Jim Connelly Masonry, Inc.

Safety and Health Program

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Backlifting Safety

Policy:

The Company will ensure that potential back injury risk factors within the facility are evaluated and controlled. This standard practice instruction is intended to address comprehensively the issues of; evaluating and identifying back injury hazards, evaluating engineering controls, work practices, administrative controls, and establishing appropriate procedures.

Responsibility:

The Safety and Health Manager is responsible for all facets of this program and has full authority to make necessary decisions to ensure success of the program. The Safety and Health Manager will develop written detailed instructions covering each of the basic elements in this program, and is the sole person authorized to amend these instructions. The Safety and Health Manager is authorized to halt any operation of The Company where there is danger of serious personal injury.

The Company Workplace Back Safety:

Written Program- The Company will review and evaluate this standard practice instruction:

On an annual basis
When changes occur to 29 CFR, that prompt revision of this document
When facility operational changes occur that require a revision of this document
When there is an accident or close-call that relates to this area of safety
Review the program any time these procedures fail

Effective implementation of this program requires support from all levels of management within The Company. This written program will be communicated to all personnel that are affected by it. It encompasses the total workplace, regardless of the number of workers employed or the number of work shifts. It is designed to establish clear goals and objectives.

Training

Supervisors will determine whether training required for specific jobs will be conducted in a classroom or on-the-job. The degree of training provided shall be determined by the complexity of the job and the associated hazards.

Initial Training. Prior to job assignment, The Company shall provide training to ensure that the hazards associated with predesignated job skills are understood by employees and that the knowledge and skills required for the safe application and usage of work place procedures and equipment, are acquired by employees. The training shall include the following:

Each affected employee shall receive training in the recognition of back injury hazards involved with a particular job, and the methods and means necessary for safe work. Training course content. All new and current workers, who work in areas where there is reasonable likelihood of back injury, will be kept informed through continuing education programs. Initial and refresher training will, as a minimum, cover the following:

Back hazards associated with the job.
Lifting techniques.
Potential health effects of back injury.
Back injury precautions.
Proper use of protective clothing and equipment.
Use of engineering controls.

Responsibility. Employees are responsible for following proper work practices and control procedures to help protect their health and provide for the safety of themselves and fellow employees, including instructions to immediately report to their supervisor of any significant back injury.

Refresher Training. Scheduled refresher training will be conducted on a(n) _____ basis.

Retraining shall be provided for all authorized and affected employees whenever there is a change in their job assignments, a change in equipment or processes that present a new hazard, or when their work takes them into other hazard areas.

Additional retraining shall also be conducted whenever a periodic inspection reveals, or whenever The Company has reason to believe, that there are deviations from or inadequacies in the employee's knowledge of known hazards, or use of equipment or procedures.

The retraining shall reestablish employee proficiency and introduce new equipment, new lifting procedures or revised control methods and procedures, as necessary.

Training Certification. The Company shall certify that employee training has been accomplished and is being kept up to date. The certification shall contain a synopsis of the training conducted, each employee's name, and dates of training.

Back Disorder Risk Factors. Identification of hazards will be based on risk factors such as, conditions of a job process, work station, or work methods that contribute to the risk of developing problems associated with back disorders. Not all of these risk factors will be present in every job containing stressors, nor is the existence of one of these factors necessarily sufficient to cause a back injury. Supervisors will use the following known risk factors to isolate and report suspected problem areas:

Back Disorder Risk Factors.

- Repetitive and/or prolonged activities
- Bad body mechanics such as
  - Continued bending over at the waist
  - Continued lifting from below the knuckles
  - Continued lifting above the shoulders
  - Twisting at the waist
  - Twisting at the waist while lifting
  - Lifting or moving objects of excessive weight
  - Lifting or moving object of asymmetric size
  - Prolonged sitting with poor posture
  - Lack of adjustable
    - Chairs
    - Footrests
    - Body supports
    - Work surfaces at work stations
  - Poor grips on handles
  - Slippery footing
  - Frequency of movement
  - Duration and pace
  - Stability of load
  - Coupling of load
    - Type of grip
  - Reach distances
  - Work height

Safe Lifting Techniques. Employees shall use a pushcart or other material-handling device as necessary. They shall also ask a co-worker for help if no device is available. The following situations show basic lifting techniques to avoid injury:

