Company Safety Policy

This training plan, compliance with **MSHA 30CFR** 56/56.12016, 12017, and **OSHAS 29CFR** 18001-2007,1910.147, 1910.146, **Supersedes** FMMOP-002 Confined Space Entry Policy, FMMOP-003 Hot Work Policy, FMMOP-004 Open Hole Policy, FMMOP-006 Flagging and Barricading Policy, 98-005 Rev 6, **NFPA 70E** Standard for Electrical safety, has been developed solely for Advanced Lining Solutions, Inc. to protect the health and welfare of Advanced Lining Solutions, Inc. employees by MSHA certified trainer Humberto V. Delgado.

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SECTION A

PERSONAL PROTECTIVE EQUIPMENT PPE

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Morenci Safe Production Standard	Standard # 2.16	
	OHSAS 18001:2007	4.4.6
Personal Protective Equipment (PPE)	Revision #	00
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	Document Owner	Health and Safety

Approvals:			
Senior VP Morenci Operations:	10/28/2011	Safety Steering Committee:	10/28/2011

1.0 PURPOSE:

This standard requires that special protective equipment and special protective clothing shall be provided, maintained in a sanitary and reliable condition, and used whenever hazards of process or environment, chemical hazards, radiological hazards, or mechanical irritants are encountered in a manner capable of causing injury or impairment.

2.0 SCOPE:

2.1 This standard addresses minimum requirements in identifying, determining and managing the use of Personal Protective Equipment (PPE).

2.2 This standard applies to:

a) Employees and other individuals (including temporary employees and contractor personnel), company's visitors, or any other person(s) who work and/or are present in the workplace.

3.0 TERMS, DEFINITIONS AND ABBREVIATIONS

Terms, definitions and abbreviations which apply to this standard are:

3.1. Administrative Control – controls that reduce exposure to employees (i.e. employee's exposures by scheduling reduced work time, application of appropriate PPE, etc. in contaminant or hazardous areas). Also included here is employee training that includes hazard recognition and specific work practices that help reduce risk of an injury.

3.2. ANSI – stands for American National Standards Institute; a private non-profit organization that oversees the development of voluntary consensus standards for products, services, processes, systems, and personnel in the United States.

3.3. Engineering Control – control method by engineering out the identified hazard, either by initial design specifications or by applying methods of substitution, isolation, enclosure, or ventilation.

3.4. Eye and Face Protection – Protection equipment to reduce risks arising from flying particles or chemical substances which could cause injuries, e.g. facial burns, or foreign bodies entering the eye, etc.

3.5. Fall Protection Equipment – A support equipment to counteract the effects of a possible fall from above ground level. Safety harness, when used properly, will reduce fall induced injuries.

3.6. **Hand and Arm Protection** – Protection equipment to protect hands and arms from burns, cuts, abrasions, dermatitis, sensitization (allergies).

3.7. Hazard Identification and Risk Assessment – a process in identifying and evaluating hazards and risks associated with the hazards in the workplaces. These hazards/risks may be associated with machinery, equipment, tools, operations, materials, and the physical plant.

3.10. Hierarchy of Control – The hierarchy of control measure is a tool used to control Safety and Health related risks/impacts in the workplace, where all possible control options are ranked by order of effectiveness. The hierarchy of control is a useful tool, as the order tells you which types of control measure provides a better level of risk control. The higher in the hierarchy of control, the better and more reliable the control is. Preferably use control measures which are presented first, so far as is reasonably practicable.

Ranks of the hierarchy of control are:

- First option – Elimination measures;
- Second option – Substitution measures;
- Third option – Engineering control measures;
- Fourth option – Administrative control measures; and
- Fifth option – Use of appropriate Personal Protective Equipment (PPE).

3.11. NIOSH – stands for the National Institute for Occupational Safety and Health; the US Federal Agency responsible for conducting research and making recommendations for the prevention of work-related injury and ill health.

3.12 Operational Areas – Anywhere in or about the mine where work is being conducted or which is a part of the extraction or production process.

3.12. Protective Clothing – General apparel worn during working activities (usually in exposure to contaminant, corrosive, acid, etc.). It should be comfortable and allow for easy movement and air circulation.

3.13. PPE Matrix – a matrix generated based on the workplace hazard identification and risk assessment to indicate appropriate PPE to be used by workforces for specific task or tasks in the designated area or areas.

3.14. Respiratory Equipment – Equipment designed to give personal protection from exposure to air borne contaminants.

3.15. Safety Footwear – Steel Toe Protective footwear appropriate to hazard exposure risks. Types could include rubber, metatarsal, ankle support, insulated soles, or closed leather shoes. The wearing of soft tops or open sandals shall not be permitted due to the risk of puncture wounds, or chemical spill hazards.

3.16 Specialized PPE – Protective Equipment, other than that required for normal entry onto mining property, that is used to control exposure to unique hazards used or created as a result of the extraction and production process.

4.0 RESPONSIBILITIES:

4.1 Supervisors will ensure that their employees understand and follow this standard, including training on the use and care of PPE applicable to their areas and work duties. Employees will be provided with the P.P.E. necessary to complete all work in compliance with this standard. Supervisor's duties include evaluation of the work to be preformed, determination of the means of protection that will be used, and adherence to this standard.

4.2 Employees will follow this standard and notify their supervisor of any situations that do not comply with this standard. Employees will be responsible for learning when PPE is necessary and how to properly inspect and use forms of personal protective equipment.

4.3 Management will provide resources for supervisors and employees to comply with this standard. Resources may include information, training, time, money and PPE.

Implement this standard in area of responsibility. This includes:

(1) Ensuring that PPE assessments to determine appropriate PPE to be used are carried out, followed up and documented.
(2) Consulting Safety and Industrial Health Department on the use of specialized personal protective equipments (PPE) before purchasing it.
(3) Ensuring that PPE Program is in place, the PPE required is made available to all employees and visitors entering his/her area of responsibility.
(4) Ensuring that users of PPE are trained/fit-tested in the use and care of the PPE.
(5) Enforcing the wearing, maintenance, storing and proper disposal of PPE in area of responsibility.
(6) Controlling and documenting issuance of PPE in area of responsibility.
(7) When required, generating SOPs for the effective use of PPE.
(8) Reviewing and evaluating the effectiveness of the PPE program (at least through management self-audits).

4.4 Health and Safety Manager will provide OH&S advice for all Morenci Operations Personnel, and Contractor Companies to ensure that they meet their responsibilities and accountabilities relevant to the implementation of this standard.

4.5 Project Managers will ensure that contractors are informed of the standard and that contractors understand the requirement for compliance with the standard, including day to day oversight.

5.0 STANDARDS OF PERFORMANCE

GENERAL REQUIREMENTS

5.1 As the last means of control, correct selection and use of PPE shall be applied to protect employees against safety and health hazards [where other controls have failed or have been less effective], as well as complying with all legal requirements.

5.2 Special protective equipment and special protective clothing shall be provided, maintained in a sanitary and reliable condition and used whenever hazards of process or environment, chemical hazards, radiological hazards, or mechanical irritants are encountered in a manner capable of causing injury or impairment.

5.3 Where a risk assessment or other means of identification indicates the need for PPE, an evaluation shall be conducted to determine the type of PPE that would be required and where its use will be necessary. *See Attachment 10.3 titled PPE Assessment Guidelines.*

a) Consideration in determining the need to use PPE must be based on the hierarchy of control in which PPE is the last resort in protecting employees from risk exposures.
b) PPE recommended to be used shall be appropriate to the risk(s).
c) When required, consultative process with the health and safety department on use of specialized PPE, shall be carried out.
d) Matrix of approved PPE to be used shall be developed, communicated to employees and relevant parties, and updated. Use of the divisional HIRA matrices can be used as means of documenting the risks and PPE control measures specific to the area. See Attachment 10.4 titled An Example of PPE Matrix for an optional documentation method.

5.4 As a result of the PPE assessment, appropriate PPE shall be purchased, stocked in adequate supplies and made accessible for users.

a) Specialized PPE shall be issued at no cost to employees at intervals specified by the manager of each division. Employees are responsible for purchasing steel toe boots, and prescription safety eyewear as specified in the Morenci prescription safety glasses replacement standard.
b) Control of PPE issuance shall be regulated as deemed necessary by division management.
c) Selection, purchasing, including purchasing/obtaining for testing purpose, and stocking levels of new PPE not currently used on site shall be based on an initial review and approved through use of Morenci's management of change process.
d) Prior to the purchasing and stocking of new PPE, these products shall be evaluated and successfully tested for use at Morenci operation.

5.5 Where visitors and contractors working within Morenci Operational areas provide their own PPE, this PPE must comply with MSHA requirements and the intent of this standard.

5.6 Task Training on the use, maintenance, storage, replacement and disposal of PPE shall be in place.

a) Users of PPE shall be informed on the correct use of each PPE according to the task being conducted, manufacturer's specifications and the health and safety consequences of wearing PPE incorrectly.
b) Users of PPE shall be informed on the need for pre-use and post-use inspections that must be carried out and any periodic checks as required by the manufacturers of specific types of PPE.
c) Users of PPE shall be trained on how to store, handle, decontaminate and disposed of contaminated PPE.
d) Users of PPE shall be informed on the need for fit-testing when required.
    i. Personal Fall Arrest Equipment (Full Body Harnesses)
    ii. Respiratory Protection
    iii. Any other form of specialized PPE if required by the manufacturer

e) Users of PPE shall be trained on any new type of PPE introduced that is significantly different than current PPE in use.
f) Training documents and records shall be maintained for reference and potential audits.

5.7 Whenever PPE is required to be worn, appropriate and adequate signage shall be posted in conspicuous locations to remind users of their obligation to wear it.

5.8 PPE shall be correctly worn as specified by the original equipment manufacturers requirements and internal Standard Operating Procedures (SOP).

5.9 PPE shall be maintained in a clean and good state of repair, and must be replaced once it is no longer serviceable and/or defects which affect safety are identified.

a) Pre and post-use checks shall be carried out by users to ensure each PPE is in a serviceable condition at all times.
b) Periodic inspections on critical PPE such as harnesses, SCBA, shall be carried out by an assigned competent person, and the inspected PPE must documented.

5.10 Pre-employment and periodic medical check-ups shall include an evaluation to determine if employees are medically fit to wear a respirator and communicate such information to appropriate parties as required. *Refer to Morenci Operations Occupational Health Procedure.*

5.11 Unserviceable or damaged PPE shall be immediately removed from work locations and disposed of. Specialized PPE in which manufacturer specifications allow for refurbishment or repair of PPE components (i.e. certain self retracting lifelines) may be retained and sent for repairs. Until the PPE is shipped an out of service tag shall be affixed to the PPE in a readily identifiable location with the specific damage or defect listed on the tag.

5.12 When employees must store their PPE at work location, appropriate PPE storage shall be designated and maintained.

5.13 Any functional modification to PPE is prohibited.

6.0 REFERENCE DOCUMENTS

6.1 Management Procedure 4.3.1 – Hazard Identification Risk Assessment

6.2 Management Procedure 4.4.6.4 – Occupational Health Procedure

6.3 Mine Safety and Health Administration (MSHA), Subpart N Personal Protection

6.4 Occupational Safety and Health Administration (OSHA), 3151-12R 2003 on personal protective equipment.

7.0 RECORDS

Name of the Document	Responsible for Control	Records Retention
Original Document of this Standard	Health and Safety	Permanent
Risk Assessments (PPE Assessment Guidelines, HIRA Matrices)	Division Management	Permanent
Training Certificates	Division Management	Duration of employment, 3 years after employment relapse
Documents and records related to the implementation of this standard (SOP,s Fit Test Records, Inspection and/or Audit Findings	Division Management	**SOP's** - Permanent **Fit Test Records** - Duration of employment, 3 years after employment relapse **Inspection/Audits** – 1 year

8.0 APPENDICES

8.1 GUIDELINES FOR THE SELECTION AND USE OF PPE

8.2 PPE MATRIX (Optional use, the HIRA Matrix may be used as a risk management tool)

8.3 PPE ASSESSMENT GUIDELINES

8.4 HARD HAT EXEMPTION FORM

9.0 REVIEW AND CHANGE

All changes, modifications and/or revisions must be documented on the table below:

Description of Changes to this Document

GUIDELINES FOR THE SELECTION AND USE OF PPE – Appendix 8.1

1. PPE Assessment and Matrix

a. An assessment shall be carried out to determine what type of PPE is required to be used for specific task(s) and/or work location(s). *Refer to Attachment 10.3 titled PPE Assessment Guidelines*
b. This assessment shall be used as the basis for the development of a PPE matrix showing what types of PPE are to be worn. *Refer to Attachment 10.4 titled An Example of PPE Matrix.*
c. All PPE shall comply with this standard, and national and/or international OH&S legislations.
d. Relevant documents and records of PPE assessment, including selection of appropriate PPE to purchase and stock, shall be maintained and updated.

2. Issuance of PPE

a. An adequate supply of PPE shall be made available at all times.
    i. The general warehouse is the only approved locations within Morenci to purchase and stock approved PPE for use on Morenci property.
    ii. All Specialized PPE shall be issued at no cost to employees at intervals specified by the manager of each division.
    iii. In certain cases, such as issuance of respiratory protection, a medical review and fit test shall be conducted by relevant experts such as a medical doctor prior to use.
b. Issuance of PPE shall be recorded and appropriately controlled.

3. Fitting and Instructions

a. Fitting and instructions in the use of PPE shall be included in the initial training (SHE Induction training) for new employees and visitors.
    i. In a case where newly introduced PPE will be used, appropriate session(s) shall be organized to meet the employees' training requirement.
    ii. At minimum, the following instructions shall be part of the PPE training/awareness program:

    • When PPE is to be used;
    • What type of PPE is to be used;
    • How to properly put on, take off, adjust and wear the PPE.
    • The limitations of PPE;
    • Proper care, pre and post-use checks, maintenance, and disposal of PPE.

    iii. Employees shall also attend SHE Annual Refresher Program where review of the use, maintenance and proper disposal of PPE is discussed.
b) Where a respiratory hazard exists, division management shall ensure that appropriate type of respirator is made available for use.
c) The type of respiratory protection to be used shall be determined by Division Management in consultation with the Safety and Health Department.
    i. All respiratory protection used other than body-worn self-contained self rescuers shall comply with NIOSH standards.
d) For the PPE as listed below, it will be the responsibility of Business Unit Head to ensure employees are trained in the use, maintenance and proper disposal of such equipment on the job:
    (1) Any respiratory protection equipment

(2) Self-contained self-rescuers
(3) Hoods and Breathing Apparatus (BA) sets
(4) Any Hearing Protection Devices (HPD's)
(5) Full body harnesses
(6) Disposable overalls and chemical suits.

4. Misusing and Abusing of PPE

a) PPE shall be used for what it is intended, correctly worn, maintained, stored when not in use and properly disposed of. Misusing and abusing PPE is strictly prohibited.
   i. No home-made PPE shall be used at Morenci.
   ii. No PPE will be modified or altered in any way, unless it is authorized and carried out by approved party/parties. Division Management requiring PPE modification shall follow Morenci Management of Change Guidelines. The Safety and Industrial Health Department shall, in turn, consult relevant manufacturer and applied regulations in determining whether the proposed modification is agreed or not.
b) No PPE will be intentionally damaged, painted or permanently marked (where application of permanent markings will affect the integrity of the PPE). Damaging of PPE items might reduce the effectiveness of the items, thereby endangering the safety and health of the person wearing the item
c) No unauthorized stickers that will impair the effectiveness of PPE will be placed on the Hard Hat.
d) Defacing Company property shall be treated as a serious offence and will result in corrective action being taken against the offender.

5. Types of PPE to Wear

a) Head Protection
   i. The intent of wearing head protection is to protect the head (including the brain) against impact and penetration in working environments.
   ii. Hard hat for head protection shall meet the ANSI Z89.1-2003.
   iii. Employees shall wear head protection if any of the following apply:
      - In all operational and maintenance areas
      - In areas containing fall of material hazards
      - In areas containing low overhead clearances that could induce an injury as a result of striking, bumping or otherwise contact the head
      - There is a possibility of inadvertent head contact with electrical hazards
      - While in mobile equipment unless use of the hard hat creates a greater hazard or could interfere with safe operation.
   iv. Special areas and or equipment in which the use of head protection could negatively affect operational processes or create a greater hazard by their use shall be evaluated and the hierarchy of controls used to effectively manage associated risks. Where possible the configuration and layout of these areas/equipment should reduce the likelihood of head injuries through redesign, padding, guarding and the use of warning systems. A hard hat exemption request must be completed for each area or equipment meeting this deviation – *See Appendix 9.4 Hard Hat Exemption Form*.
   v. Hard hats shall have a hard outer shell and a shock-absorbing/energy attenuating lining that incorporates a headband and straps that suspend the shell away from the head.
b) Eye and Face Protection

i. The wearing of eye and face protection is required for all employees working in or travelling through an area demarcated or designated as a compulsory eye or face protection zone and shall be worn for the entire period spent in that area.
ii. Prescription safety eye glasses with side-shields shall be the only prescription eye protection allowed in workplace. (Contact lenses do not qualify as eye protection)
iii. Safety eye glasses shall have clear or indoor/outdoor lenses when worn indoors or in low light situations.
iv. Certain tasks and activities, e.g. welding, flame-cutting, furnace tapping, etc. require additional or specialized eye protection.
v. Chemical goggles and face shield may be required when handling or working with hazardous chemicals. The PPE Matrix shall indicate type of chemical goggle to be used.
vi. Where hazardous chemicals are used in large quantities an eyewash and/or safety shower shall be readily available at all times.
vii. Eye and Face Protection shall meet the ANSI Z87.1-2007.

c) Safety Footwear
i. The need for protective footwear shall meet the risks for the area and only certified safety footwear complying with Morenci standards shall be worn.
ii. Appropriate protective footwear shall be worn at all times in plants, workshops, construction areas, milling operations, mining areas and other areas as designated. At a minimum steel toe boots (or equivalent protection i.e. hard toe boots) shall be worn at all time while working on Morenci Property.
iii. Where required, additional protection for the bridge of the foot (meta-guard) shall be worn.
iv. Safety footwear shall meet the ANSI Z41.1-1991.

d) Protective Clothing
i. Chemical / Acid Suits
Employees who perform the following tasks shall wear a chemical resistant suit with a full face shield for the duration of the task to be performed.
- Pumping of bulk hazardous chemical substances (caustic soda, sulphuric acid, formalin, ammonia, etc.).
- Employees performing maintenance on pipelines and equipment which convey bulk hazardous chemical substances.
- PPE is not required when pipelines, equipment and areas can be accessed and the necessary tasks conducted in a safe manner due to the presence of other controls such as guarding, protective coatings, diapers, etc…

ii. Life Jackets
The following shall apply:
- No person shall enter or work in an area that contains water where there is a risk of drowning without a life jacket.
- The buddy system shall be used when personnel enter or work in an area that contains water where there is a risk of drowning.
- Life jackets shall be worn correctly when working around water.

iii. Cold Temperature Clothing
Cold temperature clothing shall only be issued to employees working in areas that warrant the wearing of these items. Cold temperature clothing shall be issued once approved by division management.

e) Respiratory Equipment

i. Types of respiratory protection shall be determined as per risks (air contaminants present).
ii. Employees shall be fit tested prior to using the respirator for the first time.
iii. Respirators shall be worn in designated areas and whenever hazardous substances cannot be effectively controlled to an acceptable level.
iv. Non-disposable respirators shall be cleaned after each use and shall be placed in a plastic bag and stored in a clean and dry place.
v. Respirators shall be worn with the head straps securely attached around the users head underneath the hard hat.

f) Hearing Protection
i. Noise Zoning - All exits and entrances to "noisy" areas (TWA of 85 dB(A) or greater) shall be adequately marked with appropriate signs. No person may enter a zoned area without an approved hearing protection device (HPD).
ii. Stationary equipment that emits noise levels of 85 dB(A) or greater shall be adequately marked with appropriate symbolic signs. No person may operate such equipment without an approved hearing protection device (HPD). If area demarcation effectively informs employees of the need to utilize hearing protection additional signage may be deemed unnecessary.
iii. All vehicles where noise levels inside the operator cabin is found to be above 85 dB(A), shall wear hearing protection devices.
iv. Division management may consider issuing employees who are exposed to noise levels in excess of 105 dB(A) with a combination of HPDs, e.g. ear plugs together with ear muffs.

g) Personal Fall Protective Equipment (Full Body Harnesses)
i. Whenever a risk of injury from falling cannot be eliminated, personal fall protective equipment in the form of full-body harness shall be worn and 100% tie-off shall be applied.
ii. The lanyard /energy absorber shall be fastened to the full-body harness and secured to substantial objects, and if possible, these objects should be overhead. At no time should the lanyard be fastened below the person's shoulder unless a competent person has determined that fall forces can be kept to below 1800lbs, free fall distances limited to below 6ft and swing fall hazards are effectively controlled .
iii. Personal fall protective equipment and its lanyards shall be inspected prior to each use for wear, damage or other deterioration.
iv. Horizontal lifelines shall be designed, installed and used under the supervision of a qualified person and maintain a minimum of 5000lbs static load per person. Lifelines shall be protected against being cut or abraded.
v. Ropes and straps (webbing) used in lanyards, lifelines and strength components of body harness and belts shall be made of synthetic fibers.
vi. Circumstances requiring the use of fall protection and lanyards, include but are not limited to, the following:
- elevated platforms and any other type of suspended scaffolding.
- on scaffolds with incomplete decking or incomplete guardrail
- on rooftops
- within 7 feet of the edge of floors or roofs where there are no guardrails or wire rope railing
- when removing floor planks, hole covers, grating and other forms of safe work platform modifications

- in any elevated location 4ft in height or more where there is no other fall protection
- in areas exposed to protruding, unprotected, reinforced steel at any height
- when exposed to a hazard of falling into dangerous equipment, water stream, hazardous chemical, etc., at any height.
- when a hazard of any type exists at any elevation that is reasonably likely to result in a serious injury.

vii. Any fall protective equipment, including lifelines and lanyards, subjected to "service loading" shall be removed from service and discarded.

viii. For more information specific to fall protection refer to Morenci Fall Protection Policy

h) Hand and Arm Protection

i. A Survey shall be carried out of the work to be performed in consultation with employees to determine the type of hand protection required for each task. Note: Potential hazards include skin absorption of harmful substances, chemical or thermal burns, electrical dangers, bruises, abrasions, cuts, punctures, fractures and amputations.

ii. Once this survey is completed, the type of hand protection to be used shall be included in the PPE matrix or the HIRA Team Matrix

iii. Gloves selection is based upon the tasks to be performed and the performance and construction characteristics of the glove material. For protection against chemicals, glove selection shall be based on the chemicals encountered, the chemical resistance and the physical properties of the glove material.

iv. *For protection of the Hand, Arm, Body and Face when metal to metal contact occurs or is suspected refer to Morenci Hand Tools Standard*

i) Disposal of PPE

i. PPE shall be replaced on an exchange basis and exchanged items must be retained and marked to identify the item is to be discarded.

ii. The discarded PPE shall:

- be treated as hazardous waste as per the Morenci Environmental Waste Management Program when the items are contaminated (items such as disposable coveralls, chemical suits, chemical cartridge respirators; or be destroyed through tearing/cutting and discarded as domestic waste (overalls, socks, etc.).

PPE MATRIX – Appendix 8.2

Note:
1. Consult Area and/or PTFI Industrial Hygiene in developing PPE Matrix for consistency company-wide.
2. This matrix must be updated when there is any change in PPE applications or as a result of re-surveys.

Company :
Division :
Department :
Section (if required) :

Generated on: .....
Date:.....
Updated on:.....

NO	AREA/LOCATION/ OPERATION or TASK	ASSOCIATED HAZARDS	RECOMMENDED PPE
1	....	Airborne dust; flying particles; hazardous liquid chemicals splash; extreme heat; falling objects; exposed electrical wiring/components; object roll, fall onto, or strike employees' feet; explosive atmosphere; contact with tools or material that might scrape, bruise, or cut; handle chemical that might irritate skin, or come into contact with blood; bodies exposed to sharp or rough surfaces, extreme heat, or acid or other hazardous substance; exposed to loud noise; etc.	Hard Hat Safety glasses (clear or dark); Prescription safety glasses with side shield Safety Shoes - leather or rubber boots (with toe cap/steel mid sole/ metatarsal/electrical resistant) Reflective safety Vest .....
2	...	...	...
3			
4			
5			
6			

PPE ASSESSMENT GUIDELINES - Appendix 8.3

Refer to Morenci Management Procedure 4.3.1 – Hazard Identification Risk Assessment for the methodology of conducting hazard identification and risk assessment.

In order to assess the need for PPE, the following steps should be taken:

1. Survey: Conduct a walk-through survey of the area/facility/task in question to identify sources of hazards.
Categories for Consideration:

a. Impact
b. Penetration
c. Compression (roll-over)
d. Chemical
e. Heat
f. Harmful dust
g. Light (optical) radiation
h. Drowning
i. Falling

2. Sources: During the walk-through survey, observe for the following:

a) Sources of motion; for example, machinery or processes where any movement of tools, machine elements or particles could exist, or movement of personnel that could result in collision with stationary objects.
b) Sources of high temperatures that could result in burns, eye injury or ignition of protective equipment.
c) Types of chemical exposures.
d) Sources of harmful dust.
e) Sources of light radiation, for instance, welding, brazing, cutting, heat treating, furnaces, and high intensity lights.
f) Sources of falling objects or potential for dropping objects.
g) Sources of sharp objects which might pierce or cut the hands.
h) Sources of rolling or pinching objects which could crush the body part (such as foot).
i) Layout of work place/facility and location of co-workers.
j) Any electrical hazards.
k) Review injury/accident data to help identify problem areas.

3. Compile data: Following the walk-through survey, it is necessary to compile the data and other information obtained. That material provides the basis for the PPE assessment that enables the area owner to select the appropriate PPE.

4. Analyze data: Having compiled data regarding a particular occupation, area owner needs to determine appropriate PPE to use.

HARD HAT EXEMPTION REQUEST - Appendix 8.4

Employee Name (Requestor) _____ **Payroll Number** _____
Title _____ **Department** _____
Date of Request _____ **Time of Request** _____

The Exemption is related to the following: ☐ **1. Area** ☐ **2. Equipment** ☐ **3. Other**

Complete the remainder of the form under the applicable section

1. Area based Exemption:
Area Related to the Exemption _____
Reason for Exemption _____
_____
_____
_____
The Area must be evaluated for hazards:

	Low Clearances		Electrical Hazards (contact with)
	Overhead Work		Illumination
	Configuration/Layout		Other _____

What form of controls will be used to prevent head injury: _____
_____
_____
_____

2. Equipment based exemption:
Equipment Number: _____Mobile Equipment Manufacturer: _____ Model _____
Additional Equipment Numbers: _____ ; _____ ; _____ ; _____
Reason for Exemption _____
_____
_____
How much head clearance exists between the occupant and the top of the interior cab? _____
(Multiple pieces of equipment may be entered – the manufacturer/model of the primary vehicle shall be used)

3. Other:
Area or Task Related to the Exemption _____
Reason for Exemption _____
_____
_____
_____
What hazards exist or could be created that could result in a head injury? _____
_____
_____

APPROVAL (Must be filled out for all exemption types)

Health and Safety Professional _____ ☐ Approved ☐ Denied
Division Manager _____

You must keep this exemption with you at all times while operating mobile equipment

SECTION B

HEARING PROTECTION

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Publication Date: 08/05/2002

- **Publication Type:** Notice
- **Fed Register #:** 67:50610-50618
- **Standard Number:** 1910.95; 1926.52; 1926.101
- **Title:** Hearing Conservation Program for Construction Workers

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DEPARTMENT OF LABOR

Occupational Safety and Health Administration

29 CFR Part 1926

[Docket No. H-011G]

RIN No. 1218-AB89

Hearing Conservation Program for Construction Workers

AGENCY: Occupational Safety and Health Administration (OSHA), Department of Labor.

ACTION: Advance notice of proposed rulemaking (ANPR); request for information and comment.

SUMMARY: OSHA is considering rulemaking to revise the construction noise standards to include a hearing conservation component for the construction industry that provides a similar level of protection to that afforded to workers in general industry. OSHA is not, at this time, requesting information regarding the appropriateness of the permissible exposure limit (PEL) or exchange rate. This document asks the public to comment on whether specific provisions of OSHA's general industry hearing conservation amendment should be applied to the construction industry or if alternative strategies would be easier to implement and more cost effective.

DATES: Comments must be submitted by the following dates:

Hard Copy: Your comments must be submitted (postmarked or sent) by November 4, 2002.

Facsimile and electronic transmission: Your comments must be sent by November 4, 2002. (Please see the **SUPPLEMENTARY INFORMATION** provided below for additional information on submitting comments.)

ADDRESSES: ***Regular mail, express delivery, hand-delivery, and messenger service:*** You must submit three copies of your comments and attachments to the OSHA Docket Office, Docket No. H-011G, Room N-2625, U.S. Department of Labor, 200 Constitution Avenue, NW., Washington, D.C., 20210. OSHA Docket Office and Department of Labor hours of operation are 8:15 a.m. to 4:45 p.m., EST.

Facsimile: If your comments, including any attachments, are 10 pages or fewer, you may fax them to the OSHA Docket Office at (202) 693-1648 . You must include the docket number of this notice, Docket No. H-011G, in your comments.

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FOR FURTHER INFORMATION CONTACT: For general information and press inquiries, contact Ms. Bonnie Friedman, OSHA, Office of Information and Consumer Affairs, N-3647,200 Constitution Avenue, NW., Washington, DC 20210; telephone: (202) 693-1999 . For technical inquiries, contact Mr. Neil Davis, Directorate for Health Standards Programs, OSHA, N-3718, 200 Constitution Avenue, NW., Washington, DC 20210; telephone: (202) 693-2281 . For additional copies of this **Federal Register** document, contact OSHA, Office of Publications, U.S. Department of Labor, Room N-3101, 200 Constitution Avenue, NW, Washington, DC, 20210; telephone (202) 693-1888 . Electronic copies of this **Federal Register** document, as well as news releases and other relevant documents, are available at OSHA's web page on the Internet at http://www.osha.gov.

SUPPLEMENTARY INFORMATION:

Submission of Comments on This Notice and Internet Access to Comments and Submissions

You may submit comments in response to this notice by (1) hard copy, or (2) FAX transmission (facsimile), or (3) electronically through the OSHA Webpage. Please note that you cannot attach materials, such as studies or journal articles, to electronic comments. If you have additional materials, you must submit three copies of them to the OSHA Docket Office at the address above. The additional materials must clearly identify your electronic comments by name, date, subject and docket number so we can attach them to your comments. Because of security-related problems there may be a significant delay in the receipt of comments by regular mail. Please contact the OSHA Docket Office at (202) 693-2350 for information about security procedures concerning the delivery of materials by express delivery, hand delivery and messenger service.

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I. Background

The Federal Government has recognized the hazardous conditions caused by noise on construction projects for many years. OSHA's current noise standard for construction stems from the occupational noise standard originally published in 1969 by the Bureau of Labor Standards under the authority of the Construction Safety Act (40 U.S.C. 333). OSHA adopted the construction noise standard in 1971 (36 FR 7340, 4/27/ 71) and later recodified it at 29 CFR 1926.52. Another section of the construction standard (29 CFR 1926.101) contains a provision requiring employers to provide hearing protection devices when needed. Both sections 1926.52 and 1926.101 apply to employers engaged in construction and renovation work when high noise levels are present.

A. Occupational Noise Exposure Standards in Construction

Paragraph (a) of section 1926.52 requires protection against the effects of noise exposure when 8-hour time-weighted average sound levels exceed a permissible exposure limit (PEL) of 90 decibels (dBA) measured on the A scale of a sound level meter set at slow response. The exposure level is raised 5 dB for every halving of exposure duration as shown in Table D-2 of the standard.

Table D-2. -- Permissible Noise Exposures

Duration per day, hours	Sound level DBA slow response
8	90
6	92
4	95
3	97
2	100
1½	102
1	105
½	110
¼ or less	115

Paragraph 29 CFR 1926.52(b) states that when employees are subjected to noise doses exceeding those shown in Table D-2, feasible administrative or engineering controls must be used to lower employee noise exposure. If such controls fail to reduce sound to the levels shown in the table, personal protective equipment must be provided and used to reduce noise exposure to within those levels.

Paragraph (c) defines continuous noise as noise levels where the maxima occur at intervals of 1 second or less, and paragraph (d)(1) requires that a "continuing, effective hearing conservation program" be administered whenever levels exceed those in the table. However, no details are given about the components of such a program. Paragraph (d)(2) gives instruction on how to calculate an employee's noise exposure when the employee is exposed to two or more periods of noise at different levels, and paragraph (e) states that exposure to impulsive or impact noise should not exceed a peak sound pressure level of 140 dB.

The requirements of 29 CFR 1926.101 are: (a) Hearing protection devices shall be provided and used wherever it is not feasible to reduce the noise exposure (level times duration) to within the Permissible Exposure Limit (PEL) specified in Table D-2 (see above); (b) hearing protection devices inserted in the ear shall be fitted by competent persons; and (c) plain cotton is not an acceptable protective

device.

B. Occupational Noise Exposure Standard for General Industry

Workers in general industry are covered by the Agency's Occupational Noise Standard (29 CFR 1910.95), which sets maximum noise exposure levels and certain other requirements that are similar to those found in 29 CFR 1926.52 and 1926.101. However, the general industry noise standard provides more protection for general industry workers than the construction standards provide for construction workers, due to the provisions of OSHA's 1983 Hearing Conservation Amendment (HCA), which added a requirement for employers to implement a hearing conservation program if employee noise exposures exceed a time-weighted average level (TWA) of 85 dBA over an 8-hour workday, using an exchange rate of 5 dB for each doubling or halving of exposure time. The HCA program (29 CFR 1910.95(c) through (o)) includes, among other things:

- Baseline and annual audiometric testing,
- Monitoring of noise exposure levels,
- Requirements to provide effective hearing protection devices (HPDs),
- Training and education, and
- The maintenance of employee exposure and hearing loss records.

OSHA requests information and data on whether the general industry requirements should be applied to construction work and, if so, how these requirements should be adapted for the construction industry.

C. Recommendations of NIOSH and Other Groups

In 1998, the National Institute for Occupational Safety and Health (NIOSH) published "Criteria for a Recommended Standard; Occupational Exposure to Noise; Revised Criteria", in which NIOSH recommended a maximum 8-hour TWA of 85 dBA and a 3-dB exchange rate (Ex. 2-1). NIOSH originally recommended an 8-hour TWA of 85 dBA and a 5-dB exchange rate in 1972. The revised 1998 NIOSH Criteria document also recommends specific requirements that they believe should be included in hearing conservation programs, such as noise exposure assessment; engineering and administrative controls and work practices; hearing protectors; medical surveillance; hazard communication; training; program evaluation; and recordkeeping. Some of the NIOSH recommendations are discussed in later sections along with questions about how an OSHA standard on noise in construction might implement the NIOSH recommendations. The American Conference of Governmental Industrial Hygienists also recommended an 85 dBA 8-hour TWA with a 3 dB exchange rate in 1994. (ACGIH, Threshold Limit Values and Biological Exposure Indices for 1994, Ex. 2-14)

In recent years, several groups have expressed a renewed interest in the issue of hearing loss in construction workers. For example, the Laborers Health and Safety Fund of North America is sponsoring a Construction Noise Control Partnership made up of interested parties from labor, industry, academia, and government to discuss noise and hearing conservation issues. The Laborers Health and Safety Fund has also co-sponsored several conferences to discuss the best practices for preventing hearing loss in the construction industry.

D. Noise Induced Hearing Loss

In the preamble to the HCA, first issued on January 16, 1981 (46 FR 4078), OSHA described the risk of "material impairment" of health resulting from a working lifetime of noise exposure based on data developed by three organizations: The International Organization for Standardization (ISO), the U.S. Environmental Protection Agency (EPA), and NIOSH. The risk estimates are presented in Table 1 as reprinted in the 1998 NIOSH criteria document (Ex. 2-1).

Table 1. -- Estimated Excess Risk of Incurring Material Hearing Impairment [1] as a Function of Average Daily Noise Exposure Over a 40-year Working Lifetime [2]

Reporting organization	Average daily noise exposure (dBA)	Excess Risk (%)[3]
ISO	90	21
	85	10
	80	0
EPA	90	22
	85	12
	80	5
NIOSH	90	29
	85	15
	80	3

[1] For purposes of comparison in this table, material hearing impairment is defined as an average of the Hearing Threshold Levels (HTLs) for both ears at 500, 1000, and 2000 Hz that exceeds 25 dB.

[2] Adapted from 39 FR 43802.

[3] Percentage with material hearing impairment in an occupational-noise-exposed population after subtracting the percentage who would normally incur such impairment from other causes in an unexposed population, i.e., the percentage of the risk attributable to noise exposure at work.

This table shows that about one in four workers will experience impaired hearing when exposed to average daily noise levels of 90 dBA over a 40-year working lifetime. The risk is lower but still about one in eight workers at 85 dBA over 40-year working lifetime. As a result of this residual risk, OSHA established an "action level" of 85 dBA for an 8-hour TWA in its general industry noise standard (even at 80 dBA, EPA and NIOSH report a small risk of hearing impairment). When employees are occupationally exposed at or above the action level, the general industry noise standard requires employers to take certain steps to prevent noise-exposed workers from developing hearing loss. The steps required by the HCA include: Noise exposure monitoring, audiometric testing, the provision of hearing protectors, and recordkeeping.

Noise-induced hearing loss can be a serious disability. Once noise exposure damages the sensory-neural mechanism of the inner ear, the hearing loss is permanent (permanent threshold shift). The likelihood of permanent hearing loss increases with prolonged exposure. Noise-induced hearing loss can cause difficulty in hearing and understanding critical verbal instruction and warning sounds at work. It can also cause problems in hearing and perceiving spoken communication, thus interfering with normal social interaction outside the workplace.

Exposure to other agents can adversely affect the auditory system and may worsen noise-induced hearing loss (Ex. 2-1). These agents include some organic solvents, physical agents, such as whole-body vibration, and gases, such as carbon monoxide. Excessive noise may also accelerate age-related hearing loss in exposed workers, causing more serious auditory impairment than might have otherwise occurred.

E. Noise Exposure In Construction

Many construction jobs, such as concrete work, site excavation, highway construction, and carpentry involve high levels of noise. Major noise sources include heavy equipment, such as loaders, dozers, and cranes, as well as tools like jackhammers and chipping guns. Excessive noise at construction sites not only causes hearing loss, but can create a safety hazard by masking the sounds of oncoming vehicles (Ex. 2-2). Hearing loss and the use of hearing protectors by those with pre-existing hearing loss may further interfere with the workers' ability to hear and perceive the sounds of danger. Although these difficulties occur in many occupational settings, they are a particular problem in construction, where a variety of moving vehicles, back-up alarms, and other signals and activities may occur simultaneously.

There is a large body of literature describing occupational hearing loss from noise exposure (see, e.g., Exs. 2-2, 2-3, 2-4, 2-5, 2-6). OSHA commissioned several studies during 1997-1999 to provide recent information targeted specifically to the construction population. One, by Alice H. Suter, Ph.D., is entitled "Construction Noise: Exposure, Effects, and the Potential for Remediation" (Ex. 2-2). Three by Dale Hattis, Ph.D., of the Center for Technology, Environment, and Development, Clark University, are: "Preliminary Analysis of OSHA Inspection Data for Noise Exposures in Construction" (1997) (Ex. 2-3); "Occupational Noise Sources and Exposures in Construction Industries," ***Human and Ecological Risk Assessment*** 4:1417-1441(1998) (Ex. 2-4); and "Expected Hearing Loss and Disability from Noise Exposures in Construction" (co-author, Anna Makri) (1999) (Ex. 2-5). Dr. Suter also wrote a monograph in 1992 on the effects of noise on workers' ability to communicate entitled "Communication and Job Performance in Noise: A Review," ***ASHA Monographs*** No. 28 (American Speech-Language-Hearing Association, Rockville, Maryland) (Ex. 2-6).

These studies show that as many as 750,000 U.S. construction workers are currently exposed to hazardous noise levels (defined as a time weighted average of 85 dBA or above for 8 hours) on the job and that regular hearing protector use in the construction industry averages only about 15 to 33 percent among these noise-exposed workers (Exs. 2-2, 2-5). Hattis and Makri quantified the extent of hearing loss disability expected to occur among construction workers. Their measure of disability was based on the United Kingdom's "% disability method", which expresses the magnitude and duration of hearing loss disability in units of %-disability life-years, where one %-disability life-year is equal to the loss of one percent of overall hearing ability for one year (Ex. 2-5). Among the entire population of 5 million construction workers, Hattis and Makri estimated that between 25 million and 65 million %-disability life-years would accumulate each year taking into account age-related hearing loss, prevailing noise exposures, and current practice with regard to use of hearing protection (Ex. 2-5, pp. 49-52). To place the Hattis and Makri estimates of hearing disability in perspective, assume that the average age of the 750,000 most highly exposed workers is 38 and that workers are employed in the construction industry an average of 13 years (based on 1997 data for British Columbia workers, see Table 21 of Ex. 2-5). Assuming also that the average life span is 75 years, the estimated 25 million to 65 million %-disability life-years that are predicted to accumulate each year among the 750,000 most highly exposed construction workers means that construction workers exposed at or above 85 dB are predicted to lose, on average, between 12 and 30 percent of their hearing over their employment in the construction industry, and that the disability will persist for the remaining 37 years of life.[(1)] The authors conclude in their summary section that "it is clear that construction worker noise-induced hearing loss is a significant national problem" (Ex. 2-5).

Dr. Suter's review of the literature shows that the highest concentrations of workers with potentially hazardous noise exposures occur in highway and street construction, carpentry, and concrete work (Ex. 2-2). According to a 1995 study of Canadian workers by Sinclair and Haflidson, the average noise exposure for workers engaged in various types of construction is 98.8 dB, based on TWA sound levels using the 3-dB exchange rate. The average exposure would be lower if the 5-dB exchange rate were used. Boilermakers and ironworkers are particularly heavily exposed, largely as a result of pneumatic tool use (Ex. 2-7).

OSHA believes that these studies show that many U.S. construction workers suffer hearing loss from noise at their worksites. Other information shows that hearing conservation programs can be effective in reducing occupational hearing loss (Ex. 2-8). Therefore, OSHA is publishing this ANPR to solicit data, comments, and information about initiating rulemaking to revise the construction industry noise standard to include a hearing conservation component that will protect construction workers against further hearing loss.

II. Request for Information, Data and Comments

OSHA solicits data and information on the following issues related to the prevention of work-related hearing loss in construction workers. In your response to these questions, please refer to the section and subsection headings (e.g. Section II.A.2.a. Hearing

Conservation Program Provisions -- Monitoring -- Area Monitoring) as well as the specific question being referenced. Also, include relevant data and analyses to support your response.

A. Hearing Conservation Program Provisions

OSHA seeks information on whether and how the provisions of the general industry Hearing Conservation Amendment (paragraphs (c) through (o) of 29 CFR 1910.95) could be applied to the construction industry. Do the general industry requirements need to be altered to reflect the unique characteristics of the construction industry? For example, what methods have construction employers adopted to obtain baseline and periodic audiograms and to keep the records of these tests up-to-date and accessible? What approaches have employers found useful in achieving effective hearing protection device use in this industry? OSHA is particularly interested in receiving information on the results of hearing loss prevention program evaluations in the construction industry. The following paragraphs raise specific questions about selected provisions of the Hearing Conservation Amendment and their potential applicability in the construction environment.

1. Methods of Compliance

In paragraphs (c) and (d) of the general industry noise standard (29 CFR 1910.95), OSHA requires the employer to conduct an initial noise evaluation when exposure is expected to exceed 85 dBA. If this requirement was applied in a construction setting, a new evaluation might be required for each new construction site. Alternatively, in the asbestos standard (29 CFR 1926.1101(e)) and lead standard (29 CFR 1926.62(d)(2)) for construction activities, OSHA adopted a different approach of identifying tasks that are presumed to have high exposures and workers engaged in these tasks are protected by a combination of engineering and administrative controls supplemented by the use of personal protective equipment. Which approach is more appropriate to evaluate and control noise exposures in construction? Please provide noise data from construction sites to support your position. If a certain set of procedures or tasks were identified by OSHA as having presumed significant noise exposure, which are the best criteria to use: Equipment type, task type, or job title by type of construction and phase of work? OSHA also believes that the time of tool use or time spent at a task is an essential or required element in any exposure calculation. Please provide your experience and data regarding the relative efficacy of the above criteria.

The British Columbia regulation requires employers to implement a written program that includes noise measurement, education and training, engineered noise control, hearing protection, posting of noise hazard areas, hearing tests, and annual program review (Ex. 2-9). The British Columbia program presumes that employees in specific construction occupations are routinely exposed to noise in excess of the exposure limits. These occupations are carpenters, plumber pipefitters, sprinkler installers, mobile equipment operators, steel erectors, welders/fabricators, sandblasters, drillers, electricians, concrete workers operating concrete pumps, vibrators, jack hammers or powered finishing equipment, and drywallers shooting track or boarding (Ex. 2-10). Are the trades identified in British Columbia as highly exposed, and therefore presumptively covered under the HCP, reasonable and comparable to United States conditions? Are there other occupations that should be presumed to be noisy enough to be a part of a hearing conservation program?

Investigators at the University of Washington are also conducting a series of studies on Washington state construction apprentices and journeymen. These study populations include bricklayers, carpenters, operating engineers, ironworkers, electricians, insulation workers, sheet metal workers, laborers and cement masons. (Ex. 2-12, 2-13) These studies will provide additional noise-related risk data on a current U.S. construction population. Are there any other investigations on the effects of hearing conservation programs in other populations of U.S. construction workers? If so, please provide study descriptions and data.

2. Monitoring

Paragraph (d)(1)(i) of the general industry noise standard (29 CFR 1910.95) addresses noise exposure monitoring. It requires monitoring when information indicates that any employee's exposure may equal or exceed an 8-hour TWA of 85 dBA. Employers may design their own sampling strategy so long as employees above this action level are included in the program. How much noise monitoring is currently being done at construction sites?

