REV 1/03

### **7.0 Excavations & Trenching**

Excavation cave-ins cause serious and often fatal injuries to workers. An analysis by the National Institute for Occupational Safety and Health (NIOSH), suggests that excavation cave-ins cause about 1,000 work related injuries each year. Of these, about 140 result in permanent disability and 75 in death.

Cave-ins may be caused by any of the following:

- Hydrostatic pressures from freezing or thawing.
- Vibration from vehicles or equipment operating in the area.
- Improper sloping or trenching of walls.
- Placing removed soil, material or equipment too close to the excavation.
- Failure to shore properly and to brace trench walls.

### **7.1 Training**

Each site with an excavation 4 feet or greater in progress must have a designated competent person on site at all times while workers are actively working in or with the excavation. A competent person means one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions and has the authority to take immediate corrective action.

A Competent Person is required to:

- Have a complete understanding of the applicable safety standards.
- Establish that the exact locations of underground installations or utilities are located and properly marked by the appropriate organizations.
- Determine what protective system (sloping, shoring, or shielding) is required for employee protection.

- Conduct or ensure air monitoring is conducted as required.
- Conduct daily & periodic inspections of the excavation and document those findings.

All other employees working in the excavation or with the excavation crew must be trained in the recognition of hazards associated with trenching and excavating.

### **7.2 Prior to Digging**

Before trenching or excavation begins, underground utilities, such as sewer, telephone, fuel, electric and water must always be located and protected.

Supervisors and project managers must work closely with local utility companies to ensure that all employees involved with the excavation know and understand exactly where all underground utilities are located.

### **7.3 During Excavation**

When excavation operations approach the estimated location of underground installations, the exact location of the installations must be determined by safe and acceptable means, such as hand digging or probing. The Utility Notification Center of Colorado can provide specific requirements.

\* Note: Excavations 5 feet or greater in depth must be protected against cave-in. Employees are prohibited from entering excavations until the excavation is safe to do so.

While the excavation is open, underground installations must be protected, supported, or removed as necessary to safeguard employees.

### **7.4 Access and Egress**

A stairway, ladder, ramp, or other safe means of egress must be provided in all trenches greater than 4 feet in depth. Access and egress must be provided in such a manner that employees are not required to travel more than 25 feet of lateral travel to exit.

### **7.5 Exposure to Vehicular Traffic**

Anytime employees are exposed, or have the potential to be exposed to public vehicular traffic, highly visible safety vests must be worn as an added precaution. The vests must incorporate reflective material.

Prior to starting work on a public road or highway, the local jurisdiction having authority (town, city, county, state) must be contacted. Additional precautions must be taken to ensure that vehicular traffic is adequately warned of the work being conducted. Warnings may include flashing barricades, directional signs, flagman, etc.

Construction areas exposed to vehicular traffic must be properly protected at all times, including the end of shifts, overnight, etc.

### **7.6 Hazardous Atmospheres**

Where an oxygen deficient (less than 19.5%) or other hazardous atmosphere exists or could reasonably be expected to exist such as in landfill areas, or in areas where hazardous materials are stored nearby, the

atmosphere in the excavation must be tested by a competent person before employees enter excavations that are greater than 4 feet in depth.

If it is necessary to use gasoline or diesel powered equipment, or to perform welding that involves the use of a shield gas in or near the excavation, continuous atmospheric testing must be done as well. However, a single backhoe digging the excavation does not constitute the need for atmospheric testing under normal conditions.

### **7.7 Water Accumulation**

Air-Source International employees are prohibited from working in excavations where there is accumulated water or in excavations where water is accumulating unless adequate precautions are taken to protect employees against the hazards posed by water.

The precautions needed to protect employees against the hazards of water accumulation will vary depending on the nature of the excavation and the amount of water involved.

If water is controlled or prevented from accumulating by the use of water removal equipment, the equipment must be monitored by a competent person to ensure proper operation.

### **7.8 Adjacent Structures**

Anytime the stability of adjoining buildings, walls, or other structures is endangered by the excavation operation, support systems must be used to ensure the stability of the structure. Support systems may include shoring, bracing, or underpinning, depending on the structure and the proximity to the excavation.

### **7.9 Excavated Material (Spoil)**

Excavated material must be kept a minimum of two feet from the edge of the excavation. This will prevent material from falling or rolling into the excavation.

If it is not possible to maintain excavated material two feet from the opening due to the availability of space, retaining devices may be used. If retaining devices are used, they must consist of a material of adequate strength to prevent the excavated material from posing a hazard to the employees. Additional spoil must be considered as additional depth with the appropriate protective systems used as required

### **7.10 Inspections**

Prior to work beginning each day, an inspection of the excavation, adjacent area and the protective system used must be made by a Air-Source International competent person. Inspections should focus on evidence of a situation that could result in possible cave-in, failure of the protective system, hazardous atmospheres or any other hazard that workers may be exposed to.

Inspections should also be conducted throughout the day in situations where there is reason to believe that changes could occur, i.e, as after a

rainstorm. When the competent person finds evidence of any of the abovementioned

hazards, employees must not be allowed to work in the excavation until the situation is corrected.

Inspections must be documented in accordance with Section 7.15 of this manual.

### **7.11 Barricades**

Excavation must be flagged and / or barricaded in accordance with fall protection policies. For excavations six feet in depth or greater, a standard handrail system or adequate warning system at least six feet from the opening must be erected. For more information regarding standard handrail system and adequate warning systems, refer to the fall protection section of this manual.

In highly congested areas, excavations of a lesser depth should be evaluated and protected in the same manner. All excavation in close proximity to motorized traffic must be barricaded regardless of depth.

### **7.12 Soil Classification**

Soil classifications are used to determine what level protective system must be utilized to provide protection for employees entering the excavation

Soil is classified as to its stability, with stable rock being the most stable, "Type A" being slightly less stable down to "Type C", being the most unstable. The classifications are defined as follows:

**Stable Rock-** Natural solid mineral matter that can be excavated with vertical sides and remain intact while exposed. An example of Stable Rock can be seen nearly everyday when traveling the nations interstates. Rock that has been blasted and dug in order to complete a highway system remains intact and completely stable.

**Type A Soil-** Cohesive soils with an unconfined compressive strength of 1.5 ton per square foot (tsf) or greater. Examples of cohesive soils are clay, silty clay, sandy clay and clay loam. Cemented soils such as caliches and hardpan are also considered Type A.

**No soil is Type A if any of the following conditions exists:**

1. The soil is fissured meaning it has a tendency to break along definite planes of fracture with little resistance, or exhibits open cracks.
2. The soil is subject to vibration from heavy traffic, pile driving or similar.
3. The soil has been previously disturbed.

#### **Type B Soil**

1. Any soil with an unconfined compressive strength greater than .5tsf, but less than 1.5tsf.
2. Granular soils including crushed rock, silt, silt loam, sandy loam, silty clay loam and sandy clay loam.

3. Previously disturbed soils except those which would otherwise be classified as type C.
4. Soil that may meet the unconfined compressive strength required for type A, but is fissured or subject to vibration.
5. Dry rock that is not stable.

**Type C-** soil is unstable and the most dangerous soil classification.

Type C means that any of the following exist:

1. Granular soils including gravel, sand and loamy sand.
2. Submerged soil or soil from which water is freely seeping.
3. Submerged rock that is not stable.
4. Cohesive soil with an undefined compressive strength of .5 tsf

### **7.13 Methods of Classifying Soil**

Having an understanding of the different types of soil classifications, we must now gain an understanding of the skills and methods used to classify soil.

The classification must be based on the results of **at least one visual and at least one manual analysis**. Soil analysis must be conducted by the on-site competent person as designated by the Safety Department.

\*Note: If a system is layered, meaning there is more than one classification throughout the soil, the weaker classification must be chosen. If any properties, factors, or conditions change after the classification, the soil must be reclassified to reflect the changed circumstances.

#### **7.13.1 Visual Tests**

Visual testing is conducted by a competent person to determine qualitative information regarding the excavation site in general, the soil adjacent to the excavation, the soil forming the sides of the open excavation, and the soil taken as samples from excavated material.

The visual tests are as follows:

1. The competent person should evaluate samples of soil that are excavated and also in the sides of the excavation. Soil that is composed primarily of fine-grained material is cohesive. Soil composed primarily of coarse grained sand or gravel is granular material.
2. The soil should be observed as it is excavated. Soil that remains in clumps when excavated is cohesive. Soil that breaks up easily is granular.
3. An observation of the wall of the open excavation and the surface area adjacent to the excavation. Crack-like openings such as tension cracks could indicate fissured material. If chunks of soil fall off a vertical side, the soil could be fissured. Small spalls are often evidence of moving ground and are potentially hazardous situations.

4. An observation of the area adjacent to the excavation and the excavation itself for evidence of existing utilities or other underground structures to identify previously disturbed soil.
5. Look for any sources of vibration adjacent to or within the excavation that could affect the stability of the excavation face.

#### **7.13.2 Manual Tests**

A manual analysis is needed to determine properties of the soil that will assist in classifying the soil properly. The competent person may conduct one of the following manual tests:

1. **Plasticity**- Conducted by molding a moist or wet sample of soil into a ball and attempting to roll it into threads as thin as 1/8 inch in diameter. Cohesive material can be successfully rolled into threads without crumbling. For example, if a 2" length of 1/8" thread can be held on one end without tearing, the soil is cohesive.

2. **Dry Strength**- If the soil is dry and crumbles on its own, or with moderate pressure, it is granular.

3. **Thumb Penetration**- In section 7.12 we discussed unconfined compressive strength. The thumb penetration test can be used to estimate the unconfined compressive strength of cohesive soils.

**Type A Soils** with an unconfined compressive strength of 1.5tsf or greater can be indented by the thumb. However, it takes a great deal of effort to do so.

**Type B Soils** with an unconfined compressive strength between .5tsf and 1.5tsf can be more easily indented, but remains intact.

**Type C Soils** with an unconfined compressive strength of .5tsf or less can be easily penetrated several inches by the thumb, and can be molded by light pressure.

4. **Pocket Penetrometer**- Estimates of unconfined compressive soil strength can also be determined by the utilization of a Pocket Penetrometer. Employees must be properly trained in the use of the instrument before being allowed to utilize this manual test.

#### **7.14 Protective Systems**

Excavations that are 5 feet or deeper require a protective system to be in place prior to employees entering the excavation. Protective systems for excavations that are 20 feet or deeper must be designed by a Registered Professional Engineer.

Determining what type protective system that is to be used must be based on the soil classification determined by the visual and manual testing. The options are as follows:

### **7.14.1 Sloping**

Sloping is a great form of protection, if not the greatest form of protection, for it typically removes the hazard all together. However, sloping often requires a great deal of available space in which to work in order to achieve the desired angle. The degree of slope that must be maintained is based on the soil classification, and will look like the following examples:

Type A Soil:  $3/4H:1V$  = Maximum Slope Allowed

1 20 ft. Max

$3/4$

Type B Soil:  $1H:1V$  = Maximum Slope Allowed

1 20 ft. Max

1

Type C Soil:  $1\ 1/2\ H:1V$  = Maximum Slope Allowed

1 20 ft. Max.

$1\ 1/2$

### **7.14.2 Benching**

Benching an excavation is often the most practical choice to protect employees. Many Air-Source International projects will have excavations with multiple benching systems.

Benching, like sloping, is also based on the soil classification of the excavation. The maximum angle allowed during sloping must also be the standard for multiple bench systems. For example, a multiple bench system in Type B Soil must maintain a slope no greater than  $1H:1V$  and will look like the following example:

4 ft. Max Width

1

4 ft. Max Height

1

### **7.14.3 Shoring**

Shoring is a method used to hold back the soil of an excavated wall. Type C soil always requires sheeting to be used with the shoring. Sheeting may be accomplished by using a trench box or a standard waler system.

### **7.14.4 Trench Boxes**

A trench box provides continual employee protection as well as the convenience of being able to easily move the box as the work area moves. When a trench box is used, access and egress must be provided directly in and out of the box. At no time are employees to be in an unprotected section of the excavation outside of the box.

When the depth of the excavation exceeds the height of the trench box, a combination of the trench box and sloping may be performed to provide employee protection. The protection of the slope must reflect the soil classification as previously discussed.

## 7.15 Excavation Permits

All excavations 5 feet or deeper will require a written permit to be completed before entry is allowed. The following page is a copy of the Air-Source International Excavation Entry Permit. The on-site designated competent person should complete the permit.

If an Owner or General Contractor is involved with the excavation, they may post a permit per their company program. If their permit system meets or exceeds that of Air-Source International, our permit may be waived.

## 7.16

### EXCAVATION ENTRY PERMIT

NO PERSON SHALL BE ALLOWED TO ENTER THE EXCAVATION UNTIL IT HAS BEEN INSPECTED AND THE PERMIT HAS BEEN SIGNED BY THE DESIGNATED COMPETENT PERSON,

DATE: \_\_\_\_\_ WEATHER CONDITIONS \_\_\_\_\_

TIME: \_\_\_\_\_ INSPECTED BY: \_\_\_\_\_

JOB # \_\_\_\_\_ LOCATION: \_\_\_\_\_

### SLOPING SHORING

IF SHIELD:

Are there any noticeable deficiencies in the following: ( If so, explain)

Welds: \_\_\_\_\_

Connections: \_\_\_\_\_

Spreaders: \_\_\_\_\_

Accessories: \_\_\_\_\_

Corrections made: \_\_\_\_\_

Soil Classification: \_\_\_\_\_

Any change from previous inspection, please note: \_\_\_\_\_

Water accumulation: \_\_\_\_\_

Change in weather condition: \_\_\_\_\_

### AIR MONITORING

TIME:

OXYGEN LEVEL:

CARBON MONOXIDE LEVEL:

FLAMMABLE GAS CONCENTRATION:

ACCESS/EGRESS:

**NOTE: BACKFILLING SHALL PROGRESS TOGETHER WITH THE REMOVAL OF THE TRENCH SHIELD.**

**PROTECTIVE SYSTEM USED**

**EXCAVATION AND ADJACENT AREA**

**BENCHING SHIELD**

## 8.0 Employee Orientation and Training

### 8.1 Scope

Each employee will be provided an initial orientation and any necessary continued training to enable them to perform their work in a safe manner. No employee should start work until this indoctrination has taken place.

### 8.2 Objectives

The objective of the Air-Source International New Hire Orientation is to afford employees the right to know and understand the expectations regarding safety performance while working for the company prior to beginning employment. The new hire orientation is the first and most important opportunity that we as a company have to impact the actions and thought process of an individual.



During the orientation process, all client site-specific information must be covered in detail as well. Included in site-specific information there must be directives given for emergency procedures, such as: evacuations, reporting of a fire or medical emergency as well as any known chemical hazards on the site.

In accordance with Federal guidelines regarding the Hazard Communication Standard, employees must also be made aware of how to locate, read and understand Material Safety Data Sheets associated with their work activities to be performed.

### **8.3 Responsibilities**

Employee orientation and training shall be the responsibility and under the supervision of the Project Manager. On larger projects where designated Safety Professionals are assigned, they will assume the training duties. The Project Manager will, however, still review and approve of all training recommended by the Safety Professional.

If there is not a Project Manager or a Safety Professional present during times of new hires arriving, it will be the responsibility of the site Superintendent, General Foreman or Foreman. When this becomes necessary, these supervisors will be given guidance for orientation criteria through a combination of the Project Manager, Air-Source International Safety Department and the client.

### **8.4 Procedure**

The indoctrination of new employees will, at a minimum, include all information included in the Air-Source International Employee Safety Handbook, as well as the Hazard Communication Standard, with special emphasis placed on “the right to know” law. Upon completion of the New Hire Orientation, employees should not only be aware of what their rights are, but have a detailed understanding of how to obtain and understand Material Safety Data Sheets.

Topics to address in the orientation which are covered in the Employee Safety Handbook include:

- (1) Air-Source International Philosophy & Principles
- (2) Supervisory Responsibilities
- (3) Incident Investigation and Reporting Procedures
- (4) Medical Treatment
- (5) Personal Protective Equipment Required for the Project (to include fall protection).
- (6) Respiratory Protection Criteria.
- (7) Specific Rigging Requirements
- (8) Compressed Gas Cylinder Storage and Handling
- (9) Traffic and Pedestrian Safety
- (10) Permit Procedures, including blinding (where applicable)

- (11) Housekeeping Expectations
- (12) Electrical Requirements (including Lockout / Tagout)
- (13) Ladder Safety
- (14) Scaffolding
- (15) Asbestos (company policy)
- (16) Fire Protection / Prevention
- (17) Excavation Requirements (where applicable)
- (18) Substance Abuse Testing
- (19) Disciplinary Procedure

As previously mentioned, the new hire orientation must also include any pertinent site-specific information that will affect, or have potential to affect, the employees.

Site-Specific information should include, but not necessarily be limited to: Emergency procedures for evacuation and medical assistance, fire procedures, permit procedures (where applicable), known previously identified hazardous areas and any additional Personal Protective Equipment aside from the normal attire required to work in certain areas of the facility or to perform a particular task.

At the conclusion of the orientation, each employee will be required to complete the Air-Source International Orientation Quiz (See 8.7). The quiz will serve a tool to review the material covered and ensure employees have a complete understanding of the requirements. A minimum score of 80% is required to pass the examination. Employees who fail to achieve 80% or higher will have an opportunity to retest after the information has been reviewed with the employee.

After an employee completes the Air-Source International Safety Orientation Quiz, they will be asked to sign an orientation log (See 8.8). This document provides the company with written verification that the employee received the training described. This log serves as a contractual agreement between Air-Source International and the employee. By signing the log, the employee acknowledges that he/she is aware of all the work rules and regulations presented during the orientation and unconditionally agrees to comply with those rules and regulations. Compliance with Company and Client rules and regulations presented during the orientation are a condition of employment.

### **8.5 Specialized Training**

Certain projects will require “specialized” training in some subject areas that would not normally be included in the General New Hire Orientation. Following OSHA guidelines, Air-Source International is responsible for the training of our employees in all subject areas as they relate to the work being performed. These items include, but are not limited to:

- (1) Supplied Air Respiratory Training
- (2) Confined Space Entry / Attendant Training

- (3) Fire Watch Training
- (4) Man Lift Operation
- (5) Forklift Operation
- (6) Hazardous Waste Disposal
- (7) Process Safety Management

### 8.6 Supervisory Training

In addition to the general training required for employment, all employees who direct work, from foreman level of management to the project managers, will be required to complete Murphy Company Management Team Safety Training.

Further discussion regarding Management Team Safety Training can be found in this manual, in section (21). No supervisor should begin directing work prior to completing this training.

### 8.7

#### AIR-SOURCE INTERNATIONAL SAFETY ORIENTATION QUIZ

NAME: \_\_\_\_\_ CRAFT: \_\_\_\_\_

SSN: \_\_\_\_\_ DATE: \_\_\_\_\_

PLEASE CIRCLE THE LETTER OF THE CORRECT ANSWER

**1. Employees are responsible for reporting all injuries and/or illnesses \_\_\_\_\_**

A) by the end of the shift B) immediately C) by the start of the next shift

**2. Minimum personal protective equipment will consist of \_\_\_\_\_**

A) Steel toed boots B) FRC Coveralls C) Hard-hats and Safety Glasses with side shields

**3. A Personal Fall Arrest System must be used by all personnel subjected to a fall of \_\_\_\_\_**

A) 4' or more above the ground B) 6' or more above the ground C) 10' or more above the ground

**4. A green tag scaffold means: \_\_\_\_\_**

A) Don't use scaffold B) you must tie off on the scaffold C) there are no known hazards with scaffold

**5. Ladder side-rails must extend at least \_\_\_\_\_ inches above the landing.**

A) 12 B) 24 C) 36

**6. Oxygen and Fuel Gas cylinders while in storage must be separated by a minimum distance of \_\_\_\_\_**

A) 10' B) 20' C) 50'

**7. To maintain control of hoisted loads \_\_\_\_\_**

A) Radio communication with the operator C) the load must be weighed 30 minutes prior to hoisting

B) Tag lines must be used D) have an experienced rigging foreman on the job

**8. If a client requires an Assured Grounding Conductor Program, GFCI's will not need to be used.**

A) True B) False

**9) Air-Source International requires written documentation stating that insulation is asbestos-free before we can begin work on or around insulation.**

A) True B) False

**10. Permits will include what information**

A) the time the permit was written D) Special precautions

B) Personal Protective equipment required E) All of the above

C) Who wrote the permit

**(OVER)**

**11. In order to wear a respirator it will require \_\_\_\_\_**

- A) a Pulmonary Function Test C) that I be clean shaven  
B) a Fit Test D) All of the above

**12. Employees have the “right to know” what they are working with or around**

- A) True B) False

**13. MSDS stands for \_\_\_\_\_**

- A) Material Safety Data Service C) Magnified Safety Deficiency Syndrome  
B) Material Safety Data Sheet D) None of the above

**14. MSDS’s are required by law to follow the same format and look the same.**

- A) True B) False

**15. MSDS’s will all have the following information:**

- A) Product Manufacturers name, address and phone number C) Urinary Phenol Danger Level  
B) Pulmonary Function Test Requirements D) None of the above

**16. In accordance with Air-Source International’s disciplinary action procedure, a written reprimand will be issued for the first offense.**

- A) True B) False

**17. The second offense will result in \_\_\_\_\_**

- A) Immediate termination C) another reprimand with a three day penalty lay-off  
B) Transfer to another job D) non of the above

**18. The three-step process must always be followed, regardless of how severe the infraction is.**

- A) True B) False

**19. Air-Source International will have Material Safety Data Sheets on site for me to review.**

- A) True B) False

**20. By watching the Air-Source International Video Orientation, I am fully trained in all possible work activities.**

- A) True B) False

**8.8**

1233 North Price Rd. St. Louis, MO 63132

## **EMPLOYEE SAFETY ORIENTATION AND HAZARD COMMUNICATION TRAINING LOG**

JOB NAME: JOB NUMBER: DATE:

### **ACKNOWLEDGEMENT:**

By signing below, I acknowledge that I have received and understood the Air-Source International Safety Orientation and the training described in the Murphy Company Hazard Communication Handbook. I have received my own personal copies of the Air-Source International Employee Safety Handbook and the Air-Source International Hazard Communication Handbook. I further agree to comply with all safety and health requirements as set forth in the Safety Orientation, and I acknowledge that I have been made fully aware of the availability and locations of Material Safety Data Sheets pertinent to my employment with Murphy Company.

**NAME (PRINT) SIGNATURE SS # CRAFT HOME LOCAL**

**INSTRUCTOR:**

Signature

## **9.0 Personal Protective Equipment**

### **9.1 Introduction**

The elimination or control of potentially harmful situations or products can be classified into one of three categories:

- Engineering Controls
- Administrative Controls
- Personal Protective Equipment

Engineering controls should always be the preferred method to eliminate or control hazards because they often eliminate exposure of the hazard completely. Examples of engineering controls include: a change in the process design, ergonomic adjustments using barriers and guards or using ventilation to reduce exposure below the Personal Exposure Limit.

Administrative controls include: practicing good housekeeping, training of employees, ensuring training programs are followed and the rotation of employees to reduce exposure time.

Personal Protective Equipment is typically the least desired method of managing an employee's exposure to hazardous conditions or substances. Unlike some engineering and administrative controls, when personal protective equipment is used, the hazard is usually still present.

In many situations, personal protective equipment will be the only feasible and logical choice. This section outlines some of the personal protective equipment that may be required during the course of employment with Air-Source International. It is important to note that personal protective equipment must be properly selected and worn. If not, its use may be completely ineffective.

### **9.2 Training**

When personal protective equipment is required, it must be accompanied by employee training. Employees must be made aware of why the PPE is required and how to properly select and utilize the equipment.

Additionally, employees must be trained regarding company policies, how to maintain and inspect the equipment and a complete understanding of the limitations of the equipment.

### **9.3 Responsibilities**

**Safety Department-** Air-Source International Safety Department is responsible for ensuring that supervisors understand the personal protective equipment requirements for the tasks their crews perform. Training will be conducted for new supervisors initially and on an ongoing basis as the need arises.

**Project Managers and Foreman-** are responsible for ensuring all required personal protective equipment for a given task is being used and used properly.

**Employees-** are responsible for inspecting and wearing personal protective equipment as required. Training in the subject matter will be provided to employees as required.

#### **9.4 Head protection**

Air-Source International requires head protection at all times while in a construction area. Head protection is accomplished by wearing an approved hardhat which will be provided by the Company. Air-Source International uses hardhats with Quick-lock capabilities which easily accept faceshield and welding hood attachment. In the rare event it is impossible to complete a task wearing a hardhat (i.e. welding in an extremely tight area), supervisors may approve the usage of a soft hood. However, this variance is to be evaluated and documented by supervisors and an alternate form of overhead protection must be provided.

##### **9.4.1 Hard hat inspection**

The shell should be inspected for the following conditions each time it is worn and should be replaced if found to be defective. Items to look for include:

- A) Evidence of ultraviolet degradation on plastic shells. If this occurs, it will cause the hat to have a chalky appearance. As the condition worsens, the hat will become stiff or brittle and may have radial hairline cracks around the crown of the shell.
- B) Scratches, gouges or other cracks which may affect the impact resistance of the shell.
- C) Knowledge of an impact to the shell, even if there is no visual damage.

The suspension system should be inspected for the following conditions each time the hat is worn and replaced if any of the following are discovered:

- A) Cracking or fraying of the suspension system.
- B) Torn or cracked adjustment slots
- C) Cracked suspension lugs
- D) Any other sign of wear that could affect the integrity of the suspension system.

##### **9.4.2 Modifications**

The shell or suspension should not be modified or altered except in accordance with the manufacturer's recommendations. The shell should not be painted since the solvents and the paint can make it brittle and more susceptible to cracks.

Nothing should be placed between the shell and the suspension system such as gloves or other items. A clearance must be maintained between the suspension and the shell in order to absorb the shock of an impact from an object.

## **9.5 Eye and Face Protection**

A minimum of ANSI Z.87 stamped "Safety Glasses" is required at all times while in a construction area. This includes welding and grinding.

Employees required to wear prescription glasses must wear approved sideshields on their glasses at all times while in a construction area.

Face Protection is required for any activity, which produces the potential for flying debris, such as grinding or buffing. When face-shields are required, it does not eliminate the requirement for safety glasses.

The wearing of contact lenses is strictly prohibited.

## **9.6 Respiratory Protection**

Preventing atmospheric contamination or altering atmospheric conditions by incorporating engineering controls should always be the preferred method of reducing employees exposure to contaminated breathing air.

In the event engineering controls do not reduce employees exposure to an acceptable level, respiratory protection will be required.

Respiratory protection comes in a variety of forms based on the contaminant in which you are wanting protection from and the concentration of the contaminant in the atmosphere you are working.

Consult the Air-Source International Safety Department for specific guidance regarding respiratory protection. In addition to the proper respirator selection, supervisors should be aware of the additional requirements employees face prior to being allowed to use respiratory protection. Along with a medical evaluation, employees must receive training that includes explanations and discussions of:

- A) Respirator hazards and what happens if the respirator is not used properly.
- B) The engineering and administrative controls being used at the location, such as proper ventilation etc., and the reason for the required respiratory protection.
- C) The reason for choosing the particular type of respirator.
- D) The functions, capabilities and limitations of the respirator they will be using.
- E) How to put a respirator on and perform a positive / negative pressure check to ensure a proper seal.
- F) How to wear the respirator properly.
- G) How to properly inspect the respirator.

Section 25 of this manual contains the complete Murphy Company Respiratory Protection Program.

Section 23 of this manual contains a complete training program exclusively for supplied air respirators.

## **9.7 Hand Protection**

Hands are hurt more than any other part of the body. Incidents to wrists, fingers and hands account for nearly one-half of all industrial injuries.

Be sure to wear the right kind of gloves for the particular task being performed, such as welding or holding a tagline. Evaluate each situation and consider moving parts or equipment that might catch or pull on gloves creating a hand hazard.

## **9.8 Foot Protection**

Employees must wear shoes that have substantial soles, heels and upper supports while in a construction area. Wearing of approved "hard-toe" safety shoes is encouraged by Air-Source International and may even be required by some clients.

Foot guards must be worn by employees when using a pneumatic tamper or concrete breaker.

The wearing of athletic type footwear is prohibited.

## **9.9 Clothing**

Clothing is expected to fit properly and be in good condition. Cotton or wool outer clothing is recommended and long sleeve shirts are strongly encouraged. A minimum sleeve of four inches is required on all shirts. Muscle shirts, cutoffs or shorts are strictly prohibited.

Some projects may require the use of FRC's (Flame Retardant Clothing). These projects will be specified by client requirements. Client requirements will always supercede those of Murphy Company, provided they are more stringent.

## **9.10 Fall Protection**

A personal fall arrest system is required for all employees working on other than a proper work platform 6 (six) feet or more above the ground or landing.

A proper work platform is defined as a platform or scaffold having a guardrail system consisting of a top rail at a height of 42" +/-3", with a mid-rail. The platform must also be free of holes and other openings in which an employee could fall into.

Air-Source International utilizes full-body harnesses with shock absorbing lanyards for all personal fall arrest systems. There are numerous available attachment points from which to select, including: retractable lifelines, horizontal lifelines and vertical lifelines with rope grabs.

### **9.10.1 Anchorage Points**

Height - Anchorage must be at least the height of the body support D-Ring.

Strength - Must be 5,000 lb minimum or 3000 lb for self retracting Lifelines.

Location - Must be above the head during movement such that a swing fall will not reasonably cause injury.



Mobility - Accommodates the ability to move consistent with the job function requirements.

Inspected - Must be inspected daily or prior to each use.

When using retractable lifelines, anchor point shall be directly overhead. The worker shall not travel more than six feet in any direction from center point.