Employees shall be trained using the following lifting and placing of load strategies:

Lifting or lowering from a high place

- Stand on a platform instead of a ladder
- Lift the load in smaller pieces, if possible
- Slide the load as close to ones self as possible before lifting
- Grip firmly and slide it down
- Get help when they need it to avoid injury

Lifting from hard-to-get-at places

- Get as close to the load as possible

Keep the back straight, stomach muscles tight
Push buttocks out behind you
Bend the knees
Use leg, stomach, and buttock muscles to lift -- not the back

Lifting drums, barrels, and cylinders
Use mechanical assists
Be aware that loads can shift
Get help if load is too heavy

Awkward objects
Bend the knees with feet spread
Grip the top outside and bottom inside corners
Use the legs to lift, keeping back straight

Shoveling
Make sure their grip and balance are solid
Tighten the abdomen as they lift
Keep the shovel close to the body
Use the strength of the thigh muscles to bring them to an upright position
Increase their leverage by keeping their bottom hand low and toward the blade

General safety tips
Don't lift objects over their head
Don't twist the body when lifting or setting an object down
Don't reach over an obstacle to lift a load
Pace ones self to avoid fatigue

Bloodborne Pathogens

(a) Scope and Application. This section applies to all occupational exposure to blood or other potentially infectious materials as defined by paragraph (b) of this section.

(b) Definitions. For purposes of this section, the following shall apply:

"Assistant Secretary" means the Assistant Secretary of Labor for Occupational Safety and Health, or designated representative.
"Blood" means human blood, human blood components, and products made from human blood.
"Bloodborne Pathogens" means pathogenic micro-organisms that are present in human

blood and can cause disease in humans. These pathogens include, but are not limited to, hepatitis B virus (HBV) and human immunodeficiency virus (HIV).

"Clinical Laboratory" means a workplace where diagnostic or other screening procedures are performed on blood or other potentially infectious materials.

"Contaminated" means the presence or the reasonably anticipated presence of blood or other potentially infectious materials on an item or surface.

"Contaminated Laundry" means laundry which has been soiled with blood or other potentially infectious materials or may contain sharps.

"Contaminated Sharps" means any contaminated object that can penetrate the skin including, but not limited to, needles, scalpels, broken glass, broken capillary tubes, and exposed ends of dental wires.

"Decontamination" means the use of physical or chemical means to remove, inactivate, or destroy bloodborne pathogens on a surface or item to the point where they are no longer capable of transmitting infectious particles and the surface or item is rendered safe for handling, use, or disposal.

"Director" means the Director of the National Institute for Occupational Safety and Health, U.S. Department of Health and Human Services, or designated representative.

"Engineering Controls" means controls (e.g., sharps disposal containers, self-sheathing needles) that isolate or remove the bloodborne pathogens hazard from the workplace.

"Exposure Incident" means a specific eye, mouth, other mucous membrane, non-intact skin, or parenteral contact with blood or other potentially infectious materials that results from the performance of an employee's duties.

"Handwashing Facilities" means a facility providing an adequate supply of running potable water, soap and single use towels or hot air drying machines.

"Licensed Healthcare Professional" is a person whose legally permitted scope of practice allows him or her to independently perform the activities required by paragraph (f) Hepatitis B Vaccination and Post-exposure Evaluation and Follow-up.

"HBV" means hepatitis B virus.

"HIV" means human immunodeficiency virus.

"Occupational Exposure" means reasonably anticipated skin, eye, mucous membrane, or parenteral contact with blood or other potentially infectious materials that may result from the performance of an employee's duties.

"Other Potentially Infectious Materials" means:

(1) The following human body fluids: semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, saliva in dental procedures, any body fluid that is visibly contaminated with blood, and all body fluids in situations where it is difficult or impossible to differentiate between body fluids;

(2) Any unfixed tissue or organ (other than intact skin) from a human (living or dead); and

(3) HIV-containing cell or tissue cultures, organ cultures, and HIV- or HBV-containing culture medium or other solutions; and blood, organs, or other tissues from experimental animals infected with HIV or HBV.

"Parenteral" means piercing mucous membranes or the skin barrier through such events as needlesticks, human bites, cuts, and abrasions.