Many construction firms are small; approximately 85 percent of the firms employing 50 percent of the construction workforce have less than 20 employees. (U.S. Census Bureau, County Business Patterns, 1997) Should OSHA provide specific sampling strategies for the construction industry? Should these strategies be mandatory or recommended? When is exposure monitoring appropriate in the

construction industry? What criteria should trigger noise exposure monitoring?

a. Area Monitoring

Paragraph (d)(1)(ii) of the general industry noise standard (29 CFR 1910.95) permits employers to use area monitoring under certain circumstances, but where conditions such as high worker mobility, significant variations in sound level, or a significant component of impulse noise makes area monitoring inappropriate, representative personal sampling must be performed. These latter conditions characterize most construction sites. Are there any circumstances in the construction industry where area monitoring would be appropriate?

b. Continuous, Intermittent and Impulsive Sound

Paragraph (d)(2)(i) of the general industry noise standard (29 CFR 1910.95) requires that all continuous, intermittent and impulsive sound levels from 80 dB to 130 dB be integrated into the measurement of noise exposure. The range of 80 to130 dB as opposed to a range of 80 to 140 dB reflected the technological limitations of sound level meters and dosimeters at the time of the standard's promulgation. OSHA, in the preamble of the 1981 rulemaking, stated the intent to increase the upper limit to 140 dB, as improved dosimeters became readily available (46 FR 4135, 1/16/81). OSHA believes that most, if not all, of today's dosimeters and integrating sound level meters are capable of dynamic ranges from 80 dB to 140 dB. The NIOSH revised noise criteria (Ex. 2-1) and the ACGIH TLV for noise (Ex. 2-11) recommend the inclusion of all continuous, intermittent, and impulsive noise from 80 to 140 DBA in the calculation of employee exposure or dose. OSHA seeks information on the characterization of construction workers' exposures to impulse or impact noise, particularly in the range of 130-140 dB. Is the integration of all noise levels between 80 dBA and 140 dB the appropriate criteria for calculating construction workers' noise dose? Please support your answer. What are the additional costs associated with this requirement and how can they be minimized? Is 140 dB the appropriate ceiling level for impulse noise?

c. Repeat Noise Monitoring

Paragraph (d)(3) of the general industry noise standard (29 CFR 1910.95) requires that monitoring be repeated whenever a change in production, process, equipment or control increases noise exposures to the extent that additional employees may be exposed at or above the action level, or the attenuation provided by hearing protectors may be rendered inadequate. OSHA is seeking information on whether it would be practical to apply such a requirement in the construction environment. Would employers know when to repeat noise exposure monitoring? Should there be a more specific requirement, such as the NIOSH recommendation for remonitoring every 2 years or if workers are developing significant threshold shifts (STSs)(Ex. 2-1)? Would such a requirement be useful, feasible, or effective in the construction industry? Are there any alternative monitoring schemes that would be easier for construction employers to follow that would obtain the same objective?

d. Secondary Sources of Noise Exposure

The construction noise literature and field observations indicate that there are multiple sources of significant noise exposure during many phases of different types of construction projects (Ex 2-12). Many times the primary sources of exposure are tools or equipment being used by co-workers nearby (jackhammer) or by another craft working nearby (e.g. welder's compressor affecting electricians). Are there other methods, besides direct employee noise monitoring on a site-by-site basis that would characterize elevated noise exposure to other or co- workers who are not using tools or equipment generating loud noise? Please provide data showing the prevalence of noise exposures near or exceeding 85 dBA (1) to coworkers or helpers doing a supporting task, or (2) to other trades receiving secondary exposures they did not create. Also provide, if available, information on the trades, type of construction, tasks, tools or equipment used, and the range of exposure levels and distances from noise source. Has any exposure or prediction modeling been done in this area? How can information concerning expected or measured secondary exposure be incorporated into training requirements, hazard warnings and the general phasing of work in different types of construction?

3. Employee Notification

Paragraph (e) of the general industry noise standard requires that employers notify each employee exposed at or above an 8-hour TWA of 85 dBA of the results of the employee's noise monitoring. No time limit is given for this notification. Is a similar notification requirement appropriate for the construction industry? Should employers be required to notify construction workers within a certain period, such as 1, 5, 10 or 15 days, of the results of noise exposure monitoring?

4. Audiometric Testing Program

Paragraph (g) of the general industry noise standard requires employers to make audiometric testing available, at no cost, to all employees who are exposed at or above the action level of 85 dBA. Is a similar requirement appropriate and feasible for the construction industry? How can this service be delivered in a cost-effective way to a mobile workforce of predominantly small employers? In general industry the trigger for audiometric testing is an employee exposure at or above 85 dBA. Are there alternative triggers that might be more appropriate or less burdensome to initiate audiometric testing in the construction industry? For example, should OSHA require audiometric testing for those in specified construction trades? Does OSHA need more precise provisions in terms of audiometric procedures, equipment, and sound booth requirements so as to reduce the variability between audiograms or has this variability been anticipated in the general industry hearing conservation standard? Please specify and support recommended alternatives, if any.

a. Baseline Audiograms

Paragraph (g)(5) of the general industry noise standard calls for a baseline audiogram to be performed within 6 months of an employee's first exposure at or above the action level unless the audiometric provider uses a mobile van, in which case the waiting period may be up to a year. Because of the mobility of many construction workers from employer to employer, these provisions, if adopted, would result in some construction workers not receiving baseline audiograms even after many years of noise exposure. OSHA seeks information on the best way to ensure that construction workers are given a baseline audiogram prior to exposure to harmful levels of noise. Should the maximum waiting period for baseline audiograms be shorter or longer than 6 months? For example, NIOSH recommends an audiogram within 30 days after hire. What length of time with a given employer should trigger the requirement to provide an audiometric test? Should the trigger for audiometric testing be by exposure level, type of construction, job process, job title or equipment type or should there be multiple triggers? Alternatively, should baseline audiograms be considered for all workers entering construction employment?

Paragraph (g)(5)(ii) of the general industry noise standard requires workers whose exposures equal or exceed the action level to use hearing protectors until a baseline audiogram is completed, if the employer is using the one-year period allowed when mobile test vans are used. Should a construction worker be allowed to have exposures above the action level but less than the PEL without hearing protectors for any amount of time before the baseline audiogram is obtained? Should the use of hearing protectors in this circumstance be advisory rather than mandatory if exposures are between the action level and the PEL?

Paragraph (g)(5)(iii) of the general industry noise standard requires that a baseline test be preceded by at least 14 hours without exposure to workplace noise. Should this requirement be extended to the construction industry?

b. Annual Testing

Paragraph (g)(6) of the general industry noise standard requires that employers obtain audiograms at least annually for employees exposed at or above the action level. The NIOSH Criteria Document (Ex. 2-1) contains a similar recommendation. OSHA is requesting information on the feasibility and desirability of annual audiograms for construction workers. Should the frequency of audiometric testing vary by the type of work and the degree of anticipated exposures? For example, should audiograms be required every six months for workers with exposures that are consistently above 100 dBA? Should audiograms be less frequent for workers whose measured or expected exposures are between 85 and 90 dBA? Is there a way to make sure that construction workers who move from one site to another during the year are identified and given annual audiometric tests?

c. Retest Audiograms

Paragraph (g)(7)(ii) of the general industry noise standard gives employers the option to retest an employee within 30 days if an STS has occurred and to consider the retest as the annual audiogram. Considering the high mobility of the construction workforce and NIOSH's recommendation for immediate retesting (Ex 2-1, pp 49-50), should there be a requirement for an immediate retest if an STS has occurred? Is a confirmatory retest within 30 days desirable or feasible for construction workers? Should there be a requirement or recommendation that the retest be preceded by 14 hours without exposure to workplace noise and should hearing protectors be allowed to substitute for this pre-test "quiet"?

d. Follow-up Procedures for Audiograms Showing Hearing Loss

Paragraph (g)(8)(ii) of the general industry noise standard details follow-up procedures triggered by an STS unless a physician determines that the STS is neither work related nor aggravated by occupational noise exposure. These procedures include: (A) Fitting with hearing protectors and training in their use and care; (B) refitting and retraining for those already wearing hearing protectors; (C) referral for a clinical audiological or otological examination if additional testing is necessary or if an ear pathology (medical problem) is determined to be related to the wearing of hearing protectors; and (D) informing the worker of a need for an otological exam if an ear pathology is deemed unrelated to the use of hearing protectors.

OSHA is seeking comments and information on whether there are follow-up actions that should be taken even when an STS has not occurred, and specifically on the provisions of paragraph (g)(8)(ii)(C) of 1910.95, which require referral in cases where additional testing is necessary to obtain a valid audiogram or a medical problem is related to the wearing of hearing protectors, and paragraph (g)(8)(ii)(D) of 1910.95, informing the worker of a need for an otological exam regardless of whether the problem is related to the use of hearing protectors. Are there other circumstances where follow-up actions should be either required or recommended for construction workers, such as counseling in the event of an STS or pathology of the ear?

5. Hearing Protectors

The studies by Suter (Ex. 2-2) and Hattis and Makri (Ex. 2-5) report that currently available data (1998) on the use of hearing protectors among U.S. construction workers show that, at best, hearing protector use among workers routinely exposed to high noise levels is about 33%, with a range from 1% to 50% for workers in different trades. These authors note that this figure is likely to be an overestimate. This was an apparent improvement from the NIOSH NOES survey, 1981-1983, where the overall average use was 15% for workers exposed to 85 dBA or greater (Ex. 2-2). Are other data available on current hearing protector use in the U.S. construction industry? If yes, please provide such data or indicate where they may be obtained.

Dr. Suter's studies point out that construction workers need to hear warning signals and to communicate in noisy backgrounds (Exs. 2-2, 2-6). Operators of heavy mobile equipment and other workers who need to communicate with them need to be able to maintain effective two-way or multi-way communication while protecting their hearing. It is also essential for all construction workers to be able to hear and identify the location of warning signals, backup alarms, and spoken or shouted communication (localization). Workers who have already incurred hearing impairments and who must wear hearing protectors will experience difficulty hearing in those situations. The use of hearing protectors and the need for communication and identifying the location of co- workers complicate efforts to prevent noise-induced hearing loss. OSHA solicits information from employers, employees, and safety and health professionals on their experience with regard to the ability to communicate or other risks that may be incurred while wearing hearing protectors. This includes information on the effectiveness of traditional hearing protectors and particularly on the effectiveness of newer devices (both plugs and muffs) with uniform attenuation, active attenuators, and communication systems developed, at least in part, to address these problems.

a. When Should Hearing Protectors Be Required?

Paragraphs (i)(1) and (2) of the general industry noise standard require that hearing protectors be made available to all employees exposed at or above the action level of 85 dBA, but do not require workers to wear these devices until their exposures exceed the PEL or the worker has experienced a work-related STS. Should the requirement be contingent upon incurring an STS or waiting for a baseline audiogram, as in the general industry noise standard? Is there an increased hazard for these workers that is caused by the inability to hear warning signals at moderate noise levels, such as 80-85 dBA, when wearing hearing protectors?

Paragraph (b)(1) of OSHA's general industry noise standard requires that employers use feasible engineering or administrative controls whenever employees are exposed above the 90 dBA PEL. Whenever these controls fail to reduce sound levels to or below the PEL, employers must issue hearing protectors to employees and employees are required to use these devices. Similar requirements are found in 29 CFR 1926.52 and 1926.101 covering the construction industry. Whether workers must wear their hearing protectors for the entire workshift or only when noise levels exceed 90 dBA is not addressed. OSHA is aware of the potential safety hazard of overprotection during periods of relative quiet or even moderate noise levels.

The Agency is requesting information on the use of hearing protectors in varying noise environments, especially in the intermittent noise environments that characterize many construction exposures. Should construction workers be required to wear hearing protectors

only in noise levels that exceed the PEL of 90 dBA, an action level of 85 dBA, or should they be required to wear hearing protectors in all noise environments where exposures are expected to exceed a certain TWA? If the requirement is only for levels above the action level, how would workers know when to put on their hearing protectors?

b. Selection of Hearing Protectors

Paragraph (i)(3) of the general industry noise standard states that employees must be given the opportunity to select their hearing protectors from a variety of suitable hearing protectors provided by the employer. This requirement has been interpreted to mean that at least one variety of plug and one variety of muff must be available (Ex. 2-14). Is a choice between two protectors sufficiently protective where noise exposure is often intermittent and communication may be of particular importance? The Agency solicits information on the appropriate type and number of hearing protectors which should be offered to construction workers.

c. Hearing Protector Attenuation

The general industry noise standard's paragraph (j)(1) requires employers to use one of the evaluation methods described in Appendix B, "Methods for Estimating the Adequacy of Hearing Protection Attenuation" to evaluate the amount of protection the hearing protector is likely to provide under workplace conditions. The vast majority of employers and hearing conservation professionals use the Noise Reduction Rating (NRR), which, according to an EPA regulation, must be printed on the hearing protector package. The NRR represents the noise reduction potential of the protector under laboratory conditions. There are, however, large differences between the hearing protector attenuation measured in the laboratory and that found in actual field use. Therefore, it is current OSHA policy to adjust the NRR when the use of hearing protectors is, under certain circumstances, permitted in lieu of engineering noise controls. Appendix B of the general industry noise standard calls for an additional reduction in the estimated attenuation of 7 dB when the average C-weighted noise level in the worker's environment is not known. In addition, the OSHA Technical Manual (Section III, Chapter 5) and OSHA's Enforcement Directive for Noise Enforcement (CPL 2-2.35A) use a safety factor of 50%, which is applied by further dividing the NRR by 2. Thus an earplug with an NRR of 28 dB would be considered to have useful attenuation of only 10.5 dB when the NRR is subtracted from the average A-weighted noise level in the worker's environment (28 - 7 = 21 / 2 = 10.5).

NIOSH (Ex. 2-1) recommends de-rating (subtracting values from) the NRR, but conditions the amount of de-rating upon the type of hearing protector: 25% for earmuffs, 50% for slow-recovery foam earplugs, and 70% for all other plugs and semi-inserts. NIOSH further recommends that once manufacturers test and label their products using the new "subject-fit" method incorporated in ANSI S12.6-1997, the subject-fit noise reduction rating (NRR(SF)) should be used.

Should OSHA continue to recommend the use of the NRR for estimating the attenuation provided by hearing protectors for construction workers? Should a standard for construction recommend or require a 50% de-rating to account for the difference between laboratory and field performance? Should OSHA continue to require the 7-dB subtraction for spectral uncertainty? Should OSHA adopt the NIOSH device-dependent de- rating formula discussed above? Should OSHA allow or recommend the NRR(SF) or a similar rating based on subject fit data as an alternative to the NRR?

6. Training Program

Paragraph (k) of the general industry noise standard contains requirements for training programs, which must be repeated annually for each employee in the hearing conservation program. These programs must include: Information on the effects of noise on hearing; the type of task or equipment that can cause loud noise and maximum usage time without hearing protection, the purpose of hearing protectors; the advantages, disadvantages, and attenuation of various types of hearing protectors; instructions on selection, fitting, use, and care of hearing protectors; and the purpose of audiometric test procedures. Are these training requirements appropriate for the construction industry? In general industry the trigger for training is an employee exposure at or above 85 dBA. Are there alternative triggers that might be more appropriate and less burdensome in the construction industry?

OSHA is aware that some hearing conservation training programs in general industry use written materials or videos without face-to-face training. The Agency seeks information on the success of such programs. Is there a need for face-to-face training in the construction industry? Why? Also, are there exemplary training programs that are construction or trade specific that should be brought to OSHA's attention? Briefly describe these programs.

7. Recordkeeping

Most construction work is characterized by relatively short job tenures with a given employer (median of 3 to 5 years), temporary or seasonal employment, and employment in very small firms. These features may make periodic audiometric testing and recordkeeping more difficult than in the general industry environment. OSHA is aware of two possible approaches to this logistical problem in construction: (1) Centralized (possibly web based) recordkeeping systems and (2) portable smart cards carried by workers (currently being used in British Columbia). Workers could also take their records manually from one employer to the next. This might work for employment of one or two years, but would be cumbersome and inefficient over a working lifetime. OSHA seeks information on successful approaches for maintaining and transferring medical records used in the construction industry, whether maintained by the company, state, union, trade association, or other groups. What problems have surfaced in these efforts? What costs are incurred and how are the delivery of services structured between the involved parties? In any shared record system, how is the privacy of the employee's medical data protected? For what duration should employers be required to retain records?

B. Other Hearing Conservation Issues Raised by NIOSH in its Criteria Document

Most of the issues raised by NIOSH in their 1998 criteria for a recommended noise standard have been discussed throughout this document. However, NIOSH made additional recommendations, three of which are discussed below.

1. Hazard Communication

a. Warning Signs

The general industry noise standard does not contain a provision for warning signs and regulated areas, although the NIOSH criteria document recommends a requirement stating that warning signs shall be clearly visible at the entrance to or at the periphery of areas where noise exposures routinely equal or exceed a TWA of 85 dBA (Ex. 2-1). Should a hearing conservation rule for construction have such a requirement? If so, should the requirement be for areas where noise levels or noise exposures (TWAs) equal or exceed a certain level? How should these areas be selected? Should OSHA give specific guidance on how to post these areas? Could the posting of warning signs serve as an alternative to noise monitoring under the assumption that the assigned site or project is above the hearing conservation action level?

b. Noise Labeling of Equipment and Tools

Another form of hazard communication is the labeling of equipment for noise levels at a set distance. Suter's report describes a program for labeling products used in construction that has been adopted by the European Economic Community (Ex. 2-2). The European construction noise directive requires manufacturers to display labels showing either the sound power level or sound pressure level at the operator's position. Suter points out that in the United States an ANSI standard is being developed for the purpose of labeling machinery and equipment. OSHA requests data and information, including the outcomes, of any noise labeling programs in the U.S. or abroad, as well as information about the progress of the ANSI working group, S12 WG38. Have employers used noise labels on equipment or tools to communicate risk of hearing loss?

2. Program Evaluation Criteria

The general industry noise standard does not include criteria for evaluating the effectiveness of hearing conservation programs. However, the NIOSH criteria document does contain a section on this topic and there is a draft ANSI standard, S12.13-1991 (currently in the process of revision), that addresses the evaluation of audiometric testing programs. NIOSH recommends a two-step process: (1) The evaluation of an individual worker's hearing loss prevention program at the time of the annual audiometric test, and (2) Annual evaluation on a programmatic level.

OSHA seeks information on methods to evaluate the success of hearing conservation programs in construction. If the occurrence of an STS is used as the measure of hearing loss, what rates of STSs are seen in effective programs, i.e., when does an employer know that the program is working? What other benchmarks can be used to evaluate a successful program in construction? OSHA also seeks information on the advisability of using the provisions of the draft ANSI standard, S12.13, for evaluating the effectiveness of hearing conservation programs through the examination of audiometric data. Is this method practical and does it produce useful results? Is there a simple self-evaluation tool that can be used by small employers?

3. ANSI Standards

NIOSH also recommended that any new hearing conservation requirements should incorporate the current ANSI standards intended to improve performance and calibration criteria for audiometric testing, audiometric booths and vans, dosimeters, and sound level instruments. Table 2 below briefly summarizes the relevant ANSI standards. Should OSHA adopt the most recent ANSI standards? Please provide data and documentation supporting your position. Are any of these ANSI standards not applicable to the construction industry?

Table 2. -- ANSI Standards Relevant to Audiometric Testing

Equipment type or activity	Current ANSI standards	Select requirement changes
Audiometers	ANSI S3.6-1996	Tighter tolerances and criteria, multiple changes. Less background noise permitted.
Audiometric test booths and vans	ANSI S3.1-1999	
Noise Calibration, Calibrators	ANSI S1.40-1984	Tighter tolerances possible.
Integrating/Average Sound Level Meters	ANSI S1.43-1997	Broader performance range, 80-140 dB, TWA measures steady intermittent and impulsive sounds.
Noise Dosimeters	ANSI S1.25-1991	Same as above, 80-140 Db.

C. Noise and Safety on the Construction Site

Suter's work discusses the possible link between noise, hearing loss, and the occurrence of accidents in the construction industry, as well as studies of this problem in other industries (ship building, general industry) (Exs. 2-2; 2-6). OSHA seeks information and data on construction worker accidents associated with or caused by excessive construction project noise or noise-induced hearing loss, including individual accident investigation reports, and research results. The Agency also seeks information on the availability of warning signals, such as reverse alarms on heavy vehicles that are specially designed to be audible in the noise environments typical of construction sites or by workers with noise-induced hearing loss. Are there alternatives to reverse alarms (visual as well as acoustical) that have proven to be effective?

D. Noise Exposure Control

While OSHA is not considering changes to its requirements for controlling workplace noise levels at this time, the Agency is interested in obtaining information concerning the methods employers have used to successfully control or reduce noise levels on construction projects. This data may be used for several purposes, including:

- Identifying and establishing best practices
- Updating OSHA and NIOSH training materials

- Identifying effective engineering and administrative controls

1. Engineering and Administrative Controls

In construction, as in general industry, the preferred methods of abating the noise hazard are the use of engineering and administrative controls. OSHA solicits noise exposure data and noise abatement information from the manufacturers of equipment and tools used in the construction industry that emit high levels of noise and thus expose the operators and those working nearby to potentially hazardous noise levels. The Agency is particularly interested in noise exposure and noise abatement information on two major sources of construction noise: (1) Heavy equipment, such as loaders, dozers, asphalt spreaders, power shovels, crawler and other kinds of cranes, and (2) graders, and pneumatic tools, such as jackhammers and chipping guns.

What are the noise exposures of operators of heavy equipment and those who work nearby? What progress has been made over the last two decades to control the noise of heavy construction equipment? Are quieter tools powered by means other than pneumatic power available for the kinds of construction jobs traditionally done by pneumatic tools? Are these tools as efficient and cost-effective as the pneumatic versions? Please provide data on the availability of quieter equipment and tools, price quotes, productivity information, and any other data that would be helpful in determining the relative cost-effectiveness of purchasing quieter equipment. What types of engineering and administrative controls have proved most effective? How have these controls affected operations on construction sites?

2. Machine Design, Retrofit, and Substitutions

OSHA seeks information on quieter tools, equipment, or processes for the construction industry that have been developed either in the U.S. or abroad that could be substituted for existing noisy tools, equipment, and processes. The Agency also requests information from equipment manufacturers, noise control engineers, and others involved in the purchase, use, or modification of equipment or parts of equipment used in construction on those features of machine design and retrofit (including installation of mufflers, power rating of the engine, presence of enclosed, sound-insulated cabs) affecting the noise exposure of workers operating the equipment or working in the vicinity of such equipment. Please provide specific information on the types and noise emission levels (both sound power and sound pressure levels, if available), as well as information on the cost-effectiveness of various types of "quiet" construction equipment now being marketed and used in the construction industry. In commercial, road and bridge and residential construction, control of which types of equipment would have the greatest impact in reducing the number of people exposed and the intensity of exposure? Has any study or modeling been done in this area?

3. Administrative Controls

Administrative controls include changes in the work schedule or the provision of quiet areas to allow workers to recover from TTS. To what degree are administrative controls feasible or desirable in the construction industry? What administrative controls are used for noise control in the construction industry? How are such controls implemented? What are the costs? Are there any data on the effectiveness of administrative controls in the construction industry? Do certain construction operations preclude the use of administrative controls? If so, which are they, and why do they make the use of such controls difficult or impossible?

III. Authority

This document was prepared under the direction of John L. Henshaw, Assistant Secretary for Occupational Safety and Health, U.S. Department of Labor, 200 Constitution Avenue, NW, Washington, DC 20210. It is issued pursuant to sections 4, 6, and 8 of the Occupational Safety and Health Act of 1970 (29 U.S.C. 653, 655, 657); section 107 of the Construction Work Hours and Safety Standards Act (Construction Safety Act) (40 U.S.C. 333); Secretary of Labor's Order No. 3-2000 6-96 (65 FR 50017); and 29 CFR Part 1911.

Signed at Washington, DC, July 31, 2002.

John L. Henshaw,

Assistant Secretary of Labor.

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Footnote (1) The derivation of the 13 (it is actually closer to 12) to 30 percent hearing loss for the average worker was calculated as follows. The Hattis and Makri population estimate of 25 million to 65 million % disability life-years accumulated each year was divided by the estimated 750,000 workers currently at and above 85 dBA eight hour TWA. This gives, on average, between 33.3 and 86.6% disability life-years accumulated each year by an individual worker over his entire lifetime. The resulting annualized individual risk is then multiplied by the average 13 years of employment to obtain the aggregate % disability life-years experienced by the typical worker as a result of his total exposure. if the typical worker is 38 years old and has an average life span of 75 years, then the disability life-years is divided by his remaining 37 years of life to obtain the 12 to 30 percent hearing loss estimate.

(a) (25,000,000 x 13) / 750,000 x 37) = 11.7 percent
(b) (65,000,000 x 13) / (750,000 x 37) = 30.4 percent

SECTION C

RESPIRATORY PROTECTION

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Part Number:	1910
• **Part Title:**	Occupational Safety and Health Standards
• **Subpart:**	I
• **Subpart Title:**	Personal Protective Equipment
• **Standard Number:**	1910.134
• **Title:**	Respiratory Protection.
• **Appendix:**	A , B-1 , B-2 , C , D

This section applies to General Industry (part 1910), Shipyards (part 1915), Marine Terminals (part 1917), Longshoring (part 1918), and Construction (part 1926).

1910.134(a)

Permissible practice.

1910.134(a)(1)

In the control of those occupational diseases caused by breathing air contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, sprays, or vapors, the primary objective shall be to prevent atmospheric contamination. This shall be accomplished as far as feasible by accepted engineering control measures (for example, enclosure or confinement of the operation, general and local ventilation, and substitution of less toxic materials). When effective engineering controls are not feasible, or while they are being instituted, appropriate respirators shall be used pursuant to this section.

1910.134(a)(2)

A respirator shall be provided to each employee when such equipment is necessary to protect the health of such employee. The employer shall provide the respirators which are applicable and suitable for the purpose intended. The employer shall be responsible for the establishment and maintenance of a respiratory protection program, which shall include the requirements outlined in paragraph (c) of this section. The program shall cover each employee required by this section to use a respirator.

1910.134(b)

Definitions. The following definitions are important terms used in the respiratory protection standard in this section.

Air-purifying respirator means a respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element.

Assigned protection factor (APF) means the workplace level of respiratory protection that a respirator or class of respirators is expected to provide to employees when the employer implements a continuing, effective respiratory protection program as specified by this section.

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 (SARs) and self-contained breathing apparatus (SCBA) units.

Canister or cartridge means a container with a filter, sorbent, or catalyst, or combination of these items, which removes specific contaminants from the air passed through the container.

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.

Emergency situation means any occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment that may or does result in an uncontrolled significant release of an airborne contaminant.

Employee exposure means exposure to a concentration of an airborne contaminant that would occur if the employee were not using respiratory protection.

End-of-service-life indicator (ESLI) means a system that warns the respirator user of the approach of the end of adequate respiratory protection, for example, that the sorbent is approaching saturation or is no longer effective.

Escape-only respirator means a respirator intended to be used only for emergency exit.

Filter or air purifying element means a component used in respirators to remove solid or liquid aerosols from the inspired air.

Filtering facepiece (dust mask) means a negative pressure particulate respirator with a filter as an integral part of the facepiece or with the entire facepiece composed of the filtering medium.

Fit factor means a quantitative estimate of the fit of a particular respirator to a specific individual, and typically estimates the ratio of the concentration of a substance in ambient air to its concentration inside the respirator when worn.

Fit test means the use of a protocol to qualitatively or quantitatively evaluate the fit of a respirator on an individual. (See also Qualitative fit test QLFT and Quantitative fit test QNFT.)

Helmet means a rigid respiratory inlet covering that also provides head protection against impact and penetration.

High efficiency particulate air (HEPA) filter means a filter that is at least 99.97% efficient in removing monodisperse particles of 0.3 micrometers in diameter. The equivalent NIOSH 42 CFR 84 particulate filters are the N100, R100, and P100 filters.

Hood means a respiratory inlet covering that completely covers the head and neck and may also cover portions of the shoulders and torso.

Immediately dangerous to life or 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.

Interior structural firefighting means the physical activity of fire suppression, rescue or both, inside of buildings or enclosed structures which are involved in a fire situation beyond the incipient stage. (See 29 CFR 1910.155)

Loose-fitting facepiece means a respiratory inlet covering that is designed to form a partial seal with the face.

Maximum use concentration (MUC) means the maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the required OSHA permissible exposure limit, short-term exposure limit, or ceiling limit. When no OSHA exposure limit is available for a hazardous substance, an employer must determine an MUC on the basis of relevant available information and informed professional judgment.

Negative pressure respirator (tight fitting) 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 an oxygen content below 19.5% by volume.

Physician or other licensed health care professional (PLHCP) means an individual whose legally permitted scope of practice (i.e., license, registration, or certification) allows him or her to independently provide, or be delegated the responsibility to provide, some or all of the health care services required by paragraph (e) of this section.

Positive pressure respirator means a respirator in which the pressure inside the respiratory inlet covering exceeds the ambient air pressure outside the respirator.

Powered air-purifying respirator (PAPR) means an air-purifying respirator that uses a blower to force the ambient air through air-purifying elements to the inlet covering.

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.

Qualitative fit test (QLFT) means a pass/fail fit test to assess the adequacy of respirator fit that relies on the individual's response to the test agent.

Quantitative fit test (QNFT) means an assessment of the adequacy of respirator fit by numerically measuring the amount of leakage into the respirator.

Respiratory inlet covering means that portion of a respirator that forms the protective barrier between the user's respiratory tract and an air-purifying device or breathing air source, or both. It may be a facepiece, helmet, hood, suit, or a mouthpiece respirator with nose clamp.

Self-contained breathing apparatus (SCBA) means an atmosphere-supplying respirator for which the breathing air source is designed to be carried by the user.

Service life means the period of time that a respirator, filter or sorbent, or other respiratory equipment provides adequate protection to the wearer.

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.

This section means this respiratory protection standard.

Tight-fitting facepiece means a respiratory inlet covering that forms a complete seal with the face.

User seal check means an action conducted by the respirator user to determine if the respirator is properly seated to the face.

1910.134(c)

Respiratory protection program. This paragraph requires the employer to develop and implement a written respiratory protection program with required worksite-specific procedures and elements for required respirator use. The program must be administered by a suitably trained program administrator. In addition, certain program elements may be required for voluntary use to prevent potential hazards associated with the use of the respirator. The Small Entity Compliance Guide contains criteria for the selection of a program administrator and a sample program that meets the requirements of this paragraph. Copies of the Small Entity Compliance Guide will be available on or about April 8, 1998 from the Occupational Safety and Health Administration's Office of Publications, Room N 3101, 200 Constitution Avenue, NW, Washington, DC, 20210 (202-219-4667).

1910.134(c)(1)

In any workplace where respirators are necessary to protect the health of the employee or whenever respirators are required by the employer, the employer shall establish and implement a written respiratory protection program with worksite-specific procedures. The program shall be updated as necessary to reflect those changes in workplace conditions that affect respirator use. The employer shall include in the program the following provisions of this section, as applicable:

1910.134(c)(1)(i)

Procedures for selecting respirators for use in the workplace;

1910.134(c)(1)(ii)

Medical evaluations of employees required to use respirators;

1910.134(c)(1)(iii)

Fit testing procedures for tight-fitting respirators;

1910.134(c)(1)(iv)

Procedures for proper use of respirators in routine and reasonably foreseeable emergency situations;

1910.134(c)(1)(v)

Procedures and schedules for cleaning, disinfecting, storing, inspecting, repairing, discarding, and otherwise maintaining respirators;

1910.134(c)(1)(vi)

Procedures to ensure adequate air quality, quantity, and flow of breathing air for atmosphere-supplying respirators;

1910.134(c)(1)(vii)

Training of employees in the respiratory hazards to which they are potentially exposed during routine and emergency situations;

1910.134(c)(1)(viii)

Training of employees in the proper use of respirators, including putting on and removing them, any limitations on their use, and their maintenance; and

1910.134(c)(1)(ix)

Procedures for regularly evaluating the effectiveness of the program.

1910.134(c)(2)

Where respirator use is not required:

1910.134(c)(2)(i)

An employer may provide respirators at the request of employees or permit employees to use their own respirators, if the employer determines that such respirator use will not in itself create a hazard. If the employer determines that any voluntary respirator use is permissible, the employer shall provide the respirator users with the information contained in Appendix D to this section ("Information for Employees Using Respirators When Not Required Under the Standard"); and

1910.134(c)(2)(ii)

In addition, the employer must establish and implement those elements of a written respiratory protection program necessary to ensure that any employee using a respirator voluntarily is medically able to use that respirator, and that the respirator is cleaned, stored, and maintained so that its use does not present a health hazard to the user. Exception: Employers are not required to include in a written respiratory protection program those employees whose only use of respirators involves the voluntary use of filtering facepieces (dust masks).

1910.134(c)(3)

The employer shall designate a program administrator who is qualified by appropriate training or experience that is commensurate with the complexity of the program to administer or oversee the respiratory protection program and conduct the required evaluations of program effectiveness.

1910.134(c)(4)

The employer shall provide respirators, training, and medical evaluations at no cost to the employee.

1910.134(d)

Selection of respirators. This paragraph requires the employer to evaluate respiratory hazard(s) in the workplace, identify relevant workplace and user factors, and base respirator selection on these factors. The paragraph also specifies appropriately protective respirators for use in IDLH atmospheres, and limits the selection and use of air-purifying respirators.

1910.134(d)(1)

General requirements.

1910.134(d)(1)(i)

The employer shall select and provide an appropriate respirator based on the respiratory hazard(s) to which the worker is exposed and workplace and user factors that affect respirator performance and reliability.

1910.134(d)(1)(ii)

The employer shall select a NIOSH-certified respirator. The respirator shall be used in compliance with the conditions of its certification.

1910.134(d)(1)(iii)

The employer shall identify and evaluate the respiratory hazard(s) in the workplace; this evaluation shall include a reasonable estimate of employee exposures to respiratory hazard(s) and an identification of the contaminant's chemical state and physical form. Where the employer cannot identify or reasonably estimate the employee exposure, the employer shall consider the atmosphere to be IDLH.

1910.134(d)(1)(iv)

The employer shall select respirators from a sufficient number of respirator models and sizes so that the respirator is acceptable to, and correctly fits, the user.

1910.134(d)(2)

Respirators for IDLH atmospheres.

1910.134(d)(2)(i)

The employer shall provide the following respirators for employee use in IDLH atmospheres:

1910.134(d)(2)(i)(A)

A full facepiece pressure demand SCBA certified by NIOSH for a minimum service life of thirty minutes, or

1910.134(d)(2)(i)(B)

A combination full facepiece pressure demand supplied-air respirator (SAR) with auxiliary self-contained air supply.

1910.134(d)(2)(ii)

Respirators provided only for escape from IDLH atmospheres shall be NIOSH-certified for escape from the atmosphere in which they will be used.

1910.134(d)(2)(iii)

All oxygen-deficient atmospheres shall be considered IDLH. Exception: If the employer demonstrates that, under all foreseeable conditions, the oxygen concentration can be maintained within the ranges specified in Table II of this section (i.e., for the altitudes set out in the table), then any atmosphere-supplying respirator may be used.

1910.134(d)(3)

Respirators for atmospheres that are not IDLH.

1910.134(d)(3)(i)

The employer shall provide a respirator that is adequate to protect the health of the employee and ensure compliance with all other OSHA statutory and regulatory requirements, under routine and reasonably foreseeable emergency situations.

1910.134(d)(3)(i)(A)

Assigned Protection Factors (APFs) Employers must use the assigned protection factors listed in Table 1 to select a respirator that meets or exceeds the required level of employee protection. When using a combination respirator (e.g., airline respirators with an air-purifying filter), employers must ensure that the assigned protection factor is appropriate to the mode of operation in which the respirator is being used.

Table 1. -- Assigned Protection Factors[5]

Type of respirator[1], [2]	Quarter mask	Half mask	Full facepiece	Helmet/ hood	Loose-fitting facepiece
1. Air-Purifying Respirator	5	[3]10	50	.....	.....
2. Powered Air-Purifying Respirator (PAPR)	.....	50	1,000	[4]25/1,000	25
3. Supplied-Air Respirator (SAR) or Airline Respirator					
• Demand mode	.....	10	50	.....	.....
• Continuous flow mode	.....	50	1,000	[4]25/1,000	25
• Pressure-demand or other positive-pressure mode	.....	50	1,000	.....	.....
4. Self-Contained Breathing Apparatus (SCBA)					
• Demand mode	.....	10	50	50	.....
• Pressure-demand or other positive-pressure mode (e.g., open/closed circuit)	.....	.....	10,000	10,000	.....

Notes:

[1]Employers may select respirators assigned for use in higher workplace concentrations of a hazardous substance for use at lower concentrations of that substance, or when required respirator use is independent of concentration.

[2]The assigned protection factors in Table 1 are only effective when the employer implements a continuing, effective respirator program as required by this section (29 CFR 1910.134), including training, fit testing, maintenance, and use requirements.

[3]This APF category includes filtering facepieces, and half masks with elastomeric facepieces.

[4]The employer must have evidence provided by the respirator manufacturer that testing of these respirators demonstrates performance at a level of protection of 1,000 or greater to receive an APF of 1,000. This level of performance can best be demonstrated by performing a WPF or SWPF study or equivalent testing. Absent such testing, all other PAPRs and SARs with helmets/hoods are to be treated as loose-fitting facepiece respirators, and receive an APF of 25.

[5]These APFs do not apply to respirators used solely for escape. For escape respirators used in association with specific substances covered by 29 CFR 1910 subpart Z, employers must refer to the appropriate substance-specific standards in that subpart. Escape respirators for other IDLH atmospheres are specified by 29 CFR 1910.134 (d)(2)(ii).

1910.134(d)(3)(i)(B)

Maximum Use Concentration (MUC)

1910.134(d)(3)(i)(B)(1)

The employer must select a respirator for employee use that maintains the employee's exposure to the hazardous substance, when measured outside the respirator, at or below the MUC.

1910.134(d)(3)(i)(B)(2)

Employers must not apply MUCs to conditions that are immediately dangerous to life or health (IDLH); instead, they must use respirators listed for IDLH conditions in paragraph (d)(2) of this standard.

1910.134(d)(3)(i)(B)(3)

When the calculated MUC exceeds the IDLH level for a hazardous substance, or the performance limits of the cartridge or canister, then employers must set the maximum MUC at that lower limit.

1910.134(d)(3)(ii)

The respirator selected shall be appropriate for the chemical state and physical form of the contaminant.

1910.134(d)(3)(iii)

For protection against gases and vapors, the employer shall provide:

1910.134(d)(3)(iii)(A)

An atmosphere-supplying respirator, or

1910.134(d)(3)(iii)(B)

An air-purifying respirator, provided that:

1910.134(d)(3)(iii)(B)(1)

The respirator is equipped with an end-of-service-life indicator (ESLI) certified by NIOSH for the contaminant; or

1910.134(d)(3)(iii)(B)(2)

If there is no ESLI appropriate for conditions in the employer's workplace, the employer implements a change schedule for canisters and cartridges that is based on objective information or data that will ensure that canisters and cartridges are changed before the end of their service life. The employer shall describe in the respirator program the information and data relied upon and the basis for the canister and cartridge change schedule and the basis for reliance on the data.

1910.134(d)(3)(iv)

For protection against particulates, the employer shall provide:

1910.134(d)(3)(iv)(A)

An atmosphere-supplying respirator; or

1910.134(d)(3)(iv)(B)

An air-purifying respirator equipped with a filter certified by NIOSH under 30 CFR part 11 as a high efficiency particulate air (HEPA) filter, or an air-purifying respirator equipped with a filter certified for particulates by NIOSH under 42 CFR part 84; or

1910.134(d)(3)(iv)(C)

For contaminants consisting primarily of particles with mass median aerodynamic diameters (MMAD) of at least 2 micrometers, an air-purifying respirator equipped with any filter certified for particulates by NIOSH.

TABLE I. -- ASSIGNED PROTECTION FACTORS
[RESERVED]

TABLE II

Altitude (ft.)	Oxygen deficient Atmospheres (% 0_2) for which the employer atmosphere-may rely on supplying respirators
Less than 3,001	16.0-19.5
3,001-4,000	16.4-19.5
4,001-5,000	17.1-19.5
5,001-6,000	17.8-19.5
6,001-7,000	18.5-19.5
7,001-8,000[1]	19.3-19.5.

[1]Above 8,000 feet the exception does not apply. Oxygen-enriched breathing air must be supplied above 14,000 feet.

1910.134(e)

Medical evaluation. 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. Accordingly, this paragraph specifies the minimum requirements for medical evaluation that employers must implement to determine the employee's ability to use a respirator.

1910.134(e)(1)

General. The employer shall provide a medical evaluation to determine the employee's ability to use a respirator, before the employee is fit tested or required to use the respirator in the workplace. The employer may discontinue an employee's medical evaluations when the employee is no longer required to use a respirator.

1910.134(e)(2)

Medical evaluation procedures.

1910.134(e)(2)(i)

The employer shall identify a physician or other licensed health care professional (PLHCP) to perform medical evaluations using a medical questionnaire or an initial medical examination that obtains the same information as the medical questionnaire.

1910.134(e)(2)(ii)

The medical evaluation shall obtain the information requested by the questionnaire in Sections 1 and 2, Part A of Appendix C of this section.

1910.134(e)(3)

Follow-up medical examination.

1910.134(e)(3)(i)

The employer shall ensure that a follow-up medical examination is provided for an employee who gives a positive response to any question among questions 1 through 8 in Section 2, Part A of Appendix C or whose initial medical examination demonstrates the need for a follow-up medical examination.

1910.134(e)(3)(ii)

The follow-up medical examination shall include any medical tests, consultations, or diagnostic procedures that the PLHCP deems necessary to make a final determination.

1910.134(e)(4)

Administration of the medical questionnaire and examinations.

1910.134(e)(4)(i)

The medical questionnaire and examinations shall be administered confidentially during the employee's normal working hours or at a time and place convenient to the employee. The medical questionnaire shall be administered in a manner that ensures that the employee understands its content.

1910.134(e)(4)(ii)

The employer shall provide the employee with an opportunity to discuss the questionnaire and examination results with the PLHCP.

1910.134(e)(5)

Supplemental information for the PLHCP.

1910.134(e)(5)(i)

The following information must be provided to the PLHCP before the PLHCP makes a recommendation concerning an employee's ability to use a respirator:

1910.134(e)(5)(i)(A)

(A) The type and weight of the respirator to be used by the employee;

1910.134(e)(5)(i)(B)

The duration and frequency of respirator use (including use for rescue and escape);

1910.134(e)(5)(i)(C)

The expected physical work effort;

1910.134(e)(5)(i)(D)

Additional protective clothing and equipment to be worn; and

1910.134(e)(5)(i)(E)

Temperature and humidity extremes that may be encountered.

1910.134(e)(5)(ii)

Any supplemental information provided previously to the PLHCP regarding an employee need not be provided for a subsequent medical evaluation if the information and the PLHCP remain the same.

1910.134(e)(5)(iii)

The employer shall provide the PLHCP with a copy of the written respiratory protection program and a copy of this section.

Note to Paragraph (e)(5)(iii): When the employer replaces a PLHCP, the employer must ensure that the new PLHCP obtains this information, either by providing the documents directly to the PLHCP or having the documents transferred from the former PLHCP to the new PLHCP. However, OSHA does not expect employers to have employees medically reevaluated solely because a new PLHCP has been selected.

1910.134(e)(6)

Medical determination. In determining the employee's ability to use a respirator, the employer shall:

1910.134(e)(6)(i)

Obtain a written recommendation regarding the employee's ability to use the respirator from the PLHCP. The recommendation shall provide only the following information:

1910.134(e)(6)(i)(A)

Any limitations on respirator use related to the medical condition of the employee, or relating to the workplace conditions in which the respirator will be used, including whether or not the employee is medically able to use the respirator;

1910.134(e)(6)(i)(B)

The need, if any, for follow-up medical evaluations; and

1910.134(e)(6)(i)(C)

A statement that the PLHCP has provided the employee with a copy of the PLHCP's written recommendation.

1910.134(e)(6)(ii)

If the respirator is a negative pressure respirator and the PLHCP finds a medical condition that may place the employee's health at increased risk if the respirator is used, the employer shall provide a PAPR if the PLHCP's medical evaluation finds that the employee can use such a respirator; if a subsequent medical evaluation finds that the employee is medically able to use a negative pressure respirator, then the employer is no longer required to provide a PAPR.

1910.134(e)(7)

Additional medical evaluations. At a minimum, the employer shall provide additional medical evaluations that comply with the requirements of this section if:

1910.134(e)(7)(i)

An employee reports medical signs or symptoms that are related to ability to use a respirator;

1910.134(e)(7)(ii)

A PLHCP, supervisor, or the respirator program administrator informs the employer that an employee needs to be reevaluated;

1910.134(e)(7)(iii)

Information from the respiratory protection program, including observations made during fit testing and program evaluation, indicates a need for employee reevaluation; or

1910.134(e)(7)(iv)

A change occurs in workplace conditions (e.g., physical work effort, protective clothing, temperature) that may result in a substantial increase in the physiological burden placed on an employee.

1910.134(f)

Fit testing. This paragraph requires that, before an employee may be required to use any respirator with a negative or positive pressure tight-fitting facepiece, the employee must be fit tested with the same make, model, style, and size of respirator that will be used. This paragraph specifies the kinds of fit tests allowed, the procedures for conducting them, and how the results of the fit tests must be used.

1910.134(f)(1)

The employer shall ensure that employees using a tight-fitting facepiece respirator pass an appropriate qualitative fit test (QLFT) or quantitative fit test (QNFT) as stated in this paragraph.

1910.134(f)(2)

The employer shall ensure that an employee using a tight-fitting facepiece respirator is fit tested prior to initial use of the respirator, whenever a different respirator facepiece (size, style, model or make) is used, and at least annually thereafter.

1910.134(f)(3)

The employer shall conduct an additional fit test whenever the employee reports, or the employer, PLHCP, supervisor, or program administrator makes visual observations of, changes in the employee's physical condition that could affect respirator fit. Such conditions include, but are not limited to, facial scarring, dental changes, cosmetic surgery, or an obvious change in body weight.

1910.134(f)(4)

If after passing a QLFT or QNFT, the employee subsequently notifies the employer, program administrator, supervisor, or PLHCP that the fit of the respirator is unacceptable, the employee shall be given a reasonable opportunity to select a different respirator facepiece and to be retested.

1910.134(f)(5)

The fit test shall be administered using an OSHA-accepted QLFT or QNFT protocol. The OSHA-accepted QLFT and QNFT protocols and procedures are contained in Appendix A of this section.

1910.134(f)(6)

QLFT may only be used to fit test negative pressure air-purifying respirators that must achieve a fit factor of 100 or less.

1910.134(f)(7)

If the fit factor, as determined through an OSHA-accepted QNFT protocol, is equal to or greater than 100 for tight-fitting half facepieces, or equal to or greater than 500 for tight-fitting full facepieces, the QNFT has been passed with that respirator.