#### **9.10.2 How to wear a full-body harness**

1. Hold the harness by the back D-ring. Shake the harness to allow all straps to fall in place.
2. With the waist and / or leg strap unbuckled, release snaps and unbuckle at this time.
3. Slip straps over your shoulder so the D-ring is located in the middle of the back.
4. Connect the waist strap. The waist strap should be tight, but not binding.
5. Pull the buckle portion of the leg strap between your legs and connect to opposite end of the leg strap. Repeat the procedure with the second leg strap.
6. After all straps have been buckled, tighten all friction buckles so the harness fits snug but allows free range of motion.
7. Pull the chest strap around the shoulder strap and fasten it in the middle of the chest
8. To remove the harness simply reverse the procedure
9. Reconnect the waist strap after removing the harness. This will give you a starting point when next attempting to put the harness on.
10. Manufacturers recommend hanging the harness by the D-ring to help keep its shape when not in use.

#### **9.11 Roof Tops: Low Slope, (4 in 12, Vertical to Horizontal)**

In many instances we will have a need to perform tasks on flat or low sloped roofs. The majority of these roofs do not provide conventional fall protection. We must be prepared to do one of the following when confronted with such a condition:

##### **9.11.1 Leading Edge Concerns**

**Roofs that have a wall or parapet wall of 39” or higher do not need any additional perimeter protection. If the roof has “unprotected sides and edges” and is six feet or more above a lower level, one of the following safeguards must be implemented:**

##### **9.11.1.1 Guardrail systems**

The maximum amount of protection available would be to install a guardrail system around the perimeter of the roof, or at least the area that will be accessed by employees. This may not always be practical and installation of perimeter handrails could actually expose employees to unnecessary risk, especially if the work area is in the middle of the roof and

falling off the edge is not considered to be an issue.

However, if this solution is used, handrails must be constructed with the top rail being a height of 39-45 inches (Deflection must never be less than 39"). The top rail must be constructed of a material that will be capable of supporting a 200-pound force applied in an outward and downward direction. If there is no wall or parapet wall at least 21 inches high, there must also be a mid-rail. The midrail should be centered between the top rail and the walking / working surface (App. 21"). Midrails must be capable of supporting a 150 pound force in an outward and downward direction.

2"X4"s are excellent choices for both top rail and mid-rail, although a 1"X6" or equivalent is sufficient for mid-rail protection.

Guardrails should not be spanned more than eight feet without stanchion support. If wire rope is used for top rail, it must be at least 1/4" cable to prevent cuts and lacerations. Wire rope must also be flagged at not more than 6 ft. intervals with high visibility material. Again, it is important to remember that the deflection (the lowest point when pushed downward) of cable, or any other material used for top rail, must not be less than 39".

A Guardrail System must also include toe-boards. Toe-boards are included to prevent material and debris from being accidentally kicked off, or blown off by the wind. Toe-boards must be a minimum of 3 1/2" inches high and need to be capable of supporting a 50 pound force in an outward direction.

2" X 4"s are the most practical application

#### **9.11.1.2 Warning Line Systems**

Another possible solution allowed by OSHA is to utilize a warning line system. The warning line system may be used when work is more than 6 feet from the edge and employees will not need to approach the leading edge for any reason (i.e., receiving material).

Warning lines must be a visible barrier 6 feet or farther from the roof's edge and must have a tensile strength of 500 pounds. Stanchions must be able to support a 16 pound force without tipping over. The warning line at its lowest point (including sag) must not be lower than 34 inches from the walking/working surface, the highest point no more than 39 inches. At intervals of 6 ft. or less it must be flagged with a highly visible material.

When a warning line is used, it must be accompanied by a WRITTEN fall protection plan for your specific project. This plan is to be maintained at the job site at all times. If work conditions create changes to the fall protection plan, the plan must be changed in writing. Your Safety Department will assist you with the plan upon your request.

There must also be an individual assigned to the task of monitoring the employees and the warning line, ensuring that no one accidentally goes through the barrier, resulting in a fall. This individual must be in place at all times while other employees are on the roof, must be on the same working level as the other employees with full visibility of all employees and be

close enough to orally communicate with the employees to warn them of unforeseen danger. The monitor must not be given any other responsibilities which would distract from continually monitoring the position of the employees.

#### **9.11.1.3 Restraint Devices**

In many cases we encounter leading edge roof work. To erect a handrail system around the perimeter would increase exposure to falling. In these cases utilizing restraint systems have proven to be the most practical and safest method available.

Restraint systems allow employees to reach the edge but are designed to prevent employees from going over the edge. In other words, locate an attachment point towards the center of the roof, measure the distance to the edge and utilize ¼" cable or equivalent to allow the employee to reach the edge, but not enough slack to go over the edge. A full body harness is then used with the restraint attached to the employees harness. Consider possible lateral movements and always ensure that nowhere along the roof edge is it possible for the employee to fall while using the restraint system. Again, the intention of this system is to eliminate the possibility of falling, not to protect them in the event of a fall.

#### **9.11.2 Roof Openings (Including Skylights)**

**In accordance with OSHA standards a "Hole" is defined as any opening that is 2" wide in its least dimension. All "Holes" must be protected to prevent objects from falling through and protect employees from tripping or stepping into or through holes.**

##### **9.11.2.1 Hole Covers**

All hole covers must be capable of supporting, without failure, at least twice the weight of employees, equipment and materials that may be imposed on the cover at any one time.

All covers must be secured when installed to prevent accidental displacement by the wind, equipment or employees. All covers must be marked with the word "Hole" or "Cover" to provide warning of the hazard. In most cases, depending on the size of the hole and potential load, ½" plywood provides adequate protection.

##### **9.11.2.2 Guardrail Systems**

When guardrail systems are used at holes they must be erected on all unprotected sides of the hole. Construct guardrails around floor openings following the same guidelines established for perimeter protection. Holes which are used for access must have a chain or gate which can be removed and reinstalled for access.

#### **9.12 Hearing Protection**

Hearing loss is a permanent impairment that will never rejuvenate. Damage to an individual's hearing today will be there tomorrow and with each exposure, the damage increases. Often the effects of hearing loss are not

realized until years after the exposure.

Noise levels exceeding 90 decibels are common on many construction projects. If noise levels cannot be reduced through engineering controls, hearing protection must be used.

Hearing protection will be provided by Air-Source International and required for work areas and/or tasks that produce a potential hazard. Air arcing and grinding are typical tasks that require hearing protection.

A good rule of thumb for determining if hearing protection should be worn is: If you are trying to maintain a conversation with someone in close proximity and have to raise your voice to be heard, you should be wearing hearing protection.

Hearing protection will require instruction on the proper use and limitations of the brand selected. Check with Air-Source International Safety Department for specific guidance.

## **10.0 Ladders**

### **10.1 Introduction**

One of the most common tools on any construction project is the ladder. Ladders come in a variety of sizes and types such as straight, extension or stepladders.

The following guidelines should be used for the proper selection and use of ladders on all Air-Source International projects.

### **10.2 Ladder Selection**

Selecting the proper ladder for the task is the first important step for safe ladder usage. The incorrect type or size can add a considerable amount of unnecessary risk to the completion of the task.

As part of Pre-Task Planning, employees and supervisors should evaluate the area where the use of a ladder is needed, then determine which type and size would most accommodate the needs of the crew and the situation of the task.

After the size and type has been determined, the ladder selected should be inspected using the following guidelines:

### **10.3 Ladder Inspection**

All ladders must be inspected before each use. Portable ladders with structural defects such as: broken or missing rungs, cleats, steps, broken or split rails, corroded components or other faulty or defective components must immediately be tagged "Do Not Use" and removed from the job site until repaired. Ladders which are damaged beyond repair should be further destroyed to the point of being beyond use and then discarded in a local container.

Ladders should not be painted except for the purposes of numbering or color identification. When painting, care must be used to ensure that it will not interfere with the ability of the user to perform an adequate inspection of the ladder prior to use.

All Air-Source International ladders must be made of nonconductive side rails, such as fiberglass or wood.

All straight or extension ladders must have safety feet.

Air-Source International will not produce job-made ladders. Job-made ladders provided by General Contractors may be used if properly made, secured and maintained.

#### **10.4 Ladder Usage**

The following general use guidelines must be followed on all Air-Source International Projects:

- Ladders are only to be used for the purpose for which they were designed.
- Ladders are never to be used as skids, braces, workbenches, scaffolding or for any purpose other than climbing.
- Extension ladders must be secured by the first employee to ascend the ladder. This may be accomplished by utilizing a rope to tie the side rails of the ladder to a secure structural member.
- While ascending or descending a ladder, employees must not carry any object or load that could cause the employee to lose balance and fall. A three point stance, meaning both feet and one hand, or both hands and one foot, must be maintained at all times. Employees must face the ladder while ascending or descending. If at anytime an employee must face away from the ladder to perform work and / or a three point stance cannot be maintained, fall protection must be used.
- Caution must be used to not over reach while using ladders. A good rule of thumb is: at no time should your belt buckle move beyond the siderails.
- Ladders are never to be moved, shifted or extended while occupied.
- Only one employee is allowed on a ladder at a time. When ascending or descending to a different elevation, always ensure coworkers are completely clear from the ladder before proceeding.
- When portable extension ladders are used for access to an upper landing surface, the ladders side rails must extend at least 3 feet above the upper landing surface to which the ladder is used to gain access. If such an extension is not possible due to the length of the ladder, then the ladder must not only be secured at the top, but a grasping device such as a grab rail, must be provided to assist employees in mounting and dismounting the ladder. In no case should the extension be such that the ladder deflection under a load would, by itself, cause the ladder to slip off its support.
- After extension ladders have been raised to the desired height, check to verify that safety latches are in position.
- Ladders must be maintained free of oil, grease, and other slipping hazards. Ladders must be equipped with non-skid safety feet.
- Ladders shall be used only on stable and level surfaces to prevent accidental displacement.
- Ladders must never be loaded beyond the maximum intended load for which they were designed. Refer to the manufacturers rated capacity

when determining what size ladder is needed for the task.

- Ladders shall not be tied or fastened together to provide longer sections unless they are specifically designed for such use.
- Ladder components shall be surfaced so as to prevent injury to an employee from punctures or lacerations and to prevent snagging of clothing.
- Portable ladders are to be used at such a pitch that the horizontal distance from the top support to the foot of the ladder is about  $\frac{1}{4}$ " of the working length of the ladder.
- Extension ladders must never be taken apart to use either section separately.
- Clear access must be maintained around the top and bottom of ladders at all times.
- Ladders placed in any location where they can be displaced by workplace activities or traffic, such as in passageways or doorways, shall be secured to prevent accidental displacement, or a barricade shall be used to keep the activities or traffic away from the ladder.
- Avoid using stepladders in the closed position. They are designed to support weight only in a fully opened position. Always open and lock the spreaders in place. Inspect the locking devices to ensure they are strong enough to hold the sections securely open. Set all four feet on a level and stable surface.
- Never stand on the top step or the top of a stepladder.
- Never place tools or materials on the steps of a stepladder.
- Never straddle or sit on top of a ladder to maintain proper center of gravity.
- Do not use the supports on the back of the ladder for steps. They are not made to support a load.
- When not in use, store all types of ladders under suitable cover to protect them from the weather.

## **11.0 Hand and Power Tools**

### **11.1 Introduction**

The use of hand and power tools make many tasks easier. However, the same tools that assist us can create significant hazards if improperly used or maintained. This section covers Air-Source International policy and procedures for hand, electrical, pneumatic, power driven and hydraulic tools.

### **11.2 General Safety Precautions**

Employees who use hand and power tools and who are exposed to falling, flying, abrasive and splashing objects, or exposed to harmful dusts, fumes, mists, vapors or gases, must be provided with the appropriate personal protective equipment necessary to protect them from the hazard(s). Incidents involving the use of tools can be prevented by following five basic safety rules:

- Keep all tools in good condition with regular maintenance.
- Use the right tool for the job.
- Examine each tool for damage before use.
- Operate the tool in accordance with the manufacturer's instructions.
- Use the proper Personal Protective Equipment for the task.

### **11.3 Hand Tools**

Hand tools are non-powered. They include anything from axes to wrenches. The greatest hazards posed by hand tools typically result from misuse and improper maintenance.

Some examples:

- Using a screwdriver as a chisel may cause the tip of the screwdriver to break and fly, hitting the user or other employees.
- If a wooden handle on a tool such as a hammer is loose, splintered, or cracked, the head of the tool may fly off and strike the user or other employees.
- A wrench with its jaws sprung may slip, resulting in injury to the employee.
- Impact tools such as chisels, wedges or drift pins are unsafe if they have mushroomed heads. Mushroomed heads might shatter on impact.

### **11.4 Power Tools**

Power tools can also be hazardous when improperly used. There are several types of power tools based on the power source they use: electric, pneumatic, liquid fuel, hydraulic and powder actuated.

All Air-Source International personnel operating power tools must use the following precautions:

- Never carry a tool by the cord or hose.
- Never yank the cord or the hose to disconnect it from the receptacle.
- Keep cords and hoses away from heat, oil and sharp edges.
- Disconnect tools prior to servicing and when changing accessories such as blades, bits, cutters, etc.
- Secure work with clamps or a vise, freeing both hands to operate the tool.
- Avoid accidental starting. Employees should not hold a finger on the switch button while carrying a plugged in tool.
- Tools should be maintained with care. They must be kept sharp and clean for the best and safest performance.
- Keep good footing and maintain balance.
- The proper clothing must be worn. Avoid clothing, jewelry, etc., that might possibly get caught in moving parts.
- All damaged tools should be removed from the project following the Air-Source International "Red Tag" Procedure.

### **11.5 Guards**

Hazardous moving parts of a power tool need to be safeguarded. For example, belts, gears, shafts, pulleys, etc., must be guarded.

Guards must be provided to protect the employee operating the tool from the following:

- Any dangerous point of operation.
- Rotating parts.
- Flying chips/sparks.

Safety guards must never be removed for tool operation. For example, grinders must not be operated with the guard missing. If a tool is incapable of completing a task with the guard installed, the incorrect tool is being used.

### **11.6 Electrical Safety**

Among the chief hazards of electrical-powered tools are burns and shock which can lead to injuries or even heart failure. Under certain conditions, even a small amount of current can result in severe injury and eventual death. Small shocks can present additional hazards as well, such as, an employee falling off a ladder.

Section 18.0 of this manual contains additional electrical requirements, the most critical being the use of Ground Fault Circuit Interrupters. Air-Source International requires the GFCI protection on **ALL** electrically operated tools.

### **11.7 Powered Abrasive Wheel Tools**

Powered abrasive grinding, cutting, polishing and wire buffing wheels create special safety problems because of flying fragments.

Before installing an abrasive wheel, it should be inspected closely to ensure it is free from cracks or other obvious damage. To test, wheels should be tapped gently with a light non-metallic instrument. If they sound cracked or hollow, there is a good possibility that they could fly apart during operation and must not be used. A sound or undamaged wheel will give a clear metallic tone or “ring”.

To prevent the wheel from cracking, the user should be sure it fits freely on the spindle. The spindle nut must be tightened enough to hold the wheel in place without distorting the flange. Always follow the manufacturer’s recommendations. Care must be taken to assure that the speed of the spindle wheel will not exceed the abrasive wheel specifications. Inspect the abrasive wheel before use. If it is excessively worn or the edges of the wheel are chipped, replace it.

### **11.8 Pneumatic Tools**

Pneumatic tools are powered by compressed air. They can include tools such as chippers, impact guns and grinders. There are several dangers encountered with the use of pneumatic tools, the main one being the danger of getting hit by one of the tool’s attachments or by some kind of fastener the employee is using with the tool. Most pneumatic tools will require the



use of double eye protection. Refer to section 9.0 of this manual or the Air-Source International Safety Department for specific Personal Protective Equipment requirements.

One of the most important things to remember when using pneumatic tools is to make sure the hose connections are properly secured. A short wire or hose pin will ensure the hose stays together. Some hose connections will require a retainer device to be used. This device will serve to keep the hose sections from whipping out of control in the event they become disconnected. Hoses with radiator-type clamps connecting the hose to tools or hose connector fittings will not be used.

### **11.9 Powder Actuated Tools**

Powder actuated tools operate like a loaded gun and should be treated with respect and precautions. Powder actuated tools may only be operated by trained and qualified personnel. Training should be coordinated through the Air-Source International Safety Department and a local vendor.

When using powder actuated tools remember the following basic safety guidelines:

- They must not be used in explosive or flammable atmospheres.
- Before using the tool, the worker should inspect it to determine the tool is clean, all moving parts operate freely, and that the barrel is free from obstructions.
- The tool should never be pointed in the direction of anyone.
- The tool should only be loaded immediately prior to use. When a tool is loaded, it should never be left unattended.
- Hands must be kept clear of the barrel end. To prevent the tool from firing accidentally, there must be two separate motions required for firing, one to bring the tool into position, and another to pull the trigger. The tool must not be able to operate until it is pressed against the work surface with a force of at least five pounds greater than the total weight of the tool.
- Prior to starting work, ensure a bucket or other container with water in it is available close by to place spent cartridges.
- If a powder actuated tool misfires, the employee should wait at least 30 seconds, then try firing it again. If it still will not fire, the employee should wait another 30 seconds so the cartridge is less likely to explode, then carefully remove the load. The bad cartridge should be put in water.
- The muzzle end of the tool must have a protective shield or guard centered perpendicular on the barrel to confine any flying fragments or particles that might otherwise create a hazard when the tool is fired.
- The tool must be designed for varying powder charges so that the user can select a powder level necessary to do the work without excessive force.

- If the tool develops a defect during use, it should be taken out of service following the Air-Source International “red tag” policy.

### **11.10 Hydraulic Power Tools**

The fluid used in hydraulic power tools must be a fire-resistant fluid with the ability to retain its operating characteristics at the most extreme temperatures to which it will be exposed. The manufacturer’s recommended safe operating pressure for hoses, valves, pipes, filters, and other fittings must not be exceeded.

All Jacks (Lever, Ratchet, Screw, and Hydraulic) must have a device to stop them from jacking up too high. In addition, the manufacturer’s load limit must be permanently marked in a prominent place on the jack and must not be exceeded. If the load limit label or marking is unreadable, it should be taken out of service by following the Air-Source International “Red Tag” policy.

A jack should not be used to support a lifted load. Once a load has been lifted, it should be immediately cribbed.

Use wooden cribbing under the base of a jack, if necessary, to make level and secure. If the lift surface is metal, place a 1” thick hardwood block or equivalent between it and the metal jack head to reduce the danger of slippage.

When setting up a jack always ensure the following:

- The base rests on a firm and level surface.
- The jack is correctly centered.
- The jack head bears against a level surface.
- The lift force is applied evenly.

Proper maintenance of jacks is essential for safety. All jacks must be inspected before each use and lubricated regularly. If a jack is subject to an abnormal load or shock, it should be thoroughly examined for damage.

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## **12.0 Fire Prevention**

### **12.1 Equipment**

The fire protection and prevention program for each job site will determine the type and amount of fire-fighting equipment that will be required. Based on the environment of the project and the tasks to be performed, determinations can be made during the pre-task planning phases of each task.

### **12.2 Portable Fire Extinguishers**

There are many type of fire extinguishers on the market to combat the various classes of fires for buildings or areas with an ordinary and/or extra ordinary hazard occupancy.

To avoid confusion and ensure that we always have suitable fire fighting protection on hand, Air-Source International utilizes a multipurpose extinguisher known as Class A, B and C for all construction activities.

Smaller sizes will only be used in Air-Source International vehicles and on motorized conveyances such as forklift trucks.

Fires are classified in the following manner:

**Class A:**

Are fires in ordinary combustible material such as wood, paper, cloth, rubber and plastic.

**Class B:**

Are fires involving flammable liquids gases and / or greases.

**Class C:**

Are fires that involve energized electrical equipment where electrical nonconductivity of the extinguishing media is of importance.

**Class D:**

Special Extinguishing agents for combustible metals.

**Class A, B, and C Extinguishers:**

Are suitable to combat all of the above mentioned categories, with the exception of Class D. Using this type of fire extinguisher may at the surface seem to be an unnecessary expense, but it eliminates the possibility of attempting to use the wrong type of extinguisher to combat a fire in the workplace.

When performing “hot work” in confined spaces, water type fire extinguishers must be used to prevent displacing the oxygen during the extinguishing process.

**12.3 Fire Extinguisher Inspections**

Informal inspections must be conducted on each fire extinguisher immediately before staging it in the work area.

Formal inspections include Monthly and Annual Inspection:

**12.3.1 The Monthly Inspection** is to determine if the fire extinguisher will function properly if needed. The inspection includes: Verifying that the gauge needle is in the charged or green area, the handle pin is secured with a special break away tie, there is no obvious physical damage or condition to prevent operation and, that the end of the discharge hose is free of obstructions.

This inspection is to be made evident to all by utilizing a tag system which indicates the month the unit was last inspected and the initials of the inspector. No fire extinguisher should be used without this tag.

**12.3.2 The Annual Inspection** is established in order to perform a more thorough inspection of all the major components. During this inspection, the extinguisher is completely dismantled and evaluated.

The Annual inspection, like the Monthly Inspection, also requires the use of a tag system as a means of informing everyone that the extinguisher has received the required service.

If at anytime a fire extinguisher is found to be defective, it must

immediately be tagged, "Do Not Use", removed from service and returned to the Air-Source International.

#### **12.4 Location of Fire Extinguishers**

Fire Extinguishers must be marked and located in highly visible areas throughout the job site. At no time should fire extinguishers be staged higher than five feet above the floor level.

Travel distance from a work area to the nearest fire extinguisher must not exceed 100 feet, with no more than 3000 square feet of area per fire extinguisher. When flammable or combustible liquids are being used, fire extinguishers should be no further than 50 feet from the work area.

#### **12.5 Housekeeping**

The elimination of combustible material is a major part of any fire prevention program. Special effort is needed on construction sites due to the large amounts of material being generated. Scrap lumber, temporary hole covers, rags used for cleaning of oil, grease, etc., are all examples of material that are easily ignited by welding sparks or other relatively small ignition sources.

At the discretion of the project manager, Air-Source International will utilize a Housekeeping Audit form on many projects. The form, found at the end of this section, was developed in order to assist supervisors in identifying the most common housekeeping hazards. (See 12.9)

Housekeeping requires a continuous effort in order to be effective. A good housekeeping program must provide for the following:

- A) A sufficient number of containers to accommodate the amount of debris generated.
- B) Prompt, regularly scheduled removal of debris.
- C) Proper placement of containers. Avoid placing containers in the immediate proximity of materials and equipment, especially those susceptible to fires. Careful evaluation of the placement of the containers must also be given in order to provide adequate service and removal of the containers.

#### **12.6 Welding and Cutting Operations**

Suitable fire extinguishing equipment shall be available in the work area and must be maintained in a state of readiness for instant use.

Areas where cutting and welding are performed must be clean and all accumulations of trash, rags, and other combustible material must be removed. A survey of the area should be conducted with consideration given to the distance sparks and welding slag can travel.

When practical, objects to be welded, cut or heated in any other manner should be moved to a designated safe location. When this is not possible, positive steps must be taken to confine heat, sparks and / or slag.

All machinery, equipment, materials, etc., subject to damage or possibly ignition by sparks from welding and cutting operations, must be covered

with a non-combustible material such as fire blanket. Welding gas hoses often require special attention.

When cutting and welding operations are performed above grating, decks or near floor or wall openings, the deck or opening below the operation should be covered with a non-combustible material. Care should be used not to allow hot slag to remain on surfaces long enough to cause combustion or other damage.

When the welding, cutting or heating operation is such that normal fire prevention precautions are not sufficient, additional personnel will be assigned to guard against fire while the actual “hot work” is being performed. In many cases, it will be necessary for the assigned employee to remain at the area of hot work for a 20 minute period after hot work has ended to ensure there is not a delayed reaction and ignition begins.

Before heat is applied to a drum, container or similar hollow structure, a vent or opening must be provided for the release of any built up pressure during the application of heat.

Certain project will require “Hot Work” permits before any spark producing device may be used. With the vast majority of these projects, the owner will assume the responsibility of issuing the permit. In the event it is determined hot work permits are needed and the owner does not have a procedure in place, the Hot Work Authorization permit, located at the end of this section, should be used. These permits, as well as others, may be obtained by contacting the Air-Source International Safety Department. Completed permits should be maintained at the job site and returned to the home office for record retention upon job completion.

### **12.7 Employee Training**

Employees must be trained in the proper use and care of fire fighting equipment. Upon completion of training, employees must be able to visually inspect fire fighting equipment for obvious defects and understand how to properly use and care for the equipment.

Employees required to receive training include all employees that will be designated as “non-productive” fire watches. When projects do not merit such a position, training will include all employees that have potential to become involved in the use of fire fighting equipment.

Each project involving work inside a building or vessel where the possibility of fire exists must adopt an action plan which gives guidance to employees in the evacuation and emergency services notification procedures. Emergency phone numbers and evacuation routes must be conspicuously located throughout the job site.

### **12.8 Flammable and Combustible Liquids**

Only approved containers and portable tanks are allowed to be used for storage and handling of flammable and combustible liquids. Dip tanks containing flammable liquids must have covers that will close

automatically in the event of a fire.

Approved metal safety cans must be used for the handling of flammable liquids in quantities of one gallon or greater. Flammable, highly viscous (extremely hard to pour) liquid material may be used and handled in original shipping containers. No more than 25 gallons of flammable or combustible liquid may be stored indoors without being stored in a flammable storage cabinet. No more than 60 gallons may be stored in any one cabinet.

Typically, if projects require the storage of more than 60 gallons, temporary storage facility tanks that are properly staged and contained should be used. Consult the Air-Source International Safety Department prior to the installation and usage of temporary storage facilities.

## **12.9**

### **HOUSEKEEPING AUDIT**

**Name:**

**Craft:**

**Date:**

A-Adequate B-Inadequate

A B Remarks

1. General neatness of working area.
2. Regular disposal of waste and trash.
3. Passageways and walkways clear of debris.
4. Extension cords and welding lead overhead.
5. Adequate lighting.
6. Oil and grease removed.
7. Waste containers provided and used.
8. Fire hazards identified and corrected.
9. Adequate supply of drinking water to all areas.
10. Drinking cups properly disposed of.
11. Tools returned to tool room when finished.
12. Base of ladders are clear of material.

Additional comments regarding housekeeping:

### **13.0 Motor Vehicle Policy**

#### **13.1 Purpose**

To reduce the exposure of vehicle incidents. We will strive to incorporate driver safety orientation, defensive driver training, vehicle inspections, preventative maintenance, accident reporting and investigation and establish procedures to insure that only licensed drivers with acceptable driving records operate companyowned vehicles.

#### **13.2 Scope**

This program applies to all drivers of company-owned vehicles.

#### **13.3 Definitions**

For the purpose of this program, the following definitions have application to all driving situations in a company vehicle. It is the purpose of this program to track

and record all such activity and to assess an individual's qualifications to operate a vehicle in light of such activity due to the fact that the company believes that any violation which impacts an individual's drivers license or qualification therefore impacts such individual's qualification to operate a company vehicle.

**“Motor Vehicle Record (MVR)”**

Record of a driver's accidents and/or traffic violations.

**“Major Violations”**

- Driving while intoxicated
- Driving under influence of drugs
- Negligent homicide arising out of the use of a vehicle
- Using a motor vehicle for a commission of:
  - A felony
  - An aggravated assault
  - A grand theft
  - A hit and run
  - A speed contest
- Reckless driving/speeding contest
- Making a false accident report
- Careless driving
- Driving while license is suspended/revoked
- Attempting to elude a police officer

**“Minor Violations”**

Minor violations are understood to be all moving violations not listed as major violations.

**“Moving Violations”**

The commission or omission of an act by a person operating a motor vehicle that could directly result in injury or property damage and is also a violation of a statute, ordinance, rule or regulation of the state in which the individual works or resides.

**“Accident Involvement”**

A driver shall be considered to be involved in an accident if any motor vehicle which they are driving, which they are the last person to drive, or of which they are

in charge, shall come in contact with any person, animal, other vehicle or other inanimate object in a manner which results in death, injury or property damage.

Any such incident shall be considered an accident regardless of whether anyone was killed or injured, whether on private property or on a public thoroughfare, or who was responsible or at fault.

**“Light Truck”**

A light truck is any truck with a gross vehicle weight rate (GVWR) of 26,000 pounds or less.

### **“Heavy Truck”**

A heavy truck is any truck with a gross vehicle weight rate (GVWR) of 26,001 pounds or more.

### **License Types**

**“Commercial Driver’s License”** (CDL) plus the DOT medical card is required for the operation of commercial vehicles classified as a heavy truck.

**“Non-Commercial Driver’s License”** is a required license for the operation of any non-commercial vehicle or commercial vehicle not classified as a heavy truck. Consult the respective state-driving handbook for specific driving qualifications and license class.

### **“Company-Owned Vehicles”**

Any vehicle owned or leased by Air-Source International will be considered a company owned vehicle.

### **13.4 Program Description**

The Project Manager is responsible to make sure that only licensed drivers with satisfactory driving records (as determined in accordance with this program) operate company vehicles. Prior to being authorized to operate a company vehicle, a Motor Vehicle Record (MVR) will be secured on each employee driver or on any employee proposed to be authorized to drive a company vehicle. Employees whose driving records do not meet the standards of the Motor Vehicle Safety Program will not be permitted to drive a company vehicle until such time as all conditions of the Motor Vehicle Safety Program are met. MVR’s will be secured on an annual basis for all qualified drivers.

### **13.5 Procedures**

The Motor Vehicle Safety Program will be administered by the Safety Department.

It is the responsibility of the Project Manager to apply this program to determine which employees may periodically drive a company-owned vehicle.

The Project Manager will check the driver’s license of each prospective driver to verify the possession of a valid license, the type of license possessed and that the license class corresponds to the type of vehicles to be operated.

Each prospective employee driver will be required to complete a Motor Vehicle Record (MVR) Release Form.

A printed report of the employee’s driving record will be returned to the Safety Department. The Safety Department will notify the requesting Project Manager whether or not the driver is approved to operate a vehicle. Approval to drive a company vehicle must be in accordance with guidelines set forth in this program. The Project Manager will instruct each approved driver to report any license revocation, suspension, accident or restriction immediately. Failure to report any of these license violations will result in disqualification as a driver.