"Personal Protective Equipment" is specialized clothing or equipment worn by an employee for protection against a hazard. General work clothes (e.g., uniforms, pants, shirts or blouses) not intended to function as protection against a hazard are not considered to be personal protective equipment.

"Production Facility" means a facility engaged in industrial-scale, large-volume or high concentration production of HIV or HBV.

"Regulated Waste" means liquid or semi-liquid blood or other potentially infectious materials; contaminated items that would release blood or other potentially infectious materials in a liquid or semi-liquid state if compressed; items that are caked with dried blood or other potentially infectious materials and are capable of releasing these materials during handling; contaminated sharps; and pathological and microbiological wastes containing blood or other potentially infectious materials.

"Research Laboratory" means a laboratory producing or using research-laboratory-scale amounts of HIV or HBV. Research laboratories may produce high concentrations of HIV or HBV but not in the volume found in production facilities.

"Source Individual" means any individual, living or dead, whose blood or other potentially infectious materials may be a source of occupational exposure to the employee. Examples include, but are not limited to, hospital and clinic patients; clients in institutions for the developmentally disabled; trauma victims; clients of drug and alcohol treatment facilities; residents of hospices and nursing homes; human remains; and individuals who donate or sell blood or blood components.

"Sterilize" means the use of a physical or chemical procedure to destroy all microbial life including highly resistant bacterial endospores.

"Universal Precautions" is an approach to infection control. According to the concept of Universal Precautions, all human blood and certain human body fluids are treated as if known to be infectious for HIV, HBV, and other bloodborne pathogens.

"Work Practice Controls" means controls that reduce the likelihood of exposure by altering the manner in which a task is performed (e.g., prohibiting recapping of needles by a two-handed technique).

(c) Exposure Control.

(1) Exposure Control Plan.

(i) The Company having an employee(s) with occupational exposure as defined by paragraph (b) of this section shall establish a written Exposure Control Plan designed to eliminate or minimize employee exposure.

(ii) The Exposure Control Plan shall contain at least the following elements:

(A) The exposure determination required by paragraph (c)(2),

(B) The schedule and method of implementation for paragraphs (d) Methods of Compliance, (e) HIV and HBV Research Laboratories and Production Facilities, (f) Hepatitis B Vaccination and Post-Exposure Evaluation and Follow- up, (g) Communication of Hazards to Employees, and (h) Recordkeeping, of this standard, and

(C) The procedure for the evaluation of circumstances surrounding exposure incidents as required by paragraph (f)(3)(i) of this standard.

(iii) The Company shall ensure that a copy of the Exposure Control Plan is accessible to employees in accordance with 29 CFR 1910.20(e).

(iv) The Exposure Control Plan shall be reviewed and updated at least annually and whenever necessary to reflect new or modified tasks and procedures which affect occupational exposure and to reflect new or revised employee positions with occupational exposure.

(v) The Exposure Control Plan shall be made available to the Assistant Secretary and the Director upon request for examination and copying.

(2) Exposure Determination.

(i) The Company who has an employee(s) with occupational exposure as defined by paragraph (b) of this section shall prepare an exposure determination. This exposure determination shall contain the following:

(A) A list of all job classifications in which all employees in those job classifications have occupational exposure;

(B) A list of job classifications in which some employees have occupational exposure, and

(C) A list of all tasks and procedures or groups of closely related task and procedures in which occupational exposure occurs and that are performed by employees in job classifications listed in accordance with the provisions of paragraph (c)(2)(i)(B) of this standard.

(ii) This exposure determination shall be made without regard to the use of personal protective equipment.

(d) Methods of Compliance.

(1) General. Universal precautions shall be observed to prevent contact with blood or other potentially infectious materials. Under circumstances in which differentiation between body fluid types is difficult or impossible, all body fluids shall be considered potentially infectious materials.

(2) Engineering and Work Practice Controls.

(i) Engineering and work practice controls shall be used to eliminate or minimize employee exposure. Where occupational exposure remains after institution of these controls, personal protective equipment shall also be used.

(ii) Engineering controls shall be examined and maintained or replaced on a regular schedule to ensure their effectiveness.

(iii) The Company shall provide handwashing facilities which are readily accessible to employees.