1910.134(f)(8)

Fit testing of tight-fitting atmosphere-supplying respirators and tight-fitting powered air-purifying respirators shall be accomplished by performing quantitative or qualitative fit testing in the negative pressure mode, regardless of the mode of operation (negative or positive pressure) that is used for respiratory protection.

1910.134(f)(8)(i)

Qualitative fit testing of these respirators shall be accomplished by temporarily converting the respirator user's actual facepiece into a negative pressure respirator with appropriate filters, or by using an identical negative pressure air-purifying respirator facepiece with the same sealing surfaces as a surrogate for the atmosphere-supplying or powered air-purifying respirator facepiece.

1910.134(f)(8)(ii)

Quantitative fit testing of these respirators shall be accomplished by modifying the facepiece to allow sampling inside the facepiece in the breathing zone of the user, midway between the nose and mouth. This requirement shall be accomplished by installing a

permanent sampling probe onto a surrogate facepiece, or by using a sampling adapter designed to temporarily provide a means of sampling air from inside the facepiece.

1910.134(f)(8)(iii)

Any modifications to the respirator facepiece for fit testing shall be completely removed, and the facepiece restored to NIOSH-approved configuration, before that facepiece can be used in the workplace.

1910.134(g)

Use of respirators. This paragraph requires employers to establish and implement procedures for the proper use of respirators. These requirements include prohibiting conditions that may result in facepiece seal leakage, preventing employees from removing respirators in hazardous environments, taking actions to ensure continued effective respirator operation throughout the work shift, and establishing procedures for the use of respirators in IDLH atmospheres or in interior structural firefighting situations.

1910.134(g)(1)

Facepiece seal protection.

1910.134(g)(1)(i)

The employer shall not permit respirators with tight-fitting facepieces to be worn by employees who have:

1910.134(g)(1)(i)(A)

Facial hair that comes between the sealing surface of the facepiece and the face or that interferes with valve function; or

1910.134(g)(1)(i)(B)

Any condition that interferes with the face-to-facepiece seal or valve function.

1910.134(g)(1)(ii)

If an employee wears corrective glasses or goggles or other personal protective equipment, the employer shall ensure that such equipment is worn in a manner that does not interfere with the seal of the facepiece to the face of the user.

1910.134(g)(1)(iii)

For all tight-fitting respirators, the employer shall ensure that employees perform a user seal check each time they put on the respirator using the procedures in Appendix B-1 or procedures recommended by the respirator manufacturer that the employer demonstrates are as effective as those in Appendix B-1 of this section.

1910.134(g)(2)

Continuing respirator effectiveness.

1910.134(g)(2)(i)

Appropriate surveillance shall be maintained of work area conditions and degree of employee exposure or stress. When there is a change in work area conditions or degree of employee exposure or stress that may affect respirator effectiveness, the employer shall reevaluate the continued effectiveness of the respirator.

1910.134(g)(2)(ii)

The employer shall ensure that employees leave the respirator use area:

1910.134(g)(2)(ii)(A)

To wash their faces and respirator facepieces as necessary to prevent eye or skin irritation associated with respirator use; or

1910.134(g)(2)(ii)(B)

If they detect vapor or gas breakthrough, changes in breathing resistance, or leakage of the facepiece; or

1910.134(g)(2)(ii)(C)

To replace the respirator or the filter, cartridge, or canister elements.

1910.134(g)(2)(iii)

If the employee detects vapor or gas breakthrough, changes in breathing resistance, or leakage of the facepiece, the employer must replace or repair the respirator before allowing the employee to return to the work area.

1910.134(g)(3)

Procedures for IDLH atmospheres. For all IDLH atmospheres, the employer shall ensure that:

1910.134(g)(3)(i)

One employee or, when needed, more than one employee is located outside the IDLH atmosphere;

1910.134(g)(3)(ii)

Visual, voice, or signal line communication is maintained between the employee(s) in the IDLH atmosphere and the employee(s) located outside the IDLH atmosphere;

1910.134(g)(3)(iii)

The employee(s) located outside the IDLH atmosphere are trained and equipped to provide effective emergency rescue;

1910.134(g)(3)(iv)

The employer or designee is notified before the employee(s) located outside the IDLH atmosphere enter the IDLH atmosphere to provide emergency rescue;

1910.134(g)(3)(v)

The employer or designee authorized to do so by the employer, once notified, provides necessary assistance appropriate to the situation;

1910.134(g)(3)(vi)

Employee(s) located outside the IDLH atmospheres are equipped with:

1910.134(g)(3)(vi)(A)

Pressure demand or other positive pressure SCBAs, or a pressure demand or other positive pressure supplied-air respirator with auxiliary SCBA; and either

1910.134(g)(3)(vi)(B)

Appropriate retrieval equipment for removing the employee(s) who enter(s) these hazardous atmospheres where retrieval equipment would contribute to the rescue of the employee(s) and would not increase the overall risk resulting from entry; or

1910.134(g)(3)(vi)(C)

Equivalent means for rescue where retrieval equipment is not required under paragraph (g)(3)(vi)(B).

1910.134(g)(4)

Procedures for interior structural firefighting. In addition to the requirements set forth under paragraph (g)(3), in interior structural fires, the employer shall ensure that:

1910.134(g)(4)(i)

At least two employees enter the IDLH atmosphere and remain in visual or voice contact with one another at all times;

1910.134(g)(4)(ii)

At least two employees are located outside the IDLH atmosphere; and

1910.134(g)(4)(iii)

All employees engaged in interior structural firefighting use SCBAs.

Note 1 to paragraph (g): One of the two individuals located outside the IDLH atmosphere may be assigned to an additional role, such as incident commander in charge of the emergency or safety officer, so long as this individual is able to perform assistance or rescue activities without jeopardizing the safety or health of any firefighter working at the incident.

Note 2 to paragraph (g): Nothing in this section is meant to preclude firefighters from performing emergency rescue activities before an entire team has assembled.

1910.134(h)

Maintenance and care of respirators. This paragraph requires the employer to provide for the cleaning and disinfecting, storage, inspection, and repair of respirators used by employees.

1910.134(h)(1)

Cleaning and disinfecting. The employer shall provide each respirator user with a respirator that is clean, sanitary, and in good working order. The employer shall ensure that respirators are cleaned and disinfected using the procedures in Appendix B-2 of this section, or procedures recommended by the respirator manufacturer, provided that such procedures are of equivalent effectiveness. The respirators shall be cleaned and disinfected at the following intervals:

1910.134(h)(1)(i)

Respirators issued for the exclusive use of an employee shall be cleaned and disinfected as often as necessary to be maintained in a sanitary condition;

1910.134(h)(1)(ii)

Respirators issued to more than one employee shall be cleaned and disinfected before being worn by different individuals;

1910.134(h)(1)(iii)

Respirators maintained for emergency use shall be cleaned and disinfected after each use; and

1910.134(h)(1)(iv)

Respirators used in fit testing and training shall be cleaned and disinfected after each use.

1910.134(h)(2)

Storage. The employer shall ensure that respirators are stored as follows:

1910.134(h)(2)(i)

All respirators shall be stored to protect them from damage, contamination, dust, sunlight, extreme temperatures, excessive moisture, and damaging chemicals, and they shall be packed or stored to prevent deformation of the facepiece and exhalation valve.

1910.134(h)(2)(ii)

In addition to the requirements of paragraph (h)(2)(i) of this section, emergency respirators shall be:

1910.134(h)(2)(ii)(A)

Kept accessible to the work area;

1910.134(h)(2)(ii)(B)

Stored in compartments or in covers that are clearly marked as containing emergency respirators; and

1910.134(h)(2)(ii)(C)

Stored in accordance with any applicable manufacturer instructions.

1910.134(h)(3)

Inspection.

1910.134(h)(3)(i)

The employer shall ensure that respirators are inspected as follows:

1910.134(h)(3)(i)(A)

All respirators used in routine situations shall be inspected before each use and during cleaning;

1910.134(h)(3)(i)(B)

All respirators maintained for use in emergency situations shall be inspected at least monthly and in accordance with the manufacturer's recommendations, and shall be checked for proper function before and after each use; and

1910.134(h)(3)(i)(C)

Emergency escape-only respirators shall be inspected before being carried into the workplace for use.

1910.134(h)(3)(ii)

The employer shall ensure that respirator inspections include the following:

1910.134(h)(3)(ii)(A)

A check of respirator function, tightness of connections, and the condition of the various parts including, but not limited to, the facepiece, head straps, valves, connecting tube, and cartridges, canisters or filters; and

1910.134(h)(3)(ii)(B)

A check of elastomeric parts for pliability and signs of deterioration.

1910.134(h)(3)(iii)

In addition to the requirements of paragraphs (h)(3)(i) and (ii) of this section, self-contained breathing apparatus shall be inspected monthly. Air and oxygen cylinders shall be maintained in a fully charged state and shall be recharged when the pressure falls to 90% of the manufacturer's recommended pressure level. The employer shall determine that the regulator and warning devices function properly.

1910.134(h)(3)(iv)

For respirators maintained for emergency use, the employer shall:

1910.134(h)(3)(iv)(A)

Certify the respirator by documenting the date the inspection was performed, the name (or signature) of the person who made the inspection, the findings, required remedial action, and a serial number or other means of identifying the inspected respirator; and

1910.134(h)(3)(iv)(B)

Provide this information on a tag or label that is attached to the storage compartment for the respirator, is kept with the respirator, or is included in inspection reports stored as paper or electronic files. This information shall be maintained until replaced following a subsequent certification.

1910.134(h)(4)

Repairs. The employer shall ensure that respirators that fail an inspection or are otherwise found to be defective are removed from service, and are discarded or repaired or adjusted in accordance with the following procedures:

1910.134(h)(4)(i)

Repairs or adjustments to respirators are to be made only by persons appropriately trained to perform such operations and shall use only the respirator manufacturer's NIOSH-approved parts designed for the respirator;

1910.134(h)(4)(ii)

Repairs shall be made according to the manufacturer's recommendations and specifications for the type and extent of repairs to be performed; and

1910.134(h)(4)(iii)

Reducing and admission valves, regulators, and alarms shall be adjusted or repaired only by the manufacturer or a technician trained by the manufacturer.

1910.134(i)

Breathing air quality and use. This paragraph requires the employer to provide employees using atmosphere-supplying respirators (supplied-air and SCBA) with breathing gases of high purity.

1910.134(i)(1)

The employer shall ensure that compressed air, compressed oxygen, liquid air, and liquid oxygen used for respiration accords with the following specifications:

1910.134(i)(1)(i)

Compressed and liquid oxygen shall meet the United States Pharmacopoeia requirements for medical or breathing oxygen; and

1910.134(i)(1)(ii)

Compressed breathing air shall meet at least the requirements for Grade D breathing air described in ANSI/Compressed Gas Association Commodity Specification for Air, G-7.1-1989, to include:

1910.134(i)(1)(ii)(A)

Oxygen content (v/v) of 19.5-23.5%;

1910.134(i)(1)(ii)(B)

Hydrocarbon (condensed) content of 5 milligrams per cubic meter of air or less;

1910.134(i)(1)(ii)(C)

Carbon monoxide (CO) content of 10 ppm or less;

1910.134(i)(1)(ii)(D)

Carbon dioxide content of 1,000 ppm or less; and

1910.134(i)(1)(ii)(E)

Lack of noticeable odor.

1910.134(i)(2)

The employer shall ensure that compressed oxygen is not used in atmosphere-supplying respirators that have previously used compressed air.

1910.134(i)(3)

The employer shall ensure that oxygen concentrations greater than 23.5% are used only in equipment designed for oxygen service or distribution.

1910.134(i)(4)

The employer shall ensure that cylinders used to supply breathing air to respirators meet the following requirements:

1910.134(i)(4)(i)

Cylinders are tested and maintained as prescribed in the Shipping Container Specification Regulations of the Department of Transportation (49 CFR part 180);

1910.134(i)(4)(ii)

Cylinders of purchased breathing air have a certificate of analysis from the supplier that the breathing air meets the requirements for Grade D breathing air; and

1910.134(i)(4)(iii)

The moisture content in the cylinder does not exceed a dew point of -50 deg.F (-45.6 deg.C) at 1 atmosphere pressure.

1910.134(i)(5)

The employer shall ensure that compressors used to supply breathing air to respirators are constructed and situated so as to:

1910.134(i)(5)(i)

Prevent entry of contaminated air into the air-supply system;

1910.134(i)(5)(ii)

Minimize moisture content so that the dew point at 1 atmosphere pressure is 10 degrees F (5.56 deg.C) below the ambient temperature;

1910.134(i)(5)(iii)

Have suitable in-line air-purifying sorbent beds and filters to further ensure breathing air quality. Sorbent beds and filters shall be maintained and replaced or refurbished periodically following the manufacturer's instructions.

1910.134(i)(5)(iv)

Have a tag containing the most recent change date and the signature of the person authorized by the employer to perform the change. The tag shall be maintained at the compressor.

1910.134(i)(6)

For compressors that are not oil-lubricated, the employer shall ensure that carbon monoxide levels in the breathing air do not exceed 10 ppm.

1910.134(i)(7)

For oil-lubricated compressors, the employer shall use a high-temperature or carbon monoxide alarm, or both, to monitor carbon monoxide levels. If only high-temperature alarms are used, the air supply shall be monitored at intervals sufficient to prevent carbon monoxide in the breathing air from exceeding 10 ppm.

1910.134(i)(8)

The employer shall ensure that breathing air couplings are incompatible with outlets for nonrespirable worksite air or other gas systems. No asphyxiating substance shall be introduced into breathing air lines.

1910.134(i)(9)

The employer shall use only the respirator manufacturer's NIOSH-approved breathing-gas containers,marked and maintained in accordance with the Quality Assurance provisions of the NIOSH approval for the SCBA as issued in accordance with the NIOSH respirator-certification standard at 42 CFR part 84.

1910.134(j)

Identification of filters, cartridges, and canisters. The employer shall ensure that all filters, cartridges and canisters used in the workplace are labeled and color coded with the NIOSH approval label and that the label is not removed and remains legible.

1910.134(k)

Training and information. This paragraph requires the employer to provide effective training to employees who are required to use respirators. The training must be comprehensive, understandable, and recur annually, and more often if necessary. This paragraph also requires the employer to provide the basic information on respirators in Appendix D of this section to employees who wear respirators when not required by this section or by the employer to do so.

1910.134(k)(1)

The employer shall ensure that each employee can demonstrate knowledge of at least the following:

1910.134(k)(1)(i)

Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator;

1910.134(k)(1)(ii)

What the limitations and capabilities of the respirator are;

1910.134(k)(1)(iii)

How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions;

1910.134(k)(1)(iv)

How to inspect, put on and remove, use, and check the seals of the respirator;

1910.134(k)(1)(v)

What the procedures are for maintenance and storage of the respirator;

1910.134(k)(1)(vi)

How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators; and

1910.134(k)(1)(vii)

The general requirements of this section.

1910.134(k)(2)

The training shall be conducted in a manner that is understandable to the employee.

1910.134(k)(3)

The employer shall provide the training prior to requiring the employee to use a respirator in the workplace.

1910.134(k)(4)

An employer who is able to demonstrate that a new employee has received training within the last 12 months that addresses the elements specified in paragraph (k)(1)(i) through (vii) is not required to repeat such training provided that, as required by paragraph (k)(1), the employee can demonstrate knowledge of those element(s). Previous training not repeated initially by the employer must be provided no later than 12 months from the date of the previous training.

1910.134(k)(5)

Retraining shall be administered annually, and when the following situations occur:

1910.134(k)(5)(i)

Changes in the workplace or the type of respirator render previous training obsolete;

1910.134(k)(5)(ii)

Inadequacies in the employee's knowledge or use of the respirator indicate that the employee has not retained the requisite understanding or skill; or

1910.134(k)(5)(iii)

Any other situation arises in which retraining appears necessary to ensure safe respirator use.

1910.134(k)(6)

The basic advisory information on respirators, as presented in Appendix D of this section, shall be provided by the employer in any written or oral format, to employees who wear respirators when such use is not required by this section or by the employer.

1910.134(l)

Program evaluation. This section requires the employer to conduct evaluations of the workplace to ensure that the written respiratory protection program is being properly implemented, and to consult employees to ensure that they are using the respirators properly.

1910.134(l)(1)

The employer shall conduct evaluations of the workplace as necessary to ensure that the provisions of the current written program are being effectively implemented and that it continues to be effective.

1910.134(l)(2)

The employer shall regularly consult employees required to use respirators to assess the employees' views on program effectiveness and to identify any problems. Any problems that are identified during this assessment shall be corrected. Factors to be assessed include, but are not limited to:

1910.134(l)(2)(i)

Respirator fit (including the ability to use the respirator without interfering with effective workplace performance);

1910.134(l)(2)(ii)

Appropriate respirator selection for the hazards to which the employee is exposed;

1910.134(l)(2)(iii)

Proper respirator use under the workplace conditions the employee encounters; and

1910.134(l)(2)(iv)

Proper respirator maintenance.

1910.134(m)

Recordkeeping. This section requires the employer to establish and retain written information regarding medical evaluations, fit testing, and the respirator program. This information will facilitate employee involvement in the respirator program, assist the employer in auditing the adequacy of the program, and provide a record for compliance determinations by OSHA.

1910.134(m)(1)

Medical evaluation. Records of medical evaluations required by this section must be retained and made available in accordance with 29 CFR 1910.1020.

1910.134(m)(2)

Fit testing.

1910.134(m)(2)(i)

The employer shall establish a record of the qualitative and quantitative fit tests administered to an employee including:

1910.134(m)(2)(i)(A)

The name or identification of the employee tested;

1910.134(m)(2)(i)(B)

Type of fit test performed;

1910.134(m)(2)(i)(C)

Specific make, model, style, and size of respirator tested;

1910.134(m)(2)(i)(D)

Date of test; and

1910.134(m)(2)(i)(E)

The pass/fail results for QLFTs or the fit factor and strip chart recording or other recording of the test results for QNFTs.

1910.134(m)(2)(ii)

Fit test records shall be retained for respirator users until the next fit test is administered.

1910.134(m)(3)

A written copy of the current respirator program shall be retained by the employer.

1910.134(m)(4)

Written materials required to be retained under this paragraph shall be made available upon request to affected employees and to the Assistant Secretary or designee for examination and copying.

1910.134(n)

Effective date. Paragraphs (d)(3)(i)(A) and (d)(3)(i)(B) of this section become effective November 22, 2006.

1910.134(o)

Appendices. Compliance with Appendix A, Appendix B-1, Appendix B-2, Appendix C, and Appendix D to this section are mandatory.

[63 FR 1152, Jan. 8, 1998; 63 FR 20098, April 23, 1998; 71 FR 16672, April 3, 2006; 71 FR 50187, August 24, 2006; 73 FR 75584, Dec. 12, 2008; 76 FR 33606, June 8, 2011]

SECTION D

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Industry-Specific Resources

Standards

Many people are exposed to heat on some jobs, outdoors or in hot indoor environments. Operations involving high air temperatures, radiant heat sources, high humidity, direct physical contact with hot objects, or strenuous physical activities have a high potential for causing heat-related illness. Workplaces with these conditions may include iron and steel foundries, nonferrous foundries, brick-firing and ceramic plants, glass products facilities, rubber products factories, electrical utilities (particularly boiler rooms), bakeries,

confectioneries, commercial kitchens, laundries, food canneries, chemical plants, mining sites, smelters, and steam tunnels.

Outdoor operations conducted in hot weather and direct sun, such as farm work, construction, oil and gas well operations, asbestos removal, landscaping, emergency response operations, and hazardous waste site activities, also increase the risk of heat-related illness in exposed workers.

Every year, thousands of workers become sick from occupational heat exposure, and some even die. **These illnesses and deaths are preventable.**

Working Outdoors?
See OSHA's Campaign to Prevent Heat Illness in Outdoor Workers

Why is heat a hazard to workers?

When a person works in a hot environment, the body must get rid of excess heat to maintain a stable internal temperature. It does this mainly through circulating blood to the skin and through sweating.

When the air temperature is close to or warmer than normal body temperature, cooling of the body becomes more difficult. Blood circulated to the skin cannot lose its heat. Sweating then becomes the main way the body cools off. But sweating is effective only if the humidity level is low enough to allow evaporation, and if the fluids and salts that are lost are adequately replaced.

If the body cannot get rid of excess heat, it will store it. When this happens, the body's core temperature rises and the heart rate increases. As the body continues to store heat, the person begins to lose concentration and has difficulty focusing on a task, may become irritable or sick, and often loses the desire to drink. The next stage is most often fainting and even death if the person is not cooled down.

Excessive exposure to heat can cause a range of heat-related illnesses, from heat rash and heat cramps to heat exhaustion and heat stroke. Heat stroke can result in death and requires **immediate medical attention.**

Exposure to heat can also increase the risk of injuries because of sweaty palms, fogged-up safety glasses, dizziness, and burns from hot surfaces or steam.

> > **Go to Heat-Related Illnesses and First Aid**

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Who could be affected by heat?

Workers exposed to hot indoor environments or hot and humid conditions outdoors are at risk of heat-related illness, especially those doing heavy work tasks or using bulky or non-breathable protective clothing and equipment. Some workers might be at greater risk than others if they have not built up a tolerance to hot conditions, or if they have certain health conditions. The table below shows some environmental and job-specific factors that increase the risk of heat-related illness.

Factors That Put Workers at Greater Risk	
Environmental	High temperature and humidity Radiant heat sources Contact with hot objects Direct sun exposure (with no shade) Limited air movement (no breeze, wind or ventilation)
Job-Specific	Physical exertion Use of bulky or non-breathable protective clothing and equipment

Workers who are suddenly exposed to working in a hot environment face additional and generally avoidable hazards to their safety and health. New workers and those returning from time away are especially vulnerable. That's

why it is important to prepare for the heat: educate workers about the dangers of heat, acclimatize workers, gradually increase the workload or allow more frequent breaks to help new workers and those returning to a job after time away build up a tolerance for hot conditions.

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Heat Index	Risk Level	Protective Measures
Less than 91°F	Lower (Caution)	Basic heat safety and planning
91°F to 103°F	Moderate	Implement precautions and heighten awareness
103°F to 115°F	High	Additional precautions to protect workers
Greater than 115°F	Very High to Extreme	Triggers even more aggressive protective measures

How do I know if it's too hot?

- The temperature rises
- Humidity increases
- The sun gets stronger
- There is no air movement
- No controls are in place to reduce the impacts of equipment that radiates heat
- Protective clothing or gear is worn
- Work is strenuous

The heat index, which takes both temperature and humidity into account, is a useful tool for outdoor workers and employers (see Using the Heat Index: A Guide for Employers).

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How can heat-related illness be prevented?

Working Outdoors?
See OSHA's Campaign to Prevent Heat Illness in Outdoor Workers

Heat-related illnesses can be prevented. Important ways to reduce heat exposure and the risk of heat-related illness include engineering controls, such as air conditioning and ventilation, that make the work environment cooler, and work practices such as work/rest cycles, drinking water often, and providing an opportunity for workers to build up a level of tolerance to working in the heat. Employers should include these prevention steps in worksite training and plans. Also, it's important to know and look out for the symptoms of heat-related illness in yourself and others during hot weather. Plan for an emergency and know what to do — **acting quickly can save lives**!

>> **Go to Prevention**

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How can OSHA Help?

OSHA has developed this webpage to provide workers and employers useful, up-to-date information on occupational heat exposure. For additional information on occupational heat exposure, see the pagesabove or for other valuable worker protection information, such as Workers' Rights, Employer Responsibilities and other services OSHA offers, read OSHA's Workers page.

OSHA provides a free On-Site Consultation for small businesses with fewer than 250 workers at a site (and no more than 500 employees nationwide). On-site consultation services are separate from enforcement and do not result in penalties or citations. To locate the OSHA Consultation Office nearest you, visit OSHA's website or call 1-800-321-6742 .

Many states operate their own OSHA-approved safety and health program. For further information, please visit OSHA's State Occupational Safety and Health Plans page.

SECTION E

LADDER SAFETY

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- **Part Number:** 1926
- **Part Title:** Safety and Health Regulations for Construction
- **Subpart:** X
- **Subpart Title:** Ladders
- **Standard Number:** 1926.1053
- **Title:** Ladders.

1926.1053(a)

General. The following requirements apply to all ladders as indicated, including job-made ladders.

1926.1053(a)(1)

Ladders shall be capable of supporting the following loads without failure:

1926.1053(a)(1)(i)

Each self-supporting portable ladder: At least four times the maximum intended load, except that each extra-heavy-duty type 1A metal or plastic ladder shall sustain at least 3.3 time the maximum intended load. The ability of a ladder to sustain the loads indicated in this paragraph shall be determined by applying or transmitting the requisite load to the ladder in a downward vertical direction. Ladders built and tested in conformance with the applicable provisions of appendix A of this subpart will be deemed to meet this requirement.

1926.1053(a)(1)(ii)

Each portable ladder that is not self-supporting: At least four times the maximum intended load, except that each extra-heavy-duty type 1A metal or plastic ladders shall sustain at least 3.3 times the maximum intended load. The ability of a ladder to sustain the loads indicated in this paragraph shall be determined by applying or transmitting the requisite load to the ladder in a downward vertical direction when the ladder is placed at an angle of 75 1/2 degrees from the horizontal. Ladders built and tested in conformance with the applicable provisions of appendix A will be deemed to meet this requirement.

1926.1053(a)(1)(iii)

Each Fixed ladder: At least two loads of 250 pounds (114 kg) each, concentrated between any two consecutive attachments (the number and position of additional concentrated loads of 250 pounds (114 kg) each, determined from anticipated usage of the ladder, shall also be included), plus anticipated loads caused by ice buildup, winds, rigging, and impact loads resulting from the use of ladder safety devices. Each step or rung shall be capable of supporting a single concentrated load of a least 250 pounds (114 kg) applied in the middle of the step or rung. Ladders built in conformance with the applicable provisions of appendix A will be deemed to meet this requirement.

1926.1053(a)(2)

Ladder rungs, cleats, and steps shall be parallel, level, and uniformly spaced when the ladder is in position for use.

1926.1053(a)(3)

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1926.1053(a)(3)(i)

Rungs, cleats, and steps of portable ladders (except as provided below) and fixed ladders (including individual-rung/step ladders) shall

be spaced not less than 10 inches (25 cm) apart, nor more than 14 inches (36 cm) apart, as measured between center lines of the rungs, cleats and steps.

1926.1053(a)(3)(ii)

Rungs, cleats, and steps of step stools shall be not less than 8 inches (20 cm) apart, nor more than 12 inches (31 cm) apart, as measured between center lines of the rungs, cleats, and steps.

1926.1053(a)(3)(iii)

Rungs, cleats, and steps of the base section of extension trestle ladders shall be not less than 8 inches (20 cm) nor more than 18 inches (46 cm) apart, as measured between center lines of the rungs, cleats, and steps. The rung spacing on the extension section of the extension trestle ladder shall be not less than 6 inches (15 cm) nor more than 12 inches (31 cm), as measured between center lines of the rungs, cleats, and steps.

1926.1053(a)(4)

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1926.1053(a)(4)(i)

The minimum clear distance between the sides of individual-rung/step ladders and the minimum clear distance between the side rails of other fixed ladders shall be 16 inches (41 cm).

1926.1053(a)(4)(ii)

The minimum clear distance between side rails for all portable ladders shall be 11 1/2 inches (29 cm).

1926.1053(a)(5)

The rungs of individual-rung/step ladders shall be shaped such that employees' feet cannot slide off the end of the rungs.

1926.1053(a)(6)

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1926.1053(a)(6)(i)

The rungs and steps of fixed metal ladders manufactured after March 15, 1991, shall be corrugated, knurled, dimpled, coated with skid-resistant material, or otherwise treated to minimize slipping.

1926.1053(a)(6)(ii)

The rungs and steps of portable metal ladders shall be corrugated, knurled, dimpled, coated with skid-resistant material, or otherwise treated to minimize slipping.

1926.1053(a)(7)

Ladders shall not be tied or fastened together to provide longer sections unless they are specifically designed for such use.

1926.1053(a)(8)

A metal spreader or locking device shall be provided on each stepladder to hold the front and back sections in an open position when the ladder is being used.

1926.1053(a)(9)

When splicing is required to obtain a given length of side rail, the resulting side rail must be at least equivalent in strength to a one-piece side rail made of the same material.

1926.1053(a)(10)

Except when portable ladders are used to gain access to fixed ladders (such as those on utility towers, billboards, and other structures where the bottom of the fixed ladder is elevated to limit access), when two or more separate ladders are used to reach an elevated work area, the ladders shall be offset with a platform or landing between the ladders. (The requirements to have guardrail systems with toeboards for falling object and overhead protection on platforms and landings are set forth in subpart M of this part.)

1926.1053(a)(11)

Ladder components shall be surfaced so as to prevent injury to an employee from punctures or lacerations, and to prevent snagging of clothing.

1926.1053(a)(12)

Wood ladders shall not be coated with any opaque covering, except for identification or warning labels which may be placed on one face only of a side rail.

1926.1053(a)(13)

The minimum perpendicular clearance between fixed ladder rungs, cleats, and steps, and any obstruction behind the ladder shall be 7 inches (18 cm), except in the case of an elevator pit ladder for which a minimum perpendicular clearance of 4 1/2 inches (11 cm) is required.

1926.1053(a)(14)

The minimum perpendicular clearance between the center line of fixed ladder rungs, cleats, and steps, and any obstruction on the climbing side of the ladder shall be 30 inches (76 cm), except as provided in paragraph (a)(15) of this section.

1926.1053(a)(15)

When unavoidable obstructions are encountered, the minimum perpendicular clearance between the centerline of fixed ladder rungs, cleats, and steps, and the obstruction on the climbing side of the ladder may be reduced to 24 inches (61 cm), provided that a deflection device is installed to guide employees around the obstruction.

1926.1053(a)(16)

Through fixed ladders at their point of access/egress shall have a step-across distance of not less than 7 inches (18 cm) nor more than 12 inches (30 cm) as measured from the centerline of the steps or rungs to the nearest edge of the landing area. If the normal step-across distance exceeds 12 inches (30 cm), a landing platform shall be provided to reduce the distance to the specified limit.

1926.1053(a)(17)

Fixed ladders without cages or wells shall have a clear width to the nearest permanent object of at least 15 inches (30 cm) on each side of the centerline of the ladder.

1926.1053(a)(18)

Fixed ladders shall be provided with cages, wells, ladder safety devices, or self-retracting lifelines where the length of climb is less than 24 feet (7.3 m) but the top of the ladder is at a distance greater than 24 feet (7.3 m) above lower levels.

1926.1053(a)(19)

Where the total length of a climb equals or exceeds 24 feet (7.3 m), fixed ladders shall be equipped with one of the following:

1926.1053(a)(19)(i)

Ladder safety devices; or

1926.1053(a)(19)(ii)

Self-retracting lifelines, and rest platforms at intervals not to exceed 150 feet (45.7 m); or

1926.1053(a)(19)(iii)

A cage or well, and multiple ladder sections, each ladder section not to exceed 50 feet (15.2 m) in length. Ladder sections shall be offset from adjacent sections, and landing platforms shall be provided at maximum intervals of 50 feet (15.2 m).

1926.1053(a)(20)

Cages for fixed ladders shall conform to all of the following:

1926.1053(a)(20)(i)

Horizontal bands shall be fastened to the side rails of rail ladders, or directly to the structure, building, or equipment for individual-rung ladders;

1926.1053(a)(20)(ii)

Vertical bars shall be on the inside of the horizontal bands and shall be fastened to them;

1926.1053(a)(20)(iii)

Cages shall extend not less than 27 inches (66 cm), or more than 30 inches (76 cm) from the centerline of the step or rung (excluding the flare at the bottom of the cage), and shall not be less than 27 inches (68 cm) in width;

1926.1053(a)(20)(iv)

The inside of the cage shall be clear of projections;

1926.1053(a)(20)(v)

Horizontal bands shall be spaced not more than 4 feet (1.2 m) on center vertically;

1926.1053(a)(20)(vi)

Vertical bars shall be spaced at intervals not more than 9 1/2 inches (24 cm) on center horizontally;

1926.1053(a)(20)(vii)

the bottom of the cage shall be at a level not less than 7 feet (2.1 m) nor more than 8 feet (2.4 m) above the point of access to the bottom of the ladder. The bottom of the cage shall be flared not less than 4 inches (10 cm) all around within the distance between the bottom horizontal band and the next higher band;

1926.1053(a)(20)(viii)

The top of the cage shall be a minimum of 42 inches (1.1 m) above the top of the platform, or the point of access at the top of the ladder, with provision for access to the platform or other point of access.

1926.1053(a)(21)

Wells for fixed ladders shall conform to all of the following:

1926.1053(a)(21)(i)

They shall completely encircle the ladder;

1926.1053(a)(21)(ii)

They shall be free of projections;

1926.1053(a)(21)(iii)

Their inside face on the climbing side of the ladder shall extend not less than 27 inches (68 cm) nor more than 30 inches (76 cm) from the centerline of the step or rung;

1926.1053(a)(21)(iv)

The inside clear width shall be at least 30 inches (76 cm);

1926.1053(a)(21)(v)

The bottom of the wall on the access side shall start at a level not less than 7 feet (2.1 m) nor more than 8 feet (2.4 m) above the point of access to the bottom of the ladder.

1926.1053(a)(22)

Ladder safety devices, and related support systems, for fixed ladders shall conform to all of the following:

1926.1053(a)(22)(i)

They shall be capable of withstanding without failure a drop test consisting of an 18-inch (41 cm) drop of a 500-pound (226 kg) weight;

1926.1053(a)(22)(ii)

They shall permit the employee using the device to ascend or descend without continually having to hold, push, or pull any part of the device, leaving both hands free for climbing;

1926.1053(a)(22)(iii)

They shall be activated within 2 feet (.61 m) after a fall occurs, and limit the descending velocity of an employee to 7 feet/sec. (2.1 m/sec.) or less;

1926.1053(a)(22)(iv)

The connection between the carrier or lifeline and the point of attachment to the body belt or harness shall not exceed 9 inches (23 cm) in length.

1926.1053(a)(23)

The mounting of ladder safety devices for fixed ladders shall conform to the following:

1926.1053(a)(23)(i)

Mountings for rigid carriers shall be attached at each end of the carrier, with intermediate mountings, as necessary, spaced along the entire length of the carrier, to provide the strength necessary to stop employees' falls;

1926.1053(a)(23)(ii)

Mountings for flexible carriers shall be attached at each end of the carrier. When the system is exposed to wind, cable guides for flexible carriers shall be installed at a minimum spacing of 25 feet (7.6 m) and maximum spacing of 40 feet (12.2 m) along the entire length of the carrier, to prevent wind damage to the system.

1926.1053(a)(23)(iii)

The design and installation of mountings and cable guides shall not reduce the design strength of the ladder.

1926.1053(a)(24)

The side rails of through or side-step fixed ladders shall extend 42 inches (1.1 m) above the top of the access level or landing platform served by the ladder. For a parapet ladder, the access level shall be the roof if the parapet is cut to permit passage through the parapet; if the parapet is continuous, the access level shall be the top of the parapet.

1926.1053(a)(25)

For through-fixed-ladder extensions, the steps or rungs shall be omitted from the extension and the extension of the side rails shall be flared to provide not less than 24 inches (61 cm) nor more than 30 inches (76 cm) clearance between side rails. Where ladder safety devices are provided, the maximum clearance between side rails of the extensions shall not exceed 36 inches (91 cm).

1926.1053(a)(26)

For side-step fixed ladders, the side rails and the steps or rungs shall be continuous in the extension.

1926.1053(a)(27)

Individual-rung/step ladders, except those used where their access openings are covered with manhole covers or hatches, shall extend at least 42 inches (1.1 m) above an access level or landing platform either by the continuation of the rung spacings as horizontal grab bars or by providing vertical grab bars that shall have the same lateral spacing as the vertical legs of the rungs.

1926.1053(b)

Use. The following requirements apply to the use of all ladders, including job-made ladders, except as otherwise indicated:

1926.1053(b)(1)

When portable ladders are used for access to an upper landing surface, the ladder side rails shall extend at least 3 feet (.9 m) above the upper landing surface to which the ladder is used to gain access; or, when such an extension is not possible because of the ladder's length, then the ladder shall be secured at its top to a rigid support that will not deflect, and a grasping device, such as a grabrail, shall be provided to assist employees in mounting and dismounting the ladder. In no case shall the extension be such that ladder deflection under a load would, by itself, cause the ladder to slip off its support.

1926.1053(b)(2)

Ladders shall be maintained free of oil, grease, and other slipping hazards.

1926.1053(b)(3)

Ladders shall not be loaded beyond the maximum intended load for which they were built, nor beyond their manufacturer's rated capacity.

1926.1053(b)(4)

Ladders shall be used only for the purpose for which they were designed.

1926.1053(b)(5)

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1926.1053(b)(5)(i)

Non-self-supporting ladders shall be used at an angle such that the horizontal distance from the top support to the foot of the ladder is approximately one-quarter of the working length of the ladder (the distance along the ladder between the foot and the top support).

1926.1053(b)(5)(ii)

Wood job-made ladders with spliced side rails shall be used at an angle such that the horizontal distance is one-eighth the working

length of the ladder.

1926.1053(b)(5)(iii)

Fixed ladders shall be used at a pitch no greater than 90 degrees from the horizontal, as measured to the back side of the ladder.

1926.1053(b)(6)

Ladders shall be used only on stable and level surfaces unless secured to prevent accidental displacement.

1926.1053(b)(7)

Ladders shall not be used on slippery surfaces unless secured or provided with slip-resistant feet to prevent accidental displacement. Slip-resistant feet shall not be used as a substitute for care in placing, lashing, or holding a ladder that is used upon slippery surfaces including, but not limited to, flat metal or concrete surfaces that are constructed so they cannot be prevented from becoming slippery.

1926.1053(b)(8)

Ladders placed in any location where they can be displaced by workplace activities or traffic, such as in passageways, doorways, or driveways, shall be secured to prevent accidental displacement, or a barricade shall be used to keep the activities or traffic away from the ladder.

1926.1053(b)(9)

The area around the top and bottom of ladders shall be kept clear.

1926.1053(b)(10)

The top of a non-self-supporting ladder shall be placed with the two rails supported equally unless it is equipped with a single support attachment.

1926.1053(b)(11)

Ladders shall not be moved, shifted, or extended while occupied.

1926.1053(b)(12)

Ladders shall have nonconductive siderails if they are used where the employee or the ladder could contact exposed energized electrical equipment, except as provided in 1926.951(c)(1) of this part.

1926.1053(b)(13)

The top or top step of a stepladder shall not be used as a step.

1926.1053(b)(14)

Cross-bracing on the rear section of stepladders shall not be used for climbing unless the ladders are designed and provided with steps for climbing on both front and rear sections.

1926.1053(b)(15)

Ladders shall be inspected by a competent person for visible defects on a periodic basis and after any occurrence that could affect their safe use.

1926.1053(b)(16)

Portable ladders with structural defects, such as, but not limited to, broken or missing rungs, cleats, or steps, broken or split rails, corroded components, or other faulty or defective components, shall either be immediately marked in a manner that readily identifies them as defective, or be tagged with "Do Not Use" or similar language, and shall be withdrawn from service until repaired.

1926.1053(b)(17)

Fixed ladders with structural defects, such as, but not limited to, broken or missing rungs, cleats, or steps, broken or split rails, or corroded components, shall be withdrawn from service until repaired. The requirement to withdraw a defective ladder from service is satisfied if the ladder is either:

1926.1053(b)(17)(i)

Immediately tagged with "Do Not Use" or similar language;

1926.1053(b)(17)(ii)

Marked in a manner that readily identifies it as defective;

1926.1053(b)(17)(iii)

Or blocked (such as with a plywood attachment that spans several rungs).

1926.1053(b)(18)

Ladder repairs shall restore the ladder to a condition meeting its original design criteria, before the ladder is returned to use.

1926.1053(b)(19)

Single-rail ladders shall not be used.

1926.1053(b)(20)

When ascending or descending a ladder, the user shall face the ladder.

1926.1053(b)(21)

Each employee shall use at least one hand to grasp the ladder when progressing up and/or down the ladder.

1926.1053(b)(22)

An employee shall not carry any object or load that could cause the employee to lose balance and fall.

[55 FR 47689, Nov. 14, 1990; 56 FR 2585, Jan. 23, 1991; 56 FR 41794, Aug. 23, 1991]

SECTION F

FALL PROTECTION POLICY

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Morenci Safe Production Standard	Standard # 2.8 *Supersedes FMMOP-005*	
	OHSAS 18001:2007	MP 4.4.6
Fall Protection Policy	Revision #	04
	Revision Date	01/16/2012
	Effective Date	08/2011
	Document Owner	Health and Safety
Approvals:		
Senior VP Morenci Operations: 08/2011	Safety Steering Committee: 08/2011	

1.0 PURPOSE:

Establish guidelines to protect employees and contractors conducting work at Morenci Operations from hazards associated with falling from one surface to another.

2.0 SCOPE:

All employees, contractors, and vendors on Morenci Operations property will comply with all elements of this fall protection procedure. Contractors working on the property may implement their own procedure that meets or exceeds this document's requirements.

3.0 TERMS, DEFINITIONS AND ABBREVIATIONS

3.1 Anchorage: means a secure point of attachment for lifelines, lanyards or deceleration devices, and which is independent of the means of supporting or suspending the employee. Anchor points may be classified as qualified or competent depending upon the level of design, inspection, and use.

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

3.3 Competent Person: one who is capable of identifying hazardous or dangerous conditions in the personal fall arrest system or components thereof, has the ability to evaluate fall protection systems for compliance with this standard and has received the prescribed training outlined in section 8.

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

3.5 Deceleration Distance: The additional vertical distance a falling employee travels, excluding lifeline elongation and free fall distance, before stopping, from the point at which the deceleration device begins to operate. It is measured as the distance between the location of an employee's body harness or body harness attachment point at the moment of activation (at the onset of fall arrest forces) of the deceleration device during a fall, and the location of that attachment point after the employee comes to a full stop

3.6 Equivalent: means alternative designs materials or methods which the employer can demonstrate will provide an equal or greater degree of safety for employees than the methods, materials or designs specified in the standard.

3.7 Fall Arrest: An engineered system designed to stop an authorized user after a fall has begun.

3.8 Fall Hazard: The potential for injury as a result of worker exposure to falls from elevation and falls from the same level. Fall hazards can be defined based on legal definitions, legal good guidance documents, known body tolerances, human behavior, and predicated work duties.

3.9 Fall Protection: Any equipment, device or system that prevents an accidental fall from elevation or that mitigates the effect of such a fall. This includes equipment and systems of fall prevention, fall restraint, fall positioning and fall arrest.

3.10 Fall Restraint: Securing the authorized user to an anchorage using a lanyard (or equivalent means) short enough to prevent the person's center of gravity from reaching the fall hazard

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

3.12 Horizontal Lifeline: A component of a horizontal lifeline subsystem, consisting of a flexible line with connectors or other coupling means at both ends for securing it horizontally between two anchorages or anchorage connectors.

3.13 Inspections: Personal fall arrest systems shall be inspected prior to each use for mildew, wear, damage and other deterioration, and defective components shall be removed from service if their strength or function may be adversely affected.

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

3.15 Fall Prevention Systems: Passive fall protection systems which do not require active participation from the worker. Examples include netting or "catch" systems, hand railing, floor covers or safe work platforms.

3.16 Personal Fall Arrest System (PFAS): A system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, full body harness and may include a lanyard, deceleration device, lifeline, or suitable combinations of these.

3.17 Routine: Of a commonplace or repetitious character or of, relating to, or being in accordance with established procedure.

3.18 Self Retracting Lifeline: A deceleration device containing a drum-wound line which can be slowly extracted from, or retracted onto, the drum under slight tension during normal employee movement, and which, after onset of a fall, automatically locks the drum and arrests the fall.

3.19 Snap Hook: A connector comprised of a hook-shaped body with a normally closed gate or similar arrangement that may be opened to permit the hook to receive an object and, when released, automatically closes to retain the object.

3.20 Swing Fall Potential: The potential for falls involving a personal fall arrest system or equivalent to result in injuries which are generated from impacting lower work areas or obstructions due to the configuration and use of the system.

3.21 Total Fall Distance: This distance includes free fall distance + deceleration distance + harness d-ring slide + height of individual + 3ft safety factor. The general distance for systems using a 6ft shock absorbing lanyard is 18.5ft while systems comprised of self-retracting lifelines are 14.5ft. Such distances may be modified based on reduced clearances and elongation distances specified by equipment manufacturers.

3.22 Travel Restraint System: A combination of anchorage, anchorage connector, and lanyard (or other means of connection), and body support that limits travel in such a manner that the user prevents exposure to a fall hazard through length manipulation.

3.23 FMMO: Freeport-McMoRan Morenci Operations
3.24 ANSI: American National Standards Institute
3.25 MSHA: Mine Safety and Health Administration
3.26 OSHA: Occupational Safety and Health Administration
3.27 PFAS: Personal Fall Arrest System

4.0 RESPONSIBILITIES:

4.1 Area Manager: will provide resources for employees to comply with this procedure. Resources include information, training, time, money and equipment.

4.2 Health and Safety Manager: will provide or make available annual training for all employees who might reasonably be affected by this procedure. All training shall be documented, including course content. The H&S Manager will ensure that there is emergency response capability. Employees, Supervisors, and Competent Persons must work with the Health & Safety Department to evaluate rescue capabilities prior to engaging in activities in areas where rescue could be difficult.

4.3 Supervisor and/or person responsible for the work: will ensure that their employees or contractors working under them understand and follow this procedure, including training on the use and care of fall protection equipment; Employees will be provided with the equipment necessary to complete all work in compliance with this procedure. Supervisor's duties include evaluation of the work to be performed, determination of the means of protection that will be used, and adherence to this procedure. The supervisor must ensure daily, or more often if required, that the site conditions are safe for the employees to work at elevation. Supervisors will ensure that their employee's fall protection equipment is inspected in compliance with this procedure.

4.4 Rescue Personnel: will maintain written rescue procedures for activities on site that utilize active fall protection systems. Training shall be conducted on a regular basis which adequately prepares rescue personnel to respond to incidents involving fall of person hazards. Rescue personnel shall identify the resources necessary to conduct a safe and effective rescue from heights and verify that those resources are available for a prompt rescue event.

4.5 Competent Person: responsibilities include on-site evaluation to monitor safe work practices and procedures. A Competent Person is a person who has the training, knowledge, experience and authority to make decisions regarding fall hazards that affect the safety of others.