A Motor Vehicle Record (MVR) release form must be completed following any vehicle accident involvement.

Seat belt use is mandatory for drivers and occupants of vehicles being used for



company business, whether company-owned or employee-owned.

Vehicle inspections are to be performed by the operator prior to the beginning of the workday to ensure the vehicle is fit for safe operation. A quarterly inspection using the Vehicle Safety Checklist should be completed. Any problems or concerns noted during these inspections should be reported immediately to the driver's supervisor.

Perimeter inspections should be performed around the vehicle prior to entry into the vehicle to reduce the potential of backing into or striking stationary objects. Vehicle maintenance will include, at a minimum, the suggested maintenance schedule provided by the manufacturer in the warranty and operator's manuals provided with the vehicle. Documentation of all maintenance performed must be readily available.

Any person other than the assigned operator shall not operate company-owned vehicles. The transportation of passengers not employed by Air-Source International is prohibited.

Transportation or storage of firearms, explosives and associated devices will not be permitted in company-owned vehicles.

Transportation or storage of illegal drugs is strictly prohibited in company owned vehicles.

Driving under the influence of drugs and/or alcohol, as defined by State statute, is strictly prohibited in company-owned vehicles.

### **13.6 Qualification for Drivers of Heavy Trucks**

Each individual, before becoming qualified as a driver of heavy truck (truck with a gross vehicle weight rate (GVWR) of 26,000 pounds or more), will:

- Be required to possess a commercial driver's license (CDL) with proper endorsements.
- Be required to pass a driving test administered by the company.
- Undergo a Motor Vehicle Record (MVR) review. The Motor Vehicle Record (MVR) must meet the company's acceptable standards.
- Heavy truck drivers will be required to meet all Department of Transportation (DOT) driver regulations and requirements, including substance abuse testing procedures.

### **13.7 Qualification for Drivers of Cars, Pickups and Light Trucks**

Each individual, before becoming qualified as a driver of a company-owned car, pickup or light truck will:

- Be required to possess a current Class A, B or C driver's license.
  - Secure the appropriate in-state driver's license within thirty days of the date of hire or transfer.
  - Undergo a Motor Vehicle Record (MVR) review. The Motor Vehicle Record (MVR) must meet the company's acceptable standards (reference Section 8.0).
- Off-the-project accidents and violations involving any vehicle, whether personal, borrowed or company-owned, will show on the MVR and will count toward disqualification as a company driver.

### **13.8 Motor Vehicle Report Standards for Drivers of Company Vehicles**

Employees can be disqualified from driving company-owned vehicles as the result of any of the following:

- Revocation or suspension of a driver's license within the past three years as the result of accidents or moving violations.
- One major violation within the past three years.
- Four (4) or more minor violations within the past three years.

#### **Driver Records and Corrective Action**

Personnel files will include MVR, fleet accident histories, and corrective action documentation for employees who drive company-owned vehicles.

Levels of corrective action shall include:

- **No Action:**

One moving violation and/or non-preventable accident in a three-year period.

- **Counseling:**

Two moving violations in a three-year period and/or a preventable accident.

The operator shall be advised by the Department Head of his or her responsibility towards driving in a safe, courteous, and economical manner in accordance with the defensive driving concept.

- **Suspension:**

Two at-fault accidents, three or more moving violations or one major violation within a three-year period.

The driver shall have driving privileges removed for a probationary period to be established by the Motor Vehicle Safety Coordinator and Upper Management. This includes driving of all company-owned vehicles as well as use of the driver's personal vehicle on company-related business. If any additional moving violations or major violations occur within the probationary period, the driver will not be permitted to drive any company vehicles or drive their own vehicle for any company-related purposes.

- **Termination**

If the employee's position is one that requires regular driving of company vehicles or driving of personal vehicles for company business, this may lead to termination of employment due to the inability of the employee to adequately perform his/her required employment duties.

Any major violation may result in termination if deemed appropriate by the Motor Vehicle Safety Coordinator and upper management.

- **Reinstatement or Re-Hire**

At the time of termination, the Motor Vehicle Safety Coordinator and upper management may choose to establish specific criteria and requirements which, when met, could result in re-employment. The established criteria and requirements will be determined on a case-by-case basis.

### **13.9 Reporting Accidents, Driver's License Revocation, Suspension and Restrictions**

Drivers must report and provide a copy of major and minor offenses, driver's

license revocation, suspension or restriction immediately to their Project Manager. The Project Manager is responsible to send a copy of each to the Safety Department. Failure to report such action within ten (10) days will result in disqualification as a driver of company-owned vehicles.

Any driver whose license is revoked, suspended or restricted is to report this action

to their Project Manager immediately following such action. Drivers who report this action will be suspended from driving company-owned vehicles until the case is resolved.

Failure to report such action will result in disqualification as a driver of company owned vehicles. A restricted license will be reviewed to determine if the driver may continue driving.

All project-related vehicle accidents must be reported immediately to the Project Manager.

All drivers will carry an On The Spot Accident Report Form in their vehicle. This report must be filled out in the event of any accident while at the accident scene.

This report must be turned in to their Project Manager. The Project Manager will notify the Safety Department immediately and forward the report via fax or mail.

Fines and expenses incurred as the result of operating violations are the responsibility of the driver.

### **13.10 Motor Vehicle Record (MVR) Policy**

It is our company policy and requirement for employment that every employee position with driving duties requires a motor vehicle record (MVR) meeting the grading requirement stated below. This MVR policy applies to drivers of company- owned vehicles.

MVR's will be examined prior to the start of employment and **annually** thereafter.

Any job offer made to an employee-candidate for a position with driving duties, shall be contingent upon an MVR meeting the required standards. Continued employment in a position with driving duties also requires an MVR meeting the standards outlined below.

The standards for MVR's are as follows:

1. All operators must have a valid driver's license for at least the last three years.

2. No new driver will be hired with a borderline or poor MVR. MVR's will be graded based on the table below, as minimum requirements.

3. Driving records must remain acceptable or clear, as graded on the table below, for continued employment in positions with driving duties.

Any exceptions to these guidelines must be referred to senior management for approval, in writing.

#### **Motor Vehicle Record Grading Criteria (last 3 years):**

**Number of  
Violations**

**Number of At-Fault Accidents**

**Minor Violations**

Any moving violation other than a major except:

**Major Violations**

Motor vehicle equipment, load or size requirement

Improper/failure to display license plates (if they exist)

Failure to sign or display registration

Failure to have drivers license in possession (if valid license exists)

Driving under the influence of alcohol/drugs

Failure to stop/report an accident

Reckless driving/speeding contest

Driving while impaired

Making a false accident report

Homicide, manslaughter or assault arising out of the use of a vehicle

Driving while license is suspended/revoked

Careless driving

Attempting to elude a police officer

**VEHICLE SAFETY CHECKLIST**

Operator

Location

Project Manager

Year and Make of Vehicle

Date of Inspection

Odometer Reading

Was vehicle driven YES NO during Safety Check?

Driver's License Number

State

Expiration Date

Restrictions

**Safety - Minded Drivers Have Safe Equipment**

**Satisfactory**

**Unsafe**

**Corrected**

Seat Belts (accessible/condition).....

Lights: Headlights.....

Turn Signals.....

Brake Lights.....

Tail Lights.....

Flashers .....

Instrument Panel .....

Glass: Windshield.....

Other .....

Mirrors .....

Steering .....  
 Horn .....  
 Brakes.....  
 Parking Brake.....  
 Muffler .....  
 Tires.....  
 Oil Change (Odometer reading last change) .....  
 Transmission and Differential (Odometer reading last check).....  
 Condition of Vehicle (Note items reducing resale value)  
 Inside  
 Outside  
 Other Items - Requirements of Driver's Manual/Driver Comments  
 1.  
 2.  
 3.  
 4.  
 5.

**Driver Evaluation Form**

Name:

Date:

**Instructions**

1. Review the employee's MVR and assign appropriate points for each violation in the score box.

2. If prospective driver has a driver evaluation score of 6 or greater, serious consideration should be given to his/her qualifications prior to hiring.

A. Number of Accidents (within the last 3 years)

Points  
 Score  
 None 0

1 1  
 2 2  
 3 5

B. Moving Violations (within the last 3 years)

Hit and run, leaving the scene of an accident 6 each  
 Driving under the influence of alcohol or drugs 6 each  
 Any felony, homicide or manslaughter involving use of a motor vehicle 6 each  
 License suspension or revocation 6 each  
 Implied consent refusal (refusal to take blood alcohol test) 6 each  
 Racing or excessive speeds (20 mph over limits) 4 each  
 Reckless, negligent or careless driving 4 each  
 Speeding 2 each

C. Moving Violations (Quantity)(within the last 3 years)

None 0  
 1 or 2 1 each  
 3 and over 1 each

**Grading**

Best 0-1

Average 2-3

Questionable 4-5

Poor Over 5

Completed by:

**Policy Statement**

The efficiency of any organization can be measured directly by its ability to control losses. The personal safety and health of each employee, driver and the public are of primary importance.

Therefore, every attempt will be made to reduce the possibility of accidental occurrences which may result in injury or property damage.

Murphy Company is committed to providing as safe a working environment as possible. Accident prevention is always the first order of business on any day and will take precedence over expediency or short cuts.

Management is morally committed to providing a safe workplace free from hazardous conditions and complying with all safety and traffic laws and ordinances.

We will maintain a motor vehicle safety and loss control program conforming to the best practices for organizations of this type. The program will include driver qualification, training and supervision of drivers, establishment of safe practices and rules, planned inspections, vehicle maintenance, accident reporting, investigation and review of accidents.

The cooperation of all employees is expected, not only from supervision, but fellow workers as well. Only through the cooperative efforts of all employees and management can a motor vehicle safety and loss control program be effective.

Company President Motor Vehicle Safety Coordinator

Date Date

**Vehicle Incident Report Date:**

Police Officer Name Police Report Number Municipality

Signatures:

**Air-Source International Driver** Driver License Number

Vehicle Make & Model Year Truck Number License Plate Odometer Reading

Date of Incident Time AM PM Date Reported

Incident Location: (Street name/number) City State

Damage to Air-Source International Vehicle

**Other Driver** Drivers License # State Exp Date

Address City State Zip

Type of Vehicle State Year Insurance Company Policy Number

Damage to Other Vehicle

Describe How Incident Occurred (use extra pages if necessary)

Weather Road Conditions:

Signature of

Murphy Driver

Signature of

Supervisor

Signature of

Project Sponsor

Show names of streets and direction in which vehicles were going. Indicate by N.S.E.W. Show position of vehicles.

### 13.11

This form must be completed and returned to the Murphy Company Safety Department immediately.

## OPERATION OF COMPANY OWNED VEHICLE

By signing below, I acknowledge that I have received and read the Air-Source International and agree to comply with the provisions therein and understand Air-Source International will perform periodic Motor Vehicle Record (MVR) checks in accordance with the policy.

Date:

PRINTED NAME:

SOC. SEC. NUMBER

DRIVER LICENSE #:

STATE OF ISSUE

EXPIRATION DATE DATE OF BIRTH:

I authorize Air-Source International to secure a Motor Vehicle Record (MVR) report of my driving record on an annual basis and post accident.

(as it appears on your Driver License)



SIGNATURE

For completion by jobsite superintendent (or designee):

Informed driver of requirement to report future license revocation, suspension, accident or restriction immediately.



Type of vehicle to be assigned:

Car, Pickup, light truck Heavy Truck over 26,001 GVWR  

Superintendents (or designee) Signature

:

Project Name/Number:

### 14.0 OSHA Inspections

#### 14.1 Scope

When the OSHA compliance officer arrives, it is too late to get ready. A state of readiness for an inspection must be maintained on the jobsite. When an OSHA inspection starts, it is important to follow a procedure which will ensure the best outcome.

#### 14.2 Objectives

The objective of this section is to provide guidelines for on-site management to follow during an OSHA inspection. Each situation is different in nature, and Project Managers and/or supervisors will inform the Safety Department when an OSHA inspection team arrives on their project or when notification is received of possible inspection.

### **14.3 Responsibilities**

Project Managers are ultimately responsible for maintaining the highest level of compliance on their project. Project Management and on-site supervisors should consult the Air-Source International Safety Department on any issue or policy that is not understood or addressed by our Company Program. Project Managers and supervisors must observe the following practices and procedures when an OSHA inspection occurs on their job site.

### **14.4 Attitude**

One of the most important things to remember when undergoing an OSHA inspection is to remain calm and cooperate. Being polite, respectful and courteous will have a positive outcome on the inspection.

Hostile attitudes, and attempts to delay or interfere with the investigation, will only result in the employer losing precious rights during the inspection and possibly receiving maximum penalties and fines if there are violations discovered.

### **14.5 Credentials**

Employers have the right to know who is entering their job site. This may be accomplished by requesting that the OSHA Compliance Officers present their credentials. If desired, employers may call the Regional office and verify the compliance officers credentials as well as their presence on your project. Generally, calling the Regional office is not necessary or advised in that it will delay the inspection and could give the impression that the company has something to hide. At a minimum, the identification of each Compliance Officer should be checked. If a person claiming to be a Compliance Officer does not have identification indicating they are a representative of the Department of Labor, do NOT allow the inspection to be conducted and politely remove them from the project.

Once credentials have been presented, the Compliance Officer should be allowed to enter the site without delay. Again, cooperation with the Compliance Officer is expected from each Air-Source International employee.

### **14.6 Information To Gather**

Project Managers and/or Supervisors should make copies of all documentation that the Compliance Officer has. This should include the names of the Compliance Officer, copies of the complaint (if they have one), and names and addresses of all individuals involved in the inspection. Document the entire investigation. All information must be considered important during the investigation. Information that is irrelevant to the outcome may be discarded at the conclusion of the investigation if it is determined to have no bearing.

### **14.7 Opening Conference**

Prior to the inspection, the Compliance Officer will conduct an opening conference. The purpose of the conference is to explain the nature and purpose of the inspection, indicate the general scope of the inspection and



outline any records the compliance officer may want to review or question.

#### **14.8 The Inspection**

Compliance Safety and Health Officers have the authority to take environmental samples and to take or obtain photographs related to the purpose of the inspection. This could include a number of things such as air monitoring devices to check employee exposure or dosimeters for noise levels, etc. The Compliance Officer has the authority to interview any employee during the course of the inspection.

If Compliance Officers wish to video tape or take photographs, we will inform them that they are only to tape or photograph specific conditions or situations and disclose to the Air-Source International representative what they are taping or photographing and why. Air-Source International, if possible, will video or photograph the same situations or conditions. Simply walking around a project while continually taping or photographing does not constitute material that specifically relates to the purpose of the inspection and must not be allowed.

When taking photographs or samples, Compliance Officers must take reasonable precautions to insure that the use of a flash, spark producing or other equipment is not hazardous. Compliance Officers must comply with all of Air-Source International policies as well as site specific policies at all times of the investigation.

A Air-Source International representative must accompany the OSHA Compliance Officer to ensure the inspection is conducted in an orderly and prompt manner. All effort must be made to avoid disrupting the job site. If deficiencies or violations are discovered during the inspection, every effort should be made to immediately correct the condition.

#### **14.9 Closing Conference**

When the inspection has been completed, the Compliance Officer will confer with our Company representative and informally advise us of any apparent safety or health violation discovered during the investigation. During this conference, Air-Source International has an opportunity to inform the Compliance Officer of any information that is felt to be pertinent to the job site inspection.

OSHA inspectors will NOT issue citations at the closing conference, or any other time, while on site.

Any phone calls or letters received will be forwarded immediately to the Safety Department.

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#### **15.0 Man-Basket Safety**

##### **15.1 Introduction**

The following procedure will apply to any Air-Source International project whenever it becomes necessary to lift employees in platforms suspended from lifting cranes. Man-baskets are only to be used in situations where

scaffolding or aerial platforms will not provide safe access, or they are impractical due to design or work-site conditions.

### **15.2 Crane Requirements**

Any crane used to hoist personnel must be equipped with the following features:

- Boom Angle Indicator
- Boom Extension Indicator (where applicable)
- Load Radius Indicator
- Anti-two Blocking Device
- Hook with a safety latch.

In the event a crane is found to be missing any of the required devices, or if any of the devices are found to be in an unserviceable condition, the crane cannot be used to hoist personnel.

#### **15.2.1 Load Line & Swing Break**

The load line on which a platform is suspended must have a controlled load lowering function. The “free-fall” option must not be used with suspended work platforms. Load lines must have a minimum support capacity that is seven times the maximum intended load.

The swing brake (or lock) must be engaged when the suspended platform is at its working position.

#### **15.2.2 Weight Limitations**

The total weight of the loaded suspended basket (with employees in the basket) and related rigging must not exceed 50% of the rated capacity for the most extreme radius of the crane and angle of the boom during the lift.

#### **15.2.3 Inspection**

The crane must be inspected immediately prior to the man-basket work.

The inspection must include wire rope, hook breaks, boom and any other mechanical and rigging equipment vital to the safe operation of the lift.

The inspection must be performed at least once daily when the machine is being used for suspended work platform service. If a crane is moved or used for other activities, the inspection must be repeated prior to making a suspended platform lift.

### **15.3 Man-Basket Design**

Man-baskets must meet the following specific criteria in order to qualify as an acceptable personnel hoist:

- Baskets must be designed in a manner that minimizes the possibility of tipping while entering and exiting.
- Must be equipped with a 42” top-rail, an intermediate rail, 4” toe-board, and solid metal or expanded metal with openings no greater than ½” between the toe-board and mid-rail.
- Must be equipped with a grab-rail inside the entire perimeter for employee hand protection.

- Access gate (when provided) must swing to the inside of the basket.
- Must have adequate headroom for employees.
- The basket weight and capacity must be conspicuously posted on the basket.
- Fitted rigging having a 5-1 safety factor and equal distribution of the load.

#### **15.4 Operational Requirements**

After the crane has been set on a firm surface and determined by the operator to be level, the following must occur prior to hoisting personnel in the basket:

- The crane must be inspected in accordance with the aforementioned criteria.
- Communication with the operator must be established and verified.
- Each leg of the wire rope bridle must be connected to a master link or shackle in a manner that ensures the load is evenly distributed among the bridle legs.
- Hooks on overall ball assemblies, lower load blocks or other attachment assemblies must be closed and locked.
- An additional cable to act as a safety device should be installed to connect the basket to the load line above the ball of the crane. The cable selected should be capable of supporting 150% of the potential impact (typically ½" wire rope is sufficient).
- Taglines must always be installed and used unless their use creates an unsafe condition.
- A trial lift must be conducted at 125% of the platform capacity. The basket should be swung as close to its intended destination as possible.
- During the trial lift, the most extreme angle and radius of the crane must be documented. The load of the crane at the most extreme angle and radius must not exceed 50% of the crane capacity.
- Upon completion of the trial lift, the basket must be swung back towards the crane and suspended 5-10 feet off the ground for a minimum of five minutes. During this time, the rigging attached to the basket must be visually inspected to determine the load is evenly distributed and suspended level.

#### **15.5 During the Lift**

- When the personnel platform is occupied, the crane operator must remain at the controls at all times. Hoisting of employees must be immediately discontinued upon any indication of dangerous weather or other impending danger.
- Employees that are being hoisted must remain in continuous sight and in direct communication with the operator or signal person. In unique situations where direct visual contact with the operator is not possible and the use of a signal person would create a greater hazard for the

employees, direct communication alone (such as by radio) may be used.

- Employees occupying the man-basket must remain tied off at all times while in the basket. Tie off may be accomplished by attaching to the lower load block or overhaul ball or to a structural member within the platform capable of supporting a fall impact for employees using the anchorage.
- No lifts can be made on another of the crane's load lines while personnel are suspended on a platform.
- A pre-lift meeting must be conducted with all members of the operation immediately prior to the lift. During the meeting, all of the lift requirements must be reviewed. When changed, each lift must be preceded with a pre-lift meeting.

### **15.6 Suspended Platform Permit.**

The following permit is to be utilized for each lift conducted. Prior to the lift, the permit must be reviewed with each member of crew and the back of the permit signed at the conclusion of the meeting.

Client permits may be used in lieu of the Air-Source International permit, provided it includes or exceeds the information requested on the Air-Source International Company Permit.

### **15.7**

## **SUSPENDED PLATFORM PERMIT**

**Date, Job # and Name:**

**Purpose of the Lift:**

**Crane Information**

1 Crane ID Number: Type:

2 Anti-two-block : (Yes) (No) Tested:

3 Hook Type:

4 Capacity @ the most extreme angle of the lift:

5 Boom angle: Boom Radius: Boom Length:

**(Questions 4 and 5 to be filled out during the trial lift.)**

**Platform Information**

1 Basket Capacity

2 Number of employees required to work from the basket:

3 Total weight of employees and tools in the basket:

4 Weight of the basket:

Total weight:

Under basket capacity by:

\* What percent of the cranes capacity is the basket @ the most extreme condition of the lift ? (Not to exceed 50%)

\* Will the load or boom come within 10 ft. of an energy source? (Yes) (No)

\* Taglines used ? (Yes) (No)

If no, explain:

**Trial Lift, Inspections, and Proof Testing.**

Prior to hoisting or after any repairs or modifications, the platform and rigging must be proof tested to

**125%** of the platforms rated capacity. This is accomplished by holding it in a suspended position for

five minutes with the test load evenly distributed on the platform. After proof testing the rigging and basket, it must be inspected to determine that no deficiencies exist. A trial lift of the unoccupied platform loaded at least to the anticipated lift weight must be made from ground level to each location where employees will be hoisted. The lift must be performed immediately prior to placing personnel on the platform. The operator will determine that all systems, controls and safety devices are activated and functioning properly and that no interferences exist. In addition, the operator will determine the weight of the hoisted load remains under 50% of the capacity of the crane at all times during the hoist.

**Pre-Lift Meeting:**

A pre-lift meeting with all employees involved must be conducted prior to the lifting operation. Attendees

must sign the back of this form.

**Competent Person on site :**

Print Signature

## **16.0 Scaffolding**

### **16.1 Introduction**

A scaffold is any temporary elevated work platform and its supporting structure used for supporting employees, material, or both. Scaffolding can consist of a variety of types and sizes, and they can be supported or suspended.

The erection and dismantling responsibilities will vary from project to project based on the scope of work and local practice. Many projects will rely on the services of scaffolding contractors that specialize in scaffold erection, while other projects will depend on the local craft to erect scaffolding to access their work area.

The following guidelines should serve as an aide in either situation. Scaffolding must be constructed to meet both OSHA and Air-Source International standards.

### **16.2 Training**

The erection and dismantling of scaffolding must be conducted under the direct supervision of a “competent person.” OSHA defines a competent person as an “individual who is trained in the recognition of the hazards associated with the type of scaffold used, understands the procedures used to minimize those hazards, and has the authority to immediately stop work and implement corrective action”. The scaffold shall be inspected at the start of each work shift by the “Competent Person.”

ALL employees that will need to gain access to a scaffold will be required to have the following knowledge as it relates to the scaffolding being used:

- The nature of any electrical hazards, fall hazards and falling object hazards in the work area.
- The correct procedures for dealing with electrical hazards, for erecting,

maintaining and disassembling the fall protection systems and falling object protection systems being used.

- The proper use of the scaffold and the proper handling of materials on the scaffold.
- The maximum intended load and the load carrying capacities of the scaffolding being used.

### **16.3 Fall Protection**

Air-Source International exceeds the OSHA standard regarding fall protection while working from scaffolding. Air-Source International requires either an approved handrail or a personal fall arrest system for each employee working six (6) feet or more above a lower level.

The handrail must be capable of supporting, without failure, 200 pounds applied in any direction. The top rail must be between 39 inches and 45 inches above the platform. The mid-rail would then be approximately halfway between the top rail and the platform surface. The toe-board must be at least 3 ½ inches high. OSHA allows cross bracing as either midrail or top rail.

More information regarding fall protection and fall protection systems is located in Section 9.0 of this manual.

### **16.4 General Requirements**

- All scaffolding must have solid footing or anchoring capable of holding four (4) times the intended load without settling or shifting. Employees are prohibited from using any unstable object such as boxes, pallets or barrels to support scaffold or planks.
- Overhead protection must be provided for workers exposed to overhead hazards.
- Planks must extend over the end support, not less than 6 inches or more than 12 inches.
- Scaffolding which is constructed in areas where other employees are required to work or pass under the scaffolding, an 18 gauge or equivalent screen must be extended from the toeboard to the guardrail.
- The scaffold platform is to be planked or decked as tightly as possible with the space between the platform and the uprights not more than 1 inch wide. When structures or side brackets result in a wider opening, the space must not be more than 9 ½ inches.
- Scaffold platforms and walkways must be a minimum 18" wide.
- Temporary platforms for access or erection shall be a minimum of two planks wide, or 18".
- Material hoisted to a scaffold **must** have a tagline.
- Employees are prohibited from working on scaffolds which are exposed to the elements during storms or high winds.
- Tools and debris must not be allowed to accumulate in quantities which would cause a tripping hazard.

- Scaffold structures should be protected from being struck by trucks and other vehicles.
- All scaffolds must use a baseplate/post component to provide structural strength to the end frame assembly and is a manufacturer's requirement.
- Employees are prohibited from working on scaffolds covered with snow, ice or other slippery material except as necessary to remove the material causing the slippery condition.
- A ladder or other acceptable means of access must be provided. Ladder jack scaffold frames are acceptable provided the steps are uniform in height and length. Spacing between the rungs cannot exceed 16 ¾ inches and must be at least 16 inches in length.
- All scaffolds and scaffold materials should be properly stored when not in use, preferably in areas protected from weather and where they are not damaged by vehicles and other work in progress.

### **16.5 Mobile Scaffolds (Rolling)**

The wheels/casters must be locked at all times to prevent movement while the scaffold is in use. Casters without positive locking devices are not allowed on Air-Source International projects.

Workers must be instructed to exit the scaffold whenever the scaffold is being moved. Although there are specific exceptions to this rule it must be approved by Project Management and/or the Air-Source International Safety Department.

Mobile scaffolds may be mounted and dismounted from the ground level only. All tools and materials must be secured from movement whenever the scaffold is being moved.

The platform height of a rolling scaffold shall not exceed four (4) times the minimum width of the scaffold.

Don't lean over the toprail when working on scaffolding, unless additional fall protection is in use.

### **16.6 Tagging Systems**

A "**Green Tag**" means the scaffold is complete and a personal fall arrest system is not needed while working within the confines of the handrail.

A "**Yellow Tag**" means a portion of the scaffold assembly is incomplete and additional precautions must be utilized. Additional instructions will be listed on the yellow tag (i.e., personal fall arrest system must be utilized).

A "**Red Tag**" means the scaffold is being erected or dismantled and only authorized and trained personnel are allowed on the scaffold.

A scaffold or platform **not tagged** is to be considered unsafe and must not be used.

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## **17.0 Signs, Signals, and Barricades**

### **17.1 Introduction**

There are numerous signs, signals and barricades that employees will

encounter on various projects. This section will discuss many of the most commonly used and give instruction to employees on the proper selection for their own usage.

Signs and symbols that are required must be visible at all times when work is being performed and must be removed or covered promptly when the hazard no longer exists.

### **17.2 Definitions**

**“Signs”** are the warning of hazard, temporarily or permanently affixed or placed at locations where hazards exist.

**“Signals”** are moving signs, provided by workers, such as flagmen, or by devices, such as flashing lights to warn of possible or existing hazards.

**“Barricades”** are obstructions that deter the passage of vehicles or coworkers.

**“Tags”** are temporary signs, usually attached to a piece of equipment or part of a structure, to warn of existing or immediate hazards.

### **17.3 Danger Signs**

Danger signs should only be used where an immediate hazard exists. When a “Danger” sign is posted, this sends a message to all other individuals, that the area is off limits.

OSHA has specific guidelines regarding the appearance of danger signs.

They must have red as the predominate color for the upper panel, black outline on the borders, and a white lower panel for additional sign wording.

### **17.4 Caution Signs**

Caution signs are used only to warn of potential hazardous conditions, but not necessarily forbid access to the area. If a caution sign is posted, employees should survey the area and proceed if possible. During the training of New Hire Orientation, employees should be taught the difference between “Danger” and “Caution” signs and/or tape.

Caution signs must have yellow as the predominate color, black upper panel and borders, yellow lettering of “Caution” on the black panel, and the lower yellow panel for additional sign wording. Black lettering must be used for additional lettering.

### **17.5 Safety Instruction Signs**

Safety instruction signs, when used, must be white with a green upper panel with white letters to convey the principal message. Any additional wording on the sign must be black letters on a white background.

### **17.6 Signals**

Proper signaling may be accomplished by either mechanical or manual methods. Mechanical methods would include flashing lights, arrows, etc. Manual methods would involve employees staged in strategic locations to relay the desired message to pedestrians and/or vehicular traffic.

### **17.7 Barricades**

Air-Source International generally uses two forms of barricades.



### (1) Soft Barricades

Soft barricades typically consist of either Danger Tape or Caution Tape, whichever is applicable to the conditions. Soft barricades are intended for visual warnings only and should never be used as a means of employee fall protection.

### (2) Hard Barricades

Hard barricades may be pre-fabricated, purchased or built on the job to suit the needs of the project. General construction of hard barricades will be consistent with OSHA guidelines covered in CFR 1926.500, Subpart M. Further discussion regarding hard barricades can be found in the Fall Protection Section (9.10) of this manual.

The purpose of hard barricades is two-fold: (1) Provide a visual warning of an area that is being controlled, and (2) Provide a physical barrier that will prevent employees from inadvertently entering the area.

Whichever barricade is chosen, there must be a sign accompanying the barricade that will deliver the proper message to employees, (i.e., “Danger, Keep Out,” “Caution, Overhead Work,” etc.) Whenever a “Danger” or “Caution” tape is used, a sign should be attached to it stating “Air-Source International,” the reason for the tape and date on which it was installed.

When operations are such that signs, signals and barricades do not provide the necessary protection on or adjacent to a highway or street, flagmen on other appropriate traffic controls shall be provided. Signaling directions by flagmen shall be by use of red flags at least 18 inches square or sign paddles and, in periods of darkness, red lights.