(iv) When provision of handwashing facilities is not feasible, the Company shall provide either an appropriate antiseptic hand cleanser in conjunction with clean cloth/paper towels or antiseptic towelettes. When antiseptic hand cleansers or towelettes are used, hands shall be washed with soap and running water as soon as feasible.

(v) The Company shall ensure that employees wash their hands immediately or as soon as feasible after removal of gloves or other personal protective equipment.

(vi) The Company shall ensure that employees wash hands and any other skin with soap and water, or flush mucous membranes with water immediately or as soon as feasible following contact of such body areas with blood or other potentially infectious materials.

(vii) Contaminated needles and other contaminated sharps shall not be bent, recapped, or removed except as noted in paragraphs (d)(2)(vii)(A) and (d)(2)(vii)(B) below. Shearing or breaking of contaminated needles is prohibited.

(A) Contaminated needles and other contaminated sharps shall not be bent, recapped or removed unless the employer can demonstrate that no alternative is feasible or that such action is required by a specific medical or dental procedure.

(B) Such bending, recapping or needle removal must be accomplished through the use of a mechanical device or a one-handed technique.

(viii) Immediately or as soon as possible after use, contaminated reusable sharps shall be placed in appropriate containers until properly reprocessed. These containers shall be:

(A) puncture resistant;

(B) labeled or color-coded in accordance with this standard;

(C) leakproof on the sides and bottom; and

(D) in accordance with the requirements set forth in paragraph (d)(4)(ii)(E) for reusable sharps.

(ix) Eating, drinking, smoking, applying cosmetics or lip balm, and handling contact lenses are prohibited in work areas where there is a reasonable likelihood of occupational exposure.

(x) Food and drink shall not be kept in refrigerators, freezers, shelves, cabinets or on countertops or benchtops where blood or other potentially infectious materials are present.

(xi) All procedures involving blood or other potentially infectious materials shall be performed in such a manner as to minimize splashing, spraying, spattering, and generation of droplets of these substances.

(xii) Mouth pipetting/suctioning of blood or other potentially infectious materials is prohibited.

(xiii) Specimens of blood or other potentially infectious materials shall be placed in a container which prevents leakage during collection, handling, processing, storage, transport, or shipping.

(A) The container for storage, transport, or shipping shall be labeled or color-coded according to paragraph (g)(1)(i) and closed prior to being stored, transported, or shipped. When a facility utilizes Universal Precautions in the handling of **all** specimens, the labeling/color-coding of specimens is not necessary provided containers are recognizable as containing specimens. This exemption only applies while such specimens/containers remain within the facility. Labeling or color-coding in accordance with paragraph (g)(1)(i) is required when such specimens/containers leave the facility.

(B) If outside contamination of the primary container occurs, the primary container shall be placed within a second container which prevents leakage during handling, processing, storage, transport, or shipping and is labeled or color-coded according to the requirements of this standard.

(C) If the specimen could puncture the primary container, the primary container shall be placed within a secondary container which is puncture-resistant in addition to the above characteristics.

(xiv) Equipment which may become contaminated with blood or other potentially infectious materials shall be examined prior to servicing or shipping and shall be decontaminated as necessary, unless the Company can demonstrate that decontamination of such equipment or portions of such equipment is not feasible.

(A) A readily observable label in accordance with paragraph (g)(1)(i)(H) shall be attached to the equipment stating which portions remain contaminated.

(B) The Company shall ensure that this information is conveyed to all affected employees, the servicing representative, and/or the manufacturer, as appropriate, prior to handling, servicing, or shipping so that appropriate precautions will be taken.

(3) Personal Protective Equipment.

(i) Provision. When there is occupational exposure, the Company shall provide, at no cost to the employee, appropriate personal protective equipment such as, but not limited to, gloves, gowns, laboratory coats, face shields or masks and eye protection, and mouthpieces, resuscitation bags, pocket masks, or other ventilation devices. Personal protective equipment will be considered "appropriate" only if it does not permit blood or other potentially infectious materials to pass through to or reach the employee's work clothes, street clothes, undergarments, skin, eyes, mouth, or other mucous membranes under normal conditions of use and for the duration of time which the protective equipment will be used.