4.6 Qualified Person: responsibilities include design and approval of engineered anchorage points and lifeline systems for fall protection. A Qualified Person is one who, by possession of a recognized degree, certificate, or professional standing, or who, by extensive knowledge, training, and experience, has successfully demonstrated his ability to solve or resolve problems relating to the subject matter, the work, or the project.

4.7 Authorized Users (Employees): will follow this procedure and notify their supervisor of any situations that do not comply with this procedure or MSHA requirements. Employees will be responsible for identification of fall hazards related to their work, learning how to use their fall protection equipment properly, conduct a pre-use inspection, and for ensuring proper fit, care and maintenance of fall protection equipment.

4.8 Authorized Trainers: will provide or ensure provision of specific training programs for all authorized users, competent persons, and qualified individuals.

5.0 STANDARDS OF PERFORMANCE

5.1 GENERAL USE REQUIREMENTS

Fall protection must be provided and used at all times whenever persons are exposed to an uncontrolled fall hazard of 4 feet or more in height. When there is a danger of falling that exists below 4ft, employees and supervision shall use the hierarchy of controls to reduce the risk of an injury to an acceptable level.

5.2 Personal Fall Protective Equipment (Full Body Harnesses)

Whenever a risk of injury from falling cannot be eliminated or prevented through the use of engineered solutions, personal fall protection equipment in the form of a full-body harness and appropriate lanyard shall be worn and 100% tie-off shall be applied.

5.2.1 Circumstances requiring the use of fall protection include but are not limited to, the following *(For a comprehensive list of fall protection requirements refer to Appendix 10.1 Fall Protection Work Requirements)*

I. incomplete or defective elevated work platforms and scaffolds
II. on unprotected roofs and during leading edge work
III. within 7ft of the edge of high walls, embankments and floors where there are no guardrails, wire rope railings or other substantial barriers
IV. when removing floor planks, hole covers, grating, and during other forms of safe work platform modifications
V. in any elevated location 4 feet in height or more where there is no other form of fall protection (fall prevention, restraint, positioning, etc…) provided
VI. in areas exposed to protruding, unprotected, reinforced steel at any height
VII. when exposed to a hazard of falling into dangerous equipment, running water, hazardous chemical, etc., at any height
VIII. when a hazard of a reasonably serious nature exists of any type at any elevation
IX. when working from ladders 6ft or higher, when climbing ladders without a back guard or landings 20ft or higher
X. work from on top of conveyor belts and feeders

5.3 Fall Protection Systems

Application

Appropriate fall prevention and/or fall arrest systems shall be used when employees work or travel in areas where there is a danger of falling. All working places shall be evaluated for fall of person hazards and appropriate control measures implemented to prevent injury or death. Fall hazards that are created as a result of safe work platform modifications shall be evaluated as open holes and protection provided that meets the requirements established within the Morenci Open Hole Policy.

Permanent Guarding

Where routine work is conducted permanent guarding will be constructed and maintained. Permanent barriers will be constructed to support 200 pounds of horizontal force, and include a standard railing with standard toe board on all exposed sides. Permanent guarding will not be removed unless the fall hazard is eliminated by other means.

5.3.1 Guardrail Systems

At minimum, guardrail systems shall meet the following requirements:

a) Top-rails and mid-rails of guardrail systems shall be at least one-quarter inch nominal diameter, or thickness. If wire rope is used for top-rails, it shall be flagged at not more 6 feet intervals with high visibility material(s). Steel and plastic banding shall not be used as top-rails or mid-rails.
b) The height of top-rails, or guardrails, shall be 42 inches plus or minus 3 inches (8 centimeters) above the walking /working level.
c) Other structural members, such as additional mid-rails and architectural panels, shall be installed so that there are no openings in the guardrail system more than 30 inches high.
d) The guardrail system shall be capable of withstanding a force of at least 200 pounds applied within 2 inches of the top edge in an outward or downward direction.
e) Guardrail systems shall be designed to protect employees from cuts, punctures or lacerations and to prevent clothing from snagging.
f) Employees shall be protected from falling through floor openings more than 18” in depth by using hand railing, covers, or guardrails. Refer to the Morenci Open Hole Policy when safe work platform modifications result in openings through which material or persons may fall.
g) Toeboards shall be equipped when a fall of material hazard exists. When guardrail systems are positioned 6” or greater from the edge of the working surface toe boards are not required.

5.3.2 Personal Fall Arrest Systems

Fall arrest systems may consist of: anchorage point, anchor device, shock absorbing lanyard, and body harness. In some cases horizontal or vertical lifelines are also included. These components are discussed below.

a) A Personal Fall Arrest System consists of anchorage points, connectors, and a body harness. It may include a deceleration device, lifeline, or other suitable combinations.
b) All personal fall arrest system is used for fall protection, shall meet the following criteria:
    - Limit maximum arresting force on an employee to 1800 pounds
    - Be rigged so that employees can neither free fall more than 6ft nor contact any lower level.
    - Bring an employee to a complete stop and limit maximum deceleration distance an employee travels to no greater than 3.5 feet.
    - Limit swing fall hazards through design, configuration or the use of protective barriers
    - Able to withstand a minimum of 5000 lbs of static load per user
c) Personal fall arrest systems shall be inspected prior to each use for wear, damage, deterioration or other defects that affect safety.
d) Horizontal life lines shall meet the following requirements, at minimum:
    - be designed, installed and used under the supervision of a qualified person
    - maintain a minimum of 5000 lbs of static load per user
    - lifelines shall be protected against being cut or abraded through installation configuration or the use of protective coverings
e) Ropes, straps and webbing used in lanyards, lifelines, and strength components of body harnesses shall be made of synthetic fibers.
f) Body harness s, harnesses, and components shall be used only for employee protection (as part of a personal fall arrest system or positioning device system) and not to hoist materials.
g) Personal fall arrest systems and components subjected to impact loading shall be immediately removed from service and shall not be used again for employee protection unless repaired and re-certified by the manufacturer.
h) Personal fall arrest systems shall not be attached to guardrail systems, nor shall they be attached to hoists unless such anchorages have been evaluated and approved for use by a qualified person.
i) 100 % fall protection may be provided by using a dual lanyard system, a Y type lanyard, dual Self retracting lanyards or a combination of fall arrest and fall prevention systems.

Harnesses:

Full body harnesses with shoulder and leg straps are required. Employees will wear the size of harness recommended by the manufacturer based upon their physical dimensions. Persons greater than 300 lbs. must be evaluated for appropriate harness size and style. Harnesses will be adjusted for proper fit each time they are used. Body belts (a single strap or belt positioned solely around the users waist) are not permitted as part of a fall arrest system.

Compatibility considerations:

Ideally, a personal fall arrest system is designed, tested, and supplied as a complete system. However, it is common practice for lanyards, connectors, lifelines, deceleration devices and body harnesses to be interchanged since some components wear out before others. The employer and employee should realize that not all components are interchangeable. For instance, a lanyard should not be connected between a body harness (or harness) and a deceleration device of the self-retracting type since this can result in additional free fall for which the system was not designed. Any substitution or change to a personal fall arrest system should be fully evaluated or tested by a competent person to determine that it meets the standard, before the modified system is put in use.

Lanyards:

Lanyards and vertical life lines shall have a minimum breaking strength of 5,000 pounds. Employees will wear ANSI (2007) approved fall arrest equipment only. Fall arrest equipment must be fitted to the size and weight of the user. All Lanyards used on property must meet the following guidelines:

a) Must be capable of sustaining a minimum tensile load of 3,000 pounds applied to the device with the lifeline or lanyard in the fully extended position.
b) Synthetic sling lanyards are preferred except for welders who will need wire rope lanyards under most applications.
c) All snap hooks shall be of the self-closing, self-locking type.
d) Lanyards will not be attached to anchorage points by doubling back and attaching the snap hook to the lanyard unless approved for such use by the manufacture.
e) Beam straps, beam clamps and other connectors designed for the specific purpose will be used when appropriate to establish an effective anchor point.

Persons should attach the lanyard to the anchor point as high as practical to minimize free fall. The shortest lanyard practical should be used. Swing during a fall will be minimized by working directly under the tie off point whenever possible. The fully extended length of the lanyard and deceleration device must be considered when choosing an anchor point.

Lanyards will be fastened to the back of the harness just below the shoulder blades except for specific applications associated with ladder climbing systems. Knots will not be tied in lanyards.

Self Retracting Lifelines (SRL's)

Self-retracting lifelines and lanyards are specialized devices that help to reduce free fall forces and fall clearance distances through their design. In general, Self Retracting Lifelines which meet ANSI 2007 design requirements and are appropriately installed are capable of limiting free fall distance to 24 inches. Self-retracting lifelines (SRLs) should be installed directly above the user's head, or at shoulder height directly adjacent to the work area at a minimum. Extreme care should be taken to ensure the person will not be exposed to a swing hazard, strike objects below, or exceed the maximum permissible free fall distance or arresting forces on the body after a fall involving an SRL (such as may be the case if the SRL is mounted below shoulder level).

Exceptions to installing an SRL at or above shoulder level near the work zone will be approved by a competent person when no other fall protection option is feasible, and when the installation complies with applicable regulations and manufacturers' requirements addressing free-fall distance, arresting forces on the body, and swing fall hazards.

Shock-absorbing lanyards will not be used in combination with self-retracting lanyards

Anchorage Points / Tie-off Points

Anchorage points for fall arrest systems will be capable of supporting at least 5,000 pounds per person using the anchor point. All field fabricated anchorage points will be designed, tested and installed in conjunction with a qualified person or entity. Anchorages used to attach personal fall arrest systems will be independent of any anchorage being used to support or suspend platforms unless the platform is capable of supporting without deformation the forces generated from a fall.

Guardrails and handrails will not be used as anchorage points unless they are specifically designed for that purpose by a qualified individual. When persons are unsure of the strength of an anchorage point they are using, they are required to contact their supervisor for assistance before connecting to it.

- *Fall Arrest Anchor Point Requirements*

Anchorages selected for fall arrest systems shall be capable of sustaining static loads applied in all possible directions of load permitted by the system of at least:
A) 5,000 pounds for non-certified anchorages, or
B) Two times the maximum arresting force for certified anchorages, or
C) 3,000 pounds when self-retracting lifelines are used and attached above the shoulder

When more than one fall arrest system is attached to an anchorage, the strengths of the anchorage point shall be multiplied by the number of users attached to the system.

- *Work Positioning Anchor Point Requirements*

Anchorages selected for work positioning systems shall be capable of sustaining static loads applied in the directions permitted by the system of at least:

A) 3,000 pounds for non-certified anchorages, or
B) Two times the foreseeable force for certified anchorages

When more than one work positioning system is attached to an anchorage, the strengths of the anchorage point shall be multiplied by the number of users attached to the system.

- *Restraint and Travel Restraint Anchor Point Requirements*

Anchorages selected for restraint and travel restraint systems shall have strength capable of sustaining static loads applied in the directions permitted by the system of at least:
A) 1,000 lbs for non certified anchorages when working on a pitch that is less than 4:1
B) Two times the foreseeable force for certified anchorages

When more than one restraint or travel restraint system is attached to an anchorage, the strengths of the anchorage point shall be multiplied by the number of users attached to the system.

Horizontal Life Lines (static line)

Horizontal life lines may be installed by a competent person according to the manufacturer's requirements. Site built systems must be designed and installed under the supervision of a Qualified Person. A tag indicating the maximum number of persons permitted on a life line must be affixed to each accessible end of the life line. Where appropriate in line shock absorbing mechanisms should be included in the design of a horizontal lifeline to reduce impact loading of the anchorage points; fall clearance estimations must be included in the design of such systems and properly communicated to the end user.

Vertical Life Lines

Only one person may be connected to each vertical life line. If rope grabs are used, they must be specifically designed and approved by the manufacturer for attachment to the type and size of life line in use.

Work in Man Baskets and Lifts

Fall arrest equipment must be utilized per this procedure when conducting work from aerial platforms such as JLGs, man baskets, approved fork truck-mounted baskets, scissors lift platforms, approved crane suspended platforms etc. Employees must never work outside the guardrails. Employees must never climb or stand on a guardrail. To prevent the risk of over travel fall arrest equipment used in conjunction with aerial lifts shall be as short as practicable and never extend beyond a nominal 6ft length.

Nets

Nets may be applied only after other fall protection techniques have been attempted and found to be not feasible. Nets will be installed in conjunction with a qualified individual and maintained only by a competent person specifically trained in their use.

Scaffolding

Supported scaffolds consist of one or more platforms supported by outrigger beams, brackets, poles, legs, uprights, posts, frames, or similar rigid support. All scaffolding must be built in accordance with OSHA Construction Standard 1926.451 and in compliance with applicable Morenci Operations Standards.

a. Each employee on a scaffold more than 4 feet above a lower level (or where a significant fall risk exists) must be protected from falling to that lower level through fall prevention, arrest or restraint.
b. Fall protection consists of either personal fall arrest systems or guardrail systems meeting the requirements set forth in *section 5.3.1*.

c. Fall protection must be provided for employees erecting or dismantling supported scaffolds where it is feasible, and where installing and using it does not create a greater hazard. When practicable fall arrest anchor points shall be configured overhead and anchored to a support structure other than the scaffolding.

5.4 Fall Distance Calculation

When using a fall arrest system, the fall distance calculation must account for the length of lanyard, connecting hardware, deceleration distance, deployment of shock absorbers, the height of the person wearing the equipment (or the height of the D-ring attached to the back of the harness), one foot of slack in the harness, the position of the anchorage point, lanyard or rope elongation, and a safety factor.

A competent person must perform the fall distance calculation, or at a minimum verify that it was performed properly if calculated by someone else.

Depending on the above variables, the minimum height required for a fall arrest system to be effective in preventing contact with a lower level may be as much as 18.5 feet. Nominal Fall arrest systems should not be used at heights with less than 18.5 feet clearance to a lower level unless it can be determined by a competent person that the person will not contact the lower level in a fall. Where vertical clearance is inadequate, another way to gain access to the elevated work location must be identified.

The area below and to the sides of the individual must be free of obstructions that could cause injury during a fall. Fall arrest systems must be rigged so that a person cannot free fall for more than 6 feet or so that the arresting forces on the body do not exceed 900 pounds.

5.5 POST FALL RESCUE PLAN

Post-fall recovery plan means a plan for the prompt recovery of personnel in the event of a fall being arrested by the employed safety equipment - the rescue support that should be available to avoid long periods of fall arrest suspension. Prolonged suspension from fall arrest systems can cause orthostatic intolerance, which, in turn, can result in serious physical injury, or potentially, death. Orthostatic intolerance is defined by medical professionals as "the development of symptoms such as light-headedness, palpitations, tremulousness, poor concentration, fatigue, nausea, dizziness, headache, sweating, weakness and occasionally fainting". According to OSHA, suspension in a fall arrest device can result in unconsciousness, followed by death, in less than 30 minutes. To reduce the risk associated with prolonged suspension in fall arrest systems, work groups should implement plans to prevent prolonged suspension in fall protection devices. The plan should include procedures for: preventing prolonged suspension, identifying orthostatic intolerance signs and symptoms, and performing self-rescue, rescue by work crew or retrieval by rescue team.

In planning Working at Heights Tasks, a Post-Fall Recovery Plan should be considered and the appropriate equipment and resources should be available. The following should be applied to the rescue plan:

I. Means of communication, such as telephone or hand-held radio, shall be made available (or at the reachable distance within a few seconds) should an emergency occur and need to be immediately reported.
II. An evaluation of the ability for users to self rescue through the staging of ladders, man baskets, scissor lifts, or through the use of other engineered solutions
III. Ensure each individual involved in the project requiring working at height is familiar with the company emergency phone number.
IV. Notify the Morenci Emergency Response Team in advance and explain the working at height tasks that will take place.
V. The Emergency Response Team shall determine if a stand-by personnel will be assigned or not during the task execution.

5.6 INSPECTIONS

Pre- service Inspection

All fall protection equipment will be inspected prior to first use for defects that could affect safety or system functionality. When defects that affect safety are found the equipment shall be taken out of service, tagged and sent to the manufacturer for repairs or testing.

Pre-use Inspection and Disposal of Fall Arrest Equipment

Personal fall arrest systems will be inspected prior to each use for wear, damage and other deterioration. Defective or damaged components will be removed from service and made inoperable. Equipment

missing the manufacturer's labels will be taken out of service unless the label is replaced by the manufacturer. The user of fall protection will inspect their equipment immediately prior to use. During inspection the user will handle the equipment, operate its components and make a visual check. Inspection will follow the manufacturer's recommendation and will include inspection of:

a) Braids and webbing
b) Stitching
c) Conditions of grommets, buckles, and hardware
d) Presence of manufacturer's date tag, and serial number
e) Harnesses and lanyards exposed to chemicals should be closely examined for deterioration and flexibility.
f) Cleanliness, broken strands, burns, excessive wear and dirt
g) Fall indicators (usually on self-retracting lifelines)

Cuts and frays that show red or any other color inside of a piece of webbing indicate that the component must be removed from service. Hardware that is twisted, bent or does not operate properly will be removed from service. Fall arrest components will be removed from service according to manufactures recommendations.

Fall arrest components will be removed from service after they have been involved in a fall.

Periodic Inspections
Permanently installed fall arrest systems including horizontal and vertical lifelines, and trolley systems will placed on formal written preventative maintenance schedules in accordance with manufacturer's recommendations.

A competent person, other than the user, shall inspect personal fall protection equipment at intervals not exceeding once every 12 months. This inspection shall be documented using Appendix 11.4.

Storage of Fall Arrest Equipment
Fall protection system components will be stored away from corrosive materials, oils and solvents, moisture, heat, or any other substance that may cause damage. Harnesses, straps, and lanyards will be hung by the D-ring or other connecting means to keep straps in a natural and untangled position when not in use.

5.7 TRAINING
All employees and contractors who perform tasks involving fall protection must be familiar with the protective requirements outlined within this standard. In addition employees and contractors conducting tasks requiring the use of fall arrest, positioning and/or restraint systems shall be trained in at least the following:

- Recognition of fall hazards
- Controlling fall hazards
- Inspection and use of fall arrest/restraint equipment
- Methods of donning, adjusting and interconnecting system components
- Fitting Procedures
- Fall clearance determinations
- Swing fall potentials
- Suspension Trauma
- Rescue preparedness
- Storage and maintenance requirements

Employees shall receive refresher training at least once every three years or as necessary to ensure knowledge of policy changes and fall protection practices. If employees have gone 12 months or longer without using fall protection equipment re-training must be given. Employees that have undergone fall protection training in the past, but which does not cover all critical required components must receive updated training within 12 months of release of this policy.

Training received from other sites or qualified training centers may be considered adequate if it covered the elements prescribed above. Training, other than that administered by the Morenci Technical Training Department, shall be reviewed by a senior safety specialist, approved instructor or competent designee prior to being approved for use on branch property.

6.0 REFERENCE DOCUMENTS

- 30 CFR Part 56 – 15005 Safety Harnesss and Lines.
- 30 CFR Part 56 – 11012 Protection for openings around travelways.
- 30 CFR Part 56 – 11027 Scaffolds and Work Platforms.
- FCX Fall Protection Guidelines
- 29 CFR 1926.500 (subpart M)
- ANSI Z359 – 2007 Standards
- OSHA Standard Interpretations (1910 and 1926.500 Fall Protection)
- OSHA Suspension Trauma/Orthostatic Intolerance. Safety and Health Information Bulletin. SHIB 03-24-2004, updated 2011

7.0 RECORDS

Name of the Document	Responsible for Control	Records Retention
Fall Protection Planning Permit	Division	1 Year
Fall Protection Inspection Records	Department	Life of Unit(s)
Training Certificates	Technical Training Department	Duration of employment + 60 days
Engineering Certificates	Plant Engineering	Permanent

8.0 APPENDICES

Appendix 1: Specific Fall Protection Work Requirements
Appendix 2: Fall Protection Planning Permit
Appendix 3: Examples of Typical Personal Fall Arrest Systems (PFAS)
Appendix 4: Fall Protection Inspection Form
Appendix 5: Suspension Trauma

9.0 REVIEW AND CHANGE

All changes, modifications and/or revisions must be documented on the table below:

Description of Changes to this Document
Included more information describing when this and other policies apply (Lamanna 6/25/2011)
Included information specific to fall arrest on mobile equipment and other general applications (Lamanna 7/18/2011)
Modified Rescue Plan Requirements (Lamanna 7/29/2011)
Re-format (Apodaca 1/16/2012)
Modified Fall Protection Permit (Lamanna 2/24/2012)

Appendix 1 – Specific Fall Protection Work Requirements

Climbing and Working from Ladders

Persons climbing ladders of 20 feet or less may do so without fall protection as long as they maintain three points of contact at all times. Persons working on ladders may work without fall protection as long as their feet are not more than six feet from the ground, the ladder steps are dry and clean, the ladder is placed on a level surface, and the employee has effectively controlled remaining risks. Fall protection shall be used when working from ladders at any height if the employee is required to place himself in an off balanced position, increasing the fall potential. Employees, Competent Persons, and Supervisors must evaluate each situation using risk management and the hierarchy of controls to minimize fall hazards and associated risks.

NOTE: All work involving ladders must meet company Ladder Safety requirements, including ladder type, positioning and the securing of ladders.

Accessing and Working from Mobile Equipment

Accessing, operating or maintaining self-propelled mobile equipment often requires activities such as climbing ladders, or walking on machinery surfaces which expose miners to hazards such as falls during all types of weather conditions. Modern mobile equipment is designed to minimize slip and fall hazards; but, large machinery, new and old, can require access at heights with a fall potential that can cause serious injury. The following guidelines can reduce the likelihood of slip, trip or fall incidents from mobile equipment.

1. Complete work from ground level where feasible
2. Equipment shall be inspected for icy, wet, or oily areas at the start of each shift and whenever conditions dictate. Before climbing on, off or around mobile equipment, footwear shall be free of mud or other substances that could cause slipping.
3. A safe means of ingress/egress shall be provided through permanent ladder ways, footholds, or steps. Where a permanent means of access has not been provided temporary solutions may include proper use of an A-frame ladder (note the A frame shall extend at least 3ft above the surface being accessed.
4. Persons climbing on or off mobile equipment shall face the machine. Both hands shall be free for gripping the ladder, handrail, or handhold. When necessary, a rope, or other line should be used to lift and lower lunch pails, thermos bottles, or tools.
5. Walkways shall be no narrower than their original manufactured widths, constructed with slip-resistant surfaces, and securely attached. Unobstructed access should be provided to all areas of the machine where a person might travel.
6. Handholds or handrails should be within easy reach and positioned at critical locations.
7. Tripping hazards within the area of access should be removed prior to getting on mobile equipment (remove loose material, rigging, trash, rags, etc…)
8. Work such as welding, grinding, fabrication and other tasks which could result in inattention and an increased risk for a fall shall not be done on mobile equipment without fall prevention or protection devices.
9. When access is required to mobile equipment hatches, openings, or as a result of tie-down and tarp installation requirements; fall protection systems shall be used when there is a danger of falling

Any modifications to mobile equipment should not be made without an engineering evaluation and in concurrence with the manufacturer of the equipment.

Unsafe access and fall hazards from mobile equipment can be reduced by the use of:

I. Portable ladders and work platforms,
II. Harnesses and lanyards utilizing suitable overhead anchor points,
III. Man-lifts,
IV. Other mobile work stations,
V. Use of docking stations,
VI. Relocating service points to safe areas, e.g., installing extended grease lines.
VII. Conducting work from the ground level
VIII. Installing hand railing around unprotected sides
IX. Providing unobstructed walking paths away from the edge of the vehicle
X. Inspecting the equipment for defects and housekeeping issues

XI. Limiting timeframes of exposure through short term direct access

Specific Restrictions associated with mobile equipment:

a) Employees shall not work on top of, under, or from mobile equipment in a raised position until the equipment has been blocked or mechanically secured to prevent it from rolling or falling accidentally. This requirement does not include working from operator stations or other areas where a fall of person or crushing hazard does not exist.
b) Employees shall not weld, cut, braze or perform other hot work and fabrication activities from mobile equipment without fall protection.
c) Where an uncontrolled fall hazard exists employees shall not stand or travel on loads, stands, uneven surfaces or along restricted travelways that are 24" or narrower. In circumstances not meeting the above requirements; designed footholds, handholds, steps or ladder ways may be used to reduce the risk of a fall to an acceptable level.
d) Employees shall not manually clean windows from outside the cab where such cleaning activities expose employees to an uncontrolled fall of person hazard.
e) Employees shall not access mobile equipment while attempting to position a load using a tagline. Where needed taglines shall be long enough so that they can be used from ground level.

Working from Man-Cages/Working Baskets/Lift Boxes

A man-cage is an approved, engineered and constructed cage suspended from a crane for the purpose of lifting and lowering personnel to perform tasks on inaccessible plant or equipment. Each area where man-cages are used shall have a written procedure that includes a risk assessment / JSA prior to each use. Man-cages shall be approved and registered by the appropriate department and a compliance inspection tag or plate shall be affixed to the man-cage to indicate that it is approved. Refer to Morenci's Standard for use of crane suspended work platforms.

Appendix 2: Fall Protection Planning Form – Non Mandatory

Department:	**Date:**
Job Supervisor:	**Work Location:**

Can the need for active fall protection systems be mitigated by any of the following methods? (Check all that apply)

___ Redesign the process or job task	___ Use tool extensions and work from ground level
___ Work at lower heights	___ Lower equipment and tools to ground level
___ Use of ladder or scaffolding (Prevention)	___ Install covers, barricading, walls or partitions (MSHA Compliant)
___ Use appropriate aerial lifts (Prevention)	___ Design walking/working surfaces to eliminate/reduce exposure

Purpose for Fall Protection:

How often is this task conducted: ___ Daily ___ Weekly ___ Monthly ___ Quarterly ___ Annually ___ New Task

What form of protection will be used: Check all that apply

Requires approval of a "Competent person": ___ Temporary Guardrail ___ Scaffolding ___ Parapet or berm ___ Fall Restraint ___ Fall Arrest

Requires approval of a "Qualified person": ___ Nets ___ Positioning ___ Controlled Zones w/Attendant ___ Horizontal Lifeline

Personal Fall Arrest System: (ABC's)

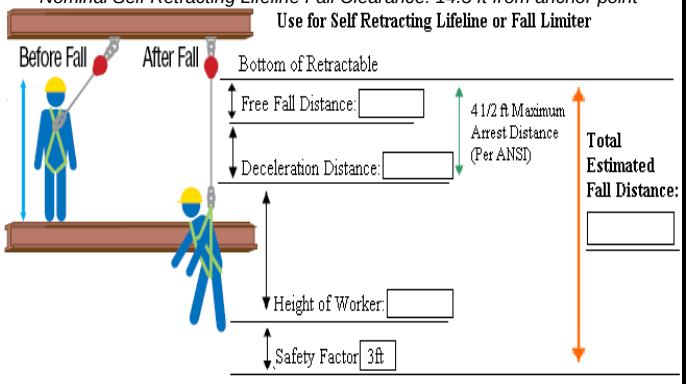
Anchorage Point: Inspected by___ Competent Person___ Qualified	What is the anchor point:

Anchoring to hand rails, floor grating, cables/wires, conduit, instrumentation, valves, rigging equipment, small diameter steel piping (3" diameter or less), tubing, lightweight joists & other lightweight objects is not permitted unless approved by a qualified engineer.

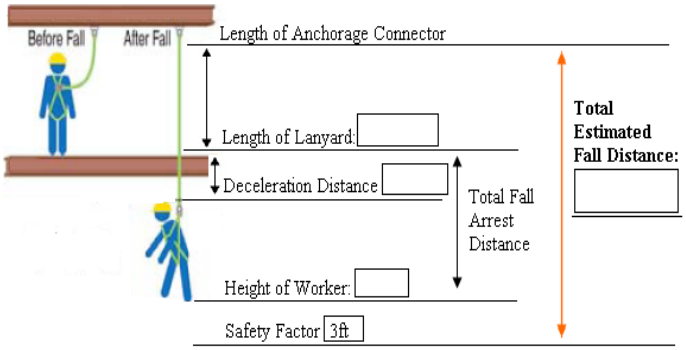
Anchorage Point Load Rating:___ 1,000lbs Restraint/Travel Restraint ___ 3,000lbs Work Positioning/Slope Restraint/Rescue ___ 5,000lbs Fall Arrest
(Qualified Person must Certify): ___ 2x Maximum Arresting Force ___ 2x Foreseeable Force ___ 5x applied load

Anchorage Connector Used:	Connecting Device Used:

**Nominal Self Retracting Lifeline Fall Clearance: 14.5 ft from anchor point*



**Nominal 6ft SA lanyard fall clearance: 18.5ft from anchor point*



Fall Forces: Potential free fall will be ____ft. (must remain under 6ft)	Manufacturer weight specifications met:___ (Yes)___ (No - qualified person)

Rescue Pre-Planning (Prompt rescue should occur within 15 minutes of a fall)

Which method(s) can be used: ___ Self rescue ___ Assisted by Co-Workers (Non-Retrieval) ___ ERRT Rescue Team

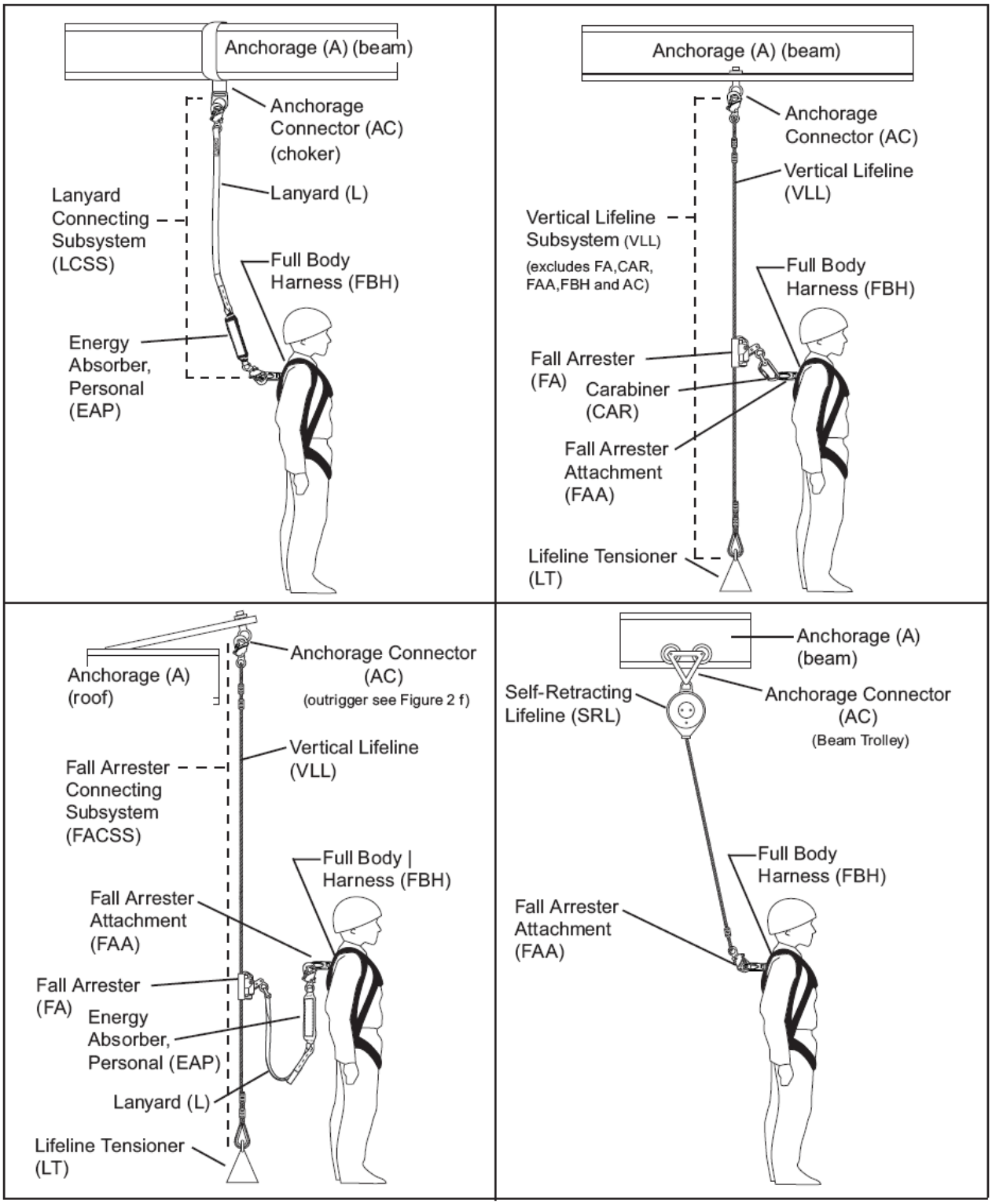
Description of Rescue Plan:

	YES	N/A	FALL PROTECTION ASSESSMENT
1			Is an SOP available or has a Job Safety Analysis been conducted and reviewed by crew prior to conducting the task?
2			Has all fall protection equipment been inspected?
3			Is area below work flagged and properly tagged?
4			Have all employees been fit tested for the harness being used?
5			Have all employees been trained by a competent person?
6			Is the anchor point strong enough to prevent bending, breaking, or deflection?
7			Is the snap hook the right size and type to prevent rollout?
8			Has swing fall potential been minimized?

Signature of Competent Person:		Signature of Supervisor:	
Signature of Authorized User(s):	#1	#2	
Signature of Qualified Person (If Applicable):			
Signature of Rescue Member/Safety Representative (If Applicable):			

This form is intended to be used as a tool when a comprehensive fall protection plan needs to be developed. Situations of use include: Non routine, high risk and new tasks in which anchor points, system components, free fall distance, swing fall hazards and fall clearance estimations are unknown.

Appendix 3: Examples of Typical Personal Fall Arrest Systems (PFAS)



Appendix 4: Fall Protection Inspection Checklist

Division:	Department:
Date Inspected:	Date of Manufacture:
Competent Inspector:	Inspector Signature:

X FAIL: Initial_____
REMOVE FROM SERVICE

PASS: Initial_____
RETURN TO SERVICE

Serial #	Type of Equipment	FAIL	PASS	Comments:

Appendix 5: Suspension Trauma

This Safety and Health Information Bulletin provides employees and employers with important information about the hazards of orthostatic intolerance and suspension trauma when using fall arrest systems. This bulletin:

- describes the signs and symptoms of orthostatic intolerance “Suspension Trauma”
- discusses how orthostatic intolerance can occur while workers are suspended following a fall
- outlines recommendations for preventing orthostatic intolerance, as well as recommendations for worker training and rescue

A well-known example of orthostatic intolerance is that of a soldier who faints while standing at attention for long period of time. The moment the soldier loses consciousness, he or she collapses into a horizontal position. With the legs, heart, and brain on the same level, blood is returned to the heart. Assuming no injuries are caused during the collapse, the individual will quickly regain consciousness and recovery is likely to be rapid.

Venous pooling typically occurs in the legs due to the force of gravity and a lack of movement. Some venous pooling occurs naturally when a person is standing. In the veins, blood normally is moved back to the heart through one-way valves using the normal muscular action associated with limb movement. If the legs are immobile, then these "muscle pumps" do not operate effectively, and blood can accumulate. Since veins can expand, a large volume of blood may accumulate in the veins.

An accumulation of blood in the legs reduces the amount of blood in circulation. The body reacts to this reduction by speeding up the heart rate and in an attempt to maintain sufficient blood flow to the brain. If the blood supply is significantly reduced, this reaction will not be effective. The body will abruptly slow the heart rate and blood pressure will diminish in the arteries. During severe venous pooling, the reduction in quantity and/or quality (oxygen content) of blood flowing to the brain causes fainting. This reduction also can have an effect on other vital organs, such as the kidneys [3]. The kidneys are very sensitive to blood oxygen, and renal failure can occur with excessive venous pooling. If these conditions continue, they potentially may be fatal [3]

Description of Hazard

Orthostatic intolerance may be experienced by workers using fall arrest systems. Following a fall, a worker may remain suspended in a harness. The sustained immobility may lead to a state of unconsciousness. Depending on the length of time the suspended worker is unconscious/immobile and the level of venous pooling, the resulting orthostatic intolerance may lead to death. While not common, such fatalities often are referred to as "harness induced pathology" or "suspension trauma." Unconscious/immobile workers suspended in their harness will not be able to move their legs and will not fall into a horizontal position, as they would if they fainted while standing. Venous pooling and orthostatic intolerance can be exacerbated by other circumstances related to the fall. For example, shock or the experience of the event that caused the fall, other injuries, the fit/positioning of the harness, the environmental conditions, and the worker’s psychological state all may increase the onset and severity of the pooling and orthostatic intolerance. Unless the worker is rescued promptly using established safe procedures, venous pooling and orthostatic intolerance could result in serious or fatal injury, as the brain, kidneys, and other organs are deprived of oxygen.

Signs & symptoms that may be observed in an individual who is approaching orthostatic intolerance:	
Faintness	Nausea
Breathlessness	Dizziness
Sweating	Unusually Low Heart Rate
Paleness	Unusually Low Blood Pressure
Hot Flashes	"Greying" or Loss of Vision
Increased Heart Rate	
References: Seddon, Paul. Harness Suspension: review and evaluation of existing information. Health and Safety Executive. Research Report 451/2002. 104 pp. Sheehan, Alan. Suspension Trauma. Training handout.	

Factors that can affect the degree of risk of suspension trauma:	
Inability to move legs	Hypothermia
Pain	Shock
Injuries during fall	Cardiovascular disease
Fatigue	Respiratory disease
Dehydration	Blood loss
References: Seddon, Paul. Harness Suspension: review and evaluation of existing information. Health and Safety Executive. Research Report 451/2002. 104 pp. Sheehan, Alan. Suspension Trauma. Training handout.	

Rescue procedures should include the following contingency based actions:

- Where feasible establish a self-rescue plan that may involve placement of extension ladders, availability of a mobile work platform or use of an engineered ascent or descent device.
- If self-rescue is impossible, or if rescue cannot be performed promptly, the worker should be trained to “pump” his/her legs frequently to activate the muscles and reduce the risk of venous pooling. Footholds can be used to alleviate pressure, delay symptoms, and provide support for “muscle pumping.”
- Continuous monitoring of the suspended worker for signs and symptoms of orthostatic intolerance and suspension trauma.
- Ensuring that a worker receives standard trauma resuscitation1 once rescued.
- If the worker is unconscious, keeping the worker’s air passages open and obtain first aid.
- Monitoring the worker after rescue, and ensuring that the worker is evaluated by a health-care professional. The worker should be hospitalized when appropriate. Possible delayed effects, such as kidney failure, which is not unusual in these cases, are difficult to assess on the scene.

SECTION G

GENERAL ENERGY CONTROL POLICY 98-005

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Morenci Safe Production Standard	Standard # 2.3	
	OHSAS 18001:2007	MP 4.4.6
General Energy Control Policy 98-005	Revision #	06
	Revision Date	1/10/2012
	Effective Date	1/1/2012
	Document Owner	BEST Team
Approvals:		
Senior VP Morenci Operations: 7/28/2011	Safety Steering Committee: 7/28/2011	

1.0 PURPOSE:

This policy establishes the minimum requirements for energy control, where unexpected energization or the unrestricted release of hazardous energy could cause injury and contains the minimum procedures for lockout/tagout/tryout of energy sources.

Energy source examples include mechanical, pneumatic, hydraulic, fluid, chemical, atmospheric, electrical, electromagnetic, thermal, nuclear, kinetic, potential, gravitational and ionizing radiation.

2.0 SCOPE:

This document applies to Freeport-McMoRan Morenci Operations employees and contractors.

This policy is mandatory and is to be used to ensure that the equipment is isolated from all sources of energy, locked, tagged and tried before work begins where individuals could be exposed to dangerous conditions. It establishes procedures for the protection of personnel from injury due to unexpected energization, start-up, recharge or release of stored energy in, on or around the equipment.

Shovels, drills, trucks and support equipment are ***not*** covered by this policy; refer to specific FMI policies for the appropriate heavy equipment lockout procedures.

3.0 TERMS, DEFINITIONS AND ABBREVIATIONS

3.1 Affected Individual:

An individual, whose job requires them to work on, or expose themselves to a hazard presented by the equipment which has been placed under a lockout/tagout/tryout condition. An Affected Individual shall place, or witness the placement of their personal lock and tag on all energy isolating devices or multiple lockout device that provides an energy source to the area where the individual is working.

3.2 Energy Control Coordinator (ECC):

This person shall be the most qualified person having technical and working knowledge of the equipment being isolated, and is chosen by the work group for each specific job. In some instances it may become necessary that management designate the ECC. The ECC will request the qualified craft representatives necessary to isolate energy sources. The ECC is charged with the overall responsibility of the energy isolation to ensure that all energy sources are locked, tagged and tried out with the assistance of the Qualified Individual.

3.3 Out of Service Tag:

When equipment is out of service and work is not being performed, it will be tagged with an Out of Service tag. A name, date and clear statement will be placed on this tag stating the reason for the placement of the tag. This tag is for equipment protection and not a function of energy isolation.

3.4 Qualified Individual:

An individual trained in and familiar with the operation of, and the hazards of the energy source associated with the equipment upon which the individual is working. By extension, a qualified individual:

i) Is capable of recognizing hazards associated with the work
ii) Is capable of avoiding hazards associated with the work
iii) Is approved to perform energy isolation
iv) Is approved to perform energy measurement/testing

3.5 Personal Tag:

Tags shall be pre-printed with a clear warning of the hazard or danger and type (Personal or ECC). **A picture ID of the employee must be featured on the personal tag.** A permanent marker/pen shall be used to state the following on the tag:

v) Printed Name
vi) Date of LOTOTO
vii) Equipment ID
viii) Reason for LOTOTO

4.0 RESPONSIBILITIES:

4.1 Branch Electrical Safety Team:

- Review processes, establish procedures, and control documents associated with this General Energy Control Policy.

4.2 Division Management:

- Ensure compliance with this policy and procedure.
- Ensure that all persons involved with LOTOTO in their areas are properly trained.
- Provide necessary resources and equipment to implement and maintain this program.

4.3 Health and Safety Department

- Audit the General Energy Control Policy for compliance.
- Participate in review of the program.

4.4 Technical Training Department:

- Provide qualified instructors to administer LOTOTO training.

4.5 Contractor Personnel:

- Meet or exceed all site requirements for locking out energy sources.
- Attend site specific LOTOTO training

5.0 STANDARDS OF PERFORMANCE

Each individual shall place or witness the placement of their personal lock and tag on each energy isolating device or the multiple lockout device, which controls the energy source(s) to the area in which the individual is working. Each lock shall be accompanied by an approved tag.

All energy isolation (LOTOTO) locks will be **colored plastic bodied** safety locks. Other locks are not acceptable for energy isolation with no exception. These locks shall not be used for any purpose other than LOTOTO. **A single lock or keyed alike locks will have only one key.** This key is to be kept in the possession of the Affected Individual. Spare keys will be destroyed.

5.1 Step-by-Step Procedures

5.1.1 Equipment Energy Isolation

(a) The Affected Individual shall identify all hazardous energies that are present and coordinate the shutdown of the equipment utilizing the appropriate shutdown procedure.

(b) A Qualified Individual isolates the energy sources using proper applicable means to verify the zero energy state.

(c) The Affected Individual shall place or witness the placement of their personal lock and tag on the energy isolating device to ensure energy control.

(d) The Affected Individual will ensure a Try Out is performed on the equipment.

5.1.2 Release of the Equipment

(a) Each Affected Individual shall remove or witness the removal of their lock and tag from the energy isolating device. Personal locks shall be removed when the Affected Individual is assigned to another task, leaves at the end of the shift, or the work is completed unless the removal of the lock exposes others to a hazard.

(b) The Affected Individual shall verify all personal locks have been removed and the equipment is safe to operate.

(c) The Qualified Individual will restore the energy source.

(d) The Affected Individual shall provide notification to the operators of the equipment when the work is complete and the equipment has been released for operation.

5.1.3 Equipment Energy Isolation (Lock Box Utilization)

(a) Select or designate the Energy Control Coordinator (ECC)

(b) The ECC shall identify all hazardous energies present and coordinate the shutdown of the equipment utilizing the appropriate shutdown procedure.

(c) A Qualified Individual isolates the energy source using proper, applicable means to verify the zero energy state.

(d) **The ECC lock and tag are placed by the Qualified Individual on the energy isolating device in the presence of the ECC**.

(e) The key for an ECC lock is placed in the lock box.

(f) The ECC places their personal lock and tag on the lock box to ensure energy control.

(g) The ECC will ensure a Try Out is performed on the equipment.

(h) Each Affected Individual shall install their personal lock and tag on the lock box.

5.1.4 Release of the Equipment (Lock Box Utilization)

(a) Each individual shall remove their lock and tag. Personal locks shall be removed when the Affected Individual is assigned to another task, leaves at the end of the shift, or the work is completed unless the removal of the lock exposes others to a hazard. One exception to this is that the ECC's personal lock shall be allowed to remain in place on the lockbox until the job is completed.

(b) The Affected Individual removes the personal lock and tag from the lock box when the work is completed.

(c) The ECC removes their personal lock and tag from the lock box when the work is completed.

(d) The Qualified Individual shall remove the ECC lock and tag from the energy isolating devices when the work is completed in the presence of the ECC.

(e) The ECC shall verify all personal locks have been removed and the equipment is safe to operate.

(f) The Qualified Individual will restore the energy source as directed by the ECC.

(g) The ECC shall provide notification to the operators of the equipment when the work is complete and the equipment has been released for operation.

5.1.5 Positive transfer of the ECC shall be performed.

(a) The ECC transferring control thoroughly briefs the new ECC taking control and shall address all energy sources that have been isolated and the means used to verify the zero energy state.

(b) Transfer lock box to the new ECC.

(c) The new ECC taking control applies a personal lock and tag on the lock box.

(d) The ECC transferring control removes their personal lock and tag from the lock box.

(e) The new ECC taking control visually inspects all energy isolating devices.

(f) The new ECC completes the tag documentation and is identified as the new ECC.

5.2 Non-Routine Lock and Tag Removal

a) The following events may make it necessary to remove a lock and tag:

i) An individual who placed a lock and tag cannot be located.

ii) The owner of a lock that has been placed cannot be identified.

b) In all cases where non-routine removal of a lock and tag is required, a thorough inspection of equipment shall be performed and the appropriate procedure, either i) or ii) below, shall be followed:

i) All reasonable efforts shall be made to contact the Affected Individual of the pending lock removal and determine why the equipment was locked out. If a **member of management** (i.e. supervisor or above) makes contact with the individual and the

reason for LOTOTO is clarified, permission may be granted by the individual to remove the lock and tag. Thoroughly inspect equipment and area before removing lock.