Flagmen shall be provided with and shall wear a red or orange warning garment while flagging. Warning garments worn at night shall be of reflective material.

## **17.8 Incident Prevention Tags**

Incident Prevention Tags are used as a temporary means of warning employees of an existing hazard, such as a defective tools, equipment, etc. They must not be used in place of, or as a substitute for, incident prevention signs.

## **18.0 Electrical**

Electricity has become a necessity of modern life, including the construction site. However, when we begin to talk about electricity, many people become confused and fail to understand the basic terms associated with electricity.

With this thought in mind, let’s look at the basic terminology of electricity. In the past, many people have used the following analogy to assist in the thought process: when electricity flows through a circuit, it is like the flow of water through a pipe. Remember this as we discuss the following terms:

### **18.1 Definitions**

**Current-** Equivalent to the total volume of water moving past a certain point in a given length of time. Electrical current is measured in amperes (amps).

**Voltage-** Would be the pressure in the line, and is measured in volts (V).

**Resistance-** is any condition that restricts the current flow; it is measured in ohms.

**Ground-** Completes the electrical circuit and prevents the hazard of electrical shock by connecting a piece of electrical equipment to the earth or other adequate substitute.

**Bonding-** assures electrical continuity by the joining of metallic parts to form an electrically conductive path.

**Watt-** can be determined by multiplying volts and amps. It equals the total quantity of electricity consumed.

### **18.2 How Injuries Occur**

The greatest concern in working with or near electricity is the possibility of the employee getting in the electrical loop and becoming the ground.

Electricity will follow any path that provides a loop from a source and back to that source and/or ground. The current will follow any and all paths that take them back to the source. The body may provide that part of an unintended loop. The amount of current and the length of time that an individual is exposed to the current, determines the severity of the injury.

Current will flow through the body limited by the resistance of the path. The resistance has been known to be as high as 100,000 ohms when the skin is dry, but most often is more like 1,000 ohms. Moisture at the point of contact greatly reduces the resistance, allowing more current to flow and doing more damage in the process.

The amount of current can be predicted by Ohm's Law.

Current = Voltage

Body Resistance

### **18.3 General Requirements**

There are a number of general requirements that have been established to ensure the safety of all our employees:

- Employees are prohibited from working in close proximity to any electric power circuit that may be contacted during the course of work unless protected against electric shock by de-energizing the circuit and grounding it or by guarding with effective insulation.
- Extension cord sets used with portable tools and appliances must be of the three-wire, grounding type, and flexible cords must be designed for hard or extra-hard usage. Use flexible cords and cables that are marked with one of the following types: S, SC, SCE, SCT, SE, SEO, SEOO, SJ, SJE, SJEO, SJEOO, SJO, SJT, SJTO SJTOO, SO, SOO, ST, STO, STOO, G, PPE or W.
- No cord or tool with a damaged or missing grounding pin may be used.
- Worn, frayed or fractured cords may not be used. Flexible cords must be provided with strain relief.
- Inspect each cord set, attachment cap, plug and receptacle of cord sets

and any equipment connected by cord and plug before each day's use for external defects and possible internal damage. Remove from service any defective item and return it to the shop for repair or discard. Never attempt to make repairs in the field. Return all defective equipment to the warehouse/shop for repair determination.

- Protect all cords from damage. Avoid placing cords in main walkways, stairways and staging areas. Wherever possible, suspend them overhead or utilize covers for maximum protection and to minimize tripping hazards to employees.
- Covers or barriers must be installed on boxes, fittings and enclosures to prevent accidental contact with live parts.
- Never perform service, change bands, blades or wheel on electrical equipment until it has been disconnected from the energy source.
- Cords shall be protected against contact with oil, hot surfaces and chemicals. Cords shall not be fastened with staples, suspended with non-insulated wire or hung over nails or other sharp edges.
- Protect extension cords against accidental damage that may be caused by traffic, sharp corners or projections and pinching in doorways.
- Maintain a 10-foot-minimum clearance from overhead power lines. Ladders used near overhead lines must have side-rails made of nonconductive material.
- Vehicles and mechanical or conductive equipment must stay at least ten feet from overhead lines.
- Consider all electrical wires and equipment live unless they are tested and proven otherwise.

#### **18.4 Ground Fault Circuit Interrupters (GFCI's)**

All electrically operated tools and equipment utilizing 120-volt circuits require Ground Fault Circuit Interrupters (GFCI's). GFCI's should be placed as close to the energy source as possible.

An Assured Equipment Grounding Program may be utilized in addition to GFCI's if required by the Client. If the Client requires an Assured Equipment Grounding Program, 100% GFCI usage will be in addition to the Assured Equipment Grounding Conductor Program. At the end of this section we have included an Assured Grounding Program to be used when needed.

Tests will be performed monthly on all GFCI's.

#### **18.5 Temporary Lighting**

Temporary lights shall be equipped with non-conductive bulb guards to prevent accidental contact with the bulb except where the bulb is deeply recessed in a reflector.

Temporary lights may not be suspended by their electric cords unless so designed by the manufacturer.

Never fasten light runs, conductors or bulb holders with nails.

Replace missing or burned-out bulbs to maintain required levels of lighting in

stairwells, basements, halls and other areas, or notify foreman to have it done. Temporary light systems should be strung high enough to avoid contact with.

### **18.6 Assured Grounding Program**

The following program is designed for Air-Source International projects that are required by the client to have an assured grounding program. As previously mentioned, regardless of this program being implemented, Ground Fault Circuit Interrupters are still required by Air-Source International. OSHA Regulations allow GFCI's to be an alternative to this program. Therefore, when this program is required, the cost impact must be considered.

This program applies to all extension cords, receptacles not part of the permanent structure and all equipment connected to the above mentioned supply outlets.

The following steps should be taken to ensure employee safety:

- Maintain a copy of this program on site.
- Workers must visually inspect all cords, receptacles and equipment for damage each day before use.
- Remove any defective or damaged equipment or cords from the project, following the Air-Source International "Red Tag" procedure, and complete an equipment failure report. (See attached)
- Equipment, cords and receptacles must be tested when any repairs are made, after any incident that may have caused damage, and at least every 90 days.
- After testing, cords, equipment, etc., must be marked to indicate that it has been tested and approved for use. The following color code has been established and should be relayed to all employees when the program is implemented:

1. Winter - January, February, March, **Blue Tape**
2. Spring - April, May, June, **Green Tape**
3. Summer – July, August, September, **Red Tape**
4. Fall – October, November, December, **Yellow Tape**
5. **Defective = White tape and Red Tagged.**

An inspection log must be maintained on each project (See attached). The log must include the equipment, cords, etc., that were inspected, the last inspection date, and the person who conducted the test.

### **18.7 Inspection Procedures**

- Inspections must always be conducted on site by a person designated by the Project Manager.
- Any type of approved continuity tester may be used.
- Items inspected must be logged on the appropriate form at the end of this section.

## **18.8**

### **Equipment Failure Report**

Project

Number Item Reason For Failure

Failure

Date

Removal

Date Removed By

## **18.9**

### **Assured Grounding Program Log**

Date Items Inspected / Tested

Failure/

Removal Date

Color

Code Inspected BY:

## **19.0 Cranes and Hoist Safety**

### **19.1 Purpose**

Air-Source International promotes the use of mechanical lifting methods, as opposed to manual lifting, whenever practical. It is our belief that a great deal of injuries can be avoided by allowing mechanical equipment, such as cranes, to do the work for our craftsmen.

There are many different types of cranes, hoists and rigging devices used at Air-Source International for lifting and moving material. The following section is established to provide safe-work procedures related to the proper selection, inspection, and usage, of cranes, hoists and rigging devices.

### **19.2 Crane Selection**

The amount of headroom, weight of load, ground calculations, boom angle, and swinging radius available are all considerations in determining the proper crane selection for a given task.

When selecting a crane, supervisors and/or estimators should consult the manufacturer's specifications and limitations applicable to the operation of the crane.

### **19.3 Crane Inspection**

Each job site must designate a competent person who will inspect all machinery and equipment prior to each use, and during each use, to make sure it is in safe operating condition. Any deficiencies must be repaired, or defective parts replaced, before continuing use. The operator of the equipment is the most likely candidate to perform the inspection in that this person will be most knowledgeable of the equipment. The inspection must be documented and a file of the inspections must be maintained on the job site. A copy of the daily inspection checklist may be found at the end of this section.

Items to be particularly concerned with during a crane inspection include:

### **19.3.1 Load Rating Charts**

All cranes must be equipped with load rating charts in the cab for the operator to reference. The charts must have clearly legible letters and figures. The operator must have a full understanding of how to reference the chart and apply the information to the equipment and/or material to be hoisted.

### **19.3.2 Windows**

All windows in the cab must be made of safety glass, or equivalent, and there must be no visible distortion of any kind. (i.e. cracks, dirt, grease, etc.)

### **19.3.3 Exhaust Pipes**

All cranes must be equipped with exhaust systems in order to reduce excessive noise, preventing the ability to observe the sound of the crane. Exhaust pipes must be guarded or insulated in areas where employees could possibly contact the pipes in the performance of normal duties.

### **19.3.4 Access to the Cab**

Guardrails, handholds and steps must be provided on cranes to allow for easy access to the cab.

### **19.3.5 Platforms**

Must be equipped with a non-skid surface, such as non-skid tape, in areas where operators are expected to walk to access the cab or for general inspection purposes.

### **19.3.6 Swing Radius**

Prior to the use of any crane, the swing radius must be evaluated for clearance from structures and other equipment. Once a safe swing radius has been established, the area must be barricaded in a manner that will prevent employees and/or vehicles from entering the area and being crushed.

### **19.3.7 Fire Extinguishers**

An accessible fire extinguisher of a 5BC rating, or higher, must be available at all operator stations or cabs of equipment.

## **19.4 Crane Usage**

Each year there are numerous employees across the country that are injured while working with or near cranes. Among the leaders of crane related fatalities is the contacting of power lines.

All overhead lines shall be considered to be energized, unless and until the person owning the line or utility company provides Murphy Company the necessary documentation indicating it has been de-energized.

When using a crane the following guidelines must be followed to ensure safe operation around power lines:

**For lines rated 50 kV. Or below-** minimum clearance between the lines and any part of the crane or load must not be less than 10 feet.

**For lines rated over 50 kV.,** minimum clearance between the lines and any

part of the crane or load must be 10 feet plus 0.4 inch per 1 kV. Over 50 kV., or twice the length of the line insulator, but never less than 10 feet.

**In Transit-** with no load and the boom lowered, the equipment clearance must be a minimum of 4 feet for voltages less than 50kV., and 10 feet for voltages over 50kV., up to and including 345 kV., and 16 feet for voltages up to and including 750kV.

In compliance with these requirements a person must be designated to observe the clearances of the equipment, load lines, and boom. This person is to be in a position to give a timely warning to the operator if it is believed to be close to the allowable distance.

### **19.5 Overhead Lifts**

At no time is an operator to be allowed or expected to hoist a load over the head of workers. Hoisting areas must be barricaded to prevent employees from walking under loads. In congested areas, which may have many accesses and prove to be difficult to barricade, employees must be stationed in strategic areas to warn employees of the overhead hazards and prevent them from gaining access to the area.

A warning device, such as the horn of the crane, should be used and sounded during the swinging of a load as an added safeguard to protect employees.

Lifts conducted over process units or other hazardous conditions must be accompanied with a Air-Source International Critical Lift Permit. A copy of the Air-Source International Critical Lift Permit may be found at the end of this section.

Section 15 of this manual provides more detailed information on manbasket safety, including the permit, which must be completed prior to utilizing a man-basket.

### **19.6 Rigging Procedures**

#### **19.6.1 Introduction**

The purpose of this procedure is to establish the minimum acceptable standards for planning and executing lifts on Murphy job sites.

This procedure applies to all Air-Source International employees, subcontractors and other third parties including owner-supplied craneage. If the owner of the facility in which Air-Source International is performing work has a “Rigging Procedure,”

the more stringent of the procedures will apply.

#### **19.6.2 Definitions:**

All mention of cranes, rigging, load tests, periodic inspection, etc. are defined by 29 CFR 1910 & 1926.

Load means the object to be lifted including all slings, shackles, spreader beams and the load block / headache ball.

A critical lift is any lift where:

The lift is being made over or in close proximity to live process

equipment and the weight is greater than ten tons.

The combined weight of the load exceeds 95% of the adjusted rated capacity of the crane.

The item to be lifted weighs more than 20 tons.

All lifts where more than one crane is used.

Any lift deemed special, i.e. - glass lined equipment.

### **19.6.3 General Requirements:**

1. The weight of the object to be lifted must be known or calculated.
2. The weight of slings, shackles, spreader beams, load blocks, etc., must be included as a part of the load.
3. Appropriate slings, shackles, spreader beams, etc., must be ordered from the Murphy Company warehouse. The use of miscellaneous rigging equipment on the crane is prohibited.
4. The load must be controlled at all times by use of a tag line or other means.
5. Crane booms will be lowered or tied off at the end of the workday or when the crane will be unattended for over two hours.
6. A minimum clearance of ten feet will be maintained at all times between the crane boom, load falls, load, etc., and power lines. Should a situation arise where this clearance cannot be maintained, the power must be disconnected or protective blankets must be installed prior to the lift being performed.
7. Any crane being moved will have a Flagman to assist the crane operator to prevent incidents or property damage.
8. All operators will be required to demonstrate proficiency in the operation of their assigned equipment prior to making their first lift. The lead foreman will administer this skills test or, where applicable, the designated job site-rigging superintendent. The operator prequalification checklist is included at the end of this section.
9. The operator is ultimately responsible for the safe operation of his assigned crane. He may, without fear of retribution, refuse to make a lift he deems unsafe.
10. Slings will be inspected before each use; damaged slings will be destroyed.
11. All cranes will be inspected by the lead foreman or, where applicable, the designated job site-rigging superintendent when they arrive on site and before it is accepted for use. The operator is responsible for a documented daily inspection of the crane. Crane certification documents will be required from the crane supplier.
12. Slings will be stored in toolboxes or on racks. Shackles will be stored in a toolbox or the tool trailer.



### 19.6.4 Critical Lift Requirements:

1. A "Critical Lifting Permit" must be completed. This is the responsibility of the Project Manager or his designee. The Project Manager must review and sign off on all Critical Lifting Permits. A completed copy of the permit will be supplied to the client as required.
2. A lift, which exceeds 95% of the adjusted rated capacity of the crane, will require the review and approval of a qualified professional engineer.
3. A determination of the existence of any underground piping, tanks or structures, in the crane set-up area will be made as a part of pre-plan preparation.
4. The allowable soil bearing capacity will be established either from existing data or from recent soil borings and analysis furnished by the owner.
5. Slings for critical lifts will be pull tested and certified. Shackles, spreader beams and other lifting components will be given appropriate inspection. Certain lifts may require additional inspection including radiography, magnetic particle, penetrant dye check or ultrasonic.
6. A pre-lift meeting will be held immediately before the lift is made to insure each person in the rigging crew knows their responsibility. The pre-lift meeting will include the operator.

### 19.9

#### CRITICAL LIFTING PERMIT LOCATION LIFT DATE

#### LIFT DESCRIPTION

#### A. WEIGHT 2. ANY ELECTRICAL HAZARDS IN F. CRANE

1. EQUIPMENT DESCRIPTION NEW  USED  AREA ? YES  NO  1. TYPE OF CRANE
2. WEIGHT EMPTY (LOAD) LBS. 3. WILL CRANE BOOM OR LOAD APPROACH 2. CRANE CAPACITY (tons)
3. WEIGHT OF HEADACHE BALL LBS. WITHIN 10 FEET OF AN ENERGIZED POWER 3. BLOCK & HOOK CAPACITY (tons)
4. WEIGHT OF BLOCK LBS. SOURCE ? YES  NO  4. LIFTING ARRANGEMENT
5. WEIGHT OF LIFTING BEAM LBS. IF YES, CONTACT SAFETY DIRECTOR TO A. MAX. RADIUS (ft.)
6. WEIGHT OF SLINGS & SHACKLES LBS. APPROVE LIFT PLAN. B. LENGTH OF BOOM (ft.)
7. WEIGHT OF JIB LBS. 4. SWING DIRECTION AND DEGREE ? C. PINNED SECT. RETRACTED ? YES  NO
8. WEIGHT OF JIB HEADACHE BALL LBS. D. PINNED SECT. EXTENDED ? YES  NO
9. WEIGHT OF CABLE (LOAD FALL) LBS. 5. OBSTACLES TO LIFT OR SWING ? E. ANGLE OF BOOM AT PICKUP (deg)
10. ALLOWANCE FOR UNACCOUNTED LBS. F. ANGLE OF BOOM AT SET (deg)

#### MATERIAL IN EQUIPMENT G. RATED CAPACITY OF CRANE UNDER

(SCALE, SLUDGE, ETC.) 6. HAS UNDERGROUND DRAWINGS BEEN SEVEREST LIFTING CONDITIONS (chart)

11. OTHER LBS. REVIEWED ? YES  NO  1. OVER REAR (lbs.)

#### TOTAL WEIGHT LBS. 2. OVER FRONT (lbs.)

#### SOURCE OF LOAD WEIGHT: D. CABLE 3. OVER SIDE (lbs.)

1. SIZE OF CABLE 5. HEIGHT LOAD IS TO BE LIFTED (ft.)
  2. CAPACITY OF CABLE 6. CAN RIGGING BE SAFELY INSTALLED OVER
- WEIGHTS VERIFIED BY: 3. NUMBER OF PARTS OF CABLE CG OF EQUIPMENT ? YES  NO
4. TOTAL CABLE CAPACITY 7. FROM CHART - RATED CAPACITY OF CRANE

#### FOR THIS LIFT

#### B. JIB 5. TOTAL CAPACITY GREATER THAN TOTAL 8. MAX. LOAD ON CRANE

ERECTED  STORED  WEIGHT LIFTED ? YES  NO  9. LIFT IS ? % OF CRANE RATED CAPACITY

1. IS JIB TO BE USED ? YES  NO

#### 2. LENGTH OF JIB E. SIZING OF SLINGS G. PRE-PLANNING MEETING

3. ANGLE OF JIB 1. SLING SELECTION HAS PRE-PLANNING BEEN HELD ?

4. RATED CAPACITY OF JIB LBS. A. TYPE OF HITCH YES  NO

#### B. NUMBER OF SLINGS AND ANGLE

5. IS CAPACITY OF JIB GREATER THAN C. SLING SIZE

TOTAL WEIGHT LIFTED ? YES  NO  D. RATED CAPACITY OF SLING ARRANGEMENT

#### C. CRANE PLACEMENT E. IS SLING ARRANGEMENT CAPACITY GREATER

1. ANY DEVIATION FROM SMOOTH SOLID THAN TOTAL WEIGHT ? YES ( ) NO ( )  
FOUNDATION IN THE AREA ? YES ( ) NO ( ) 2. SHACKLE SELECTION

A. PIN DIAMETER (inches)

B. CAPACITY (tons)

C. NUMBER OF SHACKLES

D. IS SHACKLE CAPACITY GREATER  
THAN TOTAL WEIGHT ? YES ( ) NO ( )

### **SPECIAL INSTRUCTIONS**

NOTES: 1. MULTIPLE CRANE LIFTS REQUIRE A SEPARATE LIFT PERMIT FOR EACH CRANE

2. ANY CHANGES IN THE CONFIGURATION, PLACEMENT, RIGGING, LIFT SCHEME, etc. WILL REQUIRE A NEW LIFT PERMIT

COMPANY NAME

(NAME PLATE, DRAWINGS, CALCULATIONS, etc.)

(FROM CHART)

(CAPACITY x NO. of PARTS)

LIFTING

LIFTING

CRANE

PROJECT

NAME / TITLE

19.9 Critical lift permit.XLS 2/10/2004

## **20.0 Confined Spaces**

### **20.1 Introduction**

Numerous injuries and even fatalities occur each year involving employees working in confined spaces. This section is designed to provide employees information regarding safe work practices for confined space entry. Our intention is to create an awareness of the hazards associated with confined space entry, and more specifically, “permit-required” confined spaces, where generally the greater hazards exist.

Each confined space is unique, and therefore, must be examined carefully to ensure hazards are identified and controlled prior to entry. No attempt has been made in this manual to examine every possible situation that an entrant may encounter.

### **20.2 What is a Confined Space?**

A confined space is defined as an area which:

- 1) Has adequate size and configuration for employee entry;
- 2) Has limited means of access and egress; and,
- 3) Is not designed for continuous employee occupancy.

### **20.3 Permit Required Confined Space**

A permit required confined space is a confined space that presents, or has the potential for hazards related to atmospheric conditions (toxic, flammable, asphyxiating), engulfment, configuration or any other recognized serious hazard.

### **20.4 Non-Permit Required Confined Space.**

A Non-Permit Required Confined Space is a confined space that does not contain, or have potential to contain any hazard capable of causing death or serious physical harm.

### **20.5 Training**

Initial and refresher training to provide employees with the necessary understanding, skills and knowledge to perform the job safely is required.

A Air-Source International Safety Department representative or designated supervisor trained in the subject matter will provide the training.

Refresher training must be conducted whenever an employee’s duties change, when hazards in the confined space change, or whenever

evaluations of the confined space entry program identify inadequacies in the employee's knowledge.

### **20.6 Authorized Entrants**

Authorized entrants of a Permit Required confined space must know the hazards they may face, be able to recognize signs and symptoms of exposure, and understand the consequences of exposure to hazards. Entrants must know how to use any needed equipment, communicate with attendants as necessary, alert attendants to the warning signs or the existence of a hazardous condition, and exit as quickly as possible whenever ordered or alerted to do so.

### **20.7 Attendants (Hole Watch)**

An attendant to a confined space must know the hazards of confined spaces. The attendant must be aware of behavioral effects of exposure, must maintain continuous count and identification of authorized entrants, must remain outside the space until relieved or entrants exit, and should communicate with entrants as necessary to monitor their status. Attendants must also monitor the activities inside and outside the permit space and order the entrants to exit if required, summons rescuers if needed, prevent unauthorized entry into the confined space, and perform non-entry rescue if required.

### **20.8 Entry Supervisors**

An entry supervisor is the individual responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry as well as overseeing entry operations, and for terminating entry (to include canceling the permit), in the event conditions change making the confined space unsafe.

An entry supervisor may serve as an attendant or an authorized entrant as long as that person is trained and equipped for each role he or she fills. The duties of the entry supervisor may be passed from one individual to another during the course of an entry operation. However, the current entry supervisor should be indicated on the entry permit.

Entry supervisors with the responsibility for issuing confined space permits must know the hazards of the confined space, verify that all required tests have been conducted and all procedures and/or equipment needed are in place before endorsing a permit.

The entry supervisor must also verify that all procedures regarding confined space rescue services have been established and must verify that the means of summoning these services are in place and suitable.

### **20.9 Rescue Services**

#### **20.9.1 IDLH Permit Required Confined Spaces**

Confined space work performed in IDLH (Immediately Dangerous to Life and Health) atmospheres require rescue services to be in the immediate area, ready to assist with all the necessary equipment. IDLH atmospheres

will be explained further in this section.

### **20.9.2 Non-IDLH Permit Required Confined Spaces.**

Permit required confined spaces which are not classified as Immediately Dangerous to Life and Health will not require rescue services to be positioned at the confined space during entry operation. However, adequate pre-task planning must take place to ensure suitable, trained rescue services are available with acceptable response times.

Entry supervisors must evaluate their entry conditions to determine the extent and nature of the hazards associated with the confined space to be entered. Situations that would require entry of rescue personnel must be arranged and performed by outside services.

Recent changes to the Code of Federal Regulations, require the rescue services that are selected be evaluated by the contractor to determine they have the training and equipment necessary to perform the rescue. In addition, the rescue service must be able to have a response time that matches the potential needs of the confined space.

Rescue services must be notified of the entry operation during the pre-task planning phase of the operation to determine the extent of the services that may be required.

### **20.9.3 Non-Entry Rescue/Retrieval**

Much of the work performed by Air-Source International will require the use of retrieval devices for employees entering confined spaces. A good example of such a condition is top entry man-hole work.

In the event non-entry rescue satisfies the emergency service needs, the employee(s) entering the confined space will be required to be attached to the retrieval device at all times.

## **20.10 Hazardous Atmospheres**

A hazardous atmosphere is one that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue, injury or acute illness. According to historical data, hazardous atmospheres account for most of the deaths and injuries that occur in confined spaces. The atmospheric hazards can be asphyxiating, toxic, or flammable / explosive.

### **20.10.1 Oxygen Deficient Atmosphere**

Asphyxiation, or suffocation, accounts for approximately 47% of all confined space deaths. Normally, the air we breathe contains 20.9% oxygen. When an oxygen level falls below 19.5% there is an asphyxiation danger.

Some work situations that may reduce the oxygen level in a confined space are:

- Certain chemical reactions such as metal oxidation-rust. Metal oxidation is common in tank cleaning operations because the chemicals in the cleanser react with the wall of the tank.
- Oxygen is replaced by other gases. Purge gases such as nitrogen and

argon are examples of gases that may replace oxygen. It is important to immediately remove cutting rigs from confined spaces when finished.

- Oxygen is consumed by the burning process. Welding or flame-cutting operations are classic examples.
- Simple repair or clean-up jobs may also reduce the oxygen level, such as exposure to fumes from open containers of solvent within the confined space.

### **20.10.2 Oxygen Enriched Atmospheres**

When an atmosphere is oxygen enriched there is great potential for fire. Simply stated, combustible material burns easily in oxygen enriched atmospheres.

Atmospheres should be monitored closely to ensure oxygen levels never exceed 23.5% by volume.

### **20.10.3 Toxic Atmospheres**

Regardless of the oxygen level, the toxic effect of certain gases, vapors or fumes can occur. The two most common toxic materials that are found in permit required confined spaces are carbon monoxide and hydrogen sulfide.

- **Carbon Monoxide (Co)** is a colorless, odorless gas that, in high concentrations, is fatal. Carbon monoxide may only be detected by the use of monitoring equipment.
- **Hydrogen Sulfide (H<sub>2</sub>S)** is an example of a toxic that does have minor warning properties. Low concentrations of H<sub>2</sub>S is best described as a smell similar to rotten eggs. However, H<sub>2</sub>S will deaden the sense of smell at higher concentration. Never trust your senses when dealing with toxic gases or vapors.

### **20.10.4 Flammable/ Explosive Atmospheres**

Within a confined space, flammable gas, vapor or dust, with oxygen and an ignition source can produce a very dangerous atmosphere.

Every flammable gas has an ignitable range (a range that when an ignition source is introduced an explosion or fire can occur). The lower end of this range is referred to as the Lower Explosive Limit or LEL. The upper end of the ignitable range is called the Upper Explosive Limit, or UEL.

When flammable gas or vapor concentrations reach 10% of the Lower Explosive Limit, it is considered a hazardous atmosphere. There is, therefore, a 90% safety factor figured in to each atmosphere where the presence of flammable gases or vapors are believed to exist.

Hot work should not be performed in any atmosphere that exceeds 10% of the LEL during an initial evaluation.

## **20.11 CONFINED SPACE ENTRY TRAINING**

**ALWAYS MAKE SURE THAT CONFINED SPACE ATMOSPHERES HAVE BEEN TESTED AND ARE SAFE TO ENTER.**

A. Once a confined space entry permit has been issued to your crew:

1. Conduct a pre-entry meeting at the beginning of each shift in which all precautions and provisions of the entry permit and all hazards associated with the confined space work area are discussed and understood by the "Hole Watch" and all authorized entrants. It is the responsibility of the crew foreman to conduct the meeting.

2. All safety precautions and provisions listed on the entry permit must be complied with.

B. Make sure a "Clear for Entry" sign has been posted at the confined space entryway. If the entryway has a "Danger - Do Not Enter" sign or no sign at all, do not enter the confined space.

C. A trained attendant or "Hole Watch" must be stationed at the entryway outside the confined space at all time while workers are in the confined space.

D. All entrants into the confined space must "sign-in" and "sign-out" on the Confined Space Entry Permit when they enter and exit the confined space.

E. Confined space entrants shall exit the confined space when:

1. Conditions change inside the confined space which could constitute a hazard.

2. Behavioral changes are noticed, such as headache, difficulty in breathing, ringing in the ears, loud singing, or euphoria.

3. Ordered out of the confined space by the "Hole Watch".

F. No confined space shall be entered until atmospheric testing has confirmed an uncontaminated environment. In the event a contaminated confined space must be entered, an aspiration plan must be developed and appropriate respiratory and other protective equipment must be utilized. In some circumstances, for example, if hot work must be performed in the confined space, continuous air monitoring may be required.

G. There are three types of unsafe conditions that can be associated with a confined space atmosphere.

1. Oxygen Content

2. Flammable gases or vapors

3. Toxic gases or vapors

H. Oxygen Content

1. Normal oxygen content is 20.9%.

2. Less than 19.5% can cause suffocation.

3. More than 23% constitutes a potential for spontaneous combustion or explosion.

4. Oxygen can be used up or depleted without adequate ventilation.

5. Oxygen can be displaced by inert gases.

6. Oxygen can be introduced into the confined space atmosphere by leaking torches or hoses.

## I. Flammable Gases or Vapors

1. Under normal conditions, 0%.
2. An atmosphere is abnormal if any flammable gases are present.
3. Flammable gas content is measured by the percentage of their Lower Explosive Limit.
4. An atmosphere is hazardous when flammable gases reach 10% of their Lower Explosive Limit (LEL).

## J. Toxic Gases or Vapors

1. Under normal conditions: 0%.
2. Toxic gases are measured in Parts Per Million (PPM) or Parts Per Billion (PPB).
3. Some toxins have warning properties; some do not.
4. Carbon Monoxide (CO)
  - Colorless
  - Odorless
  - Can be FATAL in high concentrations
5. Hydrogen Sulfide (H<sub>2</sub>S)
  - Smells like rotten eggs at low concentrations.
  - Deadens the sense of smell at 200 PPM.
  - Immediately Dangerous to Life and Health (IDLH) at 300 PPM.