(ii) Use. The Company shall ensure that the employee uses appropriate personal protective equipment unless the Company shows that the employee temporarily and briefly declined to use personal protective equipment when, under rare and extraordinary circumstances, it was the employee's professional judgment that in the specific instance its use would have prevented the delivery of health care or public safety services or would have posed an increased hazard to the safety of the worker or co-worker. When the employee makes this judgement, the circumstances shall be investigated and

documented in order to determine whether changes can be instituted to prevent such occurrences in the future.

(iii) Accessibility. The Company shall ensure that appropriate personal protective equipment in the appropriate sizes is readily accessible at the worksite or is issued to employees. Hypoallergenic gloves, glove liners, powderless gloves, or other similar alternatives shall be readily accessible to those employees who are allergic to the gloves normally provided.

(iv) Cleaning, Laundering, and Disposal. The Company shall clean, launder, and dispose of personal protective equipment required by paragraphs (d) and (e) of this standard, at no cost to the employee.

(v) Repair and Replacement. The Company shall repair or replace personal protective equipment as needed to maintain its effectiveness, at no cost to the employee.

(vi) If a garment(s) is penetrated by blood or other potentially infectious materials, the garment(s) shall be removed immediately or as soon as feasible.

(vii) All personal protective equipment shall be removed prior to leaving the work area.
(viii) When personal protective equipment is removed it shall be placed in an appropriately designated area or container for storage, washing, decontamination or disposal.

(ix) Gloves. Gloves shall be worn when it can be reasonably anticipated that the employee may have hand contact with blood, other potentially infectious materials, mucous membranes, and non-intact skin; when performing vascular access procedures except as specified in paragraph (d)(3)(ix)(D); and when handling or touching contaminated items or surfaces.

> **(A)** Disposable (single use) gloves such as surgical or examination gloves, shall be replaced as soon as practical when contaminated or as soon as feasible if they are torn, punctured, or when their ability to function as a barrier is compromised.
>
> **(B)** Disposable (single use) gloves shall not be washed or decontaminated for re-use.
>
> **(C)** Utility gloves may be decontaminated for re-use if the integrity of the glove is not compromised. However, they must be discarded if they are cracked, peeling, torn, punctured, or exhibit other signs of deterioration or when their ability to function as a barrier is compromised.

(D) If the Company, in a volunteer blood donation center, judges that routine gloving for all phlebotomies is not necessary then the Company shall:

(1) Periodically reevaluate this policy;
(2) Make gloves available to all employees who wish to use them for phlebotomy;
(3) Not discourage the use of gloves for phlebotomy; and
(4) Require that gloves be used for phlebotomy in the following circumstances:
(i) When the employee has cuts, scratches, or other breaks in his or her skin;
(ii) When the employee judges that hand contamination with blood may occur, for example, when performing phlebotomy on an uncooperative source individual; and
(iii) When the employee is receiving training in phlebotomy.

(x) Masks, Eye Protection, and Face Shields. Masks in combination with eye protection devices, such as goggles or glasses with solid side shields, or chin-length face shields, shall be worn whenever splashes, spray, spatter, or droplets of blood or other potentially infectious materials may be generated and eye, nose, or mouth contamination can be reasonably anticipated.

(xi) Gowns, Aprons, and Other Protective Body Clothing. Appropriate protective clothing such as, but not limited to, gowns, aprons, lab coats, clinic jackets, or similar outer garments shall be worn in occupational exposure situations. The type and characteristics will depend upon the task and degree of exposure anticipated.

(xii) Surgical caps or hoods and/or shoe covers or boots shall be worn in instances when gross contamination can reasonably be anticipated (e.g., autopsies, orthopedic surgery).

(4) Housekeeping.

(i) General. The Company shall ensure that the worksite is maintained in a clean and sanitary condition. The Company shall determine and implement an appropriate written schedule for cleaning and method of decontamination based upon the location within the facility, type of surface to be cleaned, type of soil present, and tasks or procedures being performed in the area.

(ii) All equipment and environmental and working surfaces shall be cleaned and decontaminated after contact with blood or other potentially infectious materials.

(A) Contaminated work surfaces shall be decontaminated with an appropriate disinfectant after completion of procedures; immediately or as soon as feasible when surfaces are overtly contaminated or