OR

ii) If the Affected Individual cannot be notified or identified, a qualified individual, safety representative, area supervisor and energy control coordinator shall direct a thorough inspection to ensure that the equipment is safe to re-energize. These individuals shall ensure that all personnel are clear and the equipment is safe to operate.

c) **When contact is not made or the lock is unidentified, non-routine removals shall be documented** using the non-routine lock removal form. The form shall be provided to the superintendent for review.

d) The affected individual shall be advised of the removal of the lock and tag upon return to work.

5.3 Training

1. LOTOTO Training shall be provided, in accordance with Training Department procedures, to all employees who may utilize the practice of locking out any equipment to isolate energy. The training shall consist of:

   (a) LOTOTO locks and materials

   (b) LOTOTO Definitions

   (c) Non-lockbox utilization process

   (d) Lockbox utilization process

   (e) Non-routine lock removal

   (f) Purpose for LOTOTO

   (g) Review and test

2. Training shall be documented using an approved MSHA form.

3. Affected employees will receive annual refresher training on the requirements of the LOTOTO procedure. More frequent training may be required for any trained employee who demonstrates a lack of understanding of the requirements of the procedure.

6.0 REFERENCE DOCUMENTS

6.1 Regulatory Standards

- MSHA 30 CFR 56/56.12016 and 56.12017
- OSHA 29 CFR 1910.147
- NFPA 70E Standard for Electrical Safety

6.2 Other Standards

- American National Standards Institute (ANSI), ANSI/ASSE Z244.1-2003(R2008)

Note: The ANSI Standard is available on DOHS Share Point Site – Standards include appendices that provide examples of written programs, risk assessment, etc.

7.0 RECORDS

Name of the Document	Responsible for Control	Records Retention
Task Training MSHA Approved Form	Technical Training Department	Length of employment + 60 days after
Non –Routine Lock Removal Form	Area Superintendent	1 Year

8.0 APPENDICES

Non-Routine Lock Removal Form

9.0 REVIEW AND CHANGE

All changes, modifications and/or revisions must be documented on the table below:

Description of Changes to this Document
Rev. 6 from Transversal Policy to Safe Production Standard – Policy content not changed from approved version – S.A. 01/10/2012

Non-Routine Lock Removal

Equipment: _____

Name (if known): _____

Date: _____

Time:

Individual Not Contacted or Lock Not Identified

Check List	
☐	Perform a thorough inspection of the equipment
☐	Verify that all grounds and blocking devices have been removed
☐	Verify that tools and material are clear
☐	Verify that the equipment is operable
☐	Verify that all guards have been re-installed
☐	Verify that all personnel are clear

Summary
Cause:
Steps:

Investigators	
Safety Representative	
Area Supervisor(s)	
Qualified Individual	
Energy Control Coordinator (if used)	

Provide document to area superintendent	*8-2011*

SECTION H

FIRE PREVENTION

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Part Number: 1926

- **Part Title:** Safety and Health Regulations for Construction
- **Subpart:** F
- **Subpart Title:** Fire Protection and Prevention
- **Standard Number:** 1926.150
- **Title:** Fire protection.

1926.150(a)

General requirements.

1926.150(a)(1)

The employer shall be responsible for the development of a fire protection program to be followed throughout all phases of the construction and demolition work, and he shall provide for the firefighting equipment as specified in this subpart. As fire hazards occur, there shall be no delay in providing the necessary equipment.

1926.150(a)(2)

Access to all available firefighting equipment shall be maintained at all times.

1926.150(a)(3)

All firefighting equipment, provided by the employer, shall be conspicuously located.

1926.150(a)(4)

All firefighting equipment shall be periodically inspected and maintained in operating condition. Defective equipment shall be immediately replaced.

1926.150(a)(5)

As warranted by the project, the employer shall provide a trained and equipped firefighting organization (Fire Brigade) to assure adequate protection to life.

..1926.150(b)

1926.150(b)

Water supply.

1926.150(b)(1)

A temporary or permanent water supply, of sufficient volume, duration, and pressure, required to properly operate the firefighting equipment shall be made available as soon as combustible materials accumulate.

1926.150(b)(2)

Where underground water mains are to be provided, they shall be installed, completed, and made available for use as soon as practicable.

1926.150(c)

Portable firefighting equipment-

1926.150(c)(1)

Fire extinguishers and small hose lines.

1926.150(c)(1)(i)

A fire extinguisher, rated not less than 2A, shall be provided for each 3,000 square feet of the protected building area, or major fraction thereof. Travel distance from any point of the protected area to the nearest fire extinguisher shall not exceed 100 feet.

1926.150(c)(1)(ii)

One 55-gallon open drum of water with two fire pails may be substituted for a fire extinguisher having a 2A rating.

1926.150(c)(1)(iii)

A 1/2-inch diameter garden-type hose line, not to exceed 100 feet in length and equipped with a nozzle, may be substituted for a 2A-rated fire extinguisher, providing it is capable of discharging a minimum of 5 gallons per minute with a minimum hose stream range of 30 feet horizontally. The garden-type hose lines shall be mounted on conventional racks or reels. The number and location of hose racks or reels shall be such that at least one hose stream can be applied to all points in the area.

..1926.150(c)(1)(iv)

1926.150(c)(1)(iv)

One or more fire extinguishers, rated not less than 2A, shall be provided on each floor. In multistory buildings, at least one fire extinguisher shall be located adjacent to stairway.

1926.150(c)(1)(v)

Extinguishers and water drums, subject to freezing, shall be protected from freezing.

1926.150(c)(1)(vi)

A fire extinguisher, rated not less than 10B, shall be provided within 50 feet of wherever more than 5 gallons of flammable or combustible liquids or 5 pounds of flammable gas are being used on the jobsite. This requirement does not apply to the integral fuel tanks of motor vehicles.

1926.150(c)(1)(vii)

Carbon tetrachloride and other toxic vaporizing liquid fire extinguishers are prohibited.

1926.150(c)(1)(viii)

Portable fire extinguishers shall be inspected periodically and maintained in accordance with Maintenance and Use of Portable Fire

Extinguishers, NFPA No. 10A-1970.

1926.150(c)(1)(ix)

Fire extinguishers which have been listed or approved by a nationally recognized testing laboratory, shall be used to meet the requirements of this subpart.

1926.150(c)(1)(x)

Table F-1 may be used as a guide for selecting the appropriate portable fire extinguishers.

TABLE F-1 FIRE EXTINGUISHERS DATA
(For Table F-1, Click Here)

..1926.150(c)(2)

1926.150(c)(2)

Fire hose and connections.

1926.150(c)(2)(i)

One hundred feet, or less, of 1 1/2-inch hose, with a nozzle capable of discharging water at 25 gallons or more per minute, may be substituted for a fire extinguisher rated not more than 2A in the designated area provided that the hose line can reach all points in the area.

1926.150(c)(2)(ii)

If fire hose connections are not compatible with local firefighting equipment, the contractor shall provide adapters, or equivalent, to permit connections.

1926.150(c)(2)(iii)

During demolition involving combustible materials, charged hose lines, supplied by hydrants, water tank trucks with pumps, or equivalent, shall be made available.

1926.150(d)

Fixed firefighting equipment-

1926.150(d)(1)

Sprinkler protection.

1926.150(d)(1)(i)

If the facility being constructed includes the installation of automatic sprinkler protection, the installation shall closely follow the construction and be placed in service as soon as applicable laws permit following completion of each story.

..1926.150(d)(1)(ii)

1926.150(d)(1)(ii)

During demolition or alterations, existing automatic sprinkler installations shall be retained in service as long as reasonable. The operation of sprinkler control valves shall be permitted only by properly authorized persons. Modification of sprinkler systems to permit alterations or additional demolition should be expedited so that the automatic protection may be returned to service as quickly as possible. Sprinkler control valves shall be checked daily at close of work to ascertain that the protection is in service.

1926.150(d)(2)

Standpipes. In all structures in which standpipes are required, or where standpipes exist in structures being altered, they shall be brought up as soon as applicable laws permit, and shall be maintained as construction progresses in such a manner that they are always ready for fire protection use. The standpipes shall be provided with Siamese fire department connections on the outside of the structure, at the street level, which shall be conspicuously marked. There shall be at least one standard hose outlet at each floor.

1926.150(e)

Fire alarm devices.

1926.150(e)(1)

An alarm system, e.g., telephone system, siren, etc., shall be established by the employer whereby employees on the site and the local fire department can be alerted for an emergency.

1926.150(e)(2)

The alarm code and reporting instructions shall be conspicuously posted at phones and at employee entrances.

1926.150(f)

Fire cutoffs.

1926.150(f)(1)

Fire walls and exit stairways, required for the completed buildings, shall be given construction priority. Fire doors, with automatic closing devices, shall be hung on openings as soon as practicable.

..1926.150(f)(2)

1926.150(f)(2)

Fire cutoffs shall be retained in buildings undergoing alterations or demolition until operations necessitate their removal.

[44 FR 8577, Feb. 9, 1979; 44 FR 20940, Apr. 6 1979, as amended at 58 FR 35162; June 30, 1993; 61 FR 31427, June 20, 1996]

SECTION I

HAZARD COMMUNICATION

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- **Part Number:** 1910
- **Part Title:** Occupational Safety and Health Standards
- **Subpart:** Z
- **Subpart Title:** Toxic and Hazardous Substances
- **Standard Number:** 1910.1200
- **Title:** Hazard Communication.
- **Appendix:** A , B , C , D , E

1910.1200(a)

"Purpose."

1910.1200(a)(1)

The purpose of this section is to ensure that the hazards of all chemicals produced or imported are evaluated, and that information concerning their hazards is transmitted to employers and employees. This transmittal of information is to be accomplished by means of comprehensive hazard communication programs, which are to include container labeling and other forms of warning, material safety data sheets and employee training.

..1910.1200(a)(2)

1910.1200(a)(2)

This occupational safety and health standard is intended to address comprehensively the issue of evaluating the potential hazards of chemicals, and communicating information concerning hazards and appropriate protective measures to employees, and to preempt any legal requirements of a state, or political subdivision of a state, pertaining to this subject. Evaluating the potential hazards of chemicals, and communicating information concerning hazards and appropriate protective measures to employees, may include, for example, but is not limited to, provisions for: developing and maintaining a written hazard communication program for the workplace, including lists of hazardous chemicals present; labeling of containers of chemicals in the workplace, as well as of containers of chemicals being shipped to other workplaces; preparation and distribution of material safety data sheets to employees and downstream employers; and development and implementation of employee training programs regarding hazards of chemicals and protective measures. Under section 18 of the Act, no state or political subdivision of a state may adopt or enforce, through any court or agency, any requirement relating to the issue addressed by this Federal standard, except pursuant to a Federally-approved state plan.

1910.1200(b)

"Scope and application."

1910.1200(b)(1)

This section requires chemical manufacturers or importers to assess the hazards of chemicals which they produce or import, and all employers to provide information to their employees about the hazardous chemicals to which they are exposed, by means of a hazard communication program, labels and other forms of warning, material safety data sheets, and information and training. In addition, this section requires distributors to transmit the required information to employers. (Employers who do not produce or import chemicals need only focus on those parts of this rule that deal with establishing a workplace program and communicating information to their workers. Appendix E of this section is a general guide for such employers to help them determine their compliance obligations under the rule.)

1910.1200(b)(2)

This section applies to any chemical which is known to be present in the workplace in such a manner that employees may be exposed under normal conditions of use or in a foreseeable emergency.

1910.1200(b)(3)

This section applies to laboratories only as follows:

1910.1200(b)(3)(i)

Employers shall ensure that labels on incoming containers of hazardous chemicals are not removed or defaced;

..1910.1200(b)(3)(ii)

1910.1200(b)(3)(ii)

Employers shall maintain any material safety data sheets that are received with incoming shipments of hazardous chemicals, and ensure that they are readily accessible during each workshift to laboratory employees when they are in their work areas;

1910.1200(b)(3)(iii)

Employers shall ensure that laboratory employees are provided information and training in accordance with paragraph (h) of this section, except for the location and availability of the written hazard communication program under paragraph (h)(2)(iii) of this section; and,

1910.1200(b)(3)(iv)

Laboratory employers that ship hazardous chemicals are considered to be either a chemical manufacturer or a distributor under this rule, and thus must ensure that any containers of hazardous chemicals leaving the laboratory are labeled in accordance with paragraph (f)(1) of this section, and that a material safety data sheet is provided to distributors and other employers in accordance with paragraphs (g)(6) and (g)(7) of this section.

1910.1200(b)(4)

In work operations where employees only handle chemicals in sealed containers which are not opened under normal conditions of use (such as are found in marine cargo handling, warehousing, or retail sales), this section applies to these operations only as follows:

1910.1200(b)(4)(i)

Employers shall ensure that labels on incoming containers of hazardous chemicals are not removed or defaced;

..1910.1200(b)(4)(ii)

1910.1200(b)(4)(ii)

Employers shall maintain copies of any material safety data sheets that are received with incoming shipments of the sealed containers of hazardous chemicals, shall obtain a material safety data sheet as soon as possible for sealed containers of hazardous chemicals received without a material safety data sheet if an employee requests the material safety data sheet, and shall ensure that the material safety data sheets are readily accessible during each work shift to employees when they are in their work area(s); and,

1910.1200(b)(4)(iii)

Employers shall ensure that employees are provided with information and training in accordance with paragraph (h) of this section (except for the location and availability of the written hazard communication program under paragraph (h)(2)(iii) of this section), to the extent necessary to protect them in the event of a spill or leak of a hazardous chemical from a sealed container.

1910.1200(b)(5)

This section does not require labeling of the following chemicals:

1910.1200(b)(5)(i)

Any pesticide as such term is defined in the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. 136 et seq.), when subject to the labeling requirements of that Act and labeling regulations issued under that Act by the Environmental Protection Agency;

1910.1200(b)(5)(ii)

Any chemical substance or mixture as such terms are defined in the Toxic Substances Control Act (15 U.S.C. 2601 et seq.), when subject to the labeling requirements of that Act and labeling regulations issued under that Act by the Environmental Protection Agency;

..1910.1200(b)(5)(iii)

1910.1200(b)(5)(iii)

Any food, food additive, color additive, drug, cosmetic, or medical or veterinary device or product, including materials intended for use as ingredients in such products (e.g. flavors and fragrances), as such terms are defined in the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 301 et seq.) or the Virus-Serum-Toxin Act of 1913 (21 U.S.C. 151 et seq.), and regulations issued under those Acts, when they are subject to the labeling requirements under those Acts by either the Food and Drug Administration or the Department of Agriculture;

1910.1200(b)(5)(iv)

Any distilled spirits (beverage alcohols), wine, or malt beverage intended for nonindustrial use, as such terms are defined in the Federal Alcohol Administration Act (27 U.S.C. 201 et seq.) and regulations issued under that Act, when subject to the labeling requirements of that Act and labeling regulations issued under that Act by the Bureau of Alcohol, Tobacco, and Firearms;

1910.1200(b)(5)(v)

Any consumer product or hazardous substance as those terms are defined in the Consumer Product Safety Act (15 U.S.C. 2051 et seq.) and Federal Hazardous Substances Act (15 U.S.C. 1261 et seq.) respectively, when subject to a consumer product safety standard or labeling requirement of those Acts, or regulations issued under those Acts by the Consumer Product Safety Commission; and,

1910.1200(b)(5)(vi)

Agricultural or vegetable seed treated with pesticides and labeled in accordance with the Federal Seed Act (7 U.S.C. 1551 et seq.) and the labeling regulations issued under that Act by the Department of Agriculture.

..1910.1200(b)(6)

1910.1200(b)(6)

This section does not apply to:

1910.1200(b)(6)(i)

Any hazardous waste as such term is defined by the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery

Act of 1976, as amended (42 U.S.C. 6901 et seq.), when subject to regulations issued under that Act by the Environmental Protection Agency;

1910.1200(b)(6)(ii)

Any hazardous substance as such term is defined by the Comprehensive Environmental Response, Compensation and Liability ACT (CERCLA) (42 U.S.C. 9601 et seq.) when the hazardous substance is the focus of remedial or removal action being conducted under CERCLA in accordance with the Environmental Protection Agency regulations.

1910.1200(b)(6)(iii)

Tobacco or tobacco products;

1910.1200(b)(6)(iv)

Wood or wood products, including lumber which will not be processed, where the chemical manufacturer or importer can establish that the only hazard they pose to employees is the potential for flammability or combustibility (wood or wood products which have been treated with a hazardous chemical covered by this standard, and wood which may be subsequently sawed or cut, generating dust, are not exempted);

1910.1200(b)(6)(v)

Articles (as that term is defined in paragraph (c) of this section);

1910.1200(b)(6)(vi)

Food or alcoholic beverages which are sold, used, or prepared in a retail establishment (such as a grocery store, restaurant, or drinking place), and foods intended for personal consumption by employees while in the workplace;

..1910.1200(b)(6)(vii)

1910.1200(b)(6)(vii)

Any drug, as that term is defined in the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 301 et seq.), when it is in solid, final form for direct administration to the patient (e.g., tablets or pills); drugs which are packaged by the chemical manufacturer for sale to consumers in a retail establishment (e.g., over-the-counter drugs); and drugs intended for personal consumption by employees while in the workplace (e.g., first aid supplies);

1910.1200(b)(6)(viii)

Cosmetics which are packaged for sale to consumers in a retail establishment, and cosmetics intended for personal consumption by employees while in the workplace;

1910.1200(b)(6)(ix)

Any consumer product or hazardous substance, as those terms are defined in the Consumer Product Safety Act (15 U.S.C. 2051 et seq.) and Federal Hazardous Substances Act (15 U.S.C. 1261 et seq.) respectively, where the employer can show that it is used in the workplace for the purpose intended by the chemical manufacturer or importer of the product, and the use results in a duration and frequency of exposure which is not greater than the range of exposures that could reasonably be experienced by consumers when used for the purpose intended;

1910.1200(b)(6)(x)

Nuisance particulates where the chemical manufacturer or importer can establish that they do not pose any physical or health hazard

covered under this section;

1910.1200(b)(6)(xi)

Ionizing and nonionizing radiation; and,

1910.1200(b)(6)(xii)

Biological hazards.

1910.1200(c)

"Definitions."

"Article" means a manufactured item other than a fluid or particle: (i) which is formed to a specific shape or design during manufacture; (ii) which has end use function(s) dependent in whole or in part upon its shape or design during end use; and (iii) which under normal conditions of use does not release more than very small quantities, e.g., minute or trace amounts of a hazardous chemical (as determined under paragraph (d) of this section), and does not pose a physical hazard or health risk to employees.

"Assistant Secretary" means the Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor, or designee.

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

"Chemical manufacturer" means an employer with a workplace where chemical(s) are produced for use or distribution.

"Chemical name" means the scientific designation of a chemical in accordance with the nomenclature system developed by the International Union of Pure and Applied Chemistry (IUPAC) or the Chemical Abstracts Service (CAS) rules of nomenclature, or a name which will clearly identify the chemical for the purpose of conducting a hazard evaluation.

"Combustible liquid" means any liquid having a flashpoint at or above 100 deg. F (37.8 deg. C), but below 200 deg. F (93.3 deg. C), except any mixture having components with flashpoints of 200 deg. F (93.3 deg. C), or higher, the total volume of which make up 99 percent or more of the total volume of the mixture.

"Commercial account" means an arrangement whereby a retail distributor sells hazardous chemicals to an employer, generally in large quantities over time and/or at costs that are below the regular retail price.

"Common name" means any designation or identification such as code name, code number, trade name, brand name or generic name used to identify a chemical other than by its chemical name.

"Compressed gas" means:

(i) A gas or mixture of gases having, in a container, an absolute pressure exceeding 40 psi at 70 deg. F (21.1 deg. C); or

(ii) A gas or mixture of gases having, in a container, an absolute pressure exceeding 104 psi at 130 deg. F (54.4 deg. C) regardless of the pressure at 70 deg. F (21.1 deg. C); or

(iii) A liquid having a vapor pressure exceeding 40 psi at 100 deg. F (37.8 deg. C) as determined by ASTM D-323-72.

"Container" means any bag, barrel, bottle, box, can, cylinder, drum, reaction vessel, storage tank, or the like that contains a hazardous chemical. For purposes of this section, pipes or piping systems, and engines, fuel tanks, or other operating systems in a vehicle, are not considered to be containers.

"Designated representative" means any individual or organization to whom an employee gives written authorization to exercise such

employee's rights under this section. A recognized or certified collective bargaining agent shall be treated automatically as a designated representative without regard to written employee authorization.

"Director" means the Director, National Institute for Occupational Safety and Health, U.S. Department of Health and Human Services, or designee.

"Distributor" means a business, other than a chemical manufacturer or importer, which supplies hazardous chemicals to other distributors or to employers.

"Employee" means a worker who may be exposed to hazardous chemicals under normal operating conditions or in foreseeable emergencies. Workers such as office workers or bank tellers who encounter hazardous chemicals only in non-routine, isolated instances are not covered.

"Employer" means a person engaged in a business where chemicals are either used, distributed, or are produced for use or distribution, including a contractor or subcontractor.

"Explosive" means a chemical that causes a sudden, almost instantaneous release of pressure, gas, and heat when subjected to sudden shock, pressure, or high temperature.

"Exposure or exposed" means that an employee is subjected in the course of employment to a chemical that is a physical or health hazard, and includes potential (e.g. accidental or possible) exposure. "Subjected" in terms of health hazards includes any route of entry (e.g. inhalation, ingestion, skin contact or absorption.)

"Flammable" means a chemical that falls into one of the following categories:

(i) "Aerosol, flammable" means an aerosol that, when tested by the method described in 16 CFR 1500.45, yields a flame projection exceeding 18 inches at full valve opening, or a flashback (a flame extending back to the valve) at any degree of valve opening;

(ii) "Gas, flammable" means: (A) A gas that, at ambient temperature and pressure, forms a flammable mixture with air at a concentration of thirteen (13) percent by volume or less; or

(B) A gas that, at ambient temperature and pressure, forms a range of flammable mixtures with air wider than twelve (12) percent by volume, regardless of the lower limit;

(iii) "Liquid, flammable" means any liquid having a flashpoint below 100 deg. F (37.8 deg. C), except any mixture having components with flashpoints of 100 deg. F (37.8 deg. C) or higher, the total of which make up 99 percent or more of the total volume of the mixture.

(iv) "Solid, flammable" means a solid, other than a blasting agent or explosive as defined in 1910.109(a), that is liable to cause fire through friction, absorption of moisture, spontaneous chemical change, or retained heat from manufacturing or processing, or which can be ignited readily and when ignited burns so vigorously and persistently as to create a serious hazard. A chemical shall be considered to be a flammable solid if, when tested by the method described in 16 CFR 1500.44, it ignites and burns with a self-sustained flame at a rate greater than one-tenth of an inch per second along its major axis.

"Flashpoint" means the minimum temperature at which a liquid gives off a vapor in sufficient concentration to ignite when tested as follows:

(i) Tagliabue Closed Tester (See American National Standard Method of Test for Flash Point by Tag Closed Tester, Z11.24-1979 (ASTM D 56-79)) for liquids with a viscosity of less than 45 Saybolt Universal Seconds (SUS) at 100 deg. F (37.8 deg. C), that do not contain suspended solids and do not have a tendency to form a surface film under test; or

(ii) Pensky-Martens Closed Tester (see American National Standard Method of Test for Flash Point by Pensky-Martens Closed Tester, Z11.7-1979 (ASTM D 93-79)) for liquids with a viscosity equal to or greater than 45 SUS at 100 deg. F (37.8 deg. C), or that contain suspended solids, or that have a tendency to form a surface film under test; or

(iii) Setaflash Closed Tester (see American National Standard Method of Test for Flash Point by Setaflash Closed Tester (ASTM D 3278-78)).

Organic peroxides, which undergo autoaccelerating thermal decomposition, are excluded from any of the flashpoint determination methods specified above.

"Foreseeable emergency" means any potential occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment which could result in an uncontrolled release of a hazardous chemical into the workplace.

"Hazardous chemical" means any chemical which is a physical hazard or a health hazard.

"Hazard warning" means any words, pictures, symbols, or combination thereof appearing on a label or other appropriate form of warning which convey the specific physical and health hazard(s), including target organ effects, of the chemical(s) in the container(s). (See the definitions for "physical hazard" and "health hazard" to determine the hazards which must be covered.)

"Health hazard" means a chemical for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees. The term "health hazard" includes chemicals which are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic system, and agents which damage the lungs, skin, eyes, or mucous membranes. Appendix A provides further definitions and explanations of the scope of health hazards covered by this section, and Appendix B describes the criteria to be used to determine whether or not a chemical is to be considered hazardous for purposes of this standard.

"Identity" means any chemical or common name which is indicated on the material safety data sheet (MSDS) for the chemical. The identity used shall permit cross-references to be made among the required list of hazardous chemicals, the label and the MSDS.

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

"Importer" means the first business with employees within the Customs Territory of the United States which receives hazardous chemicals produced in other countries for the purpose of supplying them to distributors or employers within the United States.

"Label" means any written, printed, or graphic material displayed on or affixed to containers of hazardous chemicals.

"Material safety data sheet (MSDS)" means written or printed material concerning a hazardous chemical which is prepared in accordance with paragraph (g) of this section.

"Mixture" means any combination of two or more chemicals if the combination is not, in whole or in part, the result of a chemical reaction.

"Organic peroxide" means an organic compound that contains the bivalent -O-O-structure and which may be considered to be a structural derivative of hydrogen peroxide where one or both of the hydrogen atoms has been replaced by an organic radical.

"Oxidizer" means a chemical other than a blasting agent or explosive as defined in 1910.109(a), that initiates or promotes combustion in other materials, thereby causing fire either of itself or through the release of oxygen or other gases.

"Physical hazard" means a chemical for which there is scientifically valid evidence that it is a combustible liquid, a compressed gas, explosive, flammable, an organic peroxide, an oxidizer, pyrophoric, unstable (reactive) or water-reactive.

"Produce" means to manufacture, process, formulate, blend, extract, generate, emit, or repackage.

"Pyrophoric" means a chemical that will ignite spontaneously in air at a temperature of 130 deg. F (54.4 deg. C) or below.

"Responsible party" means someone who can provide additional information on the hazardous chemical and appropriate emergency

procedures, if necessary.

"Specific chemical identity" means the chemical name, Chemical Abstracts Service (CAS) Registry Number, or any other information that reveals the precise chemical designation of the substance.

"Trade secret" means any confidential formula, pattern, process, device, information or compilation of information that is used in an employer's business, and that gives the employer an opportunity to obtain an advantage over competitors who do not know or use it. Appendix D sets out the criteria to be used in evaluating trade secrets.

"Unstable (reactive)" means a chemical which in the pure state, or as produced or transported, will vigorously polymerize, decompose, condense, or will become self-reactive under conditions of shocks, pressure or temperature.

"Use" means to package, handle, react, emit, extract, generate as a byproduct, or transfer.

"Water-reactive" means a chemical that reacts with water to release a gas that is either flammable or presents a health hazard.

"Work area" means a room or defined space in a workplace where hazardous chemicals are produced or used, and where employees are present.

"Workplace" means an establishment, job site, or project, at one geographical location containing one or more work areas.

..1910.1200(d)

1910.1200(d)

"Hazard determination."

1910.1200(d)(1)

Chemical manufacturers and importers shall evaluate chemicals produced in their workplaces or imported by them to determine if they are hazardous. Employers are not required to evaluate chemicals unless they choose not to rely on the evaluation performed by the chemical manufacturer or importer for the chemical to satisfy this requirement.

1910.1200(d)(2)

Chemical manufacturers, importers or employers evaluating chemicals shall identify and consider the available scientific evidence concerning such hazards. For health hazards, evidence which is statistically significant and which is based on at least one positive study conducted in accordance with established scientific principles is considered to be sufficient to establish a hazardous effect if the results of the study meet the definitions of health hazards in this section. Appendix A shall be consulted for the scope of health hazards covered, and Appendix B shall be consulted for the criteria to be followed with respect to the completeness of the evaluation, and the data to be reported.

1910.1200(d)(3)

The chemical manufacturer, importer or employer evaluating chemicals shall treat the following sources as establishing that the chemicals listed in them are hazardous:

1910.1200(d)(3)(i)

29 CFR part 1910, subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA); or,

..1910.1200(d)(3)(ii)

1910.1200(d)(3)(ii)

"Threshold Limit Values for Chemical Substances and Physical Agents in the Work Environment," American Conference of Governmental Industrial Hygienists (ACGIH) (latest edition). The chemical manufacturer, importer, or employer is still responsible for evaluating the hazards associated with the chemicals in these source lists in accordance with the requirements of this standard.

1910.1200(d)(4)

Chemical manufacturers, importers and employers evaluating chemicals shall treat the following sources as establishing that a chemical is a carcinogen or potential carcinogen for hazard communication purposes:

1910.1200(d)(4)(i)

National Toxicology Program (NTP), "Annual Report on Carcinogens" (latest edition);

1910.1200(d)(4)(ii)

International Agency for Research on Cancer (IARC) "Monographs" (latest editions); or

1910.1200(d)(4)(iii)

29 CFR part 1910, subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration.

Note: The "Registry of Toxic Effects of Chemical Substances" published by the National Institute for Occupational Safety and Health indicates whether a chemical has been found by NTP or IARC to be a potential carcinogen.

1910.1200(d)(5)

The chemical manufacturer, importer or employer shall determine the hazards of mixtures of chemicals as follows:

1910.1200(d)(5)(i)

If a mixture has been tested as a whole to determine its hazards, the results of such testing shall be used to determine whether the mixture is hazardous;

..1910.1200(d)(5)(ii)

1910.1200(d)(5)(ii)

If a mixture has not been tested as a whole to determine whether the mixture is a health hazard, the mixture shall be assumed to present the same health hazards as do the components which comprise one percent (by weight or volume) or greater of the mixture, except that the mixture shall be assumed to present a carcinogenic hazard if it contains a component in concentrations of 0.1 percent or greater which is considered to be a carcinogen under paragraph (d)(4) of this section;

1910.1200(d)(5)(iii)

If a mixture has not been tested as a whole to determine whether the mixture is a physical hazard, the chemical manufacturer, importer, or employer may use whatever scientifically valid data is available to evaluate the physical hazard potential of the mixture; and,

1910.1200(d)(5)(iv)

If the chemical manufacturer, importer, or employer has evidence to indicate that a component present in the mixture in concentrations of less than one percent (or in the case of carcinogens, less than 0.1 percent) could be released in concentrations which

would exceed an established OSHA permissible exposure limit or ACGIH Threshold Limit Value, or could present a health risk to employees in those concentrations, the mixture shall be assumed to present the same hazard.

1910.1200(d)(6)

Chemical manufacturers, importers, or employers evaluating chemicals shall describe in writing the procedures they use to determine the hazards of the chemical they evaluate. The written procedures are to be made available, upon request, to employees, their designated representatives, the Assistant Secretary and the Director. The written description may be incorporated into the written hazard communication program required under paragraph (e) of this section.

..1910.1200(e)

1910.1200(e)

"Written hazard communication program."

1910.1200(e)(1)

Employers shall develop, implement, and maintain at each workplace, a written hazard communication program which at least describes how the criteria specified in paragraphs (f), (g), and (h) of this section for labels and other forms of warning, material safety data sheets, and employee information and training will be met, and which also includes the following:

1910.1200(e)(1)(i)

A list of the hazardous chemicals known to be present using an identity that is referenced on the appropriate material safety data sheet (the list may be compiled for the workplace as a whole or for individual work areas); and,

1910.1200(e)(1)(ii)

The methods the employer will use to inform employees of the hazards of non-routine tasks (for example, the cleaning of reactor vessels), and the hazards associated with chemicals contained in unlabeled pipes in their work areas.

1910.1200(e)(2)

"Multi-employer workplaces." Employers who produce, use, or store hazardous chemicals at a workplace in such a way that the employees of other employer(s) may be exposed (for example, employees of a construction contractor working on-site) shall additionally ensure that the hazard communication programs developed and implemented under this paragraph (e) include the following:

1910.1200(e)(2)(i)

The methods the employer will use to provide the other employer(s) on-site access to material safety data sheets for each hazardous chemical the other employer(s)' employees may be exposed to while working;

..1910.1200(e)(2)(ii)

1910.1200(e)(2)(ii)

The methods the employer will use to inform the other employer(s) of any precautionary measures that need to be taken to protect employees during the workplace's normal operating conditions and in foreseeable emergencies; and,

1910.1200(e)(2)(iii)

The methods the employer will use to inform the other employer(s) of the labeling system used in the workplace.

1910.1200(e)(3)

The employer may rely on an existing hazard communication program to comply with these requirements, provided that it meets the criteria established in this paragraph (e).

1910.1200(e)(4)

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

1910.1200(e)(5)

Where employees must travel between workplaces during a workshift, i.e., their work is carried out at more than one geographical location, the written hazard communication program may be kept at the primary workplace facility.

1910.1200(f)

"Labels and other forms of warning."

1910.1200(f)(1)

The chemical manufacturer, importer, or distributor shall ensure that each container of hazardous chemicals leaving the workplace is labeled, tagged or marked with the following information:

..1910.1200(f)(1)(i)

1910.1200(f)(1)(i)

Identity of the hazardous chemical(s);

1910.1200(f)(1)(ii)

Appropriate hazard warnings; and

1910.1200(f)(1)(iii)

Name and address of the chemical manufacturer, importer, or other responsible party.

1910.1200(f)(2)

1910.1200(f)(2)(i)

For solid metal (such as a steel beam or a metal casting), solid wood, or plastic items that are not exempted as articles due to their downstream use, or shipments of whole grain, the required label may be transmitted to the customer at the time of the initial shipment, and need not be included with subsequent shipments to the same employer unless the information on the label changes;

1910.1200(f)(2)(ii)

The label may be transmitted with the initial shipment itself, or with the material safety data sheet that is to be provided prior to or at the time of the first shipment; and,

1910.1200(f)(2)(iii)

This exception to requiring labels on every container of hazardous chemicals is only for the solid material itself, and does not apply to hazardous chemicals used in conjunction with, or known to be present with, the material and to which employees handling the items in transit may be exposed (for example, cutting fluids or pesticides in grains).

..1910.1200(f)(3)

1910.1200(f)(3)

Chemical manufacturers, importers, or distributors shall ensure that each container of hazardous chemicals leaving the workplace is labeled, tagged, or marked in accordance with this section in a manner which does not conflict with the requirements of the Hazardous Materials Transportation Act (49 U.S.C. 1801 et seq.) and regulations issued under that Act by the Department of Transportation.

1910.1200(f)(4)

If the hazardous chemical is regulated by OSHA in a substance-specific health standard, the chemical manufacturer, importer, distributor or employer shall ensure that the labels or other forms of warning used are in accordance with the requirements of that standard.

1910.1200(f)(5)

Except as provided in paragraphs (f)(6) and (f)(7) of this section, the employer shall ensure that each container of hazardous chemicals in the workplace is labeled, tagged or marked with the following information:

1910.1200(f)(5)(i)

Identity of the hazardous chemical(s) contained therein; and,

1910.1200(f)(5)(ii)

Appropriate hazard warnings, or alternatively, words, pictures, symbols, or combination thereof, which provide at least general information regarding the hazards of the chemicals, and which, in conjunction with the other information immediately available to employees under the hazard communication program, will provide employees with the specific information regarding the physical and health hazards of the hazardous chemical.

..1910.1200(f)(6)

1910.1200(f)(6)

The employer may use signs, placards, process sheets, batch tickets, operating procedures, or other such written materials in lieu of affixing labels to individual stationary process containers, as long as the alternative method identifies the containers to which it is applicable and conveys the information required by paragraph (f)(5) of this section to be on a label. The written materials shall be readily accessible to the employees in their work area throughout each work shift.

1910.1200(f)(7)

The employer is not required to label portable containers into which hazardous chemicals are transferred from labeled containers, and which are intended only for the immediate use of the employee who performs the transfer. For purposes of this section, drugs which are dispensed by a pharmacy to a health care provider for direct administration to a patient are exempted from labeling.

1910.1200(f)(8)

The employer shall not remove or deface existing labels on incoming containers of hazardous chemicals, unless the container is

immediately marked with the required information.

1910.1200(f)(9)

The employer shall ensure that labels or other forms of warning are legible, in English, and prominently displayed on the container, or readily available in the work area throughout each work shift. Employers having employees who speak other languages may add the information in their language to the material presented, as long as the information is presented in English as well.

1910.1200(f)(10)

The chemical manufacturer, importer, distributor or employer need not affix new labels to comply with this section if existing labels already convey the required information.

..1910.1200(f)(11)

1910.1200(f)(11)

Chemical manufacturers, importers, distributors, or employers who become newly aware of any significant information regarding the hazards of a chemical shall revise the labels for the chemical within three months of becoming aware of the new information. Labels on containers of hazardous chemicals shipped after that time shall contain the new information. If the chemical is not currently produced or imported, the chemical manufacturer, importers, distributor, or employer shall add the information to the label before the chemical is shipped or introduced into the workplace again.

1910.1200(g)

"Material safety data sheets."

1910.1200(g)(1)

Chemical manufacturers and importers shall obtain or develop a material safety data sheet for each hazardous chemical they produce or import. Employers shall have a material safety data sheet in the workplace for each hazardous chemical which they use.

1910.1200(g)(2)

Each material safety data sheet shall be in English (although the employer may maintain copies in other languages as well), and shall contain at least the following information:

1910.1200(g)(2)(i)

The identity used on the label, and, except as provided for in paragraph (i) of this section on trade secrets:

1910.1200(g)(2)(i)(A)

If the hazardous chemical is a single substance, its chemical and common name(s);

1910.1200(g)(2)(i)(B)

If the hazardous chemical is a mixture which has been tested as a whole to determine its hazards, the chemical and common name(s) of the ingredients which contribute to these known hazards, and the common name(s) of the mixture itself; or,

1910.1200(g)(2)(i)(C)

If the hazardous chemical is a mixture which has not been tested as a whole:

..1910.1200(g)(2)(i)(C)(1)

1910.1200(g)(2)(i)(C)(1)

The chemical and common name(s) of all ingredients which have been determined to be health hazards, and which comprise 1% or greater of the composition, except that chemicals identified as carcinogens under paragraph (d) of this section shall be listed if the concentrations are 0.1% or greater; and,

1910.1200(g)(2)(i)(C)(2)

The chemical and common name(s) of all ingredients which have been determined to be health hazards, and which comprise less than 1% (0.1% for carcinogens) of the mixture, if there is evidence that the ingredient(s) could be released from the mixture in concentrations which would exceed an established OSHA permissible exposure limit or ACGIH Threshold Limit Value, or could present a health risk to employees; and,

1910.1200(g)(2)(i)(C)(3)

The chemical and common name(s) of all ingredients which have been determined to present a physical hazard when present in the mixture;

1910.1200(g)(2)(ii)

Physical and chemical characteristics of the hazardous chemical (such as vapor pressure, flash point);

1910.1200(g)(2)(iii)

The physical hazards of the hazardous chemical, including the potential for fire, explosion, and reactivity;

1910.1200(g)(2)(iv)

The health hazards of the hazardous chemical, including signs and symptoms of exposure, and any medical conditions which are generally recognized as being aggravated by exposure to the chemical;

1910.1200(g)(2)(v)

The primary route(s) of entry;

..1910.1200(g)(2)(vi)

1910.1200(g)(2)(vi)

The OSHA permissible exposure limit, ACGIH Threshold Limit Value, and any other exposure limit used or recommended by the chemical manufacturer, importer, or employer preparing the material safety data sheet, where available;

1910.1200(g)(2)(vii)

Whether the hazardous chemical is listed in the National Toxicology Program (NTP) Annual Report on Carcinogens (latest edition) or has been found to be a potential carcinogen in the International Agency for Research on Cancer (IARC) Monographs (latest editions), or by OSHA;

1910.1200(g)(2)(viii)

Any generally applicable precautions for safe handling and use which are known to the chemical manufacturer, importer or employer preparing the material safety data sheet, including appropriate hygienic practices, protective measures during repair and maintenance of contaminated equipment, and procedures for clean-up of spills and leaks;

1910.1200(g)(2)(ix)

Any generally applicable control measures which are known to the chemical manufacturer, importer or employer preparing the material safety data sheet, such as appropriate engineering controls, work practices, or personal protective equipment;

1910.1200(g)(2)(x)

Emergency and first aid procedures;

1910.1200(g)(2)(xi)

The date of preparation of the material safety data sheet or the last change to it; and,

..1910.1200(g)(2)(xii)

1910.1200(g)(2)(xii)

The name, address and telephone number of the chemical manufacturer, importer, employer or other responsible party preparing or distributing the material safety data sheet, who can provide additional information on the hazardous chemical and appropriate emergency procedures, if necessary.

1910.1200(g)(3)

If no relevant information is found for any given category on the material safety data sheet, the chemical manufacturer, importer or employer preparing the material safety data sheet shall mark it to indicate that no applicable information was found.

1910.1200(g)(4)

Where complex mixtures have similar hazards and contents (i.e. the chemical ingredients are essentially the same, but the specific composition varies from mixture to mixture), the chemical manufacturer, importer or employer may prepare one material safety data sheet to apply to all of these similar mixtures.

1910.1200(g)(5)

The chemical manufacturer, importer or employer preparing the material safety data sheet shall ensure that the information recorded accurately reflects the scientific evidence used in making the hazard determination. If the chemical manufacturer, importer or employer preparing the material safety data sheet becomes newly aware of any significant information regarding the hazards of a chemical, or ways to protect against the hazards, this new information shall be added to the material safety data sheet within three months. If the chemical is not currently being produced or imported the chemical manufacturer or importer shall add the information to the material safety data sheet before the chemical is introduced into the workplace again.

..1910.1200(g)(6)

1910.1200(g)(6)

1910.1200(g)(6)(i)

Chemical manufacturers or importers shall ensure that distributors and employers are provided an appropriate material safety data

sheet with their initial shipment, and with the first shipment after a material safety data sheet is updated;

1910.1200(g)(6)(ii)

The chemical manufacturer or importer shall either provide material safety data sheets with the shipped containers or send them to the distributor or employer prior to or at the time of the shipment;

1910.1200(g)(6)(iii)

If the material safety data sheet is not provided with a shipment that has been labeled as a hazardous chemical, the distributor or employer shall obtain one from the chemical manufacturer or importer as soon as possible; and,

1910.1200(g)(6)(iv)

The chemical manufacturer or importer shall also provide distributors or employers with a material safety data sheet upon request.

1910.1200(g)(7)

1910.1200(g)(7)(i)

Distributors shall ensure that material safety data sheets, and updated information, are provided to other distributors and employers with their initial shipment and with the first shipment after a material safety data sheet is updated;

1910.1200(g)(7)(ii)

The distributor shall either provide material safety data sheets with the shipped containers, or send them to the other distributor or employer prior to or at the time of the shipment;

..1910.1200(g)(7)(iii)

1910.1200(g)(7)(iii)

Retail distributors selling hazardous chemicals to employers having a commercial account shall provide a material safety data sheet to such employers upon request, and shall post a sign or otherwise inform them that a material safety data sheet is available;

1910.1200(g)(7)(iv)

Wholesale distributors selling hazardous chemicals to employers over-the-counter may also provide material safety data sheets upon the request of the employer at the time of the over-the-counter purchase, and shall post a sign or otherwise inform such employers that a material safety data sheet is available;

1910.1200(g)(7)(v)

If an employer without a commercial account purchases a hazardous chemical from a retail distributor not required to have material safety data sheets on file (i.e., the retail distributor does not have commercial accounts and does not use the materials), the retail distributor shall provide the employer, upon request, with the name, address, and telephone number of the chemical manufacturer, importer, or distributor from which a material safety data sheet can be obtained;

1910.1200(g)(7)(vi)

Wholesale distributors shall also provide material safety data sheets to employers or other distributors upon request; and,

1910.1200(g)(7)(vii)

Chemical manufacturers, importers, and distributors need not provide material safety data sheets to retail distributors that have informed them that the retail distributor does not sell the product to commercial accounts or open the sealed container to use it in their own workplaces.

..1910.1200(g)(8)

1910.1200(g)(8)

The employer shall maintain in the workplace copies of the required material safety data sheets for each hazardous chemical, and shall ensure that they are readily accessible during each work shift to employees when they are in their work area(s). (Electronic access, microfiche, and other alternatives to maintaining paper copies of the material safety data sheets are permitted as long as no barriers to immediate employee access in each workplace are created by such options.)

1910.1200(g)(9)

Where employees must travel between workplaces during a workshift, i.e., their work is carried out at more than one geographical location, the material safety data sheets may be kept at the primary workplace facility. In this situation, the employer shall ensure that employees can immediately obtain the required information in an emergency.

1910.1200(g)(10)

Material safety data sheets may be kept in any form, including operating procedures, and may be designed to cover groups of hazardous chemicals in a work area where it may be more appropriate to address the hazards of a process rather than individual hazardous chemicals. However, the employer shall ensure that in all cases the required information is provided for each hazardous chemical, and is readily accessible during each work shift to employees when they are in in their work area(s).

1910.1200(g)(11)

Material safety data sheets shall also be made readily available, upon request, to designated representatives and to the Assistant Secretary, in accordance with the requirements of 29 CFR 1910.1020(e). The Director shall also be given access to material safety data sheets in the same manner.

..1910.1200(h)

1910.1200(h)

"Employee information and training."

1910.1200(h)(1)

Employers shall provide employees with effective information and training on hazardous chemicals in their work area at the time of their initial assignment, and whenever a new physical or health hazard the employees have not previously been trained about is introduced into their work area. Information and training may be designed to cover categories of hazards (e.g., flammability, carcinogenicity) or specific chemicals. Chemical-specific information must always be available through labels and material safety data sheets.

1910.1200(h)(2)

"Information." Employees shall be informed of:

1910.1200(h)(2)(i)

The requirements of this section;

1910.1200(h)(2)(ii)

Any operations in their work area where hazardous chemicals are present; and,

1910.1200(h)(2)(iii)

The location and availability of the written hazard communication program, including the required list(s) of hazardous chemicals, and material safety data sheets required by this section.

1910.1200(h)(3)

"Training." Employee training shall include at least:

1910.1200(h)(3)(i)

Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area (such as monitoring conducted by the employer, continuous monitoring devices, visual appearance or odor of hazardous chemicals when being released, etc.);

1910.1200(h)(3)(ii)

The physical and health hazards of the chemicals in the work area;

..1910.1200(h)(3)(iii)

1910.1200(h)(3)(iii)

The measures employees can take to protect themselves from these hazards, including specific procedures the employer has implemented to protect employees from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment to be used; and,

1910.1200(h)(3)(iv)

The details of the hazard communication program developed by the employer, including an explanation of the labeling system and the material safety data sheet, and how employees can obtain and use the appropriate hazard information.