## **CONFINED SPACE ENTRY "HOLE WATCH" TRAINING**

A. Your job is to make sure those persons working inside the confined space stay safe.

1. Continuously monitoring conditions both inside and out of the space. If conditions change or a hazard develops, order the workers out of the confined space.
2. NEVER allow yourself to get distracted.
3. DO NOT leave your work station for any reason while personnel are inside the confined space.
4. Know who is inside the confined space at all times.
5. Keep unauthorized persons out of the confined space.
6. Insure each person entering the confined space "signs-in" and "signs-out" on the Air-Source International Confined Space Entry Log.
7. Maintain voice or visual contact with those persons working within the confined space.
8. Be watchful of "DANGER SIGNS" confined space workers may exhibit if their breathing atmosphere becomes contaminated or oxygen deficient.
9. Be familiar with and understand client emergency signals and procedures.

B. If the confined space worker becomes unconscious or incapacitated due to injury:

1. Call for help immediately. Instruct others nearby to immediately notify Plant Operations and Air-Source International Safety of the emergency and its location.

2. Stay on "HOLE WATCH" until trained and qualified rescue personnel arrive.
3. Once qualified rescue personnel arrive, help them into their protective equipment and remain on "HOLE WATCH".

## **CONFINED SPACE ENTRY EXAMINATION**

**Date:**

**Name: SS#:**

Circle the most appropriate answer(s) below.

1. A "Pre-Entry" meeting should be held at the beginning of each shift only if the atmosphere became Immediately Dangerous to Life and Health on the prior shift.
  - A. True
  - B. False
2. Safety precautions and provisions for entry into the confined space will be listed \_\_\_\_\_ .
  - A. In the Air-Source International Employee Safety Handbook
  - B. On the Confined Space Entry Permit
  - C. In the OSHA Standard 1910.146
  - D. In the Clients formal written safety program
3. A \_\_\_\_\_ must be posted at the Confined Space Entryway before anyone can enter the confined space.
  - A. Recent Copy of the OSHA Regulations
  - B. No Smoking Sign
  - C. Sign indicating "Possible Toxic Atmosphere"
  - D. Sign indicating "Clear for Entry"
  - E. All of the above
4. A \_\_\_\_\_ must be stationed at the entryway outside the confined space at all times while entrants are in the confined space.
  - A. Representative of the Client
  - B. Trained attendant ("Hole Watch")
  - C. Air-Source International Safety Engineer
  - D. Foreman or General Foreman
5. The "Hole Watch" must get approval from the Project Manager before ordering workers to exit the confined space.
  - A. True
  - B. False
6. \_\_\_\_\_ is a type of unsafe condition that can be associated with a confined space atmosphere.
  - A. Low Oxygen Content
  - B. Flammable Gases or Vapors
  - C. Toxic Gases or Vapors
  - D. All of the above
7. Normal Oxygen Content is \_\_\_\_\_ .
  - A. 16.8 percent
  - B. 18.9 percent



- C. 20.9 percent
- D. 25.0 percent
- E. None of the above

8. \_\_\_\_\_ can introduce an abundance of oxygen into the confined space atmosphere, causing a high potential for explosion.

- A. Leaking hoses on supplied air respirators
- B. Leaking torches or hoses on cutting rigs.
- C. Too much ventilation
- D. All of the above
- E. None of the above

9. An atmosphere becomes hazardous when flammable gases reach \_\_\_\_\_ of their Lower Explosive Limit (LEL).

- A. 05.0 percent
- B. 10.0 percent
- C. 15.0 percent
- D. 25.0 percent

10. Carbon Monoxide in a confined space atmosphere \_\_\_\_\_.

- A. Is colorless
- B. Is Odorless
- C. Can be fatal in high concentrations
- D. Smells like rotten eggs
- E. A,B, & C

11. Hydrogen Sulfide (H<sub>2</sub>S) in a confined space atmosphere \_\_\_\_\_.

- A. Smells like rotten eggs at low concentration
- B. Deadens the sense of smell at 200 PPM or above
- C. is Immediately Dangerous to Life and Health at 300 PPM
- D. All of the above

12. The Hole Watch may leave his work station while workers are inside the confined space as long as he / she is not gone for periods longer than 5 minutes at a time.

- A. True
- B. False

13. It is the Hole Watch's responsibility to \_\_\_\_\_.

- A. Know who is inside the confined space at all times
- B. Keep unauthorized persons out of the confined space
- C. Obtain the Confined Space Entry Permit
- D. A & B

14. If one or more confined space entry workers become unconscious or incapacitated due to injury, the Hole Watch should \_\_\_\_\_.

- A. Immediately go into the Confined Space to rescue the injured workers
- B. Call for Help Immediately. Instruct others nearby to immediately notify Plant Operations and Air-Source International Safety Personnel of the emergency and it's location, and remain on Hole Watch until all workers and rescue personnel are out of the Confined Space
- C. Go to a plant phone and call the Rescue Squad
- D. All of the above

## 20.12 Confined Space Entry Permit

1 Space to be entered:

2 Purpose for entry:

3 Date / Time of entry: am pm Permit Expires: am pm

4 Entrants: 1 4

2 5

3 6

5 Name of entry Supervisor: Attendant:

6 Record hazards of the permit space to be entered Check or list the measures used to isolate,

**Hazard** Yes No N/A eliminate, and/or control the hazard before entry

**A** Lack of Oxygen Purge-Flush and Vent

**B** Combustible Gases Ventilation

**C** Toxic Gases Lockout / Tagout

**D** Toxic Vapors Blind

**E** Chemical Contact Inerting

**F** Electrical Hazards

**G** Engulfment

**H** Fall Hazards

7 Tests to be taken Monitor Used:

**A** Oxygen Content % (Between 19.5-23.5) Model:

**B** Lower Explosive Limit % (Below 10%) ID Number

**C** Hydrogen Sulfide PPM (0)

**D** Carbon Monoxide PPM (Below 35 PPM)

8 Check and explain any personal protective equipment required for entry:

Fall Protection / Life Line

Negative Pressure Respirators

Positive Pressure Respirators

Mechanical Ventilation

Communication Devices

Other

Permit Issued By : Company:

## 20.13

### CONFINED SPACE ENTRY LOG JOB# \_\_\_\_\_

DATE: \_\_\_\_\_ JOB NAME: \_\_\_\_\_

LOCATION: \_\_\_\_\_

TIME PERSON ENTERING IN OUT am pm

### 21.0 Management Team Safety Training

The following is a PowerPoint presentation designed to prepare supervisors for the safety responsibilities that are required while directing work. ALL employees functioning in a role, which results in other employees working under their direction, must have this training.

Upon completion of this program, supervisors will have an understanding of not only what is required of them, but they will also be more knowledgeable in Hazard Analysis Techniques as well as in the preparation of Job Safety Analysis forms used by the Company.

The training focuses on four primary sections. The sections are as follows:

- (1) Safety is Everyone's Business
- (2) The Employee Safety Orientation
- (3) Job Hazard Recognition, Evaluation, and Corrective Action

#### (4) Incident Investigation

The first two sections are primarily principles and philosophy. The last two sections are tools and procedures used by Air-Source International in Hazard Analyses and Incident Investigation, and they conclude with a workshop job safety analysis and an injury investigation exercise.

##### **21.1 Retraining Criteria**

Retraining of long term supervisors will be scheduled as the course is revised, or when management feels it would be beneficial for the employee. This program will occasionally be revised to stay abreast of the most current needs of the company.

##### **22.0 Lockout / Tagout**

###### **22.1 Purpose**

The purpose of this regulation is to establish safe procedures for performing service or maintenance activities on machines, process equipment and piping systems where the potential of injury could result from the unexpected start-up or release of stored energy and hazardous chemicals.

In most instances, Lockout / Tagout will be accomplished by following the owners program. The primary purpose of this procedure is to protect employees in the event a client does not have an established procedure.

###### **22.2 Policy**

No person shall work on, or be exposed to, equipment or lines containing hazardous energy until the following have been met:

- Hazardous energy sources have been **identified, isolated, rendered safe, locked and tagged in a SAFE, OFF, OPEN, or OUT** position and **TRIED** prior to starting work.
- The hazards and proper handling precautions for Hazardous Materials have been identified prior to opening equipment and the equipment has been drained, vented, flushed, and purged as applicable.

**Any exceptions must be approved by the Director of Safety, or his designee, and included on an exception list.**

All authorized employees must be qualified to lockout hazardous energy sources. To become qualified, an individual must successfully complete initial and annual "control of hazardous energy sources and line breaking" training and be knowledgeable of the process of the involved equipment.

###### **22.3 Scope**

This regulation applies to all Air-Source International employees and subcontractor personnel who perform maintenance or servicing activities where:

- Injuries may occur from potential hazardous energy sources such as unexpected startup or releases of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, kinetic, radioactive or other potential hazardous energy sources or during blinding and opening of process

equipment and / or piping to facilitate maintenance activities.

- Machinery or equipment guards or other safety devices must be removed or bypassed.

#### **22.4 Definitions**

**Authorized Person.** A project manager, general foreman, line foreman, or station manager who has responsibility for lockout activities in their respective areas. These individuals may delegate lockout functions to company employees who have been trained and are knowledgeable in lockout / tagout procedures.

**Energized.** The condition in which equipment or machinery is connected to an energy source containing hazardous residual or static energy that has not been isolated or rendered safe.

**Energy, Hazardous.** Any energy which may be released in quantities or at rates that would harm an employee.

**Energy Isolating Device.** A mechanical device that physically blocks or isolates energy. This includes, but is not limited to the following: electrical circuit breaker, manually operated switch, disconnecting and plugging or capping, paddle blind, blind flange, chained and locked double block and bleed or twin seal valve. This does not include a push button, selector switch and other control circuit type devices. These devices must be durable, standardized (distinguishable from other devices used in the operation), substantial, user identifiable and be the only ones authorized for isolation.

**Energy Potential.**

- Mechanical motion: potential energy due to pressure, as in hydraulic, pneumatic or vacuum systems, or it can be due to gravity or springs.
- Generated or static electrical energy.
- Thermal energy resulting from high or low temperatures.
- High or low pH.
- Radiation energy.
- Unexpected flow of gas, vapor or liquid into an open process vessel or piping system undergoing maintenance.

**Energy Source.** Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, gravitational, radiation or other hazardous energy. There are three very important considerations when identifying energy sources:

- 1) Energy is always present in machinery, equipment or processes.
- 2) Energy is not necessarily dangerous.
- 3) Danger is only present when energy may be released in quantities or at rates or quantities that would harm an employee.

**Hazardous Material.** Substances or materials in quantities or forms that may pose an unreasonable risk to health, safety or property.

**Isolation List.** A pre-written list of isolation points for all energy sources

for the equipment, line or a system. This list is prepared prior to initiation of work and must be strictly followed.

**Line Breaking.** Any job requiring opening of a process line (permanent or temporary) such as disconnecting / loosening flanges, removing fittings or valves and opening pumps or vessels. This includes lines containing or having contained acid, caustic, flammable, reactive toxic, high temperature materials or other hazardous liquid or gas. This applies to servicing or maintenance as compared to normal operations.

**Lock, Individual.** Individually keyed padlock applied by an individual to hold an energy-isolating device in the safe position and prevents the energizing of a machine or equipment.

**Lock, Mechanical Crew.** Keyed alike padlock applied by a mechanical crew supervisor, or designee, to hold an energy isolating device in the safe position and prevent the energizing of a machine or piece of equipment. The lock is to be attached before individual locks are removed, a shift change or other LOTO custody changes.

**Lock, Operations.** Keyed alike padlock applied by operations to hold an energy isolating device in the safe position and prevent the energizing of a machine or piece of equipment. **The operations lock is the first lock on and the last lock off.**

**Lockout.** The placement of a lockout device on an energy isolating device in accordance with an established procedure to ensure that the equipment being controlled cannot be operated or energized until the lockout device is removed.

**Lockout Device.** A device which utilizes a positive means to hold an energy isolating device in the safe position and prevents the energizing of a machine or piece of equipment. The following devices are considered to be lockout devices at Murphy Company: keyed padlocks, bolting of blinds into flanged connections, lockable chain or cable, lockable valve handle.

**Lockout, Group.** Lockout / tagout procedures which afford a level of protection equivalent to individual lockout / tagout. Examples of group lockout include the use of a lockbox, satellite lockboxes and lockbox master tag.

**Process Equipment Opening.** Any job requiring opening of a process equipment system (temporary or permanent) such as disconnecting or loosening flanges, removing fittings or valves, opening pumps or vessels. This will include process equipment containing or having contained acid, caustic, flammable, reactive, toxic, high temperature materials, or other hazardous liquid or gas.

**Tag, Equipment Decommission.** A tag affixed to equipment which has been decommissioned.

**Tag, Lock Box Master.** A written log of "hold" and "release" signatures of individuals performing maintenance work on equipment in which the

unexpected energizing, startup, or release of stored energy and / or process chemicals could occur and cause injury to personnel and / or damage to property.

Tag, Lockout. Tag attached by operations or mechanical to a switch, valve, blind or other energy isolating device, which warns against the untimely activation of an energy source. This tag is the first tag on and the last tag off.

Tag, Personal Identification. Tag attached by the individual craftsman to a switch, valve, blind, or other isolating device, which warns against the untimely activation of an energy source.

### **22.5 Procedure**

The following steps must be taken for all equipment in which the unexpected energizing, startup, or release of stored energy and / or process chemicals could occur and cause injury to personnel and / or damage to equipment.

**Step one: Prepare, complete and follow the "Hazardous Energy Control, Equipment Opening & Line Breaking Procedure".**

**This written procedure shall be prepared prior to initiation of work and must address the following:**

- Type and magnitude of hazardous energy (i.e. voltage, pressure, temperature)
- Procedures for the control of hazardous energy
- Procedures for safe shutdown of process equipment / lines
- Procedures and precautions for properly draining, venting, flushing for safe opening of process equipment or line breaking
- Procedures for safe return to service of process equipment / lines

**Step Two: Identify and Isolate Hazardous Energy Sources**

Isolate and De-energize Equipment

All electrically driven electric equipment circuit breakers and manually operated switches must be placed in the **OPEN, OUT or OFF** position, **LOCKED** and **TRIED**.

Isolate and De-energize Equipment and Lines Containing Other Forms of Hazardous Energy.

Equipment and lines containing other forms of hazardous energy (e/g/ steam, hydraulic, chemical, pneumatic, hydrocarbon) shall be isolated as follows:

**Temporary Opening of Lines** - Installation of Blinds, Repair on Gage Glass, Quick Plugging, Control Valve Repair.

If the repair on gage glass, quick plugging or control valve repair is continuous (completed the same day) and minor in nature, and if the maintenance and operating supervisors and those doing the work agree that there are greater risks involved when blinding, a single block and bleed

(breaking the flange is considered a bleed) may be used.

**Class I Isolation - For Entry in or Hot Work on Equipment or Lines.**

- All hydrocarbon, chemical and inert gas lines must be blinded or disconnected and plugged. This includes closed drains and pumpout lines. If possible, connections to closed relief systems must be blinded, or disconnected and plugged unless the relief valve system has been purged and blinded.
- All steam, water, air, nitrogen and other utility service lines must be blinded, disconnected and plugged, or have chain locked double block valves and bleeders. The bleeders must be verified open and locked.
- Instrument purge streams (e.g. flushing oil, gas, steam, air, nitrogen) for instrument taps must be blinded or disconnected at the vessel.
- Gage glasses and float chambers must be purged and their primary valves blinded, removed, rotated out of position, or isolated by other approved means. Gage glasses and float chambers for steam and water drums need not be blinded.

**Class II Isolation - For repairs on Equipment Containing Hydrocarbons, Hazardous Chemicals or Temperature and Pressure Extremes.**

- If the work being done is not continuous or if it involves opening the case of the machine or removing the equipment, blinding is required.
- If the work being done is continuous and minor in nature, and if the Maintenance and Operating Supervisors and those doing the work agree that the hazards involved in blinding are greater than the hazards involved in performing the work to be done, blinding may be waived.

**Class III Isolation - TARs**

- If the equipment is part of a larger unit turnaround isolated by battery limit blinds and drained and purged of all hazardous substances, most blinding may be waived.
- Isolation for entry into confined spaces must follow Murphy Company's Confined Space Entry Policy.

Equipment isolated for LOTO shall be properly drained, vented, and rendered safe. The authorized person may also specify other precautions such as: special personal protective equipment to be worn during flushing, line breaking, etc.; barricading the work site to prevent unauthorized entry. Depending on the contents and draining procedures, the authorized person may require certain gas tests to be taken to ensure a safe working environment.

**Step Three: Verify and Document that Equipment is Isolated and De-Energized.**

The authorized person will ensure that all equipment has been isolated from

energy sources and de-energized. Verification of de-energization will be done by:

- Performing an operations test to "**TRY**" the energy isolation equipment to verify that the equipment cannot be operated.
- Verifying that the bleed is not plugged and the energy has been dissipated downstream of the energy isolation device.
- Initialing each isolation point on the **Equipment Isolation List** after verification that isolation and de-energization has occurred. Attach this list the Lock Box Master Tag.

#### **Step Four: Install Lockout / Tagout Devices.**

The Authorized Person will:

- Install the lockout device (operations lock) on each isolation point to hold the energy isolating device in a "SAFE" position. Multiple valves in a cluster in common service may be locked out using a single chain or cable if the chain or cable goes through the yoke and handle.
- Attach a signed and dated **Lockout Tag**.
- Enter the Lockout Tag number on the Equipment Isolation List.

If the isolation device is not capable of being locked out, such as a blind, a **Lockout Tag** must be affixed to the device.

The bottom section of the Lockout Tag must be completed, placed in a Lock Box and Locked Out. **No isolation device may be removed until authorized. Authorization occurs when the authorized person releases the tag stub.**

#### **Step Five: Worker Verification and Protection; Transfer of Custody; Equipment Testing**

Worker Verification. Each worker performing a task / activity on the equipment will **verify with the Equipment Isolation List and Lock Box Master Tag that the equipment has been rendered safe.** Employees must not attempt to restart or re-energize equipment that has been locked or tagged out.

Worker Protection. Worker protection is achieved through individual or group lockout.

Individual Lockout. If an individual feels that it is to his benefit he may lockout each isolation point. Each worker places his personal lock and "Personal Identification Tag" on each isolation device. In cases where a lock cannot be affixed to the isolation device a "Personal Identification Tag" will be attached.

Group Lockout. For Refinery jobs, group lockout will be utilized. To provide for consistency and uniformity, lock boxes will be located on the job. Group lockout is accomplished by:

- Placing the key(s) to the Operations Lock affixed to each energy isolation device in a Lock Box.



- Placing each completed Lockout Tag Stub affixed to each energy isolating device in a lock box with the key(s).
- Each worker places his individual keyed lock with his "Personal Identification Tag" on the lock box hasp and completes the "**Hold**" and "**Task / Activity**" sections of the **Lock Box Master Tag**.

**Equipment Testing Prior to Return to Service.**

Equipment testing may be necessary during maintenance or service. The following procedures will be followed when testing equipment which has been locked out to control hazardous energy.

**Prior to Testing.** The authorized person will ensure that:

- The equipment is safe for testing.
- Operations and maintenance employees have been notified and have removed their lock(s) and Personal Identification Tag(s).
- Personnel and all tools and materials are clear of the equipment.

**Following the Test, And Additional Maintenance Is Needed, The Authorized Person Will Ensure That:**

- The equipment has been shut down
- Hazardous energy has been isolated and rendered safe
- Employees have been notified
- Locks and Personal Identification Tags are in place

**Transfer of Custody**

Where work continues through multiple shifts / crews:

- The supervisor, or designee, of each crew will ensure that each individual removes their Lockout Lock(s) and Personal Identification Tag(s) and signs the "Release" section of the Lock Box Master Tag.
- The supervisor, or designee, of each crew will affix the mechanical crew lock during multiple shift changes or if LOTO custody is transferred to ensure that inadvertent startup does not occur.
- Workers coming on shift will verify that energy sources have been identified, isolated, locked out, tagged, and rendered safe.
- For individual lockout each worker will apply their Individual Lock and Personal Identification Tag to each isolation device.
- For group lockout each worker will apply their Individual Lock and Personal Identification Tag to the lock box containing the Lockout Key(s) and lockout Tag Stubs and sign the "Hold" and "Task / Activity" sections of the Lock Box Master Tag.
- The authorized person will review the status of the energy isolation and lockout and transfer the Lock Box (group lockout) with the Equipment Isolation List, Lock Box Master Tag, Operations Lock Key, and Lockout Tag stubs (both are locked inside the lock box) to the oncoming supervisor.

### **Step Six: Release From Lockout / Tagout**

**Individual Lockout.** When each worker completes his task, he will:

- Remove their personal locks and personal identification tag from each energy isolation device.
- Where blinds are the lockout device, remove their personal identification tag from each blind.

**Group Lockout.** When each individual completes their task they will:

Remove their personal lock and personal identification tag from the lockbox and complete the “release” section of the lockbox master tag. Where blinds are the lockout device, complete the “release” section of the lock box master tag.

**When an individual leaves the site:** If an individual leaves the site without removing their personal lock and personal identification tag, or completing the “release” section of the master tag, the following procedures will be followed:

- Contact the person, in person or by phone. The worker will then return to remove the personal lock and personal identification tag, as well as complete the “release” section of the lock box master tag. If the worker is off-site, the worker may authorize his immediate supervisor to remove his personal lock, tag and complete the “release” form. (*SEE 22.8*)
- If the worker cannot be contacted in person or by phone, the authorized person in conjunction with the worker’s supervisor, may remove the lock, tag and sign off on the “release” if it is determined it is safe to do so.

### **Step Seven: Return of Equipment to Operations**

When returning equipment to operations the authorized person will remove the Operations lock and lockout tag only when he/she has verified that:

- Maintenance / servicing is complete.
- Non-essential tools and equipment have been removed.
- All equipment guards are in place.
- All locks and personal identification tags have been removed.
- There is a “release” signature for each “hold” signature on the master tag.
- Each Lockout tag stub has been matched with the corresponding tag.
- Isolation devices have been removed.
- Equipment is ready for startup.

### **Step Eight: Equipment Startup**

Appropriate personnel will ensure that safe procedures for startup are followed.

## **22.6 Lockout / Tagout Devices**

**Locks.** Must be one type and used only for controlling energy. Each lock must be singularly identified.

- **Individual locks** will be identified by affixing the person,s name on the lock using the personal identification tag.
- Contractor locks will be identified by affixing the company name and authorized person,s name on the lock using the Contractor Personal Identification Tag.

**Tags.** Tags must be durable and be able to withstand the environment (weather, chemicals, etc.). The attaching device must be self locking and have a minimum of 50 pounds, breaking strength. There are four types of tags used for LOTO:

- The “Lockout Tag” is used by the authorized person to tag each isolation device. This tag is the first tag to be installed and the last tag to be removed.
- The “Personal Identification Tag” is used for individual lockout. This tag is attached by the worker to each personal lock which is affixed to the isolation device or lock box.
- The “Lock Box Master Tag” is for all refinery lockout. Each worker must complete the “hold” section of this tag after verifying that hazardous energy isolation is complete and locked out. Following completion of the job, the worker must complete the “release” section of this tag.
- The “Equipment Decommissioned Tag” is used when decommissioning equipment.

**Indelible marker (i.e. black sharpie) must be used when writing information on any tag.**

## **22.7 Training**

Training will address the following:

- Air-Source International Hazardous Energy Control, Lockout / Tagout, Process Equipment Opening and Line Breaking Program.
- Recognition of hazardous energy sources found within the workplace.
- Procedures and methods of control and isolation of energy sources.
- Purpose and use of hazardous energy control procedures.
- Recognition and purpose of hazardous energy control procedures.
- Importance of employees not attempting to restart or re-energize equipment locked or tagged out.
- Disregard or violation of the requirements could endanger their own lives and the lives of fellow coworkers.

## **22.8**

DATE OF LOCK REMOVAL:

TIME OF LOCK REMOVAL:

SAFETY LOCK AFFIXED TO:

EQUIPMENT LOCATION:

OWNER OF SAFETY LOCK:

PRIOR TO REMOVAL OF SAFETY LOCK, PERFORM THE FOLLOWING STEPS AND PROVIDE

SUPPORTING DOCUMENTATION:

1. VERIFY THAT EMPLOYEE HAS LEFT PREMISES.

ENTER TIME THAT EMPLOYEE LEFT SITE. TIME:

2. ATTEMPT TO CONTACT EMPLOYEE TO NOTIFY OF LOCK REMOVAL.

ENTER TIME THAT PHONE CALL WAS MADE. TIME:

3. INSPECT THE EQUIPMENT THOROUGHLY TO ENSURE THAT ALL PERSONNEL ARE CLEAR AND THAT THE EQUIPMENT CAN BE OPERATED SAFELY.

\* After completion this form must be retained as part of project records. When the project consists

of more than one shift the lock removal must be communicated to the other shifts.

## **SAFETY LOCK REMOVAL PERMIT**

Craft Foreman Air-Source International Project Manager

### **23.0 Supplied Air Respirator Training**

#### **23.1 Introduction**

A supplied air respirator is the highest form of respiratory protection available to avoid employee exposure to airborne contaminants.

A half mask negative pressure respirator has a protection factor of 10 times that of the Personal Exposure Limit (PEL). A full-face negative pressure respirator has a protection factor of 50 times the PEL. Supplied Air Respirators provide respiratory protection regardless of the atmospheric concentration.

Respirators which receive a supply of fresh air, either by cylinders through an airline or self contained systems with their own supply of air, are known as supplied air respirators. Employees can work in Immediately Dangerous to Life and Health (IDLH) conditions, and/or conditions which are far above the PEL's allowed, and/or atmospheres of unknown concentrations, without fear of adverse health effects.

Supplied air respirators transfer Grade "D" breathing air (or equivalent), directly to the employee bypassing all atmospheric contaminants.

The following training is to provide all employees with the necessary information to safely perform work in unknown or highly hazardous atmospheric conditions with the use of supplied air respirators.

**Supplied air must be used when an atmosphere has atmospheric hazards in which the level of concentration is unknown or exceeds the protection provided by negative pressure respirators. In addition, any atmosphere which contains less than 19.5% oxygen by volume is considered oxygen deficient and will require the use of supplied air respirators.**

#### **23.2 Definitions**

**Atmosphere-supplying respirator**- means a respirator that supplies the respirator user with breathing air from a source independent of the ambient atmosphere and includes supplied air respirators (SAR's) and self contained breathing apparatus (SCBA) units.

**Demand respirator**- means an atmosphere-supplying respirator that admits breathing air to the facepiece only when a negative pressure is

created inside the facepiece by inhalation.

**Employee exposure-** means exposure to a concentration of an airborne contaminant that would occur if the employee were not using respiratory protection.

**Immediately Dangerous to Life and Health (IDLH)-** means an atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects or would impair an individual's ability to escape from a dangerous atmosphere.

**Negative pressure respirator-** means a respirator in which the air pressure inside the facepiece is negative during inhalation with respect to the ambient air pressure outside the respirator.

**Oxygen deficient atmosphere-** means an atmosphere with oxygen content below 19.5% by volume.

**Positive pressure respirator-** means a respirator in which the pressure inside the respiratory inlet covering exceeds the ambient air pressure outside the respirator.

**Pressure demand respirator-** means a positive pressure atmosphere-supplying respirator that admits breathing air to the facepiece when the positive pressure is reduced inside the facepiece by inhalation.

**Self-contained breathing apparatus (SCBA)-** means an atmosphere-supplying respirator for which the breathing air source is designed to be carried by the user.

**Supplied-air respirator (SAR) or airline respirator-** means an atmosphere-supplying respirator for which the source of breathing air is not designed to be carried by the user.

### **23.3 Airline Respirators**

#### **Personnel Requirements and Responsibilities**

Four people will be the minimum number of people that can perform work with supplied air. The positions and responsibilities are as follows:

- All work requiring atmosphere-supplying respirators will require a minimum of two people to actually be in supplied air and perform the task. At no time should only one worker be in an area that requires supplied air.
- One employee equipped with a 30-minute SCBA, near the crew, as an emergency standby. The emergency standby should be within a visible distance of the workers to render assistance when necessary but not so close to become exposed to the hazard. Careful consideration should be given to wind direction, wind speed and the type of hazard in the area. The emergency standby is in place to offer minor assistance only, such as a worker's airline caught on equipment. Alternate rescue plans must be made for more serious rescue situations, such as a designated rescue team or fire department notification.
- A fourth person will be required to serve as a bottle watch to ensure an

adequate supply of air is maintained. The bottle watch must remain with the bottles, in full view of the regulator at all times, while workers are using supplied air. The bottle watch is responsible for exchanging empty bottles for full and stopping the workers in the event of an air distribution problem or plant emergency requiring evacuation.

### **Special Notes**

- Always check ALL air bottles to be used to ensure they are full before proceeding with work.
- In the event of a loss of air while performing work, DO NOT panic. Turn the valve of the emergency escape bottle to the “on” position, disconnect your ¼” airline and immediately leave the work area. Never open the valve of the emergency egress bottle unless an emergency escape is required. The egress bottle will provide a positive pressure which will result in a rapid loss of air supply.
- In the event of an emergency egress, notify your supervisor immediately.
- DO NOT use an emergency egress bottle or 30-minute SCBA to perform work, regardless of the duration. **They are for emergency use only.**

Bottle Regulated

Pressure Pressure

Cascade whip w/

Reverse flow

Check Valve Increase/Decrease air to workers

½” airline to a manifold

Bottle 1 Bottle 2

¼” airline to workers

### **23.4 Procedure**

On a two-bottle operation, work must always be performed from bottle one (which is the cylinder farthest away from the regulator). If the bottle pressure drops below 500psi, the bottle watch must turn the valve of bottle 2 on and close the valve on bottle 1. Bottle 1 must then be replaced with a full bottle and the operation switched back to working from Bottle 1. Full bottles will typically have between 2200-2400 PSI, which will be shown on the bottle pressure gauge. Typically, a comfortable regulated air pressure for workers is 70-80 PSI. Workers should don their masks prior to entering the contaminated area and communicate their level of comfort with the bottle watch.