1910.1200(i)

"Trade secrets."

1910.1200(i)(1)

The chemical manufacturer, importer, or employer may withhold the specific chemical identity, including the chemical name and other specific identification of a hazardous chemical, from the material safety data sheet, provided that:

1910.1200(i)(1)(i)

The claim that the information withheld is a trade secret can be supported;

1910.1200(i)(1)(ii)

Information contained in the material safety data sheet concerning the properties and effects of the hazardous chemical is disclosed;

1910.1200(i)(1)(iii)

The material safety data sheet indicates that the specific chemical identity is being withheld as a trade secret; and,

1910.1200(i)(1)(iv)

The specific chemical identity is made available to health professionals, employees, and designated representatives in accordance with the applicable provisions of this paragraph.

..1910.1200(i)(2)

1910.1200(i)(2)

Where a treating physician or nurse determines that a medical emergency exists and the specific chemical identity of a hazardous chemical is necessary for emergency or first-aid treatment, the chemical manufacturer, importer, or employer shall immediately disclose the specific chemical identity of a trade secret chemical to that treating physician or nurse, regardless of the existence of a written statement of need or a confidentiality agreement. The chemical manufacturer, importer, or employer may require a written statement of need and confidentiality agreement, in accordance with the provisions of paragraphs (i)(3) and (4) of this section, as soon as circumstances permit.

1910.1200(i)(3)

In non-emergency situations, a chemical manufacturer, importer, or employer shall, upon request, disclose a specific chemical identity, otherwise permitted to be withheld under paragraph (i)(1) of this section, to a health professional (i.e. physician, industrial hygienist, toxicologist, epidemiologist, or occupational health nurse) providing medical or other occupational health services to exposed employee(s), and to employees or designated representatives, if:

1910.1200(i)(3)(i)

The request is in writing;

1910.1200(i)(3)(ii)

The request describes with reasonable detail one or more of the following occupational health needs for the information:

1910.1200(i)(3)(ii)(A)

To assess the hazards of the chemicals to which employees will be exposed;

1910.1200(i)(3)(ii)(B)

To conduct or assess sampling of the workplace atmosphere to determine employee exposure levels;

1910.1200(i)(3)(ii)(C)

To conduct pre-assignment or periodic medical surveillance of exposed employees;

1910.1200(i)(3)(ii)(D)

To provide medical treatment to exposed employees;

..1910.1200(i)(3)(ii)(E)

1910.1200(i)(3)(ii)(E)

To select or assess appropriate personal protective equipment for exposed employees;

1910.1200(i)(3)(ii)(F)

To design or assess engineering controls or other protective measures for exposed employees; and,

1910.1200(i)(3)(ii)(G)

To conduct studies to determine the health effects of exposure.

1910.1200(i)(3)(iii)

The request explains in detail why the disclosure of the specific chemical identity is essential and that, in lieu thereof, the disclosure of the following information to the health professional, employee, or designated representative, would not satisfy the purposes described in paragraph (i)(3)(ii) of this section:

1910.1200(i)(3)(iii)(A)

The properties and effects of the chemical;

1910.1200(i)(3)(iii)(B)

Measures for controlling workers' exposure to the chemical;

1910.1200(i)(3)(iii)(C)

Methods of monitoring and analyzing worker exposure to the chemical; and,

1910.1200(i)(3)(iii)(D)

Methods of diagnosing and treating harmful exposures to the chemical;

1910.1200(i)(3)(iv)

The request includes a description of the procedures to be used to maintain the confidentiality of the disclosed information; and,

..1910.1200(i)(3)(v)

1910.1200(i)(3)(v)

The health professional, and the employer or contractor of the services of the health professional (i.e. downstream employer, labor organization, or individual employee), employee, or designated representative, agree in a written confidentiality agreement that the health professional, employee, or designated representative, will not use the trade secret information for any purpose other than the health need(s) asserted and agree not to release the information under any circumstances other than to OSHA, as provided in paragraph (i)(6) of this section, except as authorized by the terms of the agreement or by the chemical manufacturer, importer, or employer.

1910.1200(i)(4)

The confidentiality agreement authorized by paragraph (i)(3)(iv) of this section:

1910.1200(i)(4)(i)

May restrict the use of the information to the health purposes indicated in the written statement of need;

1910.1200(i)(4)(ii)

May provide for appropriate legal remedies in the event of a breach of the agreement, including stipulation of a reasonable pre-estimate of likely damages; and,

1910.1200(i)(4)(iii)

May not include requirements for the posting of a penalty bond.

1910.1200(i)(5)

Nothing in this standard is meant to preclude the parties from pursuing non-contractual remedies to the extent permitted by law.

1910.1200(i)(6)

If the health professional, employee, or designated representative receiving the trade secret information decides that there is a need to disclose it to OSHA, the chemical manufacturer, importer, or employer who provided the information shall be informed by the health professional, employee, or designated representative prior to, or at the same time as, such disclosure.

..1910.1200(i)(7)

1910.1200(i)(7)

If the chemical manufacturer, importer, or employer denies a written request for disclosure of a specific chemical identity, the denial must:

1910.1200(i)(7)(i)

Be provided to the health professional, employee, or designated representative, within thirty days of the request;

1910.1200(i)(7)(ii)

Be in writing;

1910.1200(i)(7)(iii)

Include evidence to support the claim that the specific chemical identity is a trade secret;

1910.1200(i)(7)(iv)

State the specific reasons why the request is being denied; and,

1910.1200(i)(7)(v)

Explain in detail how alternative information may satisfy the specific medical or occupational health need without revealing the specific

chemical identity.

1910.1200(i)(8)

The health professional, employee, or designated representative whose request for information is denied under paragraph (i)(3) of this section may refer the request and the written denial of the request to OSHA for consideration.

1910.1200(i)(9)

When a health professional, employee, or designated representative refers the denial to OSHA under paragraph (i)(8) of this section, OSHA shall consider the evidence to determine if:

..1910.1200(i)(9)(i)

1910.1200(i)(9)(i)

The chemical manufacturer, importer, or employer has supported the claim that the specific chemical identity is a trade secret;

1910.1200(i)(9)(ii)

The health professional, employee, or designated representative has supported the claim that there is a medical or occupational health need for the information; and,

1910.1200(i)(9)(iii)

The health professional, employee or designated representative has demonstrated adequate means to protect the confidentiality.

1910.1200(i)(10)

1910.1200(i)(10)(i)

If OSHA determines that the specific chemical identity requested under paragraph (i)(3) of this section is not a "bona fide" trade secret, or that it is a trade secret, but the requesting health professional, employee, or designated representative has a legitimate medical or occupational health need for the information, has executed a written confidentiality agreement, and has shown adequate means to protect the confidentiality of the information, the chemical manufacturer, importer, or employer will be subject to citation by OSHA.

..1910.1200(i)(10)(ii)

1910.1200(i)(10)(ii)

If a chemical manufacturer, importer, or employer demonstrates to OSHA that the execution of a confidentiality agreement would not provide sufficient protection against the potential harm from the unauthorized disclosure of a trade secret specific chemical identity, the Assistant Secretary may issue such orders or impose such additional limitations or conditions upon the disclosure of the requested chemical information as may be appropriate to assure that the occupational health services are provided without an undue risk of harm to the chemical manufacturer, importer, or employer.

1910.1200(i)(11)

If a citation for a failure to release specific chemical identity information is contested by the chemical manufacturer, importer, or employer, the matter will be adjudicated before the Occupational Safety and Health Review Commission in accordance with the Act's enforcement scheme and the applicable Commission rules of procedure. In accordance with the Commission rules, when a chemical manufacturer, importer, or employer continues to withhold the information during the contest, the Administrative Law Judge may review the citation and supporting documentation "in camera" or issue appropriate orders to protect the confidentiality of such matters.

1910.1200(i)(12)

Notwithstanding the existence of a trade secret claim, a chemical manufacturer, importer, or employer shall, upon request, disclose to the Assistant Secretary any information which this section requires the chemical manufacturer, importer, or employer to make available. Where there is a trade secret claim, such claim shall be made no later than at the time the information is provided to the Assistant Secretary so that suitable determinations of trade secret status can be made and the necessary protections can be implemented.

1910.1200(i)(13)

Nothing in this paragraph shall be construed as requiring the disclosure under any circumstances of process or percentage of mixture information which is a trade secret.

..1910.1200(j)

1910.1200(j)

"Effective dates." Chemical manufacturers, importers, distributors, and employers shall be in compliance with all provisions of this section by March 11, 1994.

Note: The effective date of the clarification that the exemption of wood and wood products from the Hazard Communication standard in paragraph (b)(6)(iv) only applies to wood and wood products including lumber which will not be processed, where the manufacturer or importer can establish that the only hazard they pose to employees is the potential for flammability or combustibility, and that the exemption does not apply to wood or wood products which have been treated with a hazardous chemical covered by this standard, and wood which may be subsequently sawed or cut generating dust has been stayed from March 11, 1994 to August 11, 1994.

[59 FR 17479, April 13, 1994; 59 FR 65947, Dec. 22, 1994; 61 FR 5507, Feb. 13, 1996]

SECTION J

CONFINED SPACE POLICY

P.O. Box 20825 Phoenix, Arizona 85036 Phone (602) 716-5552 Fax: (602) 716-9894
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Morenci Safe Production Standard	Standard # 2.6	
	OHSAS 18001:2007	MP 4.4.6
Confined Space Policy	Revision #	00
	Revision Date	N/A
	Effective Date	5/2011
	Document Owner	Health and Safety
Approvals:		
Senior VP Morenci Operations: 5/2011	Safety Steering Committee: n/a	

1.0 PURPOSE:

To objective of this document is to provide health & safety guidance in accordance with 29-CFR-1910.146 for FMMO and contract personnel entering and/or working in confined spaces on company property in accordance with 29 – CFR – 1910.146.

2.0 SCOPE:

This procedure applies to all persons entering and/or performing work in confined spaces on the FMMO property.

3.0 TERMS, DEFINITIONS AND ABBREVIATIONS

3.1 Acceptable Entry Conditions:
Conditions that must exist in a confined space to allow entry and to ensure that employees involved with a confined space entry can safely enter into and work within the space.

3.2 Attendant:
An individual stationed outside permit required confined spaces who monitors the authorized entrants and who performs all the attendant duties assigned in the confined space program (watch only one space at a time). This responsibility can be rotated. The attendant shall never break the plane of the entrance into the confined space.

3.3 Authorized Entrant:
Any employee or contractor who will be entering the confined space and is aware of the hazards, PPE, and communication procedures prior to entry.

3.4 Confined Space (has all of the following characteristics)

1. Large enough and so configured that an employee can bodily enter and perform assigned work.

2. Limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, and vaults are spaces that may have limited means of entry).

3. Not designed for continuous employee occupancy.

3.5 Emergency:
Any occurrence (including any failure of hazard control or monitoring equipment) or event internal or external to the permit space that could endanger entrants.

3.6 Engulfment:
The surrounding and effective capture of a person by a liquid or flow able solid.

3.7 Entry:
The action by which a person passes through an opening into a permit-required confined space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as ***any part of the entrant's body breaks the plane of an opening into the space.***

3.8 Entry Permit:
The written document provided by the entry supervisor to allow and control entry into a permit required space. One copy remains in the department for one year.

3.9 Entry Supervisor:
The person responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry, overseeing entry operations, and for terminating entry. The entry supervisor may or may not have the formal title of supervisor.

> *Note: An entry supervisor may also serve as an attendant or as an authorized entrant as long as that person is trained and equipped as an authorized entrant. Also the duties of the entry supervisor may pass from one individual to another during the course of the entry operation.*

3.10 Hazardous Atmosphere:
An atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue, injury or acute illness from one or more of the following:

1. Flammable gas, vapor, or mist greater than 10% of the lower flammable (explosive) limit (LFL or LEL);

2. Airborne combustible dust at a concentration that meets or exceeds its LFL; Note: This concentration may be approximated as a condition in which the dust obscures vision at a distance of 5 feet or less;

3. Atmospheric oxygen concentration below 19.5% or above 23.5%;

4 Atmospheric concentration of any substance that is immediately hazardous to life or health (for example: heat)

5. Any other atmospheric condition that is immediately hazardous to life or health (for example: heat).

3.11 Hot Work Permit:
A written authorization to perform operations (for example, riveting, welding, cutting, burning, and heating) capable of providing a source of ignition.

3.12 Immediately Hazardous to Life or Health (IDLH) :
A condition that is likely to cause death or immediate or delayed permanent health effects or prevent escape from the confined space.

3.13 Isolation:
The control of all energy sources such that the potential for exposure does not exist. Examples of isolation may include: blanking of supply lines, a double block and bleed system, lockout/tagout/tryout of all sources of energy, and blocking or disconnecting all mechanical linkages.

3.14 Lower Flammable Limit / Lower Explosive Limit (LFL/LEL):
The minimum concentration of a combustible gas, vapor or dust in air (expressed in percent volume), which will ignite if an ignition source is present.

3.15 Non-Permit Confined Space:
A confined space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm. Non-permit required confined space shall have atmospheric levels the same as normal air. All other hazards have been eliminated through isolation.

3.16 Permit Required Confined Space:
A confined space that has one or more of the following:

1. Contains or has the potential to contain a hazardous atmosphere.

2. Contains a material that has the potential for engulfing an entrant.

3. Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls, or by a floor which slopes downward and tapers to a smaller cross-section.

4. Contains any other recognized serious safety or health hazard. Example: temperature extremes, energy sources, fall potentials

3.17 Retrieval System:
Equipment (including a retrieval line, full-body harness, wristlets if appropriate, and a lifting device or anchor) used for non-entry rescue of persons from permit spaces.

3.18 Serious Health or Safety Hazard:
Any condition that poses an immediate or delayed threat to life, or that would cause irreversible health effects or that would interfere with an individual's ability to escape unaided from a permit space. Other examples of hazards include: heat, electricity, falls.

4.0 RESPONSIBILITIES:

4.1 H&S Manger will:

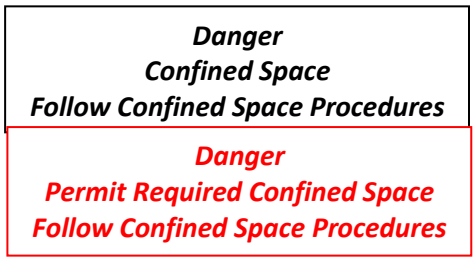
Implement the Confined Space Management Program.

4.2 Division Management who control confined spaces or entries will:

1. Ensure compliance with this policy and procedure.

2. Ensure that all confined spaces within their division or areas (under their control) are identified (reviewed annually) and properly labeled.

- *Examples:*



3. Once the permit required spaces have been identified, management will include this inventory in **Appendix 3** of this policy.

4. Conduct a hazard evaluation and risk analysis on these spaces ***(Appendix 2).***

5. Ensure that all persons involved with the confined space entry program are properly trained. This will include awareness training, task training for authorized entrants, attendants, and entry supervisors, as per training outlined in section 5.3.

6. Provide necessary resources and equipment to implement and maintain the confined space entry program.

7. Ensure that Safe Operating Procedures and/or Job Safety Analysis have been written for each non-permit confined space that is entered by area employees.

8. Ensure that contractors working within confined spaces meet or exceed the requirements of this policy and procedure.

4.3 Entry Supervisors will:

1. Conduct the pre-entry meeting to ensure complete communication with all involved or impacted ***(Appendix 1).***

   Ensure monitoring instruments are calibrated according to the manufacturer recommendations. (Each area should designate a responsible person to coordinate calibration efforts with the Industrial Hygiene Department)

2. Ensure that the required atmospheric tests are performed in the confined space and results recorded on the permit prior to entry authorization ***(Appendix 2).***

3. Verify that all procedures and equipment listed on the permit are in place.

4. Verify that rescue services have been notified and are available and the means for summoning them are operable.

5. Identify hazards within a confined space and hazards which may result from work activities within the space, and ensure acceptable entry conditions exist initially and conditions remain acceptable throughout the duration of the entry.

6. Verify all training requirements for a specific confined space entry have been met.

7. Authorize entry by signing the Confined Space Entry Permit after all conditions for safe entry have been met ***(Appendix 3).***

8. Post the completed, signed permit at the entrance to the space.

9. Terminate the entry and cancel the permit when entry operations covered by the entry permit have been completed or when uncontrolled hazards arise in or near the permit space.

10. In the event an IDLH condition is encountered refer to Appendix 5.

11. Maintain each original canceled permit for one year. Send a copy to the Health and Safety Department.

4.4 Attendants will:

1. Be familiar with the hazards of the confined space during the entry, including route of exposure (e.g., inhalation, absorption, etc.) signs, or symptoms, and consequences of over exposure.

2. Look for any behavioral changes as a result of the effects of exposure in authorized entrants.

3. Continuously maintain an accurate count of authorized entrants (by name) in the permit space.

4. Remain outside the permit space until relieved by another attendant, and/or job activities are completed.

5. Communicate with the authorized entrants as necessary to monitor entrant status and to alert the entrants of the need to evacuate the space.

6. Monitor activities inside and outside the space. Evacuate the space immediately when any one of the following takes place:

    a. The attendant detects a non-acceptable entry condition (reference definitions).
    b. The attendant detects behavior changes.
    c. The attendant detects a situation outside the confined space that may endanger the authorized entrants.
    d. The attendant cannot effectively perform all the duties.
    e. Atmospheric monitor detects a hazardous atmosphere (reference definitions) or sounds an alarm of any type.

7. Summon rescue and other emergency services as soon as the attendant determines that authorized entrants may need assistance to escape from a permit space hazard.

8. Keep unauthorized personnel from entering or approaching the permit space.

9. Perform no duties that might interfere with the attendant's primary duty to monitor and protect authorized entrants.

4.5 Entrants will:

1. Be familiar with the hazards of the confined space during the entry, including route of exposure (e.g., inhalation, absorption, etc.) signs, or symptoms, and consequences of over exposure.

2. Communicate with the attendant.

3. Alert the attendant whenever the entrant recognizes any warning sign or symptom of exposure to a hazardous situation, or the entrant detects a prohibited condition.

4. Exit from the permit space whenever;

    a. The entrant recognizes any warning sign or symptom of exposure to a hazardous situation.
    b. The entrant detects a prohibited condition.
    c. The attendant orders to evacuate.
    d. A warning signal is given that means to evacuate.

5. Each authorized entrant into a permit required confined space shall use a full body harness at all times. A retrieval line should be attached to the safety harness when its use could assist with a possible rescue and it doesn't create an additional hazard during the entry. Wristlets may be used in lieu of full body harness if the entry supervisor determines the use of the full body harness is infeasible or creates a greater hazard and the use of wristlets is the safer alternative.

4.6 Health and Safety Department will:

1. Audit the confined space entry program compliance.

2. Administer and maintain the Confined Space Entry Program including a comprehensive list of confined spaces.

3. Participate in review of program and cancelled permits.

4.7 Contract Personnel will:

1. Contractors working within confined spaces must meet or exceed the requirements of this policy and procedure.

2. Provide an attendant.

3. Conduct atmospheric monitoring using their own equipment. Where the contractor has the capability to conduct monitoring using their own equipment, they must provide proof of calibration of monitoring equipment before use.

5.0 STANDARDS OF PERFORMANCE

When entrance into a confined space is required, one of the two procedures listed below must be followed (when in doubt, use the permit-required procedure).

5.1. Entry Procedure for NON-PERMIT REQUIRED CONFINED SPACE

1. Entrants must evaluate the space using the Confined Space Survey Form, Confined space Hazard Identification and Confined Space Entry Permit to ensure that there are no potential or actual hazards in the space.

2. If potential or actual hazards exist, follow the permit-required confined space entry procedures. For example: if welding, torch cutting, burning, painting, applying solvents, or chemical cleaning will take place in the space.

3. Isolate or eliminate all energy sources that could enter the space according to the LOTOTO policy.

4. Prevent unauthorized or accidental entry into the space by placing temporary railing, cones or other devices around the space opening in accordance with the Barricading and Flagging Policy.

5. Follow the written Safe Operating Procedure for the space being entered.

5.2. Entry Procedure for PERMIT-REQUIRED CONFINED SPACE

1. Designate authorized entrants, attendants, and an entry supervisor. These employees must be trained in confined space entry. At least two persons shall be assigned to confined space work with one person acting as the attendant outside the confined space. The attendant and entrants must remain in continuous communication with each other at all times.

2. Prevent unauthorized or accidental entry into the confined space by placing temporary railing, cones or other devices around the confined space opening. Follow the Barricading and Flagging Policy.

3. Identify, evaluate, and control the energy sources of the permit space before employees enter.

4. The Entry Supervisor will perform a pre-task meeting for all Entrants, Attendants, and any other employees who may affect conditions of the confined space to explain the hazards, PPE required, testing and communication procedures.

5. Notify rescue services of planned entry.

6. Eliminate or control physical and chemical hazards by locking out, tagging, and testing all energy sources such as electricity, fluids, and mechanical energy. All pipes entering the space must be broken or double blocked and bled. Follow the LOTOTO policy.

7. Purge, inert, flush or ventilate the permit space as necessary to eliminate or control atmospheric hazards. These activities must be performed from outside the confined space. Ventilate continuously whenever the work inside the space will put contaminants into the air, example, sandblasting, painting, solvent cleaning, welding.

8. If a hazardous atmosphere is known to exist, has the potential to exist, cannot be validated as safe for entry or may develop during the entry, use of an approved and calibrated atmospheric monitor is required. When required the atmosphere shall be tested immediately prior to entry. When testing for atmospheric conditions, test first for oxygen then for combustible gases and vapors, and then for toxic gases and vapors. Test at the upper, middle, and lower portions of the space. See Appendixes 4 - 5 for a detailed discussion NOTE: Continuous monitoring is necessary if:
    - The atmosphere hazards have not been completely eliminated.
    - New or additional atmospheric hazards result from the tasks being performed in the space.
    - Unacceptable atmospheric conditions can re-occur within the space due, for example, to the near-by processes or activities.

    To discontinue monitoring, none of the three atmospheric conditions (oxygen rich/deficient; toxic; >10% of LEL/LFL) can exist or have a potential to exist.

    For larger or more complex situations, an alternative is to utilize individual monitors the entrant wears into the space.

    Air sampling must be taken within the breathing zone of the entrant. The zone is defined as being within an 18” sphere surrounding the head of the entrant.

    For work with flammables or combustibles gases, vapors, mists, etc. sampling of the atmosphere must also be done in the zones around the entrant (i.e. top, middle, bottom) to ensure there is no build up which approaches the lower explosive limit values.

9. Provide the following equipment as necessary for safe work:

    a. Personal Protective Equipment, (skin, hearing, respiratory, eye protection),
    b. A full body harness at all times. A retrieval line should be attached to the safety harness when its use could assist with a possible rescue and it doesn’t create an additional hazard during the entry. Wristlets may be used in lieu of full body harness if the entry supervisor determines the use of the full body harness is infeasible or creates a greater hazard and the use of wristlets is the safer alternative.
    c. Lighting equipment rated for explosive atmospheres if the potential for explosive atmospheres exist.
    d. Ladders, ramps or other effective means for proper egress, and
    e. Any other equipment necessary for safe entry into permit spaces.
    f. Testing and monitoring equipment (rated for explosive atmospheres, as applicable),
    g. Ventilation equipment, (rated for explosive atmospheres, as applicable),
    h. Communication equipment, (rated for explosive atmospheres, as applicable),
    i. Barriers and shelves, and
    j. Rescue and emergency equipment (rated for explosive atmospheres, as applicable)

10. Ensure the communication system and rescue equipment is fully functional prior to entry.

11. Complete the Confined Space Entry Permit and keep a copy posted at the space. A new permit must be completed at the start of each shift, when the entry crew changes. The permit will be updated when the safety or health conditions inside the space change during entry.

12. Provide at least one attendant outside the permit space for the duration of entry operations. The attendant must never leave the space while an entrant is in the confined space and must maintain continuous contact with the entrant. The attendant must not perform other work while acting as the attendant. If there are multiple confined spaces, an attendant must be stationed outside each permitted space.

13. All entrants must immediately leave the space under the following conditions:

    a. Atmospheric monitor detects a hazardous atmosphere or fails. (Reference definitions)
    b. An uncontrolled hazard is suspected or observed.
    c. An entrant experiences signs or symptoms of exposure to hazards.
    d. The communication link between the entrant and attendant is broken.
    e. When conditions outside the space threaten the entrants or attendant.
    f. The attendant calls for an evacuation.

14 If a rescue becomes necessary, activate the emergency response process. Remain outside the space; attempt remote retrieval if possible. If entry is necessary, prevent unauthorized personnel from attempting a rescue. Do not enter the space unless you are a trained rescuer with an attendant and you have the proper personal protective equipment.

15 Notify the appropriate departments after entry operations are complete.

16 Review the entry operations to determine if measures taken were adequate to protect employees. Maintain the original permit in the department.

5.3. Training

1. Confined Space Entry Training shall be provided to all employees entering confined spaces. The training shall consist of:

   a) This policy and procedure
   b) Relevant regulations and standards
   c) The use of all equipment for safe entry
   d) Air monitoring equipment use and procedures
   e) Emergency procedures
   f) Hazards of confined spaces
   g) Review of energy control procedures
   h) Roles and responsibilities of parties involved
   i) IDLH conditions – what might create an IDLH condition, and the requirements to work under IDLH conditions
   j) Locations of confined spaces in the employees' work area

2. Refresher training shall be provided to entrants, entry supervisors, and attendants annually and shall cover the topics above in a format that ensures that appropriate levels of knowledge continue.

3. Awareness training shall be provided to all employees and shall consist of: informing employees that a policy and procedure exists and must be followed, recognition of confined spaces and confined space danger signs, and resources for further information.

4. The site rescue team shall be fully trained in procedures associated with confined space rescue.

5. Training shall be documented using an approved MSHA form.

6.0 REFERENCE DOCUMENTS

6.1 29 – CFR – 1910.146.
6.2. Standard # 2.3 General Energy Control Policy
6.3. Standard # 2.5 Barricading and Flagging Policy

7.0 RECORDS

Name of the Document	Responsible for Control	Records Retention
Original Cancelled Confined Space Entry Permit	Supervisor of area	1 Year
Monitoring Equipment Calibration Records	Responsible area	1 Year

8.0 APPENDICES

8.1 Appendix No. 1: Air Monitoring Procedure
8.2 Appendix No. 2: Equipment Use
8.3 Appendix No. 3: IDLH Procedures
8.4 Appendix No. 4: Confined Space Survey Form
8.5 Appendix No. 5: Confined Space Hazard Identification
8.6 Appendix No. 6: Confined Space Entry Permit

9.0 REVIEW AND CHANGE

All changes, modifications and/or revisions must be documented on the table below:

Description of Changes to this Document
09/01/2011 – Changed Confined Space Entry Permit to clarify that the Entry Supervisor is the one to sign. This change does not require re-approval as it is for clarification purposes and is in alignment with the policy. S. Apodaca
10/05/2011 – Changed Confined Space Entry Permit and Section 8 of the policy to stipulate when atmospheric monitoring is required. Also made available the permit (by itself) on the intranet under the same folder for ease of printing by employees.
01/16/2011 – Format change – S. Apodaca

APPENDIX No. 1-

AIR MONITORING PROCEDURE

A. Prior to any person entering a permit required confined space in which a hazardous atmosphere is known, suspected or cannot be validated as safe, pre-testing of the atmosphere inside the confined space must take place. All confined space atmospheres must be pre-tested, in the following order:

1. Oxygen Deficiency: Confined spaces containing less than 19.5% oxygen shall be considered as oxygen deficient and hazardous. Entry shall not be made without self-contained breathing apparatus. Oxygen content over 23.5% shall be considered oxygen enriched and hazardous. Entry shall not be made.

2. Flammable gases: Flammable gases may be present in a confined space that contains acceptable levels of oxygen, and toxic levels below exposure limits. Flammable gases such as acetylene, butane, propane, hydrogen, hydrogen sulfide, methane, natural or manufactured gases or vapors from liquid hydrocarbons can be trapped in confined spaces, resulting in a flammable or explosive atmosphere. An atmosphere shall be considered as flammable or potentially flammable or explosive if pre-entry tests show a concentration greater than ten percent (10%) of the lower explosive limit (LEL) of the flammable gas.
   Note: When oxygen concentrations are less than 10% the readings obtained for the LEL will be inaccurate. Refer to the manufacturers recommendations for the appropriate actions in such instances.

3. Toxicity: If a toxic substance is determined to be in the confined space a Material Safety Data Sheet (MSDS) or other chemical information shall be used to determine what type of personal protective equipment required, the potential health effects, the Permissible Exposure Limits, and any other information needed to safely conduct the work.

B. Monitoring equipment shall be examined prior to use by performing a “bump test”, checking batteries, alarm settings, and calibration dates, etc. Air monitoring equipment will be calibrated per the manufacturer’s recommendations. A record will be kept by the individual making the calibration.

C. All permit required confined space atmospheres must be pre-tested at a minimum of three levels (top, middle, bottom) prior to any entry. This is necessary for the potential for layering of heavy and light gases and vapors.

D. If a potentially hazardous atmosphere exists in a space, prior to opening the cover, pre-testing of the atmosphere should be through small cover openings or by cracking open the cover and utilizing a probe suction line attachment with the monitoring instrument. Note: consult manufacturer's guidelines for delayed monitor response time when using probe suction lines
E. Whenever hazardous atmospheres are identified or experienced, such information must be recorded on the entry permit, and also referred to other departments who may have occasion to enter such space.

F. If work has been interrupted for any time, all air monitoring procedures outlined herein must be repeated before work is resumed.

G. Monitoring shall be continuous for all entries into permit-required confined spaces.

APPENDIX No. 2-

EQUIPMENT USE

A. When work in wet or damp confined spaces is performed, all electrical equipment used shall be of a design so as to prevent moisture or water from accumulating in enclosures, circuit breakers, etc. To accomplish this, all connections, etc. shall be in “weatherproof” enclosures. Ground fault interrupters shall be used.

B. Tanks or cylinders of compressed gases (acetylene, oxygen, etc) other than breathing air are prohibited in confined spaces. Hose extensions, etc. shall be used when welding or cutting is required. All welding leads and cutting torch hoses shall be removed from the space when not in use.

APPENDIX No.3-

IDLH PROCEDURES

Confined spaces with an immediate danger to life and health (IDLH) should not be entered unless entry is a rescue by trained personnel. IDLH spaces are those spaces that have an atmosphere that is oxygen deficient (less than 19.5%) or enriched (greater than 23.5%), or a flammable mixture that's greater than 10% of the LEL, or when the toxins have reached their IDLH limits. An example of the latter would be an instrument reading of 100ppm SO2 (Sulfur Dioxide).

When all engineering efforts have been exhausted, including purging with air or an inert gas, ventilating, and an IDLH Space must still be entered for rescue of personnel or to prevent a severe or catastrophic event, the following steps must be taken.

1. Contact a Safety Professional/Specialist skilled in confined space entry to discuss the need for actually entering into the space. If entry is necessary due to a specified emergency (as noted above) then a plan of action will be developed and documented with a new permit.

2. Use of any electrical equipment in areas where a flammable atmosphere exists is prohibited. This determination is made during the pre-entry atmosphere survey.

APPENDIX No. 4

CONFINED SPACE SURVEY FORM

SPACE DESCRIPTION _____ DEPARTMENT _____

BUILDING OR LOCATION _____ NAME/EQUIPMENT # _____

DATE _____

PERSON(S) PERFORMING SURVEY _____ SIGNATURE _____

_____ SIGNATURE _____

_____ SIGNATURE _____

_____ SIGNATURE _____

SECTION I - CONFINED SPACE DETERMINATION		
YES	**NO**	IS THE " SPACE " LARGE ENOUGH AND SO CONFIGURED THAT AN EMPLOYEE CAN BODILY ENTER AND PERFORM ASSIGNED WORK : AND (**NOTE** : PRIMARILY INTENDED FOR FULL OR WHOLE BODY ENTRY)
		HAS LIMITD OR RESTRICTED MEANS FOR ENTRY OR EXIT (i.e. TANKS, VESSELS, SILOS, STORAGE BINS, HOPPERS, and VAULTS); AND (NOTE): DOORWAYS AND OTHER PORTALS THROUGH WHICH A PERSON CAN WALK ARE NOT CONSIDERED TO BE LIMITED MEANS FOR ENTRY OR EXIT.
		IS NOT DESIGNED FOR CONTINUOUS EMPLOYEE OCCUPANCY. (NOTE): A VENTED TELECOMMUNICATIONS VAULT WOULD BE DESIGNED FOR CONTINUOUS OCCUPANCY. AN UNVENTED VAULT WOULD NOT.
IF ALL THREE (3) ANSWERS ARE YES, THIS CLASSIFIED IS AS CONFINED SPACE, PROCEED TO SECTION II.		

SECTION II – DETERMINING PERMIT REQUIRED CONFINED SPACE		
YES	**NO**	CONTAINS OR HAS A POTENTIAL TO CONTAIN A HAZARDOUS ATNOSPHERE. (**NOTE** : EXPOSURES TO COMBUSTIBLE DUSTS OR FLAMMABLE MIXTURES, OXYGEN DEFICIENCIES, THAT MAY EXPOSE EMPLOYEES TO THE RISK OF DEATH, INCAPACITATION, ACUTE ILLNESS OR IMPAIR SELF RESCUE)
		CONTAINS A MATERIAL THAT HAS THE POTENTIAL FOR ENGULFING AN ENTRANT. (NOTE: PRIMARILY LIQUID OF FINELY DIVIDED (FLOWABLE) SOLID).
		HAS AN INTERNAL CONFIGURATION SUCH THAT AN ENTRANT COULD BE TRAPPED OR ASPHYXIATED BY INWARDLY CONVERGING WALLS OR BY A FLOOR WHICH SLOPES.
		CONTAINS ANY OTHER RECOGNIZED SERIOUS SAFETY OR HEALTH HAZARD. (NOTE): MAY INCLUDE RADIATION, NOISE, ELECTRICITY, AND MOVING PARTS OF MACHINERY.
IF ANY OF THE FOUR (4) ANSWERS IS YES, THIS IS CLASSIFIED AS A PERMIT REQUIRED CONFINED SPACE. COMPLETE A PERMIT SYSTEM FORM.		

APPENDIX No. 5

CONFINED SPACE HAZARD IDENTIFICATION

(MEANS, PROCEDURES AND PRACTICES NECESSARY FOR SAFE PERMIT REQUIRED CONFINED SPACE ENTRY OPERATION).

PERMIT-REQUIRED CONFINED SPACE IDENT : ..... EQUIPMENT TO BE WORKED ON :	LEVEL OF RISK Very High ( ) High ( ) Moderate ( ) Low ( )

POSSIBLE OR KNOWN HAZARDS AND RISKS

EXPLANATION OF HAZARD/RISK 1. .... 2. .... 3. .... 4.	OXYGEN (19.5 - 23.5) ..... % EXPLOSIVE (LEL) ..... % (LOWER FLAMMABILITY LIMITS = 10%) **LIMITS** TOXIC GASES ( ) ..... PPM ( ) ..... PPM ( ) ..... PPM **OTHERS : GASES AND DUSTS** .... Extreme Temperature (Hot/Cold) ..... VENTILATION ..... MECHANICAL ..... ELECTRICAL ..... LINES ..... FLUES ..... RADIATION .....

REQUIREMENTS FOR ENTRY

1. STEPS TO REMOVE HAZARDS/RISK (i.e. Ventilation, Purging of process lines, Capping, Installation of Blank Plates, LOTO, HOT WORK Permit, Housekeeping, Barriers, etc.).
.....
.....
.....

FREEPORT-McMoRan COPPER & GOLD
Morenci Operations

APPENDIX No. 6 - CONFINED SPACE ENTRY PERMIT

DIVISION:	DEPARTMENT:
LOCATION OF CONFINED SPACE:	DATE:
SHIFT: DAY / NIGHT	CONFINED SPACE ID#
ENTRY SUPERVISOR NAME:	APPROVAL SIGNATURE:
ENTRY ATTENDANT(S) NAME(S):	
AUTHORIZED ENTRANT(S) NAME(S):	

STEP 1 – ARE HAZARDOUS ENERGY SOURCES/CONDITIONS PRESENT?

Section A – Hazard Checklist			Section B – Hazard Checklist		
YES	NO	HAZARD	YES	NO	HAZARD
		Hazardous Atmosphere (including the potential)			Pre-Opening Hazards
		Sloping walls or floors			Flammables / Fire
		Engulfment / Entrapment			Toxins – Corrosive material
		Any other SERIOUS safety hazard			Hazardous Energy
Type of Serious hazard:					Conditions Outside Space
If Yes to any question in section A (above) the space must be classified as PERMIT REQUIRED. Other Serious safety hazards are those in which an injury of a serious nature is reasonably likely to occur if specific controls are not applied.					Falls / Falling Objects
					Lighting / Noise
					Biological Hazards
					Other

If NO to all questions in Section A, this space may be CLASSIFIED as a Non-Permit Required Confined Space (sign below)

Name_____ **Signature**_____

STEP 2 – PREPARATION PROCEDURES

PRE-ENTRY AIR TESTING			DONE	PROCEDURE/CONTROL	DONE	PROCEDURE/CONTROL
GAS	*ACCEPTABLE*	*READING*		Pre-Entry Checklist		Lighting/Hearing Protection
Oxygen	19.5 – 23.5%			Oxygen Pre-Entry Reading		Thermal Protection
LEL	<10%			Chemical Cleanout Electrical		Hydraulic Isolation
Toxins	<PEL/TLV			Ventilation Purge Time		Radiation Protection
Other				Lock out/Tag out/Try out		Traffic Control/Barricading
Date of last calibration:				Mechanical Isolation		Pneumatic Isolation
Test Instrument and #				Fall Protection		Hot Work Permit

REQUIRED EQUIPMENT/TOOLS/PPE

REQUIRED	EQUIPMENT	REQUIRED	EQUIPMENT
	Ventilator		Hand/Foot Protection
	Respirator		Body Protection
	Atmospheric Monitor		Ground Fault Provided
	Blocking Device		Lighting
	Harness		Spark proof Tools
	Tripod – emergency escape apparatus		Ladder/Safe Access
	Eye Protection		Fire Extinguisher
	Hearing Protection		Intrinsically Safe Radio/Phone
	Other:		

ACCEPTABLE ENTRY CONDITIONS

DONE	ACTION	DONE	EQUIPMENT
	Review Permit with Attendant and Entrant		All Safety Equipment Available
	Entry Permit Posted at Portal		MSDSs Reviewed
	Preparation/Isolation Procedures Done		Pre-Opening Hazards Eliminated
	Traffic Control/Barricading Done		Employee Task Training
	Attendant/Entrant Communication Tested		Is an Atmospheric Test Needed? If Yes, is it Satisfactory
	CSE / Crews, Emergency Services		Surrounding Areas Free From Vapors and Other Hazards

CONTINUED ATMOSPHERIC MONITORING – required if a hazardous atmosphere exists or has the potential to exist

GAS	ACCEPTABLE	TIME	READING	TIME	READING	TIME	READING
Oxygen	19.5 – 23.5%						
LEL	<10%						
Toxins	<PEL/TLV						
Other							

LEL = Lower Explosive Limit
PEL = Permissible Exposure Limit
TLV = Threshold Limit Value
IDLH = Immediately Dangerous to Life or Health

Post Entry Cancellation of Permit by Confined Space Entry Supervisor_____

SECTION K

OCIP INCIDENT REPORT FORM

P.O. Box 20825 Phoenix, Arizona 85036 Phone (602) 716-5552 Fax: (602) 716-9894
www.advancedlining.com

2.0
Emergency Action and Medical Procedures

2.1 General Procedures

- In the event of a serious injury, trained contractor personnel should render first aid to any incident victims and shall immediately activate the site emergency response system. Contractor personnel shall immediately contact the Freeport-McMoRan Safety Department, their insurance company's safety professional, and the Freeport-McMoRan project manager. Freeport-McMoRan senior management will address any media inquiries or announcements and make other decisions critical to the overall site.
- Emergency telephone numbers shall be posted at all contractor telephones.
- Nothing is to be disturbed or removed after evacuation of the injured employee until a thorough investigation has been completed by all Government Agencies, and Freeport-McMoRan representatives. The area can only be released by the owner.

2.2 Incident Reporting

- All employees shall promptly report any incident (including near-misses), no matter how slight, to their supervisor. All incidents shall also be reported to the Freeport-McMoRan Safety Department immediately.
- Incidents of a serious nature may require "immediate" notification to state or federal agencies. It is the responsibility of each contractor to identify what constitutes "immediate" notification and who must be notified, and the time limits required (15 minutes in some cases with MSHA). It is required to notify Freeport-McMoRan representatives of such notifications to be made before notifying the agency.
- A completed "Incident Reporting Form" must be provided to the Freeport-McMoRan site Safety Department within 24 hours of all injuries, regardless of severity. Contractor needs to coordinate record information and details of an incident using the site Incident Report form. (Note: Some incidents at MSHA regulated properties require "immediate" notification to MSHA. Contractors are responsible for understanding these reporting requirements.)
- All incidents of a serious nature, including near-misses, shall be fully investigated to determine root cause. Actions plans will be developed and implemented to prevent re-occurrence. Investigations shall be fully documented and maintained on site for review.
- Failure to promptly report a workplace injury or illness may result in cancellation of the contract.

2.2.1 Monthly Frequency Report

- All contractors shall provide to the Freeport-McMoRan site Safety Department a monthly safety summary for results occurring on the project, which must include the following:
    - Number of lost time/restricted duty injuries
    - Number of medical treatment injuries
    - Number of occupational illnesses
    - Number of first aid injuries
    - Number of hours worked by contract personnel (Note: Hours and injuries reported are specific to the location where contract work is being completed).
    - Fire incidents
    - Vehicle equipment damages
    - Property damages
- Monthly summary reports will be due no later than the 6th of the following month (Note: These reports are to be site-specific, not company-wide data)

SECTION L

OSHA FORM 300

P.O. Box 20825 Phoenix, Arizona 85036 Phone (602) 716-5552 Fax: (602) 716-9894
www.advancedlining.com

OSHA's Form 300 (Rev. 01/2004)

Log of Work-Related Injuries and Illnesses

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

Year _____

U.S. Department of Labor
Occupational Safety and Health Administration

You must record information about every work-related injury or illness that involves loss of consciousness, restricted work activity or job transfer, days away from work, or medical treatment beyond first aid. You must also record significant work-related injuries and illnesses that are diagnosed by a physician or licensed health care professional. You must also record work-related injuries and illnesses that meet any of the specific recording criteria listed in 29 CFR 1904.8 through 1904.12. Feel free to use two lines for a single case if you need to. You must complete an injury and illness incident report (OSHA Form 301) or equivalent form for each injury or illness recorded on this form. If you're not sure whether a case is recordable, call your local OSHA office for help.

Form approved OMB no. 1218-0176

Establishment name _____

City _____ State _____

Identify the person				Describe the case		Classify the case											
						CHECK ONLY ONE box for each case based on the most serious outcome for that case:				Enter the number of days the injured or ill worker was:		Check the "injury" column or choose one type of illness:					
(A) Case No.	(B) Employee's Name	(C) Job Title (e.g., Welder)	(D) Date of injury or onset of illness (mo./day)	(E) Where the event occurred (e.g. Loading dock north end)	(F) Describe injury or illness, parts of body affected, and object/substance that directly injured or made person ill (e.g. Second degree burns on right forearm from acetylene torch)	Death	Days away from work	Remained at work		Away From Work (days)	On job transfer or restriction (days)	(M) Injury	Skin Disorder	Respiratory Condition	Poisoning	Hearing Loss	All other illnesses
								Job transfer or restriction	Other record-able cases								
						(G)	(H)	(I)	(J)	(K)	(L)	(1)	(2)	(3)	(4)	(5)	(6)
					Page totals	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*

Be sure to transfer these totals to the Summary page (Form 300A) before you post it.

Public reporting burden for this collection of information is estimated to average 14 minutes per response, including time to review the instruction, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any aspects of this data collection, contact: US Department of Labor, OSHA Office of Statistics, Room N-3644, 200 Constitution Ave, NW, Washington, DC 20210. Do not send the completed forms to this office.

Injury	Skin Disorder	Respiratory Condition	Poisoning	Hearing Loss	All other illnesses
(1)	(2)	(3)	(4)	(5)	(6)

OSHA's Form 300A (Rev. 01/2004)

Summary of Work-Related Injuries and Illnesses

Year 2008

U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

All establishments covered by Part 1904 must complete this Summary page, even if no injuries or illnesses occurred during the year. Remember to review the Log to verify that the entries are complete

Using the Log, count the individual entries you made for each category. Then write the totals below, making sure you've added the entries from every page of the log. If you had no cases write "0."

Employees former employees, and their representatives have the right to review the OSHA Form 300 in its entirety. They also have limited access to the OSHA Form 301 or its equivalent. See 29 CFR 1904.35, in OSHA's Recordkeeping rule, for further details on the access provisions for these forms.

Number of Cases

Total number of deaths	Total number of cases with days away from work	Total number of cases with job transfer or restriction	Total number of other recordable cases
0	0	0	0
(G)	(H)	(I)	(J)

Number of Days

Total number of days away from work	Total number of days of job transfer or restriction
0	0
(K)	(L)

Injury and Illness Types

Total number of… (M)			
(1) Injury	0	(4) Poisoning	0
(2) Skin Disorder	0	(5) Hearing Loss	0
(3) Respiratory Condition	0	(6) All Other Illnesses	0

Post this Summary page from February 1 to April 30 of the year following the year covered by the form

Public reporting burden for this collection of information is estimated to average 58 minutes per response, including time to review the instruction, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any aspects of this data collection, contact: US Department of Labor. OSHA Office of Statistics. Room N-3644. 200 Constitution Ave. NW. Washington. DC 20210. Do not send the completed forms to this office.

Establishment information

Your establishment name U.S. Trade and Development Agency

Street 1000 Wilson Boulevard, Suite 1600

City Arlington State Virginia Zip 22209

Industry description (e.g., Manufacture of motor truck trailers)

Standard Industrial Classification (SIC), if known (e.g., SIC 3715)

OR North American Industrial Classification (NAICS), if known (e.g., 336212)

Employment information

Annual average number of employees 42.4

Total hours worked by all employees last year 90,297

Sign here

Knowingly falsifying this document may result in a fine.

I certify that I have examined this document and that to the best of my knowledge the entries are true, accurate, and complete.

Carolyn Hum
Company executive

Administrative Offic
Title

703-875-4357
Phone

Dec. 31, 2008
Date

OSHA's Form 301
Injuries and Illnesses Incident Report

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

U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

This *Injury and Illness Incident Report* is one of the first forms you must fill out when a recordable work-related injury or illness has occurred. Together with the *Log of Work-Related injuries and Illnesses* and the accompanying *Summary*, these forms help the employer and OSHA develop a picture of the extent and severity of work-related incidents.

Within 7 calendar days after you receive information that a recordable work-related injury or illness has occurred, you must fill out this form or an equivalent. Some state workers' compensation, insurance, or other reports may be acceptable substitutes. To be considered an equivalent form, any substitute must contain all the information asked for on this form.

According to Public Law 91-596 and 29 CFR 1904, OSHA's recordkeeping rule, you must keep this form on file for 5 years following the year to which it pertains

If you need additional copies of this form, you may photocopy and use as many as you need.

Completed by _____

Title _____

Phone _____ Date _____

Information about the employee

1) Full Name _____

2) Street _____

City _____ State _____ Zip _____

3) Date of birth _____

4) Date hired _____

5) ☐ Male
☐ Female

Information about the physician or other health care professional

6) Name of physician or other health care professional

_____

_____

7) If treatment was given away from the worksite, where was it given?

Facility _____

Street _____

City _____ State _____ Zip _____

8) Was employee treated in an emergency room?
☐ Yes
☐ No

9) Was employee hospitalized overnight as an in-patient?
☐ Yes
☐ No

Information about the case

10) Case number from the Log _____ *(Transfer the case number from the Log after you record the case.)*

11) Date of injury or illness _____

12) Time employee began work _____ AM/PM

13) Time of event _____ AM/PM ☐ Check if time cannot be determined

14) **What was the employee doing just before the incident occurred?** Describe the activity, as well as the tools, equipment or material the employee was using. Be specific. Examples: "climbing a ladder while carrying roofing materials"; "spraying chlorine from hand sprayer"; "daily computer key-entry."

15) **What happened?** Tell us how the injury occurred. Examples: "When ladder slipped on wet floor, worker fell 20 feet"; "Worker was sprayed with chlorine when gasket broke during replacement"; "Worker developed soreness in wrist over time."

16) **What was the injury or illness?** Tell us the part of the body that was affected and how it was affected; be more specific than "hurt", "pain", or "sore." Examples: "strained back"; "chemical burn, hand"; "carpal tunnel syndrome."

17) **What object or substance directly harmed the employee?** Examples: "concrete floor"; "chlorine"; "radial arm saw." If this question does not apply to the incident, leave it blank.

18) **If the employee died, when did death occur?** Date of death

Public reporting burden for this collection of information is estimated to average 22 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Persons are not required to respond to the collection of information unless it displays a current valid OMB control number. If you have any comments about this estimate or any other aspects of this data collection, including suggestions for reducing this burden, contact: US Department of Labor, OSHA Office of Statistics, Room N-3644, 200 Constitution Ave, NW, Washington, DC 20210. Do not send the completed forms to this office.

SECTION M

PREVENTION OF ACCIDENTS

P.O. Box 20825 Phoenix, Arizona 85036 Phone (602) 716-5552 Fax: (602) 716-9894
www.advancedlining.com

Instructions for using the Safety and Health Program Assessment Worksheet

This ALS OSHA Safety and Health Program Assessment (S&HPA) Worksheet is designed as a tool for use in conducting assessments of an employer's safety and health program in order to evaluate the effectiveness of that employer's safety and health management system.

A Safety and Health Program Assessment (S&HPA) is an assessment of the company's safety and health management system (using the Safety and Health Program Assessment Worksheet). A S&HPA can be done during a comprehensive consultation or independently of a comprehensive consultation.

SHARP companies or companies working toward SHARP must have a full assessment, meaning to have all 58 elements evaluated.

All completed assessment forms should have some justification and/or recommendations under the comment section for questions rated as 0 and 1. All completed assessments should be included and/or referenced in the report sent to the employer.

Instructions for using the worksheet are as follows:

Categories: The S&HPA Worksheet is divided into the following seven categories (or elements):

I	Hazard Anticipation and Detection,
II	Hazard Prevention and Control,
III	Planning and Evaluation,
IV	Administration and Supervision,
V	Safety and Health Training,
VI	Management Leadership, and
VII	Employee Participation.

There are several attributes or sub-elements in each category.

Attributes: Each attribute or sub-element is listed as a survey question. All 58 attributes are positive statements that the evaluator agrees with varying degrees of continuity. The 58 attributes are considered building blocks to effective safety and health management systems.

Rating Instructions: Each survey question or attribute has six possible ratings: 0, 1, 2, 3, NA, or NE. The value for each rating is described in the following table.

Rating	Description		Descriptor
0	No discernable or meaningful indication that the item is even partially in place	No or	None
1	Some portion or aspect is present, although major improvement is needed	Mostly No	Some
2	Item is largely in place, with only minor improvements needed	Yes or	Most
3	Item is completely in place	Mostly Yes	All
NE	Not Evaluated: Recognizes that comprehensive evaluations can be incremental		Not Evaluated
NA	Not Applicable: Must have justification in the comments box why the item is not applicable		Not Applicable

Using your best professional judgment rate each attribute based on the information obtained during the consultation. To rate an attribute, simply put an "X" in the box under the desired rating indicator.

Rating Cues: The bits of information obtained in the assessment are rating cues. A rating cue is a fact or perception that prompts and supports the rating of a relevant topic. Each attribute is worded as a positive statement. All rating cues will either confirm (support) or negate (deny) the statement. The cues give weight to the rating for the individual attributes.

Cues confirm or deny: the existence of the attribute; the extent of the attribute; the character of the attribute; and, the effect of the attribute. Cues are found in observations and measurements, interviews, and reviews of documentation. There can be multiple cues: initial cues, corroborating cues; and conflicting cues. The following table illustrates how cues are used to rate attributes.

Rating Value	
0	Eliminated by a single CONFIRMING cue
1	Requires a few CONFIRMING cues **and** one or more NEGATING cues
2	Requires multiple CONFIRMING cues **and** a few NEGATING cues
3	Eliminated by a single NEGATING cue

Comments: The comment section is to be used to give the employer recommendations on how to improve in this specific attribute. Ratings that are "0" or "1" should include a

recommendation for improvement. The only time the consultant must justify a rating is when "NA" is marked.

Some Suggestions: In reality, there is a very small gap between the 0 (zero) rating and the 1 (one) rating and between the 2 (two) rating and the 3 (three) rating. There is a large gap between the 1 (one) rating and the 2 (two) rating. That gap is the difference between mostly no and mostly yes.

Look for things that are done well. Reinforce these things with personnel for their good efforts. The more you can encourage small positive steps, the greater chance that significant positive change will follow and the greater the opportunity to return and provide comprehensive assistance.

Consider using the Assessment Tips from the Oregon OSHA SHARP web page to help you as you complete the Safety and Health Program Assessment Worksheet. The document contains assessment tips for each of the 58 elements and includes cross references to like or similar items.

Also, consider using the Attributes of Excellence from the Oregon OSHA SHARP web page. That document contains many best practices or attributes that are indicators of effective programs. The Attributes of Excellence can also offer suggestions of ways to improve your rating in each of the 58 sub-elements.

Finally, consider mentoring with another SHARP company or an Oregon SHARP Alliance member. Those companies can be linked to from the Oregon OSHA SHARP web page as well. Mentoring between SHARP companies is encouraged by Oregon OSHA and has proven to be beneficial to both those companies being mentored as well as those companies doing the mentoring.

Safety and Health Program Assessment Worksheet

Employer				**Visit Date**			
Site Location							
Consultant			**Contact Person**				
Consultation Report #		**SIC**		**Total Employees**		**Interviewed**	

Legend: 0 = No
1 = No, Needs major improvement
2 = Yes, Needs minor improvement
3 = Yes

*NA = Not Applicable**
*NE = Not Evaluated **
**NOT FOR USE WITH SHARP*

I. Hazard Anticipation and Detection

	0	1	2	3	NA	NE
1. A comprehensive, baseline hazard survey has been conducted within the past five (5) years.	☐	☐	☐	☐	☐	☐

Comments:

Hazard Anticipation and Detection	0	1	2	3	NA	NE
2. Effective safety and health self-inspections are performed regularly.	☐	☐	☐	☐	☐	☐

Comments:

Hazard Anticipation and Detection	0	1	2	3	NA	NE
3. Effective surveillance of established hazard controls is conducted.	☐	☐	☐	☐	☐	☐

Comments:

Hazard Anticipation and Detection	0	1	2	3	NA	NE
4. An effective hazard reporting system exists.	☐	☐	☐	☐	☐	☐

Comments:

Hazard Anticipation and Detection	0	1	2	3	NA	NE
5. Change analysis is performed whenever a change in facilities, equipment, materials, or processes occurs.	☐	☐	☐	☐	☐	☐

Comments:

Hazard Anticipation and Detection	0	1	2	3	NA	NE
6. Accidents are investigated for root causes.	☐	☐	☐	☐	☐	☐

Comments:

Hazard Anticipation and Detection	0	1	2	3	NA	NE
7. Material Safety Data Sheets are used to reveal potential hazards associated with chemical products in the workplace.	☐	☐	☐	☐	☐	☐

Comments:

Hazard Anticipation and Detection	0	1	2	3	NA	NE
8. Effective job hazard analysis is performed.	☐	☐	☐	☐	☐	☐

Comments:

Hazard Anticipation and Detection	0	1	2	3	NA	NE
9. Expert hazard analysis is performed.	☐	☐	☐	☐	☐	☐

Comments:

Hazard Anticipation and Detection	0	1	2	3	NA	NE
10. Incidents are investigated for root causes.	☐	☐	☐	☐	☐	☐

Comments:

II. Hazard Prevention and Control

	0	1	2	3	NA	NE
11. Feasible engineering controls are in place.	☐	☐	☐	☐	☐	☐

Comments:

Hazard Prevention and Control	0	1	2	3	NA	NE
12. Effective safety and health rules and work practices are in place.	☐	☐	☐	☐	☐	☐

Comments:

Hazard Prevention and Control	0	1	2	3	NA	NE
13. Applicable OSHA-mandated programs are effectively in place.	☐	☐	☐	☐	☐	☐

Comments:

Hazard Prevention and Control	0	1	2	3	NA	NE
14. Personal protective equipment is effectively used.	☐	☐	☐	☐	☐	☐

Comments:

Hazard Prevention and Control	0	1	2	3	NA	NE
15. Housekeeping is properly maintained.	☐	☐	☐	☐	☐	☐

Comments:

Hazard Prevention and Control	0	1	2	3	NA	NE
16. The organization is properly prepared for emergencies.	☐	☐	☐	☐	☐	☐

Comments:

Hazard Prevention and Control	0	1	2	3	NA	NE

Hazard Prevention and Control	0	1	2	3	NA	NE
17. The organization has an effective plan for providing competent emergency medical care to employees and others present at the site.	☐	☐	☐	☐	☐	☐

Comments:

Hazard Prevention and Control	0	1	2	3	NA	NE
18. Effective preventive maintenance is performed.	☐	☐	☐	☐	☐	☐

Comments:

Hazard Prevention and Control	0	1	2	3	NA	NE
19. An effective procedure for tracking hazard correction is in place.	☐	☐	☐	☐	☐	☐

Comments:

III. Planning and Evaluation

	0	1	2	3	NA	NE
20. Workplace injury/illness data are effectively analyzed.	☐	☐	☐	☐	☐	☐

Comments:

Planning and Evaluation	0	1	2	3	NA	NE
21. Hazard incidence data are effectively analyzed.	☐	☐	☐	☐	☐	☐

Comments:

Planning and Evaluation	0	1	2	3	NA	NE
22. A safety and health goal and supporting objectives exist.	☐	☐	☐	☐	☐	☐

Comments:

Planning and Evaluation	0	1	2	3	NA	NE
23. An action plan designed to accomplish the organizations safety and health objectives are in place.	☐	☐	☐	☐	☐	☐

Comments:

Planning and Evaluation	0	1	2	3	NA	NE
24. A review of in-place OSHA-mandated programs is conducted at least annually.	☐	☐	☐	☐	☐	☐

Comments:

Planning and Evaluation	0	1	2	3	NA	NE
25. A review of the overall safety and health management system is conducted at least annually.	☐	☐	☐	☐	☐	☐

Comments:

IV. Administration and Supervision

	0	1	2	3	NA	NE
26. Safety and health program tasks are each specifically assigned to a person or position for performance or coordination.	☐	☐	☐	☐	☐	☐

Comments:

Administration and Supervision	0	1	2	3	NA	NE
27. Each assignment of safety and health responsibility is clearly communicated.	☐	☐	☐	☐	☐	☐

Comments:

Administration and Supervision	0	1	2	3	NA	NE
28. An accountability mechanism is included with each assignment of safety and health responsibility.	☐	☐	☐	☐	☐	☐

Comments:

Administration and Supervision	0	1	2	3	NA	NE
29. Individuals with assigned safety and health responsibilities have the necessary knowledge, skills, and timely information to perform their duties.	☐	☐	☐	☐	☐	☐

Comments:

Administration and Supervision	0	1	2	3	NA	NE
30. Individuals with assigned safety and health responsibilities have the authority to perform their duties.	☐	☐	☐	☐	☐	☐

Comments:

Administration and Supervision	0	1	2	3	NA	NE
31. Individuals with assigned safety and health responsibilities have the resources to perform their duties.	☐	☐	☐	☐	☐	☐

Comments:

Administration and Supervision	0	1	2	3	NA	NE

Administration and Supervision	0	1	2	3	NA	NE
32. Organizational policies promote the performance of safety and health responsibilities.	☐	☐	☐	☐	☐	☐

Comments:

Administration and Supervision	0	1	2	3	NA	NE
33. Organizational policies result in correction of non-performance of safety and health responsibilities.	☐	☐	☐	☐	☐	☐

Comments:

V. Safety and Health Training

	0	1	2	3	NA	NE
34. Employees receive appropriate safety and health training.	☐	☐	☐	☐	☐	☐

Comments:

Safety and Health Training	0	1	2	3	NA	NE
35. New employee orientation includes applicable safety and health information.	☐	☐	☐	☐	☐	☐

Comments:

Safety and Health Training	0	1	2	3	NA	NE
36. Supervisors receive appropriate safety and health training.	☐	☐	☐	☐	☐	☐

Comments:

Safety and Health Training	0	1	2	3	NA	NE
37. Supervisors receive training that covers the supervisory aspects of their safety and health responsibilities.	☐	☐	☐	☐	☐	☐

Comments:

Safety and Health Training	0	1	2	3	NA	NE
38. Safety and health training is provided to managers.	☐	☐	☐	☐	☐	☐

Comments:

Safety and Health Training	0	1	2	3	NA	NE
39. Relevant safety and health aspects are integrated into management training.	☐	☐	☐	☐	☐	☐

Comments:

VI. Management Leadership

	0	1	2	3	NA	NE
40. Top management policy establishes clear priority for safety and health.	☐	☐	☐	☐	☐	☐

Comments:

Management Leadership	0	1	2	3	NA	NE
41. Top management considers safety and health to be a line rather than a staff function.	☐	☐	☐	☐	☐	☐

Comments:

Management Leadership	0	1	2	3	NA	NE
42. Top management provides competent safety and health staff support to line managers and supervisors.	☐	☐	☐	☐	☐	☐

Comments:

Management Leadership	0	1	2	3	NA	NE
43. Managers personally follow safety and health rules.	☐	☐	☐	☐	☐	☐

Comments:

Management Leadership	0	1	2	3	NA	NE
44. Managers delegate the authority necessary for personnel to carry out their assigned safety and health responsibilities effectively.	☐	☐	☐	☐	☐	☐

Comments:

Management Leadership	0	1	2	3	NA	NE
45. Managers allocate the resources needed to properly support the organizations safety and health system.	☐	☐	☐	☐	☐	☐

Comments:

Management Leadership	0	1	2	3	NA	NE

Management Leadership	0	1	2	3	NA	NE
46. Managers assure that appropriate safety and health training is provided.	☐	☐	☐	☐	☐	☐

Comments:

Management Leadership	0	1	2	3	NA	NE
47. Managers support fair and effective policies that promote safety and health performance.	☐	☐	☐	☐	☐	☐

Comments:

Management Leadership	0	1	2	3	NA	NE
48. Top management is involved in the planning and evaluation of safety and health performance.	☐	☐	☐	☐	☐	☐

Comments:

Management Leadership	0	1	2	3	NA	NE
49. Top management values employee involvement and participation in safety and health issues.	☐	☐	☐	☐	☐	☐

Comments:

VII. Employee Participation

	0	1	2	3	NA	NE
50. There is an effective process to involve employees in safety and health issues.	☐	☐	☐	☐	☐	☐

Comments:

Employee Participation	0	1	2	3	NA	NE
51. Employees are involved in organizational decision-making in regard to safety and health policy.	☐	☐	☐	☐	☐	☐

Comments:

Employee Participation	0	1	2	3	NA	NE
52. Employees are involved in organizational decision-making in regard to the allocation of safety and health resources.	☐	☐	☐	☐	☐	☐

Comments:

Employee Participation	0	1	2	3	NA	NE
53. Employees are involved in organizational decision-making in regard to safety and health training.	☐	☐	☐	☐	☐	☐

Comments:

Employee Participation	0	1	2	3	NA	NE
54. Employees participate in hazard detection activities.	☐	☐	☐	☐	☐	☐

Comments:

Employee Participation	0	1	2	3	NA	NE
55. Employees participate in hazard prevention and control activities.	☐	☐	☐	☐	☐	☐

Comments:

Employee Participation	0	1	2	3	NA	NE
56. Employees participate in the safety and health training of co-workers.	☐	☐	☐	☐	☐	☐

Comments:

Employee Participation	0	1	2	3	NA	NE
57. Employees participate in safety and health planning activities.	☐	☐	☐	☐	☐	☐

Comments:

Employee Participation	0	1	2	3	NA	NE
58. Employees participate in the evaluation of safety and health performance.	☐	☐	☐	☐	☐	☐

Comments:

Revised S&HPA Worksheet, March 2007

SECTION N

TRAINING REQUIREMENTS

P.O. Box 20825 Phoenix, Arizona 85036 Phone (602) 716-5552 Fax: (602) 716-9894
www.advancedlining.com

Morenci Safe Production Standard	Standard # 6.25.1	
	OHSAS 18001:2007	4.4.6
MSHA Training Requirements	Revision #	00
	Revision Date	N/A
	Effective Date	3/30/2012
	Document Owner	Training Department
Approvals:		
Senior VP Morenci Operations: 3/30/2012	*Safety Steering Committee: 2/24/2012*	

1.0 PURPOSE:

This standard clarifies the requirements for employees and contractors regarding receiving training prior to working on Freeport-McMoRan Morenci Operations (FMMO) property.

2.0 SCOPE:

This standard addresses the initial training requirements for new employees, employees who transfer from another FCX site *(national and international),* and contractors who will work on FMMO property. This standard does not address all other types of required training applicable to the site.

3.0 TERMS, DEFINITIONS AND ABBREVIATIONS

3.1 New Miner: means a person who has not completed MSHA approved new miner training and accumulated a minimum of 12 consecutive months of surface mining experience.

3.2 Experience Miner: A person who has completed MSHA-approved new miner training for surface miners or training acceptable to MSHA from a State agency and who has had at least 12 months of surface mining experience.

4.0 RESPONSIBILITIES:

4.1 Area Manager:

Will provide resources for employees to comply with this standard.

4.2 Health and Safety Manager:

Define the specific training or exception for contractors, who perform simple inspection, deliver or receive non-hazardous goods outside of active mining areas, provide consultation, or work solely in office areas are generally not exposed to mine hazards.

4.3 Supervisor and/or person responsible for the work:

Will ensure that the employees and contractors working under or for them comply with the requirements of this standard.

4.5 Training and Development Department:

Develop and implement the training programs according to regulatory and other specific requirements. All MSHA approved 5000-23 or approved alternate training records will be maintained by the training department (for FMMO employees).

5.0 STANDARDS OF PERFORMANCE

All initial training must be provided in accordance with the Approved Training Plan for Morenci.

5.1 New Employees

New Employees must receive New Miner MSHA Training and additional training in accordance with the position and FMMO requirements.

5.2 Transferred Employees (FCX)

5.2.1 Transfers from North American Sites

When an employee transfers to Morenci from another North American FCX site, the employee must receive Experienced Miner MSHA Training and additional training in accordance with the position and FMMO requirements.

5.2.2 Employees Transferring from International Sites

When an employee who has not worked at a North American site within the previous five years, transfers to Morenci from an international site, the employee must receive New Miner MSHA Training.

When an employee who has worked at a North American site within the last five years and meets the definition of an Experienced Miner, transfers to Morenci from an international site, the employee must receive Experienced Miner Training.

5.3 Contractor Employees

Contractor employees must receive New Miner or Experienced Miner training in accordance with 30 CFR Part 48 and additional training in accordance with the position and FMMO requirements.

5.4 Other mandatory training

Other training such as safety awareness, site specific training, policies and procedures and task training must be provided to employees and contractors based on their job position and the training needs that have been identified in the training matrix for the area.

6.0 REFERENCE DOCUMENTS

6.1 30 CFR Part 48 – Training and Retraining of Miners
6.2 MSHA Approved Training Plan for Morenci
6.3 Safe Production Standard # 6.22 Legal and Other Requirements
6.4 Safe Production Standard # 6.25 Competence, Training and Awareness
6.5 SOP FCX-11 MSHA Training Requirements for Contractors and Visitors
6.6 FMMO Training Matrices

7.0 RECORDS

Name of the Document	Responsible for Control	Records Retention
MSHA Training Certificates	Technical Training Department Contractor Company	Duration of employment + 60 days

8.0 APPENDICES

None

9.0 REVIEW AND CHANGE

All changes, modifications and/or revisions must be documented on the table below:

Description of Changes to this Document

SECTION O

SAFTY & HEALTH WORSHEET

P.O. Box 20825 Phoenix, Arizona 85036 Phone (602) 716-5552 Fax: (602) 716-9894
www.advancedlining.com

SECTION P

DRUG-FREE WORPLACE POLICY-ENGLISH/SPANISH

P.O. Box 20825 Phoenix, Arizona 85036 Phone (602) 716-5552 Fax: (602) 716-9894
www.advancedlining.com

Drug-Free Workplace Policy

Purpose and Goal

Advanced Lining Solutions, Inc. is committed to protecting the safety, health and well being of all employees and other individuals in our workplace. We recognize that alcohol abuse and drug use pose a significant threat to our goals. We have established a drug-free workplace program that balances our respect for individuals with the need to maintain an alcohol and drug-free environment.

- This organization encourages employees to voluntarily seek help with drug and alcohol problems.

Covered Workers

Any individual who conducts business for the organization, is applying for a position or is conducting business on the organization's property is covered by our drug-free workplace policy. Our policy includes, but is not limited to executive management, managers, supervisors, full-time employees and part-time employees.

Applicability

Our drug-free workplace policy is intended to apply whenever anyone is representing or conducting business for the organization. Therefore, this policy applies during all working hours and while on organization property.

Prohibited Behavior

It is a violation of our drug-free workplace policy to use, possess, sell, trade, and/or offer for sale alcohol, illegal drugs or intoxicants.

Notification of Convictions

Any employee who is convicted of a criminal drug violation in the workplace must notify the organization in writing within five calendar days of the conviction. The organization will take appropriate action within 30 days of notification. Federal contracting agencies will be notified when appropriate.

Searches

Entering the organization's property constitutes consent to searches and inspections. If an individual is suspected of violating the drug-free workplace policy, he or she may be asked to submit to a search or inspection at any time. Searches can be conducted of pockets and clothing, lockers, wallets, purses, briefcases and lunchboxes and vehicles and equipment.

Drug Testing

To ensure the accuracy and fairness of our testing program, all testing will be conducted according to Substance Abuse and Mental Health Services Administration (SAMHSA) guidelines where applicable and will include a screening test; a confirmation test; the opportunity for a split sample; review by a Medical Review Officer, including the opportunity for employees who test positive to provide a legitimate medical explanation, such as a physician's prescription, for the positive result; and a documented chain of custody.

All drug-testing information will be maintained in separate confidential records.

Each employee, as a condition of employment, will be required to participate in periodic, reasonable suspicion and follow-up testing upon selection or request of management.

The substances that will be tested for are: Amphetamines, Cannabinoids (THC), Cocaine, Opiates, Phencyclidine (PCP), Alcohol, Barbiturates, Benzodiazepines, Methaqualone, Methadone and Propoxyphene.

Testing for the presence of alcohol will be conducted by analysis of breath.

Testing for the presence of the metabolites of drugs will be conducted by the analysis of urine.

Any employee who tests positive will be immediately removed from duty and suspended without pay for a period of 30 days.

An employee will be subject to the same consequences of a positive test if he/she refuses the screening or the test, adulterates or dilutes the specimen, substitutes the specimen with that from another person or sends an imposter, will

not sign the required forms or refuses to cooperate in the testing process in such a way that prevents completion of the test.

Consequences

One of the goals of our drug-free workplace program is to encourage employees to voluntarily seek help with alcohol and/or drug problems. If, however, an individual violates the policy, the consequences are serious.

In the case of applicants, if he or she violates the drug-free workplace policy, the offer of employment can be withdrawn. The applicant may reapply after six months and must successfully pass a pre-employment drug test.

If an employee violates the policy, he or she will be subject to progressive disciplinary action and may be required to enter rehabilitation. An employee required to enter rehabilitation who fails to successfully complete it and/or repeatedly violates the policy will be terminated from employment. Nothing in this policy prohibits the employee from being disciplined or discharged for other violations and/or performance problems.

Assistance

Advanced Lining Solutions, Inc. recognizes that alcohol and drug abuse and addiction are treatable illnesses. We also realize that early intervention and support improve the success of rehabilitation. To support our employees, our drug-free workplace policy:

- Encourages employees to seek help if they are concerned that they or their family members may have a drug and/or alcohol problem.
- Encourages employees to utilize the services of qualified professionals in the community to assess the seriousness of suspected drug or alcohol problems and identify appropriate sources of help.

Treatment for alcoholism and/or other drug use disorders may be covered by the employee benefit plan. However, the ultimate financial responsibility for recommended treatment belongs to the employee.

Confidentiality

All information received by the organization through the drug-free workplace program is confidential communication. Access to this information is limited to those who have a legitimate need to know in compliance with relevant laws and management policies.

Shared Responsibility

A safe and productive drug-free workplace is achieved through cooperation and shared responsibility. Both employees and management have important roles to play.

All employees are required to not report to work or be subject to duty while their ability to perform job duties is impaired due to on- or off-duty use of alcohol or other drugs.

In addition, employees are encouraged to:

- Be concerned about working in a safe environment.
- Support fellow workers in seeking help.
- Use the Employee Assistance Program.
- Report dangerous behavior to their supervisor.

It is the supervisor's responsibility to:

- Inform employees of the drug-free workplace policy.
- Observe employee performance.
- Investigate reports of dangerous practices.
- Document negative changes and problems in performance.
- Counsel employees as to expected performance improvement.
- Refer employees to the Employee Assistance Program.
- Clearly state consequences of policy violations.

Communication

Communicating our drug-free workplace policy to both supervisors and employees is critical to our success. To ensure all employees are aware of their role in supporting our drug-free workplace program:

- All employees will receive a written copy of the policy.
- The policy and assistance programs will be reviewed at safety meetings.

Política Libre de Drogas en el lugar de Trabajo

Propósito y Objetivo

Advanced Lining Solutions, Inc. está comprometida a proteger la seguridad, la salud y el bienestar de todos los empleados y otras personas en nuestro lugar de trabajo. Reconocemos que el abuso de alcohol y el consumo de drogas plantean una amenaza importante para nuestros objetivos. Hemos establecido un programa de drogas en el lugar de trabajo sin faltar al respeto de las personas con la intención de mantener un ambiente fuera de alcohol y drogas.

• ALS anima a los empleados que voluntariamente busquen ayuda con problemas de drogas y alcohol.

Cobertura

Cualquier persona que trabaje para ALS, está solicitando una posición o realice negocios en la propiedad de ALS o sus clientes, está cubierto por nuestra política de Libre de drogas en el lugar de trabajo. Nuestra política incluye, pero no se limita a la gestión ejecutiva, gerentes, supervisores, empleados de tiempo completo y empleados a tiempo parciales.

Aplicabilidad

Nuestra política libre de drogas en el lugar de trabajo está destinada a aplicarse cada vez que alguien está representando o tiene una realización de negocios con o para ALS. Por lo tanto, esta política se aplica en todas las horas de trabajo y mientras se encuentre en la propiedad de ALS o de sus clientes.

Comportamientos y Acciones Prohibidas

Es una violación de nuestra política de libre drogas en el lugar de trabajo de usar, poseer, vender, comercializar, y / u ofrecer para la venta de alcohol, drogas ilegales o bebidas alcohólicas.

Notificación de Penas o Condenas

Cualquier empleado que sea declarada culpable de una violación criminal de drogas en el lugar de trabajo debe notificar a ALS por escrito dentro de los cinco días calendario de la condena. ALS tomará las medidas apropiadas dentro de 30 días de la notificación. Serán notificados las Agencias de contratación federal cuando sea apropiado o necesario.

Búsquedas Inspecciones

Al entrar a la propiedad de ALS o a la zona de trabajo usted está obligado a dar su consentimiento a los registros y las inspecciones. Si un individuo es sospechoso de violar la política de libre drogas en el lugar de trabajo, él o ella se le puede pedir que se someta a un registro o inspección en cualquier momento. Las búsquedas pueden llevarse a cabo en las bolsas y la ropa, armarios, billeteras, bolsos, maletines y loncheras y vehículos y equipos.

Pruebas de drogas

Para garantizar la exactitud e imparcialidad de nuestro programa de pruebas, todos los ensayos se llevarán a cabo de acuerdo con Abuso de Sustancias y Servicios de Salud Mental (SAMHSA) las directrices en su caso, e incluirá una prueba de selección, una prueba de confirmación, la oportunidad de obtener una muestra dividida, el examen será confirmado por un especialista medico, incluida la posibilidad para los empleados que obtienen un resultado positivo de proporcionar una explicación médica legítima, como la prescripción de un médico, para el resultado positivo, y un documento oficial.

Toda la información obtenida de los análisis de drogas se mantendrá en registros separados y confidenciales.

Como una condición en su empleo cada empleado, estará obligado a participar en las pruebas periódicas, haciendo un seguimiento razonable e la selección o la solicitud del supervisor.

Las sustancias que serán analizadas son: anfetaminas, cannabinoides (THC), cocaína, los opiáceos, fenciclidina (PCP), alcohol, barbitúricos, benzodiacepinas, la metacualona, metadona y propoxifenos.

Pruebas para detectar la presencia de alcohol se llevará a cabo mediante el análisis de aliento.

Pruebas para detectar la presencia de las drogas metabólicas se llevará a cabo mediante el análisis de la orina.

Cualquier empleado que dé positivo será eliminado inmediatamente de sus funciones y suspendido sin sueldo por un período de 30 días.

Un empleado estará sujeto a las mismas consecuencias con un resultado positivo si él / ella se niega el examen o a las pruebas, desvirtúa o diluye la muestra, sustituye la muestra con la de otra persona o envía un impostor, no firma los formularios requeridos o se niega a cooperar en el proceso de pruebas de tal manera que impide la finalización de la prueba.

Consecuencias

Uno de los objetivos de nuestro programa de libre de drogas en el lugar de trabajo es animar a los empleados que voluntariamente busquen ayuda con sus problemas de alcohol y / o drogas. Sin embargo, si un individuo viola la política, las consecuencias son graves.

En el caso de los solicitantes, si él o ella violan la política libre de drogas en el lugar de trabajo, la oferta de empleo puede ser retirada. El solicitante puede volver a aplicar después de seis meses y debe pasar con éxito una prueba previa de drogas.

Si un empleado viola la política, él o ella serán sujetos a la acción disciplinaria y será necesario el acceder a la rehabilitación. Un empleado que se niegue acceder a la rehabilitación y que no logra completar con éxito y / o viola repetidamente la política será despedido de su empleo. Nada en esta política prohíbe al empleado de ser disciplinado o despedido por violaciones y / o problemas de rendimiento.

Asistencia

Advanced Lining Solutions, Inc. reconoce que el alcohol y el abuso de drogas y la drogadicción son enfermedades tratables. También nos damos cuenta de que la intervención temprana y apoyo a mejorar el éxito de la rehabilitación.

Para apoyar a nuestros empleados, nuestra política de libre droga en el trabajo:

- Anima a los empleados a buscar ayuda si están preocupados de que ellos o sus familiares usan drogas y / o problemas con el alcohol.
- Anima a los empleados a utilizar los servicios de profesionales cualificados en la comunidad para evaluar la gravedad de la sospecha de drogas o alcohol, problemas e identificar las fuentes apropiadas de ayuda.

El tratamiento para el alcoholismo y / o trastornos por consumo de otras drogas pueden ser cubiertos por el plan de beneficios de los empleados. Sin embargo, la responsabilidad financiera suprema en el tratamiento recomendado pertenece al trabajador.

Confidencialidad

Toda la información recibida por la ALS a través del programa de libre de drogas en el lugar de trabajo es confidencial. El acceso a esta información se limita a aquellos que tienen una necesidad legítima de saber, en cumplimiento con las leyes y políticas en gestión.

Responsabilidad compartida

Un seguro y productivo lugar de trabajo libre de drogas se logra mediante la cooperación y la responsabilidad compartida. Tanto los empleados y los supervisores tienen un papel importante que desempeñar.

Todos los empleados están obligados a no presentarse a trabajar o estén incapacitados, mientras que su capacidad para realizar tareas de trabajo este deteriorado debido a al uso de alcohol u otras drogas.

Además, los empleados son alentados a:

- Estar preocupados por trabajar en un ambiente seguro.
- Los compañeros de trabajo
- Apoyo en la búsqueda de ayuda.
- Utilice el Programa de Asistencia al Empleado.
- Reportar comportamientos irregulares a su supervisor.

Es responsabilidad del supervisor a:

- Informar a los empleados de la política libre de drogas en el trabajo.
- Observar el desempeño del empleado.
- Informar e investigar las prácticas peligrosas.
- Documentar los cambios negativos y problemas en el rendimiento.
- Informar a los empleados del Programa de Asistencia al Empleado.
- Avisar de las consecuencias del estado de violaciones de las políticas.

Comunicación

Comunicar nuestra Política Libre de Drogas en el lugar de Trabajo a los supervisores y los empleados es crítica para nuestro éxito. Para asegurar que todos los empleados son conscientes de su papel en el apoyo a nuestro programa de Libre de Drogas en el lugar de Trabajo:

- Todos los empleados recibirán una copia escrita de la política.
- La política y los programas de asistencia serán examinadas en las reuniones de seguridad.

SECTION Q

RIGGING EQUIPMENT, MATERIAL HANDLING & HOISTING

P.O. Box 20825 Phoenix, Arizona 85036 Phone (602) 716-5552 Fax: (602) 716-9894
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Morenci Safe Production Standard	2.12	
	OHSAS 18001:2007	4.4.6
Rigging Equipment, Material Handling & Hoisting	Revision #	00
	Revision Date	N/A
	Effective Date	April 30th 2012
	Standard Owner	Technical Training
Approvals:		
Senior VP Morenci Operations: 03/30/2012	*Safety Steering Committee: 03/30/2012*	

1.0 PURPOSE

Hoisting and rigging refers to the use of mechanical devices to move, lift, and adjust loads. The objective of this standard is to protect personnel from injury, the environment from harm, and equipment and property from damage while rigging, hoisting and handling these loads. Using rigging improperly or using inadequate rigging has the potential to result in catastrophic events. To prevent such events from occurring, minimum requirements have been established through this standard to eliminate or reduce risks associated with rigging, material handling and hoisting.

2.0 SCOPE

All Freeport-McMoRan employees and contractors shall meet or exceed the minimum requirements established by this standard. This standard applies to rigging materials used in conjunction with material handling equipment for the movement or adjustment of objects by hoisting.

3.0 TERMS, DEFINITIONS AND ABBREVIATIONS

3.1 **Bird caging:** The separation or unraveling of the construction strands within a wire rope sling.

3.2 **Excessive Usage:** Operates at

3.3 **Kink:** A bend or fold in a steel wire rope that leaves permanent distortion.

3.4 **Strand:** An element of the construction of a wire rope of fabric, i.e. a single wire within a wire rope or a braid within a fabric belt.

3.5 **Choker:** The wrapping of a lifting sling around a load which causes tightening on the load as the load is lifted.

3.6 **Lifting Eye:** The “eye” portion of a lifting sling used to attach the sling to loads or lifting attachments.

3.7 **Safe Working Load:** The maximum load which may be applied to a crane, hoist, rope, chain or sling for particular conditions and use.

3.8 **Below the Hook Lifting Device**: a device, other than slings, hooks, rigging, hardware and lifting attachments, used for attaching loads to a hoist.

3.9 **Critical Lift:** See definition within Standard.

3.10 **Personnel Hoisting:** As determined by this standard, refers to any hoisting of persons using a lifting basket that is connected to a primary crane line.

3.11 **Competent Person:** An individual designated by Freeport-McMoRan to be responsible for oversight, implementation, and monitoring of any applicable policies, regulations and procedures. A competent person's training and knowledge makes them capable of identifying, evaluating, and addressing existing and/or potential hazards and who has the authority to take prompt corrective action in regard to such hazards.

3.12 **Hitch:** The manner of attachment of a sling to a load and lifting device *(Refer to manufacturer information when determining hitching methods and capacities)*

- **Basket Hitch:** A sling attached from the hook or lifting device under the load and back to the hook or lifting device.
- **Vertical Hitch:** A sling attached from the hook or lifting device directly to the object being lifted.
- **Chocker Hitch:** A sling attached around a load and back to itself through the loop, thimble or utilizing a connector

3.13 **Qualified Crane Operator:** An employee who has been through and completed an approved training course (covering, at a minimum, applicable aspects of crane use, operation, technical rigging and inspection). Whenever there is any doubt as to safety, the operator shall have the authority to stop and refuse to handle loads until the risk of the task has been reduced to an acceptable level.

3.14 **Qualified Rigger:** An employee who has been properly trained and deemed competent in applicable aspects of rigging use, selection, and inspection to include calculation of loads to be lifted. The rigger(s) will inspect all lifting components and rigging prior to the lift being made for compliance with this standard and manufacturer specifications.

3.15 **Rigging:** The art or process of safely attaching a load to a hook or lifting device by means of adequately rated and properly applied slings and related hardware.

3.16 **Rigging Hardware:**

3.17 **Slings:** Engineered wire ropes, chains, synthetic web, and metal mesh constructed and designed for material handling.

3.18 **Tag Line:** A substantial line used to assist with movement of a load and attached in a manner that prevents personnel from being exposed to a suspended load hazard.

3.19 **Lift Plan:** The pre-planning, identification of hazards implementation of control measures and documentation completed prior to the lift taking place.

4.0 RESPONSIBILITIES

4.1 **Supervisors** will ensure that their employees understand and follow this standard, including ascertaining training on the use and care of rigging equipment and material. They will ensure this standard is implemented in their area of responsibility. This includes:

i. Ensuring that inspections are conducted and that lifting gear inspection records are made available and maintained;

ii. Ensuring that competent personnel are available for equipment inspection.

iii. Ensuring that slings are stored in accordance with manufacturer requirements.
iv. Advising crews on the load limits of lifting slings and correcting unsafe conditions/practices associated with rigging and material handling.
v. Ensuring that the damaged/defected lifting equipment are either destroyed or repaired by the appropriate institutions.

4.2 **Employees** (Riggers, Operators, etc.) will follow this standard and notify their supervisor of any situations that do not comply with this standard.

i. Only use rigging with current inspection tags.
ii. Understand the limits of the load to be lifted and the proper size rigging to use.
iii. Utilize proper rigging techniques.
iv. Visually inspect rigging before and after use and ensure that slings in use do not have any obvious defects that affect safety
v. All defects shall be reported to the supervisor and/or relevant party immediately.
vi. Do not operate lifting equipment without proper training or qualifications.

4.3 **Management** will provide resources and training for supervisors and employees to comply with this standard.

4.4 **Health and Safety Manager** will enforce safety in relation to rigging, material handling and hoisting and will audit against this standard.

4.5 **Training Department Manager** will develop modules and implement new employee training and refresher training as required relevant to this standard.

a. Ensure Morenci has its own Standard to regulate lifting gear and review the standard as needed.
b. Maintain training documents and records.

4.6 **Project Managers** will ensure that contractors and employees are informed of the standard and understand the requirements needed to comply with the standard. In addition they shall be responsible for the overall implementation of this standard as it relates to special projects under their immediate control.

5.0 STANDARDS OF PERFORMANCE

Only properly trained employees will select and inspect rigging equipment used for lifting in accordance with this standard.

5.1 All lifting gear, including machines and tackle, shall be of good construction, in working order and comply with relevant standards. The design/hardware requirements contained in this document are applicable to new lifting devices/equipment purchased after 6 months from the issue date of this document. Existing equipment and that purchased during the first 6 months from issue of this document shall be reviewed for compliance with all design/hardware aspects of this standard within 12 months of its issue and the need to update such equipment shall be evaluated.

5.2 Lifting slings shall be suitable in size and construction for the material they are used to lift.

When selecting a lifting sling, consideration shall be given to:

a. The weight and shape of the load to be lifted
b. How the sling will be rigged to the load
c. The stability of the load to be lifted

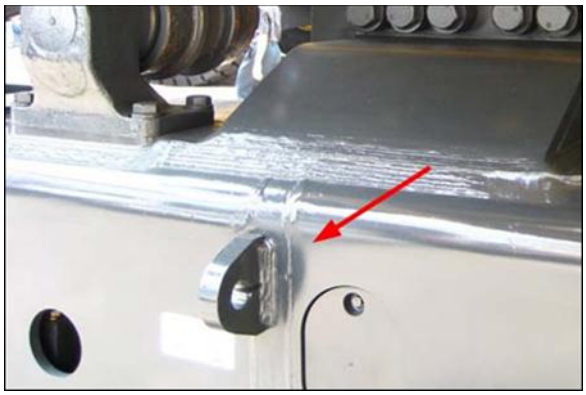
5.3 Lifting components such as Eye-bolts, clevises, pad eyes, anchor points and in the field fabricated lifting lugs must be designed by a qualified individual and installed in accordance with manufacturer specifications. Where rigging components are exposed to excessive wear, usage or repetitive hazardous environmental conditions; a formal annual inspection program must be developed which includes:

1. An evaluation of the rigging hardware by a qualified person
2. Where defects are found that indicates potential damage to the internal structure of a lifting component; a non-destructive (magnetic particle, dye-penetrate and/or x-ray analysis) test shall be performed.
3. Documentation of the test shall be retained by the division for the life cycle of the rigging component.

   If defects are found that affect safety the component shall be removed from service and either destroyed or repaired under the direction of the manufacturer and the FMMO plant engineering department.

5.4 The placement, positioning and welding of lifting lugs shall be done in accordance with engineered design drawings and the criteria in appendix 8.1. The welding shall be conducted by a certified welder who has a minimum qualification, as detailed:

- Flat Plate Welding – Qualification
- Pipe Welding – Qualification



5.5 All rigging shall be clearly marked with the Safe Working Load (SWL) capacity on the rigging device and a serial/registration number for individual identification.

a. All slings shall have a tag attached that identifies the capacity of that particular sling.
b. Lifting hardware capacities must be known and available for review but do not necessarily need to be stamped into the equipment.

5.6 All rigging shall be inspected annually and before each use. In order to ensure every rigging component is properly inspected by competent persons, the following steps shall apply:

a. A competent person shall be designated as the rigging Inspector and shall be responsible for conducting the inspection of all lifting equipment and machinery within the applicable area.
   i. The inspection date, name and signature of the inspector shall be placed in the register on completion of each scheduled inspection.
   ii. A means of identification suitable for review, shall be attached to the sling which can be referenced back to the Lifting Register, showing that the inspection has been completed.
b. Slings that are damaged or deemed unsafe to use shall be removed from service immediately and tagged with an "out of service" tag or destroyed.

5.7 Taglines shall be attached to loads which need to be guided, steadied or manipulated while suspended. The tagline shall be of sufficient strength to restrain the load and long enough to prevent exposure to suspended loads. Where needed, multiple tag lines shall be used, to prevent personnel from walking underneath loads or exposing them to safe access/fall of person hazards.

5.8 Rigging equipment shall not be loaded in excess of its recommended rated load capacity.

5.9 Rigging equipment, when not in use, shall be removed from the immediate work area so as not to present a hazard to employees. *(For storage requirements refer to section 5.12)*

5.10 All hooks fitted to lifting gear shall be equipped with a functioning safety latch to prevent accidental disconnection of the load.

a. Exception: Lifting slings and equipment that is supplied by the manufacturer and designed without safety latches/catches can be used on approved specific applications.

5.11 All lifting hooks fitted to lifting gear and equipment shall not have heat applied by welding, pre-heating, grinding or any other form of heating. These hooks shall not be repaired, aside from the replacement of the safety latch/catch, where fitted.

5.12 Rigging equipment used for lifting shall not be used for towing. Towing equipment must be identified as such and designed for the equipment being towed. Slings assembled with wire rope clips shall not be used for hoisting.

5.13 Specific Requirements

a. Working under loads
Under no circumstances will any worker be allowed to enter the area underneath a load while it is suspended in the air unless the suspended equipment is effectively blocked against inadvertent hazardous motion or the operation meets the requirements outlined in Appendix 8.4.

b. Stabilizing a load
Employees may stand beside a suspended load and guide it into place with their hands when, in view of the height of the load, actual and potential swing of the load and trip hazards, the employees are not at risk of being struck by the load if it were to fall.

c. Environmental Conditions
Slings and rigging shall be stored appropriately and away from incompatible substances as specified by the product manufacturer. Lifting gear shall be stored in an orderly and clean location designed for the storage of lifting gear. Lifting gear shall not be left on the floor in working areas.
- The lifting gear shall not be stored with fuels, oils and grease.
- Synthetic fiber slings shall be stored away from direct sunlight to prevent Ultra Violet (UV) damage.

d. Wire rope
i. Protruding ends of strands in splices on slings and bridles shall be covered or blunted. Wire rope shall not be secured by knots.
ii. Safe operating temperatures: Fiber core wire rope slings of all grades shall be permanently removed from service if they are exposed to temperatures in excess of 200 ºF. When non-fiber core wire rope slings of any grade are used at temperatures above 400 ºF or below minus 60 ºF, recommendations of the sling manufacturer regarding use at that temperature shall be followed.

e. Synthetic webbing (nylon, Kevlar, polyester, and polypropylene)
i. Each synthetic web sling shall be marked or coded to show:
- Name or trademark of manufacturer
- Rated capacities for the type of hitch
- Type of material

ii. Fittings attached to synthetic slings shall be:
- Of a minimum breaking strength equal to that of the sling; and

- Free of all sharp edges that could, in any way, damage the webbing

iii. Safe operating temperatures: Synthetic web slings of polyester and nylon shall not be used at temperatures in excess of 180 ºF. Polypropylene web slings shall not be used at temperatures in excess of 200 ºF.

f. Alloy Chain Slings

a. All chains used for rigging shall be made of alloy steel.
b. Chain type come-a-longs are included in this category.

g. Below the Hook Lifting Devices

Structural and mechanical below-the-hook lifting devices shall be designed by a qualified individual and provided with identification displaying the following data, as a minimum:

I. rated load
II. manufacturer's name (contractor's name if fabricated onsite)
III. lifting device weight (if over 100 lbs)
IV. drawing number (if applicable)
V. serial number (if applicable).