A ½” airline is used to run a maximum 300’ to a manifold which may be placed in close proximity to the working area, eliminating tripping hazards throughout the work area.

Up to five employees may then run ¼” airline from the manifold to the work area and make the connection to their individual masks.

## 23.5 Supplied Air Training Quiz

Circle the correct answer

1. If oxygen levels are less than \_\_\_\_\_, supplied air will be required.
  - a. 23.5%
  - b. 23.0%
  - c. 20.0%
  - d. 19.5%
2. If an atmosphere has an unknown concentration of a toxic atmosphere supplied air respirators must be used.
  - a. True
  - b. False
3. A bottle watch is required to continually monitor the air supply of the workers in supplied air.
  - a. True
  - b. False
4. In the event of an air supply problem or a plant evacuation who will be responsible for notifying the workers to leave the area?
  - a. The foreman
  - b. The Safety Engineer
  - c. The bottle watch
  - d. The Project Manager
5. In the event of a loss of air while working in supplied air respirators you should?
  - a. Check your hose to make sure it does not have kinks
  - b. Continue working with the five minute pack if your almost finished
  - c. Immediately leave the area utilizing the escape pack
  - d. Yell for the bottle man to turn up the air
6. On a two-bottle system, the bottle farthest away from the regulator should be the one being used for the air supply.
  - a. True
  - b. False
7. All work in supplied air will require a minimum of two employees actually working in supplied air.
  - a. True
  - b. False
8. The emergency standby must be within visual range of the workers at all times.
  - a. True
  - b. False
9. The most common regulated air pressure for employee comfort is usually
  - a. 50-60 psi
  - b. 60-65 psi
  - c. 70-80 psi

d. 100 psi

10. With a cascade air system, a reverse flow check valve must be used between the bottles to ensure an air supply is maintained during the switching of bottles.

a. True

b. False

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#### **24.0 Fire Watch Training**

The environment of each project will determine the extent of this training. Some projects will require designated “non-productive” fire watch personnel. Other projects will only require that employees performing the work safeguard against the possibility of fire.

Employees must understand that they are only being trained to monitor for potential fire hazards, atmospheric changes and to extinguish small fires as they erupt. If at anytime a fire grows beyond the capability and training of the employee, the employee should immediately evacuate the area.

#### **24.1 “Non-Productive” Fire Watch**

Projects situated in environments where there are flammable substances, or areas where there is an increased possibility of change to the atmosphere, will require full-time, designated employees to monitor job site conditions and any changes to those conditions that could result in a fire. Employees will be granted complete authority to stop work and forbid it to begin, if they do not feel the conditions meet those specified on the Fire Watch Checklist.

Employees that are assigned designated fire watch will be trained as to the potential fire hazards in the work area and must have in their immediate possession the means to combat unexpected fires. Site specific information for fire watch personnel must include the means on notifying emergency assistance in the event of fire that is beyond their ability to extinguish.

#### **24.2 “Productive” Fire Watch**

In controlled environments, where there is little threat of fire or changing atmospheric conditions, employees that are actually performing the work will be trained in the use of extinguishing equipment. In addition, will they assume the duties of their own fire prevention and / or observation.

It is of equal importance that these employees are prepared in the emergency notification procedures established for the project.

#### **24.3 Fire Watch Training**

##### **Purpose:**

The purpose of this procedure is to ensure that all personnel involved in Fire Watch activities fully understand their duties and responsibilities so that hot work can be performed in an orderly and safe manner.



**Policy:**

It is Air-Source International's policy that any hot work carried out in a hazardous or potentially hazardous area be strictly controlled to ensure that this activity is conducted with all necessary precautions and under continuous surveillance.

**Procedure:**

1. Before allowing personnel to use open flame cutting equipment, electric welding equipment or any other equipment that may provide an ignition source within an area known to contain flammable material, the following conditions must be met:

- a. A Hot Work Permit must be authorized and contain any special conditions that are to be observed during the performance of work.
- b. The air has been tested in the work area for oxygen content, explosive gases, and toxic gases, with the results of the air test posted on the hot work permit.
- c. A full time, qualified Fire Watch must be provided as specified on the permit. The person issuing the permit, or a Murphy Company representative will explain the Fire Watch responsibilities, paying particular attention to the special safety conditions spelled out on the permit.

2. Prior to hot work beginning, the Fire Watch will ensure compliance with the following:

- a. Check that the permit is correctly authorized and all special conditions are met as stated.
- b. Make sure that a fully charged, 30 lb. dry chemical fire extinguisher(s) is available at the hot work location.
- c. Locate the nearest available fire hose station and, if conditions merit, lay fire hose and charge with water.
- d. In some cases, additional fire fighting equipment may be required, such as active steam hoses. However, this should be so stated on the Hot Work Permit.
- e. All surface drains and sewers within the immediate area must be covered with birdbaths, fire resistant blankets, and aluminum sheeting, then covered with sand to prevent any vapor escape. Pipe type sewer connections (pump drains, vessel drains, etc...) must be sealed.
- f. Make sure that the area is free of debris, wood, paper, or other combustible materials.
- g. Check the workers' equipment and make sure that it is in safe working order. If not, notify the worker that it must be corrected before the job may proceed.
- h. Check the job-site, and make sure other workers in the area are familiar with the specific job to be done and are also aware of the

hazards involved.

- i. The Fire Watch will have knowledge of plant emergency procedures and the identity of plant telephones and/or control rooms.
3. Once the Fire Watch is satisfied that the area is properly prepared and the necessary fire fighting equipment is on hand, he/she will inform the person(s) performing the hot work that the work may proceed.
4. Once work is in progress, the Fire Watch will:
  - a. Continuously monitor the area for possible hydrocarbon leaks on valve stems, sewers, or releases from other operating areas.
  - b. Continuously monitor the persons performing the work to ensure that their clothing does not catch fire.
  - c. If conditions change which constitute a hazard, shut down all work in the area and notify a plant representative immediately.
  - d. Observe that work is being performed in a safe manner and stop the work if it is not.
  - e. The Fire Watch must wear a red "Fire Watch Vest".
  - f. The Fire Watch must be on the jobsite at all times, and may leave only if the hot work is stopped, or he / she is provided a relief by the supervisor.
  - g. After using a fire extinguisher, ensure that it is replaced by a fully charged extinguisher prior to allowing any hot work to resume.

**Responsibilities:**

1. It is the responsibility of the assigned Fire Watch:
  - a. To ensure that all the conditions stated in this procedure are followed to the letter. Safety has no compromise.
  - b. For stopping the work and directing the work crew to stand by should an unsafe condition develop within the area or the equipment where work is being conducted. The Fire Watch will advise the work crew to resume their task when conditions permit.

**24.4 Fire Watch Checklist**

1. Have you extensively surveyed the immediate and surrounding work area for fire hazards?
  - a. Open Sewers
  - b. Open Pump Drains
  - c. Open Sample Drawing Troughs and Drains
  - d. Additive Mixing Vessels or Drums
  - e. Leaking Pipes or Equipment
  - f. Leaking Valve Stem Packing Glands on Valves
  - g. Leaking Packing Glands on Pumps
  - h. Combustible Materials
2. Have all fire hazards been eliminated or controlled?
3. Is all appropriate fire fighting equipment immediately at hand and fully charged?
  - a. Fully charged (non-expended) Dry Chemical Fire Extinguisher

- b. Charged Fire Water Hose
- c. Charged Steam Hose
- 4. Do you have adequate means of communicating warnings to those performing the hot work?
- 5. Are you quickly able to shutdown or disconnect the hot work at its source should a fire occur?
- 6. Has a Hot Work Permit for your specific work and work location been obtained?
- 7. Do you understand all provisions of the Hot Work Permit?

### **24.5 Fire Watch Training Quiz**

- 1. T\_\_\_\_\_ F\_\_\_\_\_ As a fire watch your key responsibility is to protect your fellow workers from injury.
- 2. Which of the following is an example of hot work?
  - a. Welding
  - b. Cutting
  - c. Operating electric power tools
  - d. Operating gas or diesel engines (including vehicles)
  - e. All of the above
- 3. Before allowing hot work to take place, it is the Fire Watch's responsibility to make sure which of the following has been posted at the work location?
  - a. A Hot Work Permit
  - b. A Regular Work Permit
  - c. Air Test Results
  - d. Both A and C
- 4. T\_\_\_\_\_ F\_\_\_\_\_ All Hot Work Permits will list the same safety provisions necessary to perform the work in all areas.
- 5. T\_\_\_\_\_ F\_\_\_\_\_ Should a hazardous condition develop during the course of performing hot work, the Fire Watch must first get his supervisor's permission to stop the hot work.
- 6. T\_\_\_\_\_ F\_\_\_\_\_ One (1) Twenty pound (20#) dry chemical fire extinguisher is required at each hot work location.
- 7. T\_\_\_\_\_ F\_\_\_\_\_ Once a hot work permit has been issued, it is not necessary to monitor the work area for wind changes, leaks, spills and combustibles.
- 8. T\_\_\_\_\_ F\_\_\_\_\_ In the event of a fire, your only responsibility as a Fire Watch is to inform your fellow workers and evacuate the unit.

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### **25.0 Respiratory Protection**

Engineering and/or administrative controls will always be the preferred method of eliminating or reducing employee exposure to airborne contaminants. In the event that neither one of these options will effectively protect employees from the hazards of exposure, respiratory protection will be required.

Respiratory protection may be accomplished by variety methods: Negative pressure respirators that filter atmospheric air; Powered Air Purifying respirators (PAPR); and, Supplied Air respirators for the most extreme

conditions.

The proper selection of respiratory protection is the most important aspect to ensure employee protection.

### **25.1 Respirator Selection**

Air-Source International is responsible to our employees for evaluating each project and making a determination of the level of respiratory protection that is needed. The evaluation will focus on both existing hazards that may be present, and hazards that may potentially be created by our work activities.

After hazards have been identified, the appropriate respirator will be selected, based on the Personal Exposure Limit (PEL) of each hazard.

**\*Note:** Oxygen Deficient Atmospheres (Less than 19.5%) may only be entered with a supplied air source, such as a Self Contained Breathing Apparatus or Airline Respirator. Toxic Atmospheres, such as high concentrations of Carbon Monoxide, also require supplied air for entry.

#### **25.1.1 Half Mask Respirators**

Half mask respirators provide a fit factor of 10. Meaning, the atmospheric concentration of a given substance must not exceed 10 times the PEL.

##### **For Example:**

The PEL of Benzene is a Time-Weighted Average of 1 Part Per Million (PPM). Therefore, in concentrations less than or equal to 10 PPM of Benzene, half mask respirators with the appropriate organic vapor cartridges is suitable protection.

#### **25.1.2 Full-Face Negative Pressure Respirators**

A Full-face negative pressure respirator has a fit factor of 50. Therefore, using the same example of Benzene, and knowing that we must maintain a time-weighted average of 1 PPM or less, a full-face respirator with organic vapor cartridges will provide protection against concentrations less than or equal to 50 PPM.

#### **25.1.3 Supplied Air Respirators**

Supplied air respirators are the highest forms of respiratory protection available. As illustrated in the above examples, negative pressure respirators have exposure limitations and must be closely monitored to ensure they are not exceeded. In addition, negative pressure respirators provide no protection against oxygen deficient atmospheres. Supplied air respirators provide protection regardless of the concentration and must be used when negative pressure masks will not provide adequate protection or anytime there is an unknown concentration of a hazardous substance.

Additional information on Supplied Air respirators is located in section 23 of this manual.

### **25.2 Cartridge / Filter Selection**

Once the proper respirator has been selected, we must then ensure we match the hazard with a cartridge or filter that will safeguard against the

hazard.

Cartridges and gas mask canisters are color coded for immediate identification. The following is an example of some of the color designations:

**Atmospheric Contaminant Color Assigned**

Acid Gases White

Organic Vapors Black

Ammonia Gas Green

Carbon Monoxide Gas Blue

Acid Gases, and Organic Vapors Yellow

Acid Gases, Ammonia, and Organic Vapors Brown

Acid Gases, Ammonia, Carbon Monoxide and

Organic Vapor Red

\*Note: Gas masks are only acceptable for small concentrations. Supervisors should always consult the Murphy Company Safety Department when a determination is needed for the appropriate protection.

**25.3 Maintenance and Inspection**

If respiratory equipment malfunctions, employees could be exposed to hazards that may be severe or even fatal. The continual maintenance of respiratory equipment is essential to prevent such failures.

Employees must inspect their respirator before each use. Functional parts such as valves and filter elements are of the utmost importance. Each employee using a respirator must be trained how to conduct this inspection. Maintenance and Inspection will be conducted in accordance with the manufacturer's recommended procedure for the mask being used. Murphy Company, in most cases, will be able to comfortably and safely fit employees in 3M respirators. Our most common mask used is the 3M 6000 Series, half mask respirator.

The following is an example of how to properly inspect our most commonly used respirator:

1. Check the face-piece for cracks, tears and dirt. Make sure the facepiece, especially the face seal area, is not disturbed.
2. Examine the inhalation valves for signs of distortion, cracking or tearing. Lift the valves and inspect the valve seat for dirt or cracking.
3. Make sure the head-straps are intact and have good elasticity.
4. Examine all plastic parts for sign of cracking or fatiguing. Make sure the filter gaskets are seated and in good condition.
5. Remove the exhalation valve cover and examine the exhalation valve and the valve seat for signs of dirt, distortion, cracking or tearing. Replace the exhalation valve cover.

\*Note: The above inspection procedure is simply an example of one respirator. Always follow the manufacturer's recommended procedures for the specific respirator being used.

## **25.4 Storage**

Respirators must be stored in containers that will protect them from dust. This may be accomplished by keeping them in their original carton, case, or plastic bag. It is also important to store them safely away from sunlight, extreme heat or cold, and excessive moisture. All of the above mentioned conditions, can greatly reduce the life expectancy of the respirators.

Air-Source International requires employees to store their respirators in an area that will meet or exceed the above mentioned criteria. The most common method is to establish a central storage location. A “check-out” system, essentially the same as that used for tools, may be used for the distribution of respirators. The Project Manager will decide which storage method best suits the project.

Respiratory equipment should always be cleaned or washed in accordance with the manufacturer’s recommended procedure prior to storing.

## **25.5 Cleaning**

Respiratory protection must be washed in whatever cleaner the manufacturer recommends with warm water using a soft brush. Water temperature should never exceed 120 degrees Fahrenheit, and cleaners containing lanolin or others oils should not be used. There are a variety of cleaning agents on the market today that will satisfy the cleaning and disinfecting needs. Local suppliers generally keep an ample supply on hand, or supplies may be ordered by contacting the Murphy Company Warehouse.

After cleaning, respirators should be rinsed in fresh, warm water, and allowed to air dry in a non-contaminated atmosphere. As respiratory equipment is being rinsed, it must be inspected to ensure that all visible signs of cleaner or detergent is removed. If not, there is a possibility of employees acquiring skin irritations or even dermatitis.

## **25.6 Training**

All employees that are required to use respirators must be trained. The training must be conducted prior to the employee using the respirator. Training may be provided by a local vendor or Air-Source International, depending on the project location and / or specific equipment being used. The training must be documented and ensure that each employee can demonstrate, as needed, knowledge of at least the following:

- Why the respirator is necessary and how improper fit, usage or maintenance can compromise the protective effect of the respirator.
- Limitations and capabilities of the respirator.
- How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions.
- How to inspect, put on, remove, use and check the seals of the respirator.

- What the procedures are for maintenance and storage of the respirator.
- How to recognize medical signs and symptoms that may limit or prevent the effective use of the respirator.

### **25.7 Medical Evaluations and Examinations**

Using a respirator may place a physiological burden on employees that varies with the type of respirator worn, the job and workplace conditions in which the respirator is used, and the medical status of the employee.

Air-Source International provides a medical evaluation to determine the employee's ability to use a respirator before the employee is fit tested or required to wear the respirator.

Each employee will be provided a medical questionnaire by one of our Occupational Health Care providers (a sample of OSHA's mandatory format may be found at the end of this section). Air-Source International will ensure that a follow-up medical examination is provided for any employee who gives a positive response to any question in Part B of the questionnaire, or whose initial medical examination demonstrates the need for a follow-up medical examination. The follow-up medical examination will include any medical tests, consultations or diagnostic procedures that the physician deems necessary to make a final determination.

### **25.8 Fit Testing**

Before an employee is required to use any respirator with a negative or positive pressure, tight-fitting face piece, the employee must be fit tested with the same make, model, style and size respirator that will be used. Additional fit tests will be conducted whenever the employee, Company Physician, Supervisor or Program Administrator makes a visual observation of changes in the employee's physical condition that could affect the respirator fit. Such conditions include, but are not limited to, facial scarring, dental changes, cosmetic surgery, or an obvious change in body weight.

### **25.9 Types of Fit Tests**

Fit tests must be administered using an OSHA-accepted Qualitative or Quantitative Fit Test procedure. The type of fit test should be determined by the Medical Provider and the Air-Source International Safety Department.

**Qualitative Tests-** In the irritant or odorous chemical agent test, the wearer is exposed to isoamyl acetate vapor, or other suitable test agent easily detectable by odor or taste. An air-purifying respirator must be equipped with the appropriate air-purifying element. If the wearer cannot detect any penetration of the test agent, the respirator is properly fit.

**Quantitative Tests-** With quantitative testing, the employee, wearing a specially designed probed mask, is tested to measure the amount of leakage into the respirator. The greatest advantage of the quantitative fit test is that it does not rely on a subjective response.

## 25.10

### Appendix C to Sec. 1910.134: OSHA Respirator Medical Evaluation Questionnaire (Mandatory)

To the employer: Answers to questions in Section 1, and to question 9 in Section 2 of Part A, do not require a medical examination.

To the employee:

Can you read (circle one): Yes/No

Your employer must allow you to answer this questionnaire during normal working hours, or at a time and

place that is convenient to you. To maintain your confidentiality, your employer or supervisor must not

look at or review your answers, and your employer must tell you how to deliver or send this questionnaire

to the health care professional who will review it.

Part A. Section 1. (Mandatory) The following information must be provided by every employee who has

been selected to use any type of respirator (please print).

1. Today's date: \_\_\_\_\_

2. Your name: \_\_\_\_\_

3. Your age (to nearest year): \_\_\_\_\_

4. Sex (circle one): Male/Female

5. Your height: \_\_\_\_\_ ft. \_\_\_\_\_ in.

6. Your weight: \_\_\_\_\_ lbs.

7. Your job title: \_\_\_\_\_

8. A phone number where you can be reached by the health care professional who reviews this questionnaire (include the Area Code): \_\_\_\_\_

9. The best time to phone you at this number: \_\_\_\_\_

10. Has your employer told you how to contact the health care professional who will review this questionnaire (circle one): Yes/No

11. Check the type of respirator you will use (you can check more than one category):

a. \_\_\_\_\_ N, R, or P disposable respirator (filter-mask, non- cartridge type only).

b. \_\_\_\_\_ Other type (for example, half- or full-face piece type, powered-air purifying, supplied-air, self-contained breathing apparatus).

12. Have you worn a respirator (circle one): Yes/No

If "yes," what type(s): \_\_\_\_\_

Part A. Section 2. (Mandatory) Questions 1 through 9 below must be answered by every employee who

has been selected to use any type of respirator (please circle "yes" or "no").

1. Do you *currently* smoke tobacco, or have you smoked tobacco in the last month: Yes/No

2. Have you *ever had* any of the following conditions?

a. Seizures (fits): Yes/No

b. Diabetes (sugar disease): Yes/No

c. Allergic reactions that interfere with your breathing: Yes/No

d. Claustrophobia (fear of closed-in places): Yes/No

e. Trouble smelling odors: Yes/No

3. Have you *ever had* any of the following pulmonary or lung problems?

a. Asbestosis: Yes/No

b. Asthma: Yes/No

c. Chronic bronchitis: Yes/No

d. Emphysema: Yes/No

e. Pneumonia: Yes/No

f. Tuberculosis: Yes/No

g. Silicosis: Yes/No



- h. Pneumothorax (collapsed lung): Yes/No
  - i. Lung cancer: Yes/No
  - j. Broken ribs: Yes/No
  - k. Any chest injuries or surgeries: Yes/No
  - l. Any other lung problem that you've been told about: Yes/No
  - 4. Do you *currently* have any of the following symptoms of pulmonary or lung illness?
    - a. Shortness of breath: Yes/No
    - b. Shortness of breath when walking fast on level ground or walking up a slight hill or incline: Yes/No
    - c. Shortness of breath when walking with other people at an ordinary pace on level ground: Yes/No
    - d. Have to stop for breath when walking at your own pace on level ground: Yes/No
    - e. Shortness of breath when washing or dressing yourself: Yes/No
    - f. Shortness of breath that interferes with your job: Yes/No
    - g. Coughing that produces phlegm (thick sputum): Yes/No
    - h. Coughing that wakes you early in the morning: Yes/No
    - i. Coughing that occurs mostly when you are lying down: Yes/No
    - j. Coughing up blood in the last month: Yes/No
    - k. Wheezing: Yes/No
    - l. Wheezing that interferes with your job: Yes/No
    - m. Chest pain when you breathe deeply: Yes/No
    - n. Any other symptoms that you think may be related to lung problems: Yes/No
  - 5. Have you *ever had* any of the following cardiovascular or heart problems?
    - a. Heart attack: Yes/No
    - b. Stroke: Yes/No
    - c. Angina: Yes/No
    - d. Heart failure: Yes/No
    - e. Swelling in your legs or feet (not caused by walking): Yes/No
    - f. Heart arrhythmia (heart beating irregularly): Yes/No
    - g. High blood pressure: Yes/No
    - h. Any other heart problem that you've been told about: Yes/No
  - 6. Have you *ever had* any of the following cardiovascular or heart symptoms?
    - a. Frequent pain or tightness in your chest: Yes/No
    - b. Pain or tightness in your chest during physical activity: Yes/No
    - c. Pain or tightness in your chest that interferes with your job: Yes/No
    - d. In the past two years, have you noticed your heart skipping or missing a beat: Yes/No
    - e. Heartburn or indigestion that is not related to eating: Yes/ No
    - f. Any other symptoms that you think may be related to heart or circulation problems: Yes/No
  - 7. Do you *currently* take medication for any of the following problems?
    - a. Breathing or lung problems: Yes/No
    - b. Heart trouble: Yes/No
    - c. Blood pressure: Yes/No
    - d. Seizures (fits): Yes/No
  - 8. If you've used a respirator, have you *ever had* any of the following problems? (If you've never used a respirator, check the following space and go to question 9:)
    - a. Eye irritation: Yes/No
    - b. Skin allergies or rashes: Yes/No
    - c. Anxiety: Yes/No
    - d. General weakness or fatigue: Yes/No
    - e. Any other problem that interferes with your use of a respirator: Yes/No
  - 9. Would you like to talk to the health care professional who will review this questionnaire about your answers to this questionnaire: Yes/No
- Questions 10 to 15 below must be answered by every employee who has been selected to use either a

full-facepiece respirator or a self-contained breathing apparatus (SCBA). For employees who have been

selected to use other types of respirators, answering these questions is voluntary.

10. Have you *ever lost* vision in either eye (temporarily or permanently): Yes/No

11. Do you *currently* have any of the following vision problems?

a. Wear contact lenses: Yes/No

b. Wear glasses: Yes/No

c. Color blind: Yes/No

d. Any other eye or vision problem: Yes/No

12. Have you *ever had* an injury to your ears, including a broken ear drum: Yes/No

13. Do you *currently* have any of the following hearing problems?

a. Difficulty hearing: Yes/No

b. Wear a hearing aid: Yes/No

c. Any other hearing or ear problem: Yes/No

14. Have you *ever had* a back injury: Yes/No

15. Do you *currently* have any of the following musculoskeletal problems?

a. Weakness in any of your arms, hands, legs, or feet: Yes/No

b. Back pain: Yes/No

c. Difficulty fully moving your arms and legs: Yes/No

d. Pain or stiffness when you lean forward or backward at the waist: Yes/No

e. Difficulty fully moving your head up or down: Yes/No

f. Difficulty fully moving your head side to side: Yes/No

g. Difficulty bending at your knees: Yes/No

h. Difficulty squatting to the ground: Yes/No

i. Climbing a flight of stairs or a ladder carrying more than 25 lbs: Yes/No

j. Any other muscle or skeletal problem that interferes with using a respirator: Yes/No

Part B Any of the following questions, and other questions not listed, may be added to the questionnaire

at the discretion of the health care professional who will review the questionnaire.

1. In your present job, are you working at high altitudes (over 5,000 feet) or in a place that has lower than

normal amounts of oxygen: Yes/No

If "yes," do you have feelings of dizziness, shortness of breath, pounding in your chest, or other symptoms when you're working under these conditions: Yes/No

2. At work or at home, have you ever been exposed to hazardous solvents, hazardous airborne chemicals (e.g., gases, fumes, or dust), or have you come into skin contact with hazardous chemicals:

Yes/No

If "yes," name the chemicals if you know them: \_\_\_\_\_

\_\_\_\_\_

3. Have you ever worked with any of the materials, or under any of the conditions, listed below:

a. Asbestos: Yes/No

b. Silica (e.g., in sandblasting): Yes/No

c. Tungsten/cobalt (e.g., grinding or welding this material): Yes/No

d. Beryllium: Yes/No

e. Aluminum: Yes/No

f. Coal (for example, mining): Yes/No

g. Iron: Yes/No

h. Tin: Yes/No

i. Dusty environments: Yes/No

j. Any other hazardous exposures: Yes/No

If "yes," describe these exposures: \_\_\_\_\_

\_\_\_\_\_

4. List any second jobs or side businesses you have: \_\_\_\_\_

5. List your previous occupations: \_\_\_\_\_

6. List your current and previous hobbies: \_\_\_\_\_

7. Have you been in the military services? Yes/No

If "yes," were you exposed to biological or chemical agents (either in training or combat): Yes/No

8. Have you ever worked on a HAZMAT team? Yes/No

9. Other than medications for breathing and lung problems, heart trouble, blood pressure, and seizures

mentioned earlier in this questionnaire, are you taking any other medications for any reason (including

over-the-counter medications): Yes/No

If "yes," name the medications if you know them: \_\_\_\_\_

10. Will you be using any of the following items with your respirator(s)?

a. HEPA Filters: Yes/No

b. Canisters (for example, gas masks): Yes/No

c. Cartridges: Yes/No

11. How often are you expected to use the respirator(s) (circle "yes" or "no" for all answers that apply to you)?:

a. Escape only (no rescue): Yes/No

b. Emergency rescue only: Yes/No

c. Less than 5 hours *per week*: Yes/No

d. Less than 2 hours *per day*: Yes/No

e. 2 to 4 hours per day: Yes/No

f. Over 4 hours per day: Yes/No

12. During the period you are using the respirator(s), is your work effort:

a. *Light* (less than 200 kcal per hour): Yes/No

If "yes," how long does this period last during the average shift: \_\_\_\_\_ hrs. \_\_\_\_\_ mins.

Examples of a light work effort are *sitting* while writing, typing, drafting, or performing light assembly work;

or *standing* while operating a drill press (1-3 lbs.) or controlling machines.

b. *Moderate* (200 to 350 kcal per hour): Yes/No

If "yes," how long does this period last during the average shift: \_\_\_\_\_ hrs. \_\_\_\_\_ mins.

Examples of moderate work effort are *sitting* while nailing or filing; *driving* a truck or bus in urban traffic;

*standing* while drilling, nailing, performing assembly work, or transferring a moderate load (about 35 lbs.)

at trunk level; *walking* on a level surface about 2 mph or down a 5-degree grade about 3 mph; or *pushing*

a wheelbarrow with a heavy load (about 100 lbs.) on a level surface.

c. *Heavy* (above 350 kcal per hour): Yes/No

If "yes," how long does this period last during the average shift: \_\_\_\_\_ hrs. \_\_\_\_\_ mins.

Examples of heavy work are *lifting* a heavy load (about 50 lbs.) from the floor to your waist or shoulder;

working on a loading dock; *shoveling*; *standing* while bricklaying or chipping castings; *walking* up an 8-

degree grade about 2 mph; climbing stairs with a heavy load (about 50 lbs.).

13. Will you be wearing protective clothing and/or equipment (other than the respirator) when you're using

your respirator: Yes/No

If "yes," describe this protective clothing and/or equipment: \_\_\_\_\_

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14. Will you be working under hot conditions (temperature exceeding 77 deg. F): Yes/No

15. Will you be working under humid conditions: Yes/No

16. Describe the work you'll be doing while you're using your respirator(s):

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17. Describe any special or hazardous conditions you might encounter when you're using your respirator(s) (for example, confined spaces, life-threatening gases):

---

18. Provide the following information, if you know it, for each toxic substance that you'll be exposed to

when you're using your respirator(s):

Name of the first toxic substance: \_\_\_\_\_

Estimated maximum exposure level per shift: \_\_\_\_\_

Duration of exposure per shift: \_\_\_\_\_

Name of the second toxic substance: \_\_\_\_\_

Estimated maximum exposure level per shift: \_\_\_\_\_

Duration of exposure per shift: \_\_\_\_\_

Name of the third toxic substance: \_\_\_\_\_

Estimated maximum exposure level per shift: \_\_\_\_\_

Duration of exposure per shift: \_\_\_\_\_

The name of any other toxic substances that you'll be exposed to while using your respirator:

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19. Describe any special responsibilities you'll have while using your respirator(s) that may affect the

safety and well being of others (for example, rescue, security):

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## **26.0 Process Safety Management**

When a project involves maintenance, repair, turnaround, major renovation or specialty work with, or in close proximity to, a highly toxic, reactive, flammable or explosive chemical (as listed in OSHA Code of Federal Regulations 1910.119, Appendix A), or on a single location of any of the above in excess of 10,000 lb., specific process safety management actions are required.

Air-Source International is required to create a formal hazard assessment plan to deal with potentially catastrophic interactions. However, the client also shares responsibility for ensuring Process Safety Management information is relayed to all individuals employed at their facility. Responsibilities are as follows:

### **26.1 Client Responsibilities:**

- Pre-qualify contractors based on their safety performance and safety programs.
- Inform contract employees of particular chemical release hazards of each work location.
- Familiarize all contractor personnel of emergency action plans in response to accidental release of chemicals or other facility

emergencies, particularly evacuation plans and assembly.

- Develop and implement safe work practices to provide for the control of all known hazards dealing with contractor operations, such as Lockout / Tagout, confined space entry, entrance to vessels, piping, valves, etc.
- Implement procedures to control contractor personnel movement within the covered process area.
- Review contractor performance per their responsibilities.

## **26.2 Contractor Responsibilities**

Train, document and verify understanding of each employee based upon:

- Known chemical, fire, explosive and toxic potential of each process they will work with.
- Relevant parts of the emergency action plan including evacuation routes, assembly areas, emergency showers and phones.
- Use of, and adherence to, the safe work practices for Lockout / Tagout, confined space entry, vessel entry, line breaking procedures, etc.
- Communicate to the owner any unusual hazard created by our work or any other hazard identified during work.

Using and communicating these basic understandings of the process safety management standard will lower the probability of catastrophic release of energy at the facility.

The Air-Source International Safety Department will assist in the constructing of all Process Safety Management Action Plans.

## **27.0 CRISIS MANAGEMENT PLANNING**

### **28.0 ASBESTOS AWARENESS TRAINING**

#### **28.1 PURPOSE:**

The purpose of this training is to provide Air-Source International personnel with an awareness level knowledge of asbestos, what it is, where it is and what our procedures are for dealing with it. As a mechanical contractor, asbestos removal and abatement are not part of our job. However the nature of our work often places us in close proximity to asbestos containing material. In order to avoid exposure to ACM and contamination of work areas, a working knowledge is required.

#### **28.2 WHAT IS ASBESTOS?**

Asbestos is a name applied to six naturally occurring mineral fibers that are obtained through a mining process. The six types of asbestos are:

- Amosite
- Chrysotile
- Tremolite
- Actinolite
- Anthophyllite
- Crocidolite

The three most commonly encountered in our industry are Chrysotile (white), Amosite (off-white or brown) and Crocidolite (blue).

All forms of asbestos have a tendency to break into tiny fibers and can only be positively identified with the use of a microscope by trained and qualified personnel. Due to the microscopic size and relative weight, microscopic asbestos fibers can remain suspended in the air for extended periods of time, up to days.

The actual asbestos fibers are virtually indestructible. They are chemical and heat resistant and very stable in our environment. Asbestos cannot be dissolved in water and cannot be broken down over time. Because of these properties, asbestos is the best insulator known to man and has been used, historically in over 3,000 different products.

Asbestos is usually mixed with other materials to actually form products. Per OSHA regulations, any product or material containing 1% or more asbestos is classified as an "Asbestos Containing Material" or (ACM).

### **28.3 WHERE IS ASBESTOS FOUND?**

Any building constructed after 1978, by law, should be asbestos free. It is important to note that the definition of "asbestos free" has changed due to lowering the threshold for ACM to 1%. Asbestos containing materials have been found in structures built into the early 1980's. However, much of our work is performed in structures built prior to 1978. It is a certainty that these building contain asbestos containing materials.

As a mechanical contractor, we can encounter (ACM) in the following areas:

- Sprayed on fire proofing and insulation.
- Pipe and boiler insulation.
- Transite pipe.
- Wall and ceiling insulation.
- Ceiling tile.
- Floor tile.
- Putties, caulks and cements.
- Transite panels used for siding. (can be found in booths and hoods where fire proofing is required)
- Plaster, wall and ceiling texture and older joint compound.

### **28.4 WHEN IS ASBESTOS DANGEROUS?**

The most common way for asbestos to enter the body is through breathing. In fact, asbestos containing material is not generally considered to be harmful unless it is releasing dust or fibers into the air where they can be inhaled or digested. Many of the fibers will become trapped in the mucous membranes of the nose and throat where they can then be removed, but some may pass deep into the lungs, or if swallowed, into the digestive tract. Once they are trapped in the body, the fibers can cause health problems. Asbestos is hazardous when it is friable. The term "friable" means that the asbestos is easily crumbled by hand, releasing fibers into the air. Sprayed on asbestos insulation is highly friable. Floor tile containing asbestos is not

friable.

Asbestos containing ceiling tile, floor tile, transite siding or panels, fire doors, finished walls, etc. will not release asbestos fibers unless they are disturbed or damaged in some way. As an example, if an asbestos ceiling tile is drilled or broken, it may release fibers into the air. If it is left alone and not disturbed, it will not.

Asbestos pipe and boiler insulation does not present a hazard unless the protective canvas covering is cut or damaged in such a way that the asbestos underneath is actually exposed to the air.

Damage and deterioration will increase the friability of ACM. Water damage, continual vibration, aging and physical impact such as drilling, grinding, buffing, cutting, sawing, or striking can break the materials down causing fiber release.

### **28.5 HEALTH EFFECTS**

Because asbestos fibers are virtually indestructible, the body cannot break them down or remove them once they are lodged in the lungs or body tissue. They remain in place where they can cause disease.

There are three primary diseases associated with asbestos exposure:

- Asbestosis
- Lung Cancer
- Mesothelioma

#### **Asbestosis**

Asbestosis is a serious, chronic, non-cancerous respiratory disease. Inhaled asbestos fibers aggravate lung tissue, which causes the tissue to scar.

#### **Lung Cancer**

Lung cancer causes the largest number of deaths related to asbestos exposure. The incidence of lung cancer in people who are directly involved in the mining, milling, manufacturing and use of asbestos is much higher than the general population.

People who have been exposed to asbestos and are also exposed to some other carcinogen, such as cigarette smoking, have a significantly greater risk of developing lung cancer than people who have only been exposed to asbestos. One study found that asbestos workers who smoke are about 90 times more likely to develop lung cancer than people who neither smoke nor have been exposed to asbestos.

#### **Mesothelioma**

Mesothelioma is a rare form of cancer which most often occurs in the thin membrane lining of the lungs, chest, abdomen and heart. About 200 cases are diagnosed each year in the United States.

### **28.6 HOW TO AVOID ASBESTOS EXPOSURE**

This program has been designed to increase your awareness and knowledge of the possible location of Asbestos Containing Materials and the hazards associated with exposure.

The Air-Source International Policy and Procedures for Asbestos Containing Materials is design to protect all Murphy personnel from contact with and exposure to asbestos fibers.

Strict adherence to this policy is mandatory.

### **28.7 AIR-SOURCE INTERNATIONAL“ACM” POLICY.**

**AIR-SOURCE INTERNATIONAL EMPLOYEES AND SUBCONTRACTORS ARE PROHIBITED FROM PERFORMING ANY WORK, WHICH REQUIRES THE DISTURBANCE OR REMOVAL OF ANY ASBESTOS CONTAINING MATERIAL.**

### **28.8 PROCEDURES**

All of the above materials must be considered to be Asbestos Containing until Air-Source International is provided written **documentation** indicating otherwise.

1. Assume material is asbestos.
2. Do not disturb.
3. Contact Project Manager or Safety Department.
4. The Project Manager or Safety Department will take care of getting the necessary documentation.
5. **Do not proceed with work without documentation.**
6. If documentation indicates the presence of asbestos, the client must have the condition abated prior to the commencement of work. In the event documentation indicates that an area has been abated and there is belief that a problem still exists, contact the Safety Department for review.

### **FOR YOUR INFORMATION**

#### **28.8.1 ABATEMENT PROCEDURES**

All asbestos **abatement** must be performed by an **Asbestos Abatement Specialty Contractor**. Abatement contractors employ certified abatement personnel and provide the only legal method of asbestos removal. The two basic methods of asbestos abatement are removal and encapsulation.

1. Removal - The area removal of asbestos requires the area to be isolated with a negative pressure atmosphere. The atmosphere in the isolated area must be continuously monitored for asbestos content. Exhaust air from the isolated area must pass through High-efficiency filter to prevent contamination of surrounding areas. When abatement is completed, a clean air test must be accomplished before the negative pressure isolation can be eliminated.  
Removal - Spot removal, such as clearing a piece of pipe for cutting, can be accomplished utilizing the glove bag method. This method isolates the material to be removed, contains that material and provides for safe disposal.
2. Encapsulation - This method utilizes a plasticized coating material which encases the asbestos and prevents erosion of the material and



airborne (friable) asbestos fibers. Encapsulation is utilized on the exposed ends of insulation when portions of the insulation are removed to allow us to perform our work. Care must still be taken to prevent damage to the encapsulated areas.

Encapsulation is truly an intermediate abatement step. It prevents the asbestos containing material from being hazardous in an undisturbed state.

**POLICY AIR-SOURCE INTERNATIONAL EMPLOYEES AND SUBCONTRACTORS ARE PROHIBITED FROM PERFORMING ANY WORK WHICH REQUIRES THE DISTURBANCE OR REMOVAL OF ANY ASBESTOS CONTAINING MATERIAL.**

### **28.9 EMERGENCY ACTION**

In the event of a disturbance of suspected Asbestos Containing Material (ACM), specific procedures must be followed to minimize and control potential exposure to our employees, our Client and the General Public.

1. Isolate area to control traffic in any potentially contaminated area.
2. Contact the following personnel immediately so that appropriate measures and actions can be taken.

Job site Project Manager

Safety Department

**Note: In the event Air-Source International Personnel are unable to properly isolate an area and control traffic, the appropriate Owner/Client Representative must be contacted immediately.**

### **Safety Department Personnel**

Corporate Safety Director Safety Manager

(305) 823-0740 Office

### **29.0 Lead Paint Awareness Training**

#### **29.1 Purpose**

The purpose of this training is to provide Air-Source International Personnel with an awareness-level knowledge of lead paint, what it is, where it is, and what are the procedures for dealing with it. As a mechanical contractor, removing or complete abatement of lead paint are not activities associated with our tasks. However, the nature of our work often places us in close proximity to chipping paint or dust from chipped paint.

#### **29.2 Lead Paint and the Hazards of Exposure**

“Lead” means metallic lead, all inorganic lead compounds, and organic lead soaps. Lead is a highly toxic compound that produces a wide range of adverse health effects.

Exposure to excessive levels of lead for children can cause brain damage, kidney damage; impair hearing, vomiting, headaches and appetite loss. In adults, lead can increase blood pressure and can cause digestive problems, kidney damage, nerve disorder, sleep problems, muscle and joint pain and even mood changes.

### **29.3 Where It Is Found**

There are many ways in which humans are exposed to lead. The most common work related exposure for the mechanical trades comes from leadbased paints.

Most paint made and used after 1978 contains no intentionally added lead since it was banned from use on the interior and exterior of homes.

However, any paint made before 1978 has strong potential to contain lead. Many of the facilities in which Air-Source International performs work have process piping that was installed and painted prior to 1978. Lead paint may be found on flanges, bolts, and even walls that require the disturbance of the paint in order to perform the work.

### **29.4 Policy**

Air-Source International employees are not to engage in grinding, wire brushing, chipping, sanding, welding or any other activity that would disturb leadbased paint.

Painted surfaces on flanges, pipe, walls or any other surface of an employees work area that will be disturbed must be identified by the Owner or General Contractor as to its contents. Written documentation of lead free paint, or abatement, must be provided to Air-Source International prior to proceeding with any work activity that will disturb the painted surface.

Welding and cutting activities that potentially involve lead exposure can be especially hazardous. Lead exposure hazards are created when a piece of lead-based painted steel is heated to the melting point of the paint, either by an oxyacetylene torch or an arc welder. In this situation, lead becomes airborne as a volatized component of the coating.

Any welding, burning, or cutting on a lead-based painted surface cannot be made until a minimum of 4" is abated on each side of the area to be worked.

### **30.0 Daily Pre-Task Planning Observations**

The following list of "Best Practices" has been created by the Murphy Company Craft Safety Committees. The individual committees identified their most common tasks and carefully planned and listed the proper way to conclude the task in a safe manner.

The Quality Connection Committee has provided some helpful reminders for each identified observation.

These items, as well as the entire Safety Manual, may be used to assist foreman in the preparation of the Daily Pre-Task Planning Safety Meetings.

For a complete list of *ALL* Best Practices, please refer to the Murphy Company Best Practice Manual.

1. Ladder Usage
2. Scaffolding
3. Electrical Concerns
4. PDQ Saws
5. Plasma Cutting

- 6. Powered Hand Tools
- 7. Cutting Torches
- 8. Chop Saws
- 9. Core Drilling
- 10. Boom Lifts
- 11. Scissors Lifts
- 12. Material and Equipment Handling
- 13. Cutting in Roof Mounted Curbs
- 14. Loading and Unloading Trucks
- 15. PVC Installation
- 16. Duct Demolition
- 17. Duct Modification
- 18. Duct Assembly
- 19. Installing Underground Duct
- 20. Hanging Duct

**LADDERS YES NO N/A**

- 1. Ladders are free of defects such as broken or missing rungs, damaged hardware, cracked side rails? \_\_\_ \_\_\_ \_\_\_
- 2. Ladders are placed on a firm surface to avoid settlement or possible tipping while being secured? \_\_\_ \_\_\_ \_\_\_
- 3. Straight and extension ladders are secured at the top immediately after being placed in its desired location? \_\_\_ \_\_\_ \_\_\_
- 4. Employees face the ladder and use both hands when climbing up or down? \_\_\_ \_\_\_ \_\_\_
- 5. When employees reach from the ladder they maintain their center of gravity by ensuring their belt buckle does not extend past the side rail? \_\_\_ \_\_\_ \_\_\_
- 6. Ladders are staged in a manner that avoids being hit by equipment or opening doors? \_\_\_ \_\_\_ \_\_\_
- 7. Ladders are taken down when no longer needed? \_\_\_ \_\_\_ \_\_\_
- 8. One employee at a time is allowed to use the ladder? \_\_\_ \_\_\_ \_\_\_
- 9. Tools, material and equipment are hoisted by hand lines or other similar means, allowing employees to maintain a three point stance on the ladder at all times? \_\_\_ \_\_\_ \_\_\_
- 10. Straight and extension ladders extend 36" above the landing being accessed? \_\_\_ \_\_\_ \_\_\_
- 11. Ladders are placed at a pitch of 1 foot out from vertical for every 4 feet of ladder height? \_\_\_ \_\_\_ \_\_\_

Explain any NO answers:

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**Quality Reminders:**

- Be considerate of the client and don't block access to building, doorway or aisle.

1

**SCAFFOLDING YES NO N/A**

1. All scaffolds are erected, moved, dismantled under the direct supervision of a competent person? \_\_\_ \_\_\_ \_\_\_
2. Scaffolds are designed to support 4 times its intended load? \_\_\_ \_\_\_ \_\_\_
3. Scaffolding is placed on solid footing? \_\_\_ \_\_\_ \_\_\_
4. Each scaffold six feet or more above a lower level is equipped with handrails, mid rails and toe boards? \_\_\_ \_\_\_ \_\_\_
5. Scaffolds are properly tagged indicating any danger and listing any special personal protective equipment needed? \_\_\_ \_\_\_ \_\_\_
6. Good housekeeping is maintained at all times on scaffold decks? \_\_\_ \_\_\_ \_\_\_
7. Access and egress at grade is free of tripping hazards? \_\_\_ \_\_\_ \_\_\_
8. Wheels on rolling scaffolds are locked in place at all times while being used by employees? \_\_\_ \_\_\_ \_\_\_
9. Proper access is provided (i.e. ladders)? \_\_\_ \_\_\_ \_\_\_
10. Scaffolding is being constructed a minimum of 10 feet from power lines; lines are protected or de-energized? \_\_\_ \_\_\_ \_\_\_

Explain any NO answers:

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**Quality Reminders:**

- Are you blocking any of the client's entrances or equipment?
- Have you coordinated the building of scaffolding with the client and/or general contractor to determine there is not a conflict of space?

2

**ELECTRICAL CONCERNS YES NO N/A**

1. Cords are organized, (running overhead when possible) to avoid tripping hazards? \_\_\_ \_\_\_ \_\_\_
2. Cords are protected from being run over by man-lifts, dollies, etc? \_\_\_ \_\_\_ \_\_\_
3. All temporary lighting is equipped with cages to protect light bulbs? \_\_\_ \_\_\_ \_\_\_
4. Ground Fault Circuit Interrupters are used on all electrically operated tools and equipment? \_\_\_ \_\_\_ \_\_\_

5. Suitable means of identifying voltage is used?  
(Especially important on projects where two or more are used, such as 110 and 220) \_\_\_ \_\_\_ \_\_\_
6. All disconnects are properly marked to indicate their purpose? \_\_\_ \_\_\_ \_\_\_
7. All electrical panels are properly covered with no exposed circuit breakers? \_\_\_ \_\_\_ \_\_\_
8. All cords on electrical tools are free of nicks and cuts. Cords are not repaired with electrical tape? \_\_\_ \_\_\_ \_\_\_
9. Cords are not allowed to lay in water creating an electrical hazard? \_\_\_ \_\_\_ \_\_\_

Explain any NO answers:

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**Quality Reminders:**

- Make life easier for everyone - whenever possible, tag both ends of long extension cords with your craft and primary cord use. This will save everyone effort at tracking down who is using the cord whenever someone needs to use or shutdown the outlet.

3

**PDQ SAW USAGE YES NO N/A**

1. Proper personal protective equipment is being worn by all employees (safety glasses, face shield, long sleeve shirts)? \_\_\_ \_\_\_ \_\_\_
2. Employees are using proper position and form; Back straight, balance maintained, clear of spray or sparks and out of the path of the saw? \_\_\_ \_\_\_ \_\_\_
3. The area is in good condition for the cut, flat and free of debris? \_\_\_ \_\_\_ \_\_\_
4. A fire extinguisher is staged in the immediate area and ready for use? \_\_\_ \_\_\_ \_\_\_
5. Employee responsible for extinguishing a potential fire has been trained to use fire extinguisher? \_\_\_ \_\_\_ \_\_\_
6. If using a gas unit, the gas is stored properly a minimum of 25 feet from the work area? \_\_\_ \_\_\_ \_\_\_
7. If using an electric unit, Ground Fault Circuit Interrupters are being used and working properly? \_\_\_ \_\_\_ \_\_\_
8. Saw is stored properly between cuts? \_\_\_ \_\_\_ \_\_\_
9. The blade of the saw is in good condition? \_\_\_ \_\_\_ \_\_\_
10. Fumes are properly dispersed from employees? \_\_\_ \_\_\_ \_\_\_
11. Other crew members positioned out of path of saw? \_\_\_ \_\_\_ \_\_\_

Explain any NO answers:

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**Quality Reminders:**

- Lack of knowledge of the proper usage of this tool and all tools could cause delays on the job and the quality of your time management would be in question.
- Keeping your work area neat shows your team player attitude and pride in a quality job.
- Will the noise from the use of this tool disturb client/customer?

4

**PLASMA CUTTING YES NO N/A**

1. Required permits have been obtained and employees are complying with requirements? \_\_\_ \_\_\_ \_\_\_
2. A fire extinguisher has been placed in the immediate area of the cutting operation? \_\_\_ \_\_\_ \_\_\_
3. Do fire watch personnel observe the area for a minimum of ½ hour after cutting is complete to ensure smoldering material is completely extinguished? \_\_\_ \_\_\_ \_\_\_
4. Fire blankets are used to contain sparks and hot metal from the surrounding area? \_\_\_ \_\_\_ \_\_\_
5. Hood used is equipped with a minimum shade 10 lens? \_\_\_ \_\_\_ \_\_\_
6. The area is adequately ventilated? \_\_\_ \_\_\_ \_\_\_
7. The machine has the proper voltage? \_\_\_ \_\_\_ \_\_\_
8. All required personal protective equipment is being worn by the employees. (Hard hats, gloves, long sleeves/leather, lens and face protection)? \_\_\_ \_\_\_ \_\_\_

Explain any NO answers:

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**Quality Reminders:**

- In existing buildings, help protect our customers property by covering up anything that could be damaged by showering sparks from plasma cutting.
- Let your co-workers know before you begin cutting so they can protect themselves and their equipment.

5

**POWERED HAND TOOLS YES NO N/A**

1. Tools have been inspected to ensure all required safety guards are installed and the tool is working properly? \_\_\_ \_\_\_ \_\_\_
2. The operator of the tools has been trained to use it and demonstrates proficiency? \_\_\_ \_\_\_ \_\_\_

3. Required permits have been obtained and employees are complying with requirements? \_\_\_\_ \_\_\_\_ \_\_\_\_
4. Ground Fault Circuit Interrupters are used as needed and are working properly? \_\_\_\_ \_\_\_\_ \_\_\_\_
5. Proper voltage for the tools is determined and used? \_\_\_\_ \_\_\_\_ \_\_\_\_
6. Employees are using the required personal protective equipment. (Hard hats, safety glasses, face shields, goggles, hearing protection). \_\_\_\_ \_\_\_\_ \_\_\_\_
7. Housekeeping is maintained to avoid tripping, slipping or fall hazards? \_\_\_\_ \_\_\_\_ \_\_\_\_

Explain any NO answers:

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**Quality Reminders:**

- Will noise disturb the client or general public?
- Are cords creating tripping hazards for the client or general public?

6

**CUTTING TORCH YES NO N/A**

1. Area is free of flammable and combustible material? \_\_\_\_ \_\_\_\_ \_\_\_\_
2. Fire extinguishers are located within 25 feet of the cutting area? \_\_\_\_ \_\_\_\_ \_\_\_\_
3. Bottles are stored, used and transported in the upright position only? \_\_\_\_ \_\_\_\_ \_\_\_\_
4. Gauges are in good working condition and equipped with a reverse flow check valve? \_\_\_\_ \_\_\_\_ \_\_\_\_
5. Employees are aware they should never use oil on the gauges or hoses for any reason? \_\_\_\_ \_\_\_\_ \_\_\_\_
6. Gauges are opened slowly to check for leaks? \_\_\_\_ \_\_\_\_ \_\_\_\_
7. Employees are wearing the proper personal protective equipment? (Cutting goggles, long sleeve shirt, cutting gloves that are free from oil and grease)? \_\_\_\_ \_\_\_\_ \_\_\_\_
8. When completed, bottles are broken down, capped and properly stored? \_\_\_\_ \_\_\_\_ \_\_\_\_

Explain any NO answers:

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**Quality Reminders:**

- Communicate to all parties in the area what is going to take place so they can protect any of their tools, material, equipment, etc. that might be in the area.
- Preplan in advance with the crew so that everyone comes prepared wearing the proper clothing, etc.
- Pickup and cleanup the area well in advance so you can watch for anything that could be smoldering and cause a problem after you've left the area.

7

**CHOP SAW USAGE YES NO N/A**

1. Has the proper saw and blade for the material being cut been selected? \_\_\_ \_\_\_ \_\_\_
2. Does the chop saw have any obvious defects such as damage to the power cord or missing guard? \_\_\_ \_\_\_ \_\_\_
3. Are employees equipped with proper personal protective equipment? Hard hats, face shields, safety glasses, hearing protection? \_\_\_ \_\_\_ \_\_\_
4. Is the chop saw staged in a manner that avoids high traffic areas and tripping hazards? \_\_\_ \_\_\_ \_\_\_
5. Is the blade brought down onto the product in a smooth controlled manner? \_\_\_ \_\_\_ \_\_\_
6. Is excess material placed to avoid tripping hazards? \_\_\_ \_\_\_ \_\_\_
7. Is the material being cut locked into place prior to beginning the cut? \_\_\_ \_\_\_ \_\_\_
8. Are blades being replaced when worn or broken? \_\_\_ \_\_\_ \_\_\_

Explain any NO answers:

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**Quality Reminders:**

- A big issue when using the chop saw is noise. Need to consider if the noise will become an issue if you are working in a "populated area" or quiet zone such as a hospital.
- Just as keeping any extension cords or other excess material out of the traffic area is a safety issue, it is also a good way to ensure you are meeting your customers requirements.

8

**CORE DRILLING YES NO N/A**

1. Is the tool and core bit properly sized for the job? \_\_\_ \_\_\_ \_\_\_
2. Have proper precautions been taken to ensure utilities and/or post stress tension cables will not be in the path of the drill? \_\_\_ \_\_\_ \_\_\_
3. Does the machine have any obvious defects with the brake, switch gear, handles, anchors, etc.? \_\_\_ \_\_\_ \_\_\_
4. Is the drill protected with a Ground Fault Circuit



Interrupter? \_\_\_ \_\_\_ \_\_\_

5. Is proper personal protective equipment being worn by employees? (Hard hat, safety glasses, hearing protection)? \_\_\_ \_\_\_ \_\_\_

6. Are employees in the proper position to use the machine? \_\_\_ \_\_\_ \_\_\_

7. Are holes 2" and larger covered immediately after drilling? \_\_\_ \_\_\_ \_\_\_

8. When not used, is the core drilling machine stored properly? \_\_\_ \_\_\_ \_\_\_

Explain any NO answers:

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**Quality Reminders:**

- Make sure drop area is well marked and manned so as not to interfere with other people in the area.
- Since there is a possibility of water, make sure no other trades/customers have something on the floor that could be damaged.
- Coordinate well with other people in the area when operating this tool so that there is no possibility of electric and water being combined.

9

**BOOM LIFTS YES NO N/A**

1. Have all employees been trained to operate the lift? \_\_\_ \_\_\_ \_\_\_

2. Have the controls been tested prior to using the lift? \_\_\_ \_\_\_ \_\_\_

3. Are employees using a full-body harness with a lanyard secured to the basket? \_\_\_ \_\_\_ \_\_\_

4. Are platform decks free from oil, grease or other slick substances? \_\_\_ \_\_\_ \_\_\_

5. Are lifts being operated only on solid even surfaces? \_\_\_ \_\_\_ \_\_\_

6. Is the manufacturers rated capacity known and being observed by the operator? \_\_\_ \_\_\_ \_\_\_

7. Lifts are used only to position personnel, tools, and equipment? \_\_\_ \_\_\_ \_\_\_

8. Ground personnel are being kept away from under and near raised platforms? \_\_\_ \_\_\_ \_\_\_

9. Employees have a clear view of the area they are navigating? \_\_\_ \_\_\_ \_\_\_

10. If you must use a gas-powered lift indoors, once it's in the upright position, shutdown to avoid spreading fumes through the enclosed area. \_\_\_ \_\_\_ \_\_\_

Explain any NO answers:

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**Quality Reminders:**

- Demonstrating proper procedure while using this equipment will indicate to the customer how we will perform on the remainder of the project.
- Proper positioning of the equipment to ensure not interfering with anyone else on the site.
- Be careful to protect customer's flooring from oil/grease etc.
- Perform maintenance checklist prior to operation.

10

**SCISSORS LIFTS YES NO N/A**

1. All employees have been trained to use the specific model on site? \_\_\_ \_\_\_ \_\_\_
2. Lifts are only moved in the fully down position? \_\_\_ \_\_\_ \_\_\_
3. Lifts are only used on a smooth, stable surface? \_\_\_ \_\_\_ \_\_\_
4. Lifts are only used to elevate personnel and small tools to the desired location? \_\_\_ \_\_\_ \_\_\_
5. All controls on the lift were tested prior to beginning actual work? \_\_\_ \_\_\_ \_\_\_
6. Lifts are prohibited from running over cords, welding lead, etc., that could be damaged by the lift? \_\_\_ \_\_\_ \_\_\_
7. Employees are utilizing fall protection and are tying off to a suitable anchorage point as required? \_\_\_ \_\_\_ \_\_\_

Explain any NO answers:

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**Quality Reminders:**

- Making sure the crew is utilizing fall protection and operating the lift in the proper manner will demonstrate Air-Source International's concern for clients/other workers in the area.
- Make sure you practice good preplanning such as making sure no cords, welding leads, etc. will be run over by the lift.

11

**EQUIPMENT HANDLING AND SETTING YES NO N/A**

1. Adequate pre-planning has been done to stage material? \_\_\_ \_\_\_ \_\_\_
2. There is proper access to the off-loading site where material is received? \_\_\_ \_\_\_ \_\_\_
3. A clear path has been established to move material? \_\_\_ \_\_\_ \_\_\_
4. Employees are wearing all of the required personal protective equipment? \_\_\_ \_\_\_ \_\_\_
5. If handling by hand, size up load, use proper lifting form: Straight backs, bend legs, don't over lift.

Get help or additional equipment if needed. \_\_\_ \_\_\_ \_\_\_

6. When handling material mechanically, only Air-Source International chokers, spreaders, shackles and lifting beams are used? \_\_\_ \_\_\_ \_\_\_

7. All rigging equipment has been inspected and found free of defects? \_\_\_ \_\_\_ \_\_\_

8. If crane is required, review hoisting MVP. \_\_\_ \_\_\_ \_\_\_

9. The area has been evaluated for overhead power lines. Rigging equipment, load lines, etc., are kept a minimum of 10 feet from power lines; lines are protected or de-energized? \_\_\_ \_\_\_ \_\_\_

10. Area is properly barricaded or flagged to warn co-workers of the demolition operation? \_\_\_ \_\_\_ \_\_\_

11. Crew is communicating with one another to ensure all understand the next step of the demolition? \_\_\_ \_\_\_ \_\_\_

Explain any NO answers:

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**Quality Reminders:**

- Communicate with the general contractor regarding the lift and notify all other trades.
- Preplan and communicate with suppliers and truck lines.

12

**CUTTING IN ROOF MOUNTED CURBS YES NO N/A**

1. Employees are wearing basic personal protective Equipment: hard hats, safety glasses, gloves, etc.? \_\_\_ \_\_\_ \_\_\_

2. If exposed to a fall of 6 feet or more, employees are protected by one of the following methods: Guardrail system, fall protection or restraint system? \_\_\_ \_\_\_ \_\_\_

3. Area to be cut is located and marked with special emphasis placed on the structural integrity of the roof to avoid soft spots? \_\_\_ \_\_\_ \_\_\_

4. Roof openings are covered or protected and properly identified when workers leave the area and at the end of the day? \_\_\_ \_\_\_ \_\_\_

5. Mechanical methods are used to hoist curbs to the roof? \_\_\_ \_\_\_ \_\_\_

6. All workers and hoisted material are kept a minimum of 10 feet from power lines. If not, the lines are de-energized or protected? \_\_\_ \_\_\_ \_\_\_

7. Installed curbs are properly attached and secured to the roof? \_\_\_ \_\_\_ \_\_\_

8. If electrical power tools are used, they are in good condition and Ground Fault Circuit Interrupters are used? \_\_\_ \_\_\_ \_\_\_

Explain any NO answers:

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**Quality Reminders:**

- Coordinate with general contractor regarding roof work so he can do his scheduling of the roofer is necessary.
- Coordinate with other trades that may be working below.

13

**LOADING AND UNLOADING TRUCKS YES NO N/A**

1. Employees are wearing the proper personal protective equipment: Hard hats, safety glasses, gloves?
2. Prior to unloading tools, equipment or material from the truck, the area was surveyed to ensure there was a clear area to place it?
3. Employees are communicating movements with one another?
4. Proper lifting techniques are used when manually loading or unloading?
5. Mechanical methods are used for heavy tools, equipment and material?
6. Truck bed and surrounding area is free of slick surfaces and/or tripping hazards?
7. Tools, equipment and material loaded are properly secured on the truck prior to departure?
8. Employees avoid jumping out of the bed of trucks to avoid the possibility of injury?

Explain any NO answers:

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**Quality Reminders:**

- Always communicate the movement of material and/or equipment with not just the crew, but any other trades working in your area.
- When surveying area where you will be unloading or loading, make sure area is clear and that any truck or equipment is not in a “no parking” zone or blocking another persons spot or drop-off zone.

14

**PVC INSTALLATION YES NO N/A**

1. Material Safety Data Sheets for all material is on site and workers know the location of them?
2. Proper personal protective equipment is being worn as required. Safety glasses,

goggles/face shields, hearing protection, respirators, fall protection, gloves, etc? \_\_\_ \_\_\_ \_\_\_

3. The area is properly ventilated? \_\_\_ \_\_\_ \_\_\_

4. Housekeeping is maintained, free from tripping and/or fire hazards? \_\_\_ \_\_\_ \_\_\_

5. Ground Fault Circuit Interrupters are being used on all electrical equipment? \_\_\_ \_\_\_ \_\_\_

6. Tools not in use are stored properly? \_\_\_ \_\_\_ \_\_\_

7. Excess material & scrap are promptly discarded or stored out of the way? \_\_\_ \_\_\_ \_\_\_

8. When cut-off saw is used, proper form is maintained? \_\_\_ \_\_\_ \_\_\_

Explain any NO answers?

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**Quality Reminders:**

- When glue/solvent is used, make sure ventilation is good so you don't interfere with other customer employees or trades in the area.
- As always, wearing the proper protective equipment will set the example for the others on the project and show our team-building spirit.

15

**DUCT DEMOLITION YES NO N/A**

1. Employees are wearing all the required personal protective equipment? \_\_\_ \_\_\_ \_\_\_

2. Have all possible contaminants been identified and abated accordingly, i.e., asbestos, lead, etc.? \_\_\_ \_\_\_ \_\_\_

3. For "hot work" activities, a designated fire watch is in place with suitable fire fighting equipment? \_\_\_ \_\_\_ \_\_\_

4. All required permits are obtained and used? \_\_\_ \_\_\_ \_\_\_

5. Duct is secured or otherwise determined that it will remain under control when cut loose? \_\_\_ \_\_\_ \_\_\_

6. Proper tools for the job are being used, (i.e., cutting torch, double cuts, sawzall, snips, etc)? \_\_\_ \_\_\_ \_\_\_

7. The work area is properly ventilated? \_\_\_ \_\_\_ \_\_\_

8. Ductwork is promptly removed from the immediate area to prevent tripping hazards? \_\_\_ \_\_\_ \_\_\_

Explain any NO answers:

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**Quality Reminders:**

- Communicate your plan for the system shutdown with the owner.
- Communicate with the other trades who may be working below.

16

**DUCT MODIFICATIONS YES NO N/A**

1. Are employees wearing the proper personal protective equipment: Hard hats, safety glasses, gloves? \_\_\_ \_\_\_ \_\_\_
2. Are the proper tools being used: Sawzall, double cuts, snips, cutting torch? \_\_\_ \_\_\_ \_\_\_
3. Has the area been surveyed for contaminants: Asbestos, lead paint, other hazardous material? \_\_\_ \_\_\_ \_\_\_
4. Has the interior of the duct been checked for contaminants? \_\_\_ \_\_\_ \_\_\_
5. Are proper respirators being worn as needed? \_\_\_ \_\_\_ \_\_\_
6. Are proper supports used to ensure safe removal of the duct? \_\_\_ \_\_\_ \_\_\_
7. Are all required permits issued for the work? \_\_\_ \_\_\_ \_\_\_
8. If hot work is being conducted, is a fire watch in the immediate area with the appropriate extinguishing media? \_\_\_ \_\_\_ \_\_\_

Explain any NO answers:

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**Quality Reminders:**

- If the duct modifications are being done in a public area, make sure all precautions are taken to protect the general public.
- Preplan the details well such as having all the tools gathered you will need, surveying the area for contaminants, etc., so you avoid any unnecessary/unscheduled shutdown.

17

**DUCT ASSEMBLY YES NO N/A**

1. Employees are wearing the proper personal protective equipment: hard-hats, safety glasses, gloves? \_\_\_ \_\_\_ \_\_\_
2. Proper lifting techniques and body positioning are used when handling duct? \_\_\_ \_\_\_ \_\_\_
3. Housekeeping is maintained in the area eliminating tripping hazards? \_\_\_ \_\_\_ \_\_\_
4. For large or heavy lifting, employees seek assistance from co-workers or use mechanical lifting devices? \_\_\_ \_\_\_ \_\_\_
5. Proper air pressure is being used with pneumatic hammers? \_\_\_ \_\_\_ \_\_\_

6. When using pneumatic hammers, hoses are pinned and secured to avoid accidental separation? \_\_\_\_ \_\_\_\_ \_\_\_\_

7. Employees are aware of pinch points and use caution to avoid them? \_\_\_\_ \_\_\_\_ \_\_\_\_

8. Duct is stored in a safe manner which allows access throughout the project? \_\_\_\_ \_\_\_\_ \_\_\_\_

Explain any above NO answers:

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**Quality Reminders:**

- Since duct is sometimes exposed, work neatly as well as safely, and keep those hammer marks off any ductwork.
- Storing the duct in a safe manner out of everyone's way will demonstrate to the other trades and the owner our teamwork philosophy.

18

**INSTALLING UNDERGROUND DUCT YES NO N/A**

1. Have utilities such as electric, water, gas, etc., been identified and located prior to digging? \_\_\_\_ \_\_\_\_ \_\_\_\_

2. Are employees wearing the proper personal protective equipment: Hard hats, safety glasses, gloves? \_\_\_\_ \_\_\_\_ \_\_\_\_

3. Has a barrier been provided to avoid accidental entry? \_\_\_\_ \_\_\_\_ \_\_\_\_

4. Is the excavation greater than four feet deep requiring an excavation competent person? \_\_\_\_ \_\_\_\_ \_\_\_\_

5. Is the excavation properly ventilated? \_\_\_\_ \_\_\_\_ \_\_\_\_

6. Are mechanical lifting methods being used for large duct? \_\_\_\_ \_\_\_\_ \_\_\_\_

7. Has proper access and egress been provided for employees entering and exiting the excavation? \_\_\_\_ \_\_\_\_ \_\_\_\_

Explain any NO answers:

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**Quality Reminders:**

- A lot of preplanning and teamwork is needed here such as making sure all underground utility locating has been done so you don't interrupt the customers business.
- Has all the preplanning been done to prepare for the excavation, backfill, concrete, hauloff, etc.?

19

**HANGING DUCT YES NO N/A**

1. Employees are wearing all of the required personal protective equipment? \_\_\_\_ \_\_\_\_ \_\_\_\_
  2. Employees can easily access their work area without maneuvering through tripping hazards? \_\_\_\_ \_\_\_\_ \_\_\_\_
  3. When lifting manually, employees demonstrate proper lifting techniques and seek assistance from co-workers for heavier pieces? \_\_\_\_ \_\_\_\_ \_\_\_\_
  4. Extension ladders are used in the fully open position only? \_\_\_\_ \_\_\_\_ \_\_\_\_
  5. Straight ladders are secured at the top to safeguard against displacement? \_\_\_\_ \_\_\_\_ \_\_\_\_
  6. Fall protection is used by all employees exposed to fall hazards greater than 6 feet? \_\_\_\_ \_\_\_\_ \_\_\_\_
  7. Duct hoists are used for large or heavy pieces of duct? \_\_\_\_ \_\_\_\_ \_\_\_\_
  8. Capacity of lifting devices is known and not exceeded? \_\_\_\_ \_\_\_\_ \_\_\_\_
  9. Power tools are in good condition and protected by Ground Fault Circuit Interrupters? \_\_\_\_ \_\_\_\_ \_\_\_\_
- Explain any NO answers:

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**Quality Reminders:**

- Other craftsmen notice the quality of the work being performed around them so be proud to show off your work.
- Make sure any ladders, duct hoists or lifting devices are not blocking public traffic.

20

REV 1/03

**31.0 Forklifts**

**31.1 Purpose**

Material handling is always a significant concern. During the movement of products and material, there are numerous opportunities for personal injury and property damage if proper procedures are not followed and caution is not used.

This section applies to all powered industrial trucks, hoists and lifting gear. The information in this section will be used to train prospective industrial truck operators and provide the basis for refresher training.

**31.2 Pre-Qualifications for Operators**

All candidates for PIT operators must meet the following basic requirements prior to starting training:



- A. Must have no adverse vision problems that cannot be corrected by glasses.
- B. No adverse hearing loss that cannot be corrected with hearing aids.
- C. No physical impairments that would impair safe operation of the PIT.
- D. No neurological disorders that affect balance or consciousness.
- E. Not taking any medication that effects perception, vision or physical abilities.

### **31.3 Training Content**

Training for Powered Industrial Truck (PIT) Operators, must be conducted by an experienced operator or vendor representative selected by Air-Source International. All operational training must be conducted under close supervision. All training and evaluation must be completed before an operator is permitted to use a PIT without continual and close supervision.

#### **31.3.1 Truck Related Training Topics**

The following topics, related to the PIT, should be covered and documented for each individual trained:

- A. Operating instructions, warnings and precautions, for the type of PIT the operator will be authorized to operate.
- B. Differences between the truck and the automobile
- C. Truck controls and instrumentation: where they are located, what they do and how they work.
- D. Engine or motor operation.
- E. Steering and maneuvering
- F. Visibility (including restrictions due to loading).
- G. Fork and attachment adaptation, operation and use limitations.
- H. Vehicle capacity
- I. Vehicle stability
- J. Any vehicle inspection and maintenance that the operator will be required to perform.
- K. Refueling and/ or charging and recharging batteries.
- L. Operating limitations.

#### **31.3.2 Workplace-related Topics**

The following workplace topics should be given to each employee that will be required to operate a PIT.

- A. Surface conditions where the vehicle will be operated.
- B. Composition of loads to be carried and load stability.
- C. Load manipulation, stacking and unstacking.
- D. Pedestrian traffic in the area where the vehicle will be operated.
- E. Narrow aisles and other restricted places where the vehicle will be operated.
- F. Ramps or other sloped surfaces that could affect the vehicles stability.

G. Closed environments and other areas where insufficient ventilation or poor vehicle maintenance could result in a build-up of carbon monoxide or diesel exhaust.

#### **31.4 General Workplace Rules**

A. Only authorized and trained personnel will operate PIT's.

B. All PIT's must be equipped with manufacturer's overhead protection, fire extinguisher, back-up alarm and seat belts. Seat belts must be worn at all times while operating.

C. The operator will perform daily pre- and post- trip inspections.

D. Any safety defects (such as hydraulic fluid leaks, defective brakes, steering, lights, horn, etc.) must be reported for immediate repair or have the PIT taken out of service.

E. Operators will follow the proper recharging or refueling safety procedures.

F. Loads must be tilted back and carried no more than six inches from the ground. Loads that restrict the operator's vision will be transported backwards.

G. PIT's should not travel faster than 5 mph or faster than a normal walk.

H. Operators should sound the horn when approaching pedestrian areas, turning corners and backing.

I. No passengers are allowed on the PIT. The PIT should have decals that clearly state, "NO PASSENGERS ALLOWED."

J. Aisles should be free of obstructions, marked and wide enough for vehicle operation.

K. Lift capacity must be marked on the PIT. Operators will ensure the load does not exceed the capacity.

L. Unattended PIT's will be turned off, forks lowered to the ground and parking brake applied.

M. Operators are instructed to report all incidents, regardless of fault or severity, to management immediately. Management will conduct an accident investigation as required.

#### **31.5 Pre-use Checklist**

Each shift, a check of the following items (as applicable) is to be conducted by the operator before the PIT may be used.

A. Lights

B. Horn

C. Brakes

D. Backup Warning Alarm

E. Fire Extinguisher

#### **31.6 Fork Truck Driving Tests and Written Evaluation**

The following Driving Test Evaluation and quiz must be administered to all employees required to operate a Fork Truck. An 80% score on the written

examination is required for certification, and all nine physical maneuvers must be successfully accomplished on the Fork Truck Driving Test. Retraining will be conducted for any deficiencies discovered during the evaluation.

## **31.8**

Name

Craft

Date

### **FORKLIFT OPERATION & SAFETY**

#### **Post – Quiz**

1. You should dismount your forklift:
  - A. Facing it.
  - B. Facing away from it.
  - C. Four point stance.
  - D. Three point stance.
2. Refueling is more dangerous and requires more attention with:
  - A. Propane forklifts.
  - B. Gasoline forklifts.
  - C. Battery forklifts
  - D. All of the above
3. During the pre-operational inspection you should check:
  - A. Hydraulic system
  - B. Dock Plates
  - C. Brakes
  - D. Tires
4. When picking up a load:
  - A. Lift and then tilt the load back slightly.
  - B. Never exceed the rated load capacity of the forklift
  - C. Lower the load to about two feet off the floor.
  - D. Check under the load to make sure it is secure.
5. When traveling up or down on incline:
  - A. Avoid inclines and take another route.
  - B. Travel forward going down and backward going up.
  - C. Travel backward going down and forward going up.
  - D. Lower and tilt the load slightly forward so you can see.
6. Riders can ride on your forklift if they:
  - A. Ride on the forks
  - B. Ride in the seat next to you
  - C. Ride in back
  - D. None of these
7. When approaching blind spots or aisles:
  - A. Stop and check for danger
  - B. Sound the horn
  - C. Slow down
  - D. Always travel in reverse

8. Which of these points is the most important cause of accidents when traveling with loads:

- A. Speed
- B. Slippery floors
- C. Starts and stops
- D. Overhead obstacles

9. When raising a load the vehicle center of gravity:

- A. Shifts toward the back
- B. Shifts to the side
- C. Shifts forward
- D. Remains the same due to counter weights.

10. When stacking a load you should:

- A. Get out and check the stacking spot before you lower the load.
- B. Tilt the load forward before moving over the stack to make the load level.
- C. Never move backward with the load raised.
- D. Tilt the load forward only when over the stack.

11. When you leave your forklift:

- A. Never leave it in front of doorways or emergency exits.
- B. Lower forks two to four inches off the floor.
- C. Take the key with you.
- D. All of the above.

12. If your vision is obstructed when traveling with a load:

- A. Raise the load so you can see under it.
- B. Lower and tilt the load forward so you can see over it.
- C. Travel in reverse
- D. Travel forward.

13. A license is needed for which devices:

- A. Forklifts
- B. Powered hand trucks
- C. Manual hand trucks
- D. Hand carts.

14. Class DY forklifts have what type of power source?

- A. Propane
- B. Diesel Fuel
- C. Gasoline
- D. Battery

15. Class E forklifts can operate in:

- A. Any environment, because they are electric powered.
- B. Any environment, because they are LP powered.
- C. Only in open air or non-hazardous environments.
- D. Areas where flammable liquids are handled.

## **32.0 Incident Without Injury Identification and Processing**

### **32.1 Definition**

IWI's are: Opportunities to improve safety practices based on a condition, or an incident, with potential for a more serious consequence. This means an IWI is *anything* that a witness views as potential to cause harm.

“**NEAR MISS**” is **history**. The IWI Report replaces the previously used near miss report.

### **32.2 Classifying Incident Without Injury Cases. (Level 1 or 2)**

Since the IWI is a broader focus on hazard recognition, it is important to classify the IWI based on the potential severity of the incident as well as the company wide benefits of sharing the information.

**32.2.1 Level 1 IWI Cases** are those that involve routine or common tasks and have consequences of a lesser nature. They include important issues of hazard awareness, but do not merit **immediate** company-wide distribution.

*Example: An employee steps over a pile of construction debris that has been carelessly placed in a designated walkway.*

**32.2.2 Level 2 IWI Cases** are cases that, when distributed, will have a meaningful and positive effect on the entire company. These cases include situations where an employees narrowly missed serious injury or may have caused significant property damage. Level 2 case reporting significantly benefits ALL employees.

*Example: During a weekly audit a Project Manager or Foreman discovers we have been using grinding wheels that do not match the RPM's of the grinder. We could have had a grinding wheel explosion at anytime. We must take steps to ensure we do not have the same exposure on another project.*

### **32.3 IWI Reporting**

After the Project Manager or foreman has classified the incident as either a level 1 or level 2 case, the following reporting criteria should be followed:

**Level 1 cases** are handled promptly, without corporate assistance. The foreman or project manager will determine what corrective action must be taken and immediately implement and/or coordinate the change. **Level 1 case reports are only submitted when the Project Manager or Foreman believes there is company wide value.**

**Level 2 cases** must immediately be reported to the home office. The safety department will determine the level of investigation that should be placed on the incident. In some cases, where the root cause is not readily apparent, an incident investigation team will be assembled on site to conclude the report. In other cases, the foreman along with the Project Manager will submit a report for distribution. Level 2 cases are always of value to the entire company and will be distributed accordingly. **Reports are sent to the home office as soon as possible on Level 2 IWI Cases.**

### **32.4 Sharing the information**

- All level 2 IWI cases will be maintained in a real-time database. Project Managers or Sponsors will have the ability to access the information in preparation for weekly safety meetings or monthly safety lunches.
- Level 1 cases of value should be submitted to the office on a weekly basis for entry into the database.

- Level 2 cases with corrective action will also be included in the monthly Safety Notice publication.

## 32.4

### Incident Without Injury Report (IWI)

#### LEVEL 1 or 2

PROJECT: ANHEUSER BUSCH LOCATION: TEXAS

DATE: 00/00/00 SUBMITTED BY: JOHN DOE

#### Describe what happened:

AN OPERATOR WAS DIRECTED TO DIG A TRENCH ALONG THE WEST SIDE OF THE ACC NORTH TO THE MIDDLE OF THE STRUCTURE. A 480 VOLT TEMPORARY LINE HAD PREVIOUSLY BEEN BURIED IN THE VICINITY. THE OPERATOR DEVIATED FROM HIS PATH TO AVOID A CRANE. THIS PLACED THE 480 VOLT CABLE 5 FEET FROM ITS INTENDED LOCATION. UNAWARE OF THIS, MR. MILLHOUSE CUT DIRECTLY THROUGH THE ENERGIZED 480 VOLT LINE.

#### Immediate Resolution:

1. IMPROVE AS BUILT, DOCUMENT SYSTEM
2. MARK RED TAPE, ALL BURIED ELECTRICAL
3. USE LOCATOR FOR ALL EXCAVATIONS
4. DIG WHERE DIRECTED DO NOT DEVIATE
5. HAND DIG IF NECESSARY
6. USE ELECTRICIAN AND OPERATOR FOR LOCATING CABLE

#### Corporate Resolution (for level two reports only)

Distribution method: (ie Monthly Notice, *Database*, etc.) DATABASE

Was a Project Safety Analysis performed on this project? Does it address this activity? \_\_\_\_\_

Is there a Best Practice that addresses this incident? NO If so, which one ?

OFFICE USE ONLY

## 32.5

### Incident Without Injury Report (IWI)

#### LEVEL 1 or 2

PROJECT: LOCATION:

DATE: SUBMITTED BY:

#### Describe what happened:

#### Immediate Resolution:

#### Corporate Resolution (for level two reports only)

Distribution method: (ie Monthly Notice, Database, etc.)

Was a Project Safety Analysis performed on this project? Does it address this activity? \_\_\_\_\_

Is there a Best Practice that addresses this incident? If so, which one ?

OFFICE USE ONLY

## 33.0 Mold Awareness Program

### 33.1 Outline

- What To Do If You Find Mold
- Remediation
- Selection Of A Remediation Contractor
- Oversight And Follow-up
- Understanding Mold In The Workplace

### 33.2 What To Do If You Find Mold.

#### 1.) Documentation:

Accurate and complete documentation is necessary in proper reporting and handling of mold issues. Document the location of the

mold found within the building. Include date, time of day, weather conditions, name of the person who initially observed the condition and list any / all witnesses.

**2.) Photographs:**

Take several photos of the area. Photos should be digital with date encoding capability. The more photos the better. “A picture is worth a thousand words.”

**3.) Isolate The Area:**

Restrict workers and general public from entering an area where you have discovered mold. Use a railing system, danger barricade tape, or other barricade devices to block access. Post signage at the entrance to the area stating “Do Not Enter – Hazardous Area – No Trespassing.”

**4.) Notification:**

Report your discovery to the Project Manager and the Corporate Safety Director immediately.

**33.3 Remediation**

Air-Source International does not perform remediation work. We are not qualified for hazardous material handling, disposal or clean-up. Should we discover the existence of a mold condition on a project, it is our company policy to request that the owner and / or General Contractor obtain a licensed remediation sub-contractor to abate the condition.

The remediation sub-contractor will be responsible for all remediation activities including assessment, inspection, remediation, sampling, sample analysis, remediation and certification of results upon completion of the job. All sampling, including bulk / surface and air monitoring, must be performed by a qualified individual trained in the methodology for collection, handling and shipping. All analysis must be performed by a certified laboratory specializing in mycology.

**33.4 Selection Of A Remediation Contractor**

Typically the Owner / General Contractor will be making the selection of the remediation contractor. Items to consider when making the selection are:

- Obtain and verify the statements of qualification
- Check list of references
- Ensure that all insurance is current, meets minimum requirements, and includes indemnifications
- Ensure the subcontract agreement has been properly executed, prior to the commencement of work.

**33.5 Oversight and Follow-up**

The Owner / General Contractor’s responsibility is only to ensure that the remediation is accomplished in a safe manner, within the pre-determined timeframe and meets or exceeds OSHA regulations, industry standards and

the sub-contract agreement.

- The Owner's representative or the General Contractor's superintendent must ensure that the remediation subcontractor inspects to ensure that there has not been any damage to other materials within the structure.
- Ensure that all clean-up activities conform to OSHA Guidelines.
- Ensure that the subcontractor has removed all mold residue from the affected area(s) and have them sign-off on it.

### **33.6 Understanding Mold In The Workplace**

At times, we in the construction industry have encountered job environments containing mold and fungi. These conditions can be found in demolition work, remodels, new construction and tenant improvements. Currently, OSHA has not developed a standard to address mold and fungi in the workplace.

Although there is considerable debate in the scientific and medical community regarding possible hazards associated with mold and fungi, we should be aware of the current suspected hazard and effects of respirable or skin exposure. This section addresses:

- Health Issues
- Environmental Assessment

Many fungi (e.g., species of *Aspergillus*, *Penicillium*, *Fusarium*, *Trichoderma* and *Memnoniella*) in addition to *Stachybotrys Chartarum* (SC) can produce potent mycotoxins, some of which are identical to compounds produced by SC. Mycotoxins are fungal metabolites that have been identified as toxic agents. For this reason, SC cannot be treated as a uniquely toxic in indoor environments.

People performing renovations / cleaning of widespread fungal contamination may be at risk for developing Organic Dust Toxic Syndrome (ODTS) or Hypersensitivity Pneumonitis (HP). ODTS may occur after a single heavy exposure to dust contaminated with fungi and produces flu-like symptoms. It differs from HP in that it is not an immune-mediated disease and does not require repeated exposures to the same causative agent. A variety of biological agents may cause ODTS including common species of fungi. HP may occur after repeated exposures to an allergen and can result in permanent lung damage.

Fungi can cause allergic reactions. The most common symptoms are runny nose, eye irritation, cough, congestion and aggravation of asthma.

Fungi are present almost everywhere in indoor and outdoor environment. The most common symptoms of fungal exposure are runny nose, eye irritation, cough, congestion, and aggravation of asthma. Although there is evidence of documented severe health effects of fungi in humans, most of this evidence is derived from ingestion of contaminated food (i.e., grain and peanut products) or occupational exposures in agricultural settings where



inhalation exposures were very high. With the possible exception of remediation to very heavily contaminated indoor environments, such high level exposure is not expected to occur while performing remedial work.

### **33.6.1 Health Issues**

#### **33.6.1.1 Health Effects**

Inhalation of fungal spores, fragments (parts), or metabolites (e.g. mycotoxins and volatile organic compounds) from a wide variety of fungi may lead to or exacerbate immunologic (allergic) reactions, cause toxic effect, or cause infections.

There are only a limited number of documented cases of health problems from indoor exposure to fungi. The intensity of exposure and health effects seen in studies of fungal exposure in the indoor environment was typically much less severe than those that were experienced agricultural workers but were of long term duration. Illnesses can result from both high levels, shortterm exposures and lower levels, long-term exposures. The most common symptoms reported from exposure in indoor environments are runny nose, eye irritation, cough, congestion, aggravation of asthma, headache, and fatigue

The presence of fungi on building materials as identified by a visual assessment or by bulk surface sampling results does not necessitate that people will be exposed or exhibit health effects. In order for humans to be exposed indoors, fungal spores, fragments or metabolites must be released into the air and inhaled, physically contacted (dermal exposure) or ingested. Whether or not symptoms develop in people exposed to fungi depends on the nature of the fungal material (e.g., allergenic, toxic or infectious), the amount of exposure, and the susceptibility of exposed persons. Susceptibility varies with the genetic predisposition (e.g., allergic reactions do not always occur in all individuals), age, state of health and concurrent exposures. For these reasons, and because measurements of exposure are not standardized and biological markers of exposure to fungi are largely unknown, it is not possible to determine “safe” or “unsafe” levels of exposure for people in general.

#### **33.6.1.2 Immunological Effects**

Immunological reactions include asthma, HP, and allergic rhinitis. Contact with fungi may also lead to dermatitis. It is thought that these conditions are caused by an immune response to fungal agents. The most common symptoms associated with allergic reactions are runny nose, eye irritation, cough, congestion and aggravation of asthma. HP may occur after repeated exposures to allergen and can result in permanent lung damage. HP has typically been associated with repeated heavy exposures in agricultural settings but has also been reported in office settings. Exposure to fungi through renovation work may also lead to irritation or exacerbation of allergic or respiratory symptoms.

### **33.6.1.3 Toxic Effects**

A wide variety of symptoms have been attributed to the toxic effects of fungi. Symptoms such as fatigue, nausea, headaches and eye and/or respiratory irritation have been reported. Some of the symptoms related to fungal exposure are non-specific, such as discomfort, inability to concentrate and fatigue.

ODTS describes the abrupt onset of fever, flu-like symptoms, and respiratory symptoms in the hours following a single heavy exposure to dust containing organic material including fungi. It differs from HP in that it is not an immune-mediated disease and does not require repeated exposures to the same causative agent. ODTS may be caused by a variety of biological agents including common species of fungi (e.g., species of *Aspergillus* and *Penicillium*). ODTS has been documented in farm workers handling contaminated material but is also of concern to workers performing renovation work on building materials contaminated with fungi. Some studies have suggested an association between SC (*Strachybotrys Chartarum*) and pulmonary hemorrhage / hemosiderosis in infants, generally those less than six months old. Pulmonary hemosiderosis is an uncommon condition that results from bleeding in the lungs. The cause of this condition is unknown, but may result from a combination of environmental contaminants and conditions (e.g., smoking, fungal contaminants, other bioaerosols and water damaged homes) and currently its association with SC is unproven.

### **33.6.1.4 Infectious Disease**

Only a small group of fungi have been associated with infectious disease. Aspergillosis is an infectious disease that can occur in immune suppressed persons. Health effects in this population can be severe. Several species of *Aspergillus* are known to cause aspergillosis. The most common is *Aspergillus Fumigatus*. Exposure to this common mold, even to high concentrations is unlikely to cause infection in a healthy person. Exposure to fungi associated with bird and bat droppings (e.g., *Histoplasma capsulatum* and *Cryptococcus Neoformans*) can lead to health effect, usually transient flu-like illnesses in healthy individuals. Severe health effects are primarily encountered in immunocompromised persons.

### **33.7 Medical Evaluation**

Individuals with persistent health problems that appear to be related to fungi or other bioaerosol exposure should see their physician for a referral to a practitioner who is trained in occupational / environmental medicine or related specialties and are knowledgeable about these types of exposures. Infants (less than 12 months old) who are experiencing non-traumatic nosebleeds or are residing within dwellings with damp and moldy conditions and are experiencing breathing difficulties should receive a medical evaluation to screen for alveolar hemorrhage. Following this

evaluation, infants who are suspected of having alveolar hemorrhaging should be referred to a pediatric pulmonologist. Infants diagnosed with pulmonary hemosiderosis should not be returned to dwelling until remediation and air testing are completed.

### **33.8 Environmental Assessment**

The presence of mold, water damage, or musty odor should be addressed immediately. In all instances, any source(s) of water must be stopped and the extent of water damage determined. Water damaged materials should be dried and repaired. Mold damaged materials should be remediated by a licensed Remediation Contractor.

### **34.0 Reserved**

### **35.0 Reserved**