The identification data may be displayed on a name tag, nameplate, metal stamp, or other permanent marker.

Note: If the lifting device of several components that can be detached from the assembly, these individual lifting devices shall be marked with their individual load rating also.

When below the hook lifting devices or other specialized rigging components are purchased or designed in house, clear instructions shall be provided to the designer and fabricator detailing:

1. A description of the intended function of the rigging device
2. Method of rigging attachment to the load and/or hosting apparatus
3. Intended duty cycle of the device including any known hazardous environmental conditions
4. The desired load capacity of the unit and heaviest load that will be handled

(Refer to the Morenci Operations Below-the-Hook Lifting Device standard for more detailed information)

h. Critical Lift

Prior to making any Critical Lift, a documented Critical Lift Plan must be developed and adhered to throughout the duration of the lift (See *appendix 1* for Critical Lift Permit).

A critical lift means any lift that meets one or more of the following characteristics:

1. Exceeds 75 percent of the rated load capacity of the crane
2. The load item, if damaged or upset would result in a release into the environment of radioactive or hazardous material exceeding the established permissible exposure limits or which could endanger personnel.
3. The load item is unique and, if damaged, would be irreplaceable or not repairable and is vital to a system, facility or project operation.
4. Any Lift over occupied buildings, heavily trafficked roadways or where failure or loss of control could result in damage to critical facility components.
5. Any multi-crane lifts
6. Any Lift involving personnel hoisting
7. Any lift within 10 feet or a booms length of an energized power line, whichever is closer
8. Lifts where the center of gravity could change
9. Lifts without the use of outriggers using rubber tire load charts
10. Lifts using more than one hoist on the same crane or trolley
11. Lifts involving non-routine or technically difficult rigging arrangements
12. Lifts out of the operator's view
13. Any Lifts requiring the crane to be set up over underground building structures or transportation tunnels.

The Critical Lift Plan will include the following:

1. Determining the maximum weight of the equipment or device that is to be lifted to include any fluids contained therein, sediment, or foreign material build up on the device or equipment
2. Selecting the rigging based on determining the maximum weight
3. Calculating the combined weight of the load, all rigging equipment ,load blocks and/or jibs
4. Determining the required boom angle and swing radius
5. Selection of the proper crane or cranes for the lift
6. Inspecting the lift site for soil conditions and any other hazards
7. Determine the area to be restricted during the lifting process
8. Equipment operator or operators to include the designated signal person
9. Completion and review of all documentation and forms to include signatures prior to the actual lift proceeding
10. Designation of who will be the qualified rigger for the lift and their respective signatures on the documentation.
11. Review of the lift plan with all affected personnel prior to the lift. If there is anything questionable or a concern prior to or during the lift the project supervisor shall immediately inform safety and management to help address those concerns.

6.0 REFERENCE DOCUMENTS

6.1 Mine Safety and Health Administration (MSHA) Regulations: 56.16007

6.2 Occupational Safety and Health Administration (OSHA) Regulations: 1910.176, 1910.179, 1910.180, 1926.251, 1926.554, 1926.400, 1936.1438, 1926.1501

6.3 Department of Energy standard: DOE-STD-1090-2007

6.4 American Society of Mechanical Engineers (ASME): B30.2, B30.5, B30.9, B30.10, B30.16 B30.20, B30.21, B30.23, B30.26

7.0 RECORDS

Name of the Document	Responsible for Control	Records Retention
Original Document of this Standard	Health and Safety	Permanent
Training Certificates	Division Management	Duration of employment, 3 years after employment relapse
Rigging Inspection Records	Division Management	Annual Inspections – 2 years Non-Destructive Tests – Life of Units.
Documents and records related to the implementation of this standard (SOP's, Inspection and/or Audit Findings	Division Management	**SOP's** - Permanent **Inspection Records –** 3 years **Audits** – 3 year

8.0 APPENDICES

8.1 Welding Lifting Lugs

8.2 Critical Lift Permit

8.3 FMMO Alternative Safety Requirements for Suspended Load Operations

8.4 Rigging Inspection Form

9.0 REVIEW AND CHANGE

All changes, modifications and/or revisions must be documented on the table below:

Description of Changes to this Document
Prior to distribution – Changed # of Standard to match table of contents in website – Removed MP from OHSAS Reference - Changed FMMOP to Morenc in title The above changes are minor administrative changes and do not affect the process/procedure. The changes were made prior to initial distribution not requiring re-approval therefore the Revision # remains 00 – S. Elias 04/04/2012

Appendix 8.1 - Welding Lifting Lugs

General
These guidance notes are the minimum requirements that must be adhered to during the process of welding lifting lugs to material that is to be lifted.

Purpose
The purpose of the lifting lug is to provide safe, strong lifting points from which lifting and material handling equipment can be safely attached for the purpose of transferring equipment from one location to another.

Safety Considerations
The following shall be considered:

i. The incorrect use of welding rods/electrodes or poor welds will result in failure of the weld and the lift;
ii. An engineered design (welding procedure) shall be obtained and the details of the design adhered to during all in the field lifting lug installations.
iii. All welding surfaces shall be properly prepared;
iv. Only certified welder who has a minimum qualification, as detailed below shall perform the task(s):
    1. Flat Plate Welding – Qualification
    2. Pipe Welding – Qualification
v. Employees shall wear the correct PPE at all times.

#	Stage / Step	Action / Key Points
1.	**Preparation and Planning:** • Preheat material to required temperature; • Cover with welding blanket for slow cooling.	• Special care shall be taken to ensure correct welding rod is used, the correct capacity lifting lug is identified and the weld is of high quality to sustain the load.
2.	**Lifting Lug Design**	• All Lifting Lugs shall be manufactured from the correct gauge of grade 250 steel.
3.	**Preparing the Welding Surface:** • Grind surface area; • Preheat and weld; • Cover with asbestos blanket for slow cooling; • Conduct crack tests where necessary using dye penetrate to detect cracks.	• All surfaces shall be prepared, all contaminates and corrosion shall be removed; • Edge preparation of material for fillet weld should be performed prior to weld; • Preheat the material to take chill from steel of any thickness more than 10 mm. • When temperature is less than 10 degrees C, all steels shall be preheated.

4.	**Welding Lifting Lugs on Manganese:** • All welding on Manganese shall be with a Weld; Electrode is to be conducted on a flat surface (Down hand weld position).	• All Lifting Lugs shall be manufactured from Grade 250 steel; • The Lifting Lugs shall be made from correct gauge of Grade 250 steel. • When welding Grade 250 Steel Lifting Lugs to Manganese Stainless Steel Rods shall be used;
		• All Lifting Lugs shall be welded parallel to the direction of the lift; • All Lifting Lugs shall be stamped with Safe Working Load, e.g. 2 Ton SWL; • All Lifting Lugs shall be stamped with the size of the Fillet Weld, e.g. 6 CFW; • All Lifting Lugs shall be correctly positioned to ensure the distribution of weight of the lift evenly.
5.	**Welding Lifting Lugs to Mild Steel and Alloy:** • Grind edge for Surface preparation and grind Lifting Lugs; • Preheat location and weld; • Cover with asbestos blanket when finished; Allow to cool slowly; • Conduct crack tests where necessary using dye penetrate to detect cracks.	• All Lifting Lugs shall be manufactured from Grade 250 steel; • The Lifting Lugs shall be made from correct gauge of Grade 250 steel. • When welding Grade 250 Steel Lifting Lugs to Mild Steel and alloy, only Low Hydrogen Rod shall be used and / or as Manufacturer advises; • All Lifting Lugs shall be welded parallel to the direction of the lift; • All Lifting Lugs shall be stamped with Safe Working Load, e.g. 2 Ton SWL; • All Lifting Lugs shall be stamped with the size of the Fillet Weld, e.g. 6 CFW; • All Lifting Lugs shall be correctly positioned to ensure the distribution of weight of the lift evenly.
6.	**Special Tools / Work Area:** • Materials • Welding Rods / Electrodes • Testing weld	• Material required 250 Grade Steel; • Use only Stainless Steel welding rods / electrodes for welding Grade 250 steel Lifting Lugs to Manganese and / or as per manufacturers requirements; • Use only low Hydrogen welding rods / electrodes when welding Grade 250 steel Lifting Lugs to Mild Steel & alloy; • Dye penetrate crack test welds.
7.	**Notes:**	• The Lifting Lug calculation to determine conformance with specification AWS E-70, series electrode for structural steel, floor plate and grating. Welding shall conform to AISC and AWS D1.1 specification. Use the general guideline of ANSI/ AWS A5.01, filler Metal Procurement Guidelines. • A minimum Safety Factor of 5 has been selected to cover a variety of conditions, e.g. welding position, weld quality etc; • All lifting lugs shall be welded parallel to the direction of the lift;

Appendix 8.2 – CRITICAL LIFT PERMIT

Operator:		Date:
Crane #(s):	Crane Type(s):	Max Crane Capacity at Current Configuration:

PICK-UP/SET-DOWN DATA		
Lift Description (include why this is considered a critical lift):		
Lift Data		
Main Boom ☐	Manual Extension ☐	Jib Extension ☐
Load Radius (feet) =		
Max Boom Length (feet) =		
Max Boom Angle =		
Using Main Block or Auxilliary?		
Gross Load		
Jib or Extension:		**Weights**
Stowed ☐	Erected ☐	
Net Load (lbs) =		
Rigging (lbs) =		
Main Block (lbs) =		
Headache Ball (lbs) =		
Aux. Boom Head (lbs) =		
Wire Rope (lbs) =		
Other (example: fluids, sediment, solid material build-up) (lbs) =		
Total Gross Load =		
Was Appropriate Rigging Selected? Yes ☐ No ☐		
Gross (Boom) Capacity for this lift at above radius and boom length (Which one are you working with?)		
360˚(lbs) =		
Pick & Carry (lbs) =		
Over the Front (lbs) =		
Over the Side (lbs) =		
Over the Rear (lbs) =		
Can the Boom Make the Lift? Yes ☐ No ☐		

Hoist Rope
Capacity per Parts of Line =
Minimum Parts of Line Needed =
Actual Parts of Line Reeved =
Total Suspended Weight =
Can the rope make the lift? Yes ☐ No ☐

Decision
Can the boom and the hoist line make the lift? Yes ☐ No ☐
Can the Set-down be made? Yes ☐ No ☐
Is more than one craned needed to make the lift? Yes ☐ No ☐
If yes, explain:

PRE-LIFT SAFETY CHECKLIST
Note: all safety checklist items must be marked "yes" for the lift to proceed
Boom clearance sufficient? Yes ☐ No ☐
Swing radius verified & flagged? Yes ☐ No ☐
Soil conditions okay? Yes ☐ No ☐
Taglines in place? Yes ☐ No ☐
Weather/Wind acceptable? Yes ☐ No ☐
Annual inspection current? Yes ☐ No ☐
Please list any additional hazards below:

APPROVAL	
Qualified Crane Operator's Name & Signature:	
Qualified Rigger's Name & Signature:	
Supervisor's Name & Signature:	
Designated Signal Person Name & Signature:	
All affected personnel must review the Critical Lift Plan before involvement in the lift. If any concerns should arise, please contact the lift supervisor. Please print and sign below after reviewing	

Appendix 8.3 - FMMO Alternative Safety Requirements for Suspended Load Operations

This standard applies to specifically identified operations conducted on FMMO property involving both FMMO employees and/or contractor personnel. The standard is an alternate means of offering protection for personnel that are required to work directly under or in a hazardous area within close proximity of a suspended load. FMMO Management and the Safety Department is responsible for its implementation and enforcement. The Morenci Health and Safety Department will inspect the working conditions of employees performing these specified operations for compliance with these alternate standard requirements.

Suspended Load Operation Definition
An operation is considered a suspended load operation and subject to the requirements of this standard if it meets all three of the following criteria:

1. The operation involves the use of a crane or hoisting apparatus that supports the weight of a suspended load. (This excludes operations where the load is secured in a holding fixture or on substantial blocks supporting the entire load even though the crane/hoist hook may still be attached.) No distinction is made between a static load and a dynamic load. Rigging, i.e., slings, Hydra-sets, lifting fixtures, shackles, straps, when attached to the hook, is considered part of the load.
2. Personnel involved in the operation have any part of the body directly beneath the suspended load. (This excludes operations where employees have their hands on the sides of a load, i.e., to guide the load.)
3. In the event of a crane/hoist failure, as the load drops it could contact personnel working directly beneath it, with injury or death as a possible result. (This excludes operations where employees have their hands only partially under a load such that a crane or hoist device failure would push their hands out of the way not resulting in injury. This also excludes situations where the falling load would come to rest on hardware that is not suspended before an employee could be injured.)

Requirements
It is recognized that cranes and hoists do not generally meet the support requirements of a system that would allow personnel to work beneath a suspended load. FMMO's first hazard avoidance protocol is to design hazards out of the system or operation. Accordingly, it is FMMO intent and goal that all future systems, hardware, and equipment be engineered, designed, installed, and operated to prevent exposing employees to working under loads suspended from cranes and hoists. Due to the uniqueness of specific mining activities and the limitations imposed when using present systems, hardware, equipment, and facilities, suspended load operations may be permitted only under specifically approved and controlled conditions. Each suspended load operations shall be reviewed on a case by case basis and shall NOT be performed unless all (15) of the following special requirements are met:

1. All suspended load operations will be approved by the manager in charge of the work upon review of a detailed risk assessment of the operation. The risk assessment will be prepared by the superintendent, employees and safety representative responsible for the area and coordinated through the engineering department as needed. The analysis documentation will include the following:
2. A justification why the operation cannot be conducted without personnel beneath the load. Feasible procedure/design options will be investigated to determine if the work can be accomplished without personnel working under a load suspended from a crane/hoist.

3. Details of the precautions taken to protect personnel should the load drop. Secondary support systems, i.e. equipment designed to assume support of (catch) the load preventing injury to personnel should the crane/hoist fail, shall be evaluated and used whenever feasible. Secondary support systems will be constructed with a minimum safety factor of 2 to yield.
4. The maximum number of exposed personnel allowed and timeframes of exposure. Steps shall be taken to limit the number of personnel working under a load suspended from a crane/hoist. Only those essential personnel absolutely necessary to perform the operation will be allowed to work in the safety controlled area. Steps shall be taken to ensure that personnel do not remain under the load any longer than necessary to complete the work.
5. Only those suspended load operations approved by the by the manager of the area and safety department will be permitted, subject to this standard. A list of approved suspended load operations will be maintained by the Safety department and made available for review.
6. Applicable SOP's and or JSA's (e.g. documents used as operational controls for the task) will be revised to specify the necessary additional requirements identified by the risk assessment. The procedures will be available on site for review during the operation.
7. During a suspended load operation, if a new procedure not covered by the original analysis is deemed necessary due to unusual or unforeseen circumstances, the manager of the area and safety department will be consulted and must approve and document the procedure before operations continue. Safety will coordinate with Operations, Engineering, and other organizations as appropriate.
8. The crane/hoist shall be designed, tested, inspected, maintained, and operated in accordance with manufacturer specifications and this standard. Test, inspection, and maintenance procedures will be developed and approved by qualified, responsible FMMO engineers. The results of the annual inspections will be maintained and made available to OSHA personnel upon request.
9. Each crane, hoist and rigging apparatus involved in suspended load operations shall remain, throughout all steps of the task, under 75% of its capacity.
10. Mobile cranes equipped with a friction drum or without active breaking mechanisms shall not be used to facilitate suspended load operations.
11. Before lifting the load involved in a suspended load operation, the crane/hoist will undergo a visual inspection (without major disassembly) of components instrumental in assuring that the load will not be dropped (e.g., primary and secondary brake systems, hydraulics, mechanical linkages, and wire rope). Noted discrepancies will be resolved before the operation continues. This pre-lift inspection will be in addition to the inspections required in section 5.5 of this standard.
12. A trained and competent operator shall remain at the crane/hoist controls while personnel are under the load.
13. Restricted access areas shall be established with appropriate barriers (flagging, rope, cones, etc.). All nonessential personnel shall be required to remain behind the barriers.
14. Prior to the suspended load operation, a meeting with the crane/hoist operator(s), signal person(s), person(s) who will work under the load, and the person responsible for the task shall be held to plan and review the approved operational procedures that will be followed, including procedures for entering and leaving the safety controlled area.
15. Communications (voice, radio, hard wired, or visual) between the operator(s), signal person(s), and the person(s) working under the load shall be maintained. Upon communication loss, operations shall stop immediately, personnel shall clear the hazardous area, and the load shall be secured. Operations shall not continue until communications are restored.

Appendix 8.4 – Rigging Inspection Form

Division:	**Department:**
Print Name:	**Payroll #:**
Date:	**Storage Location:**

# legs/ sling	Manufacturer	Serial #	Size	Load Rating	Length	Tag Insp. Date	Link wear or stretch	Ok Repair Replace
1.								
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9.								
10.								
11.								
12.								
13.								
14.								
15.								
16.								
17.								
18.								
19								
20.								

Comments:

SECTION R

HAND TOOLS

P.O. Box 20825 Phoenix, Arizona 85036 Phone (602) 716-5552 Fax: (602) 716-9894
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Morenci Safe Production Standard	Standard 2.14	
	OHSAS 18001:2007	4.4.6
Hand Tools	Revision #	00
	Revision Date	N/A
	Effective Date	04/30/2012
	Document Owner	Health and Safety
Approvals:		
Senior VP Morenci Operations: 11/22/2011	Safety Steering Committee: Approved 11/22/2011	

1.0 PURPOSE:

Hand tools in poor condition or misused are a major cause of accidents in the workplace. Proper maintenance and necessary replacement of hand tools are critical to reducing accidents and injuries. To prevent injuries it is necessary that each individual ensure that their tools are safe to use, in good repair, adequate for the job, and free of defects.

2.0 SCOPE:

This standard addresses the minimum requirements of occupational safety and health (OH&S) matters in regard with managing the use of hand tools. All employees, contractors, and vendors on Morenci Operations property will comply with all elements of this standard. Divisions, Departments and Contractors may implement their own procedure that meets or exceeds this document's requirements.

3.0 TERMS, DEFINITIONS AND ABBREVIATIONS

Terms and definitions which apply to this standard are:

3.1. Hand Tool: A tool that is portable, both electrically and non-electrically powered, such as hammers, chisels, trolleys, etc. used by a worker to perform assigned tasks such as maintenance, installations, repairs and adjustments on equipment or property.

3.2. Qualified person: one with extensive knowledge, training, or experience who is capable of designing, analyzing and evaluating hand tools to the extent required by this standard.

3.3. Tool Modification: any change of the components, size, configuration or function of a tool beyond that originally designed by the manufacturer or qualified individual. Replacement of same in kind tool components or the addition of manufacturer approved attachments or accessories is not considered modification under this standard.

4.0 RESPONSIBILITIES:

4.1 Supervisors will ensure that their employees understand and follow this standard, including training on the use and care of hand tools applicable to their areas and work duties. Employees will be provided with the tools and P.P.E. necessary to complete all work in compliance with this standard. Supervisor's duties include evaluation of the work to be performed, determination of the means of protection that will be used, and adherence to this standard. The supervisor must ensure daily, or more often if required, that the site conditions are safe for the employees to work.

4.2 Employees will follow this standard and notify their supervisor of any situations that do not comply with this standard. Employees will be responsible for learning how to use their hammering tools and P.P.E. properly, conduct a pre-use inspection.

4.3 Management will provide resources for supervisors and employees to comply with this standard. Resources may include information, training, time, money and equipment.

4.4 Health and Safety Manager will provide or make available annual training for all employees who might reasonably be affected by this standard. All training shall be documented, including course content.

4.5 Project Managers will ensure that contractors are informed of the standard and that contractors understand the requirement for compliance with the standard, including day to day oversight.

5.0 STANDARDS OF PERFORMANCE

GENERAL REQUIREMENTS

5.1 Workers must inspect their hand tools before their use to ensure that they are in proper working order. Damaged or defective tools must be reported to the supervisor and must be repaired or removed from service.

5.2 Supervisors must inspect the tools of all apprentices and craftspeople at least twice a year to ensure that tools are in proper working condition and meet requirements. Inspection lists must be prepared, inspections must be made, and records must be kept under the direction of the respective Job Site maintenance superintendent.

5.3 Tools fabricated internally for a specific purpose shall be designed and constructed by a qualified individual to ensure that they will not create a hazard through their use. Tool modifications shall be done in accordance with manufacturer specifications. All new tools and tool modifications shall undergo a management of change review.

5.4 Proper and appropriate personnel protective equipment must be worn when using all tools.

5.5 All tools must be cleaned and properly stored after use. Each tool must have its own storage area to prevent damage. This is particularly important with power tools.

5.6 Tools must not be used beyond their manufacturer's designed capacity since such use may create a personal hazard. Tools must be used solely for their intended purpose. The designed capacity of tools must not be exceeded by unauthorized attachments.

5.7 A hand tool should never be used when a power tool is more appropriate.

5.8 Power drills, disc sanders, grinders, and circular saws (when used in the hand-held mode) must be operated with controls that require constant hand pressure.

5.9 Circular saws must not be equipped with devices that lock onto the operating controls.

5.10 Power saws, grinders, and other power tools must have proper guards in place at all times and must be properly grounded or equipped with insulating properties. Those with automatically adjusting guards must be inspected for proper movement.

5.11 Power tools must be hoisted or lowered by hand line and never by the cord or hose.

5.12 All fuel-powered tools must be shut down while being refueled. Smoking is prohibited during refueling operations. Other nearby sources of ignition, such as burning and welding, also

must be halted during refueling operations.

5.13 Chisels, screwdrivers, and pointed tools should never be carried edge or point up in a pocket. They should be carried in a toolbox, cart, carrying belt, tool pouch, or in the hand with points and cutting edges away from the body.

5.14 Inspect and check the following common hand tools:

A. Screwdrivers: Ensure that handles are smooth and clean and that bits are sharp and square. A sharp square-edged bit will not slip as easily as a dull rounded one and requires less pressure. When working around electrical-current-bearing equipment, use an insulated screwdriver as a secondary precaution.

B. Hammers: Ensure that handles are unbroken and clean and that the face of the head is smooth and clean. Hammers are made in various types and sizes, with varying degrees of hardness, and different configurations for specific purposes. Use the correct hammer for the correct purpose. Inspect hammer head before use. Mushroomed edges shall be dressed before use. Utilize a grinder or saw to dress. Do not use torch to dress hammer head.

1. Common Nail Hammers: These are designed for driving unhardened common nails, finishing nails, and nail sets by using the center of the hammer face. They are made with a curved, straight, or ripping claw.
2. Ball-Peen Hammers: These are designed for striking chisels and punches and for riveting, shaping, and straightening unhardened metal.
3. Sledge Hammers: Sledge hammers are designed for general sledging operations in striking wood, metal, concrete, or stone.
4. Air Hammers:

Employees shall inspect air hammer and bits before use.
Employees shall ensure that the bit is at a straight angle when using air hammer.
Do not use air hammer to drive metal on or off.

WARNING: Always wear safety glasses when using a hammer. A hammer blow should always be struck squarely. Avoid glancing blows.

SPECIFIC REQUIREMENTS

5.15 METAL to Metal Contact (Striking Tools) - The following information regarding Metal-to- Metal work is intended to address the safety aspects associated with performing tasks where Metal-to-Metal chipping may occur.

5.15.1 When at all possible, hard surface metals shall not be struck with a metal hammer. Use of wooden blocks, Teflon paddles, or dead blow hammers should be utilized.

5.15.2 Where tasks are identified that require Metal to Metal contact area management in conjunction with the health and safety department shall use risk management techniques and the hierarchy of controls to reduce the likelihood of injuries stemming from flying debris

5.15.3 Only those involved in the task shall be in the immediate vicinity (within 6ft of the striking area or other established boundary) of the work when Metal-to-Metal contact is being made. When routine work requires Metal to Metal contact near travelways, work platforms or operator stations; barriers shall be installed that help to mitigate the likelihood of stray material contact.

5.15.4 All employees involved in the task shall wear the following PPE when Metal-to-Metal contact is occurring:

i. Safety glasses and/or goggles
ii. Face shield
iii. Leather work gloves
iv. Leather sleeves, apron and/or leggings or Kevlar clothing covering entire torso, arms, and legs

5.15 Punches: Punches are designed to mark metal and other materials softer than the point end, to drive and remove pins, and to align holes. Never use a punch with a mushroomed struck face or with a dull, chipped, or deformed point. Any bent, cracked, or chipped punch must be removed from service.

5.17 Chisels: Cold chisels have a cutting edge for cutting, shaping, and removing metal softer than the cutting edge. Factors determining the selection of a cold chisel are the material to be cut, the size and shape of the tool, and the depth of the cut to be made. Ball chisels held by one person and struck by another require the use of tongs or a chisel holder to guide the chisel.

5.18 Files: Ensure that tangs are protected by handles and that teeth are sharp and clean. The correct way to hold a file is to grasp the handle firmly in one hand and use the thumb and forefinger of the other to guide the point. Push the file forward while bearing down on it. Release the pressure and bring the file back to its original position. Never use a file without a smooth, crack-free handle. Select the proper file for the job.

5.19 Knives: Ensure that the handle is guarded and that the blade is sharp. The cutting stroke should be away from the body. Avoid jerky motions. Keep knives and other sharp hand tools separated from other tools. Wipe the blade with a towel or cloth, with the knife's sharp edge turned away from the hand. Do not substitute knives for can openers, screwdrivers, or ice picks.

5.20 Shovels: Keep shovel edges trimmed, and check handles for splinters. When not in use, hang up shovels, stand them against walls, or keep them in racks or boxes. Only wooden or plastic handles are permitted on shovels, hoes, and similar tools.

5.22 Wrenches: Safe use of all wrenches requires that the user always be alert and prepared for the possibility that the wrench may slip, the fastener may suddenly turn free, or the wrench or fastener may break. The user must always inspect the wrench for flaws.

5.22.1 Open-End Wrenches: Open-end wrenches have strong jaws and are satisfactory for medium-duty turning.

5.22.2 Box and Socket Wrenches: These wrenches are necessary for a heavy pull. Never overload the capacity of a wrench by using a pipe extension on the handle or by striking the handle with a hammer. For extra stubborn bolts and nuts, use a heavy duty, sledgetype box wrench. When possible, use penetrating oil to loosen tight nuts.

5.22.3 Socket Wrenches: Socket wrenches should be kept clean of dirt and grime inside the socket to ensure that the tool fits securely on the bolt or nut.

5.22.4 Adjustable Wrenches: Adjustable wrenches are generally recommended for light-duty jobs. Place the adjustable wrench on the nut with the open jaws facing the user; wrenches should be pulled, not pushed.

5.22.5 Pipe Wrenches: Pipe wrenches both straight and chain tong, must have sharp jaws and be kept clean to prevent their slipping. The handle of every wrench is designed to be long enough for the maximum allowable safe pressure. Do not use handle extensions to gain extra turning power unless the wrench is so designed. Never use a pipe wrench on nuts or bolts.

Note: Pliers may be used for gripping and cutting operations, but they are not a substitute for a wrench.

6.0 USING HAMMERS AND BARS IN CLOSE QUARTERS

6.1 SPECIAL EQUIPMENT REQUIRED - Work gloves, (Metal to Metal contact PPE if applicable)

6.2 Hammers and bars serve many purposes throughout the Job Site including:

- Unplugging Hoppers, chutes, and transfer points that have become blocked with wet or lumpy material.
- Prying open inspection doors and covers.
- Serving as levers to lift objects for easier handling or better gripping.

Using hammers and bars can be hazardous any time, but the danger greatly increases when these tools are used near other equipment, structures, or personnel. Since hammers and bars are often used in close or restricted quarters, extra care must be taken to prevent injury (e.g., being struck by the tools or caught in a pinch point).

SPECIFIC REQUIREMENTS

6.3 Thoroughly examine the work area. Determine how much room there is to work, including side and overhead clearances. Clean up spills in the area, particularly oil or grease, that can cause slippery footing.

6.2 If the work is to be done in, on, or near power equipment, lock it out according to the established lock and tag standard.

6.3 Wear gloves and properly fitting safety glasses when using bars or hammers.

6.4 Use only bars that are in good condition; bars that are not in good condition must be removed from service. Bars must be straight, free of sharp snags, and have ends that are not badly mushroomed. If necessary, bars should be sharpened and properly shaped by the maintenance department before use.

6.5 Do not stand on or jerk a bar to increase the force of the leverage. Do not straddle the bar. Keep clear of the bar's potential path of travel.

6.6 Keep hands and other body parts clear of striking points when using a hammer.

6.7 Do not hammer on any part of the bar except the end intended for that purpose.

6.8 Do not hammer on any part of another hammer or similar tool. The extreme hardness of these tools can cause them to splinter, sending metal fragments flying at great velocity throughout the immediate vicinity.

6.9 Use adequate lighting in the working area.

6.10 Return tools to their proper storage area when the job is completed.

WARNING: Be careful and know personal limits! Avoid personal injury and injury to others while working in close quarters. Failure to remain outside of the Line of Fire may result in significant injuries stemming from the inadvertent release of hand tools or pieces of material being struck.

7.0 REFERENCE DOCUMENTS

7.1 None

8.0 RECORDS

8.1 None generated

9.0 APPENDICES

9.1 None

10.0 REVIEW AND CHANGE

All changes, modifications and/or revisions must be documented on the table below:

Description of Changes to this Document

SECTION S

IN PIT DRIVING

P.O. Box 20825 Phoenix, Arizona 85036 Phone (602) 716-5552 Fax: (602) 716-9894
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Morenci Safe Production Standard	3.1	
	OHSAS 18001:2007	4.4.6
IN-PIT DRIVING	Revision #	00
	Revision Date	N/A
	Effective Date	3/30/2012
	Document Owner	Mine Operations
Approvals:		
Senior VP Morenci Operations: 3/30/2012	*Safety Steering Committee: 2/24/2012*	

1.0 PURPOSE:

There are many substantial inherent risks associated with in-pit driving; therefore discipline for driving can only be established through adequate training and verification of competency. This standard establishes the minimum requirements for all left handed mine driving.

2.0 SCOPE:

At the Freeport-McMoRan Morenci site, this standard applies to all employees, contractors, vendors and visitors that may work or travel in the mine.

3.0 TERMS, DEFINITIONS AND ABBREVIATIONS

3.1 **Mine** – As used in this standard, includes all areas of the FMI Morenci property where left-hand driving is mandated.

3.2 **Mobile Equipment** – means wheeled or track-mounted equipment such as trucks, dump trucks, front-end loaders, dozers, buses, forklifts, light vehicles, etc. utilized as work tool and/or mode moving or transporting either earth material, cargo loads, or passengers.

3.3 **Hazardous Zone** – an area in which the likelihood of inadvertent contact between haulage equipment and other forms of equipment is increased due to the design, layout, configuration and traffic flow within the area.

3.4 **Heavy Vehicles and Equipment** – As used in this standard, includes all vehicles which would be considered too large to normally travel on public roads and highways.

3.5 **Light Vehicles** – As used in this standard, includes any vehicle small enough to travel on public roads and highways normally.

3.6 **Employee Transport Vehicle** – A light vehicle used to transport employees to various areas of the mine and has the capability of seating more than five passengers.

3.7 **Light Vehicle Access Route (LVA)** – In the mine, roadways separated from routine haulage traffic through established berms or barriers specifically designated for light vehicles only. At times heavy equipment may utilize LVAs for activities such as dust control and maintenance.

4.0 RESPONSIBILITIES:

4.1 Management will ensure all employees and contractors that work within their respective division understand and adhere to all requirements of this standard. If the manager's primary responsibilities are within the mine, they will ensure road controls are adequate to support safe driving in their areas.

4.2 Health and Safety will maintain records for in-pit driving authorization in accordance with the In Pit Driving Authorization Standard. Health and Safety will also audit to this standard.

4.3 Employees and contractors will ensure they comply with all requirements of this standard. They must also recognize that non-adherence to this standard may result in revoking driving rights in the mine or even expulsion from the mine.

4.4 Training Department will develop and provide In Pit Driver Training in accordance with the In Pit Driving Authorization Standard.

5.0 STANDARDS OF PERFORMANCE

5.1 Vehicles may only operate on mine haul roads if they meet the following requirements:

a. All self-propelled mobile equipment entering or working in the mine, if the height of the vehicle is less than 12 feet, must have a buggy whip.
   1. The buggy whip must extend, at minimum, 12 feet from ground level. This will allow added visibility of light vehicles.
   2. The buggy whip must be equipped with a flag and light at the top. The light must remain functional during operation in the mine and emit light from the front and rear.

b. Self-propelled mobile equipment that is higher than 12ft in height must be equipped with illuminated markers visible from all approaches and placed at least 12ft above ground level.

c. Headlights must be on during all vehicle operation in the mine to aid with visibility.

d. All vehicles working in or entering the mine must have a discrete identifier, such as a vehicle number. This will allow workers needing to contact the vehicle operator to be able to do so without difficulty.

e. Pre-Use equipment inspections will take place once per shift and be documented on approved inspection forms prior to the operation of any vehicle or equipment within the mine. Each Operator shall conduct an inspection prior to operating the vehicle to ensure the vehicle is safe to operate.
   1. The inspection form will identify key safety components which are required to function during operation. If any of these items are identified as non-functional, the vehicle or equipment will be tagged with an “out of service” tag and will not be used until the non-functional item is repaired.
   2. Heavy mine equipment may utilize orange flags to show an out of order state.
   3. On the inspection document, the non-functional items will be accompanied by a description and nature of the problem.

f. All vehicles traveling in the mine (beyond the LVA route) must be equipped with two way radios. If a radio is not provided inside the vehicle, a hand held radio must be provided to the vehicle operator.

g. If operating employee transport vehicles (man vans, buses), the operator must ensure that all employees are using their PPE (hard hat if not exempt, safety glasses, appropriate dress attire, and hard toe boots), and that they are properly wearing seat belts. The only exception to this is when seat belts are not provided by the manufacturer of the vehicle.
   1. If a passenger refuses to comply with this requirement, the employee transport vehicle will not be moved. Any such incident must be immediately reported to a supervisor and corrected.
   2. At no time will employees be allowed to move from one place to another within their employee transport vehicle while it is in motion. They must remain seated.
   3. Passenger loading and unloading will only take place while the vehicle is at a complete stop.

h. ATVs and UTVs are not permitted to operate on mine haul roads. Refer to specific division requirements for operating these types of vehicles.

5.2 Driving to work locations or designated parking areas

a. Driving, unless otherwise posted, is left handed within the boundaries of the mine. Because of the unique rules surrounding left handed driving, all operators must go through and pass a mine driving course before they are allowed to operate a vehicle within the mine. (*Refer to Procedures for Pit Driving Authorization*)
b. Prior to the start up of any self-propelled mobile equipment in the mine, an alarm or equivalent warning device must sound, which will give adequate warning to workers in close proximity to that equipment. Additionally, prior to any movement of any self propelled mobile equipment, there must be an alarm/warning device that sounds.
    1. The alarm/warning device must be audible above all surrounding noise.
    2. Adequate time (about 5 seconds) should be given between the sounding of the alarm/warning device and the startup and subsequent movement of the vehicle.
    3. For all equipment with horns the following rules apply:
        A. Sound horn once prior to equipment start up
        B. Sound horn twice prior to movement forward
        C. Sound horn three times prior to movement backwards, unless a backup alarm is provided.
c. The maximum speed limit allowed in pit is 45 miles per hour. This speed may be reduced depending on road conditions, visibility factors, and additional department procedures. Reasonable judgment must be exercised when determining adequate speed for the existing conditions. Areas with lower specified speed limits must be observed. The only vehicles that may exceed the 45 mile per hour speed limit are emergency response units, and vehicles carrying emergency responders. If response to emergencies requires exceeding the maximum allowable speed, control of the responding vehicle must be maintained.
d. At mine intersections, the right-of-way is always allotted to heavy mining equipment over smaller vehicles because of visibility constraints.
    1. Haul trucks and water trucks have significant visibility restrictions because of the cab location. For this reason all haulage/water trucks have the right-of-way to any other vehicle on the haul road. The only exception to this is for emergency vehicles, vehicles maintaining roadways which are equipped with strobe lights in the on position, and vehicles hauling blasting and explosive material.
    2. All smaller vehicles, if not in an emergency or road maintaining state, must yield to the vehicle on the left.
    3. Refer to specific divisional procedures for additional requirements.
e. When following haulage or water trucks, adequate distance must be maintained between vehicles. The established distance in Morenci is at minimum 150 ft, but may increase depending on road conditions.
f. When passing vehicles and equipment on a haul road, adequate communication must be maintained between operators.
    1. Passing any heavy mine equipment is strictly prohibited on haul roads when permission is not granted.
    2. If a vehicle wishes to pass heavy mine equipment, that vehicle must transmit the request to pass by radio and receive confirmation by the equipment operator that they are clear to pass.
        A. The operator making the request to pass must identify themselves by vehicle number and they must clearly identify who they are speaking to by vehicle number. The equipment operator must then confirm receipt of the transmission the same way, and identify if the requestor is clear to pass.

B. In cases where radio communication is not established by the operator requesting to pass (example: road maintenance equipment using a different frequency) the following requirements apply:
   I. The equipment operator must have a clear line of site back to the employee requesting to pass (example: a bull dozer with an un-obstructed view behind him, not needing to rely solely on mirrors to see the vehicle following)
   II. The equipment operator must give a clear indication, such as an obviously discrete wave, that a pass is allowed.
C. The equipment operator granting permission to be passed must ensure that permission is only granted when the road is clear and there is an adequate line of vision in front of the equipment (there must be no blind corners or hills that may restrict visibility). When passing, speed should never exceed 35 miles per hour.

5.3 When approaching heavy equipment, it is critical to maintain direct visibility to the equipment cab regardless of if there is an operator in it or not. Approach should occur from the cab/operator side of the heavy equipment and remain outside hazardous areas.
   a. If there is an operator in the cab, permission to approach must be granted, either by radio or with a clear visible signal. When receiving permission by radio, the vehicle operator approaching the heavy equipment must identify themselves by vehicle number and identify the equipment they are wishing to approach. The heavy equipment operator must respond using vehicle numbers in the same manner.
   b. If an operator is not seen in the cab, the approaching personnel will continue to maintain a clear line of sight to the cab and stay out of blind spots.
   c. Prior to approaching any equipment that has a swing-radius; permission must be granted in the same manner unless other operational controls are in place to prevent inadvertent contact.
   d. When leaving the equipment, communication with the operator must be made.

5.4 Procedures for parking equipment in the mine
   a. For general parking in the mine, refer to the FMMO Parking Standard.
   b. Wheel chocks or ditches will be utilized for all wheeled and track mounted equipment parking in the mine on a grade, regardless of size, except when ground engagement devices (buckets, blades, ripper shanks, etc.) are set firmly on the ground.
   c. Vehicles shall not park within blind areas of heavy mine equipment unless controls are in place to prevent inadvertent movement of the equipment. When practicable light vehicles shall park away from heavy equipment within designated parking areas.
   d. Equipment shall not be left unattended within hazardous zones of active mining areas (i.e. dumps, Q points, shovel pits, fueling stations and haulage roads) normally traveled by haulage equipment unless the following controls are in place:
      1. The location and status of the unattended equipment is communicated to all haulage traffic reasonably likely to be affected by the equipment (if the equipment will remain in the hazardous area for multiple shifts the communication must be given to each affected crew); and
      2. The equipment is identified using methods that will increase the likelihood that haulage traffic is able to readily identify the location of the equipment; and
      3. The vehicle is removed from the hazardous area within 12 hours of identification or the equipment is segregated from haulage traffic through the use of berms, tires or other substantial barriers.

If unattended equipment is identified which does not conform to the requirements established above, employees are responsible for contacting the 402 command center or a mine management representative so the unsafe condition can be resolved.

e. Persons shall not work, travel or park between machinery or equipment and a highwall or bank where the machinery or equipment may hinder escape from falls or slides of the highwall or bank. Travel is permitted when necessary for persons to dismount. Unless barricades, catch berms or other controls exist no persons shall park within 50ft or the height of the first bench (whichever is higher) of a highwall. Where work is required within 50ft of a high wall the workgroup shall inspect the work location and complete a high wall permit.

5.5 Restricted areas for driving

a. Restrictions to specific areas of the mine may be established based on existing or potential hazards, and will be controlled through physical barricades where feasible.

b. For most closed off areas, physical barricades will be of the type and configuration to restrict access to the largest piece of prohibited equipment (example: haul truck tires blocking a dump prohibit haul trucks from entering, but they do not prohibit pickup trucks from entering).

c. Where physical barricades are not used, signage shall be posted in a readily identifiable location warning of the hazards, restrictions, and appropriate contact information.

6.0 REFERENCE DOCUMENTS

6.1 Morenci safe operating procedure – *Haul Truck Operation Around Heavy Duty Shop Areas*

6.2 Morenci safe operating procedure – *Driving in the Pit*

6.3 FMMOP-0011 – *Procedure for Pit Driving Authorization*

7.0 RECORDS

Name of the Document	Responsible for Control	Records Retention
Training Records	Each Department	5 Years Corporate ID: TRA-07-030
In Pit Driving Standard	Mine Operations	Permanent
Pre-Operation (Pre-use) Inspection of Vehicle	Each Department	2 Years Corporate ID: TRA-07-030

8.0 APPENDICES

8.1 APPENDIX 8.1 – Haulage Equipment Blind Zones

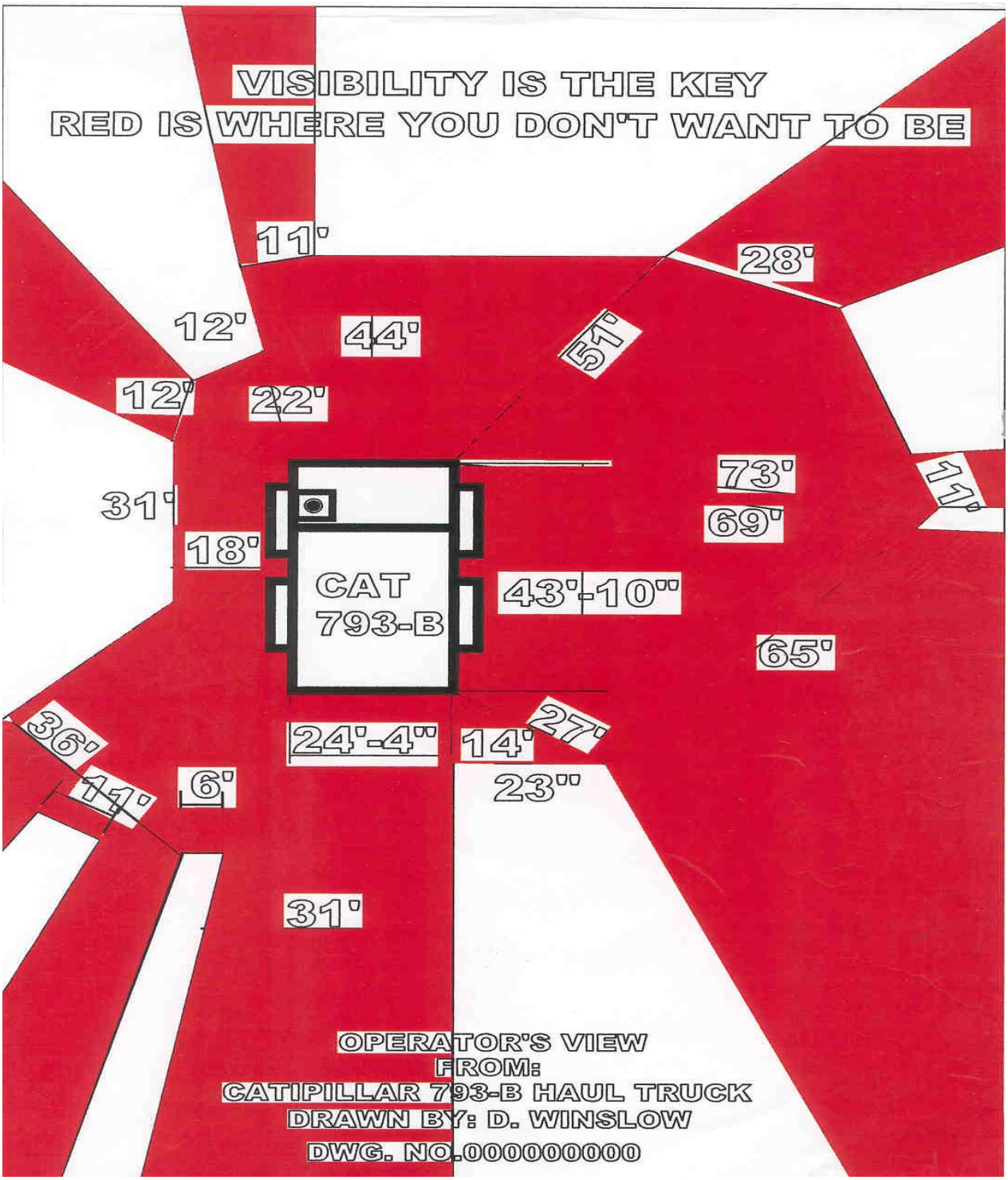
9.0 REVIEW AND CHANGE

All changes, modifications and/or revisions must be documented on the table below:

Description of Changes to this Document

APPENDIX 8.1 – Haulage Equipment Blind Zones

A *blind area is the area around a vehicle* or piece of construction/mining equipment that is not visible to the operators, either by direct line-of-sight or indirectly by use of internal and external mirrors


VISIBILITY IS THE KEY
RED IS WHERE YOU DON'T WANT TO BE
11'
28'
12'
44'
51'
12'
22'
73'
11'
31'
69'
18'
CAT
793-B
43'-10"
65'
36'
24'-4"
14'
27'
11'
6'
23"
31'
OPERATOR'S VIEW
FROM:
CATIPILLAR 793-B HAUL TRUCK
DRAWN BY: D. WINSLOW
DWG. NO.000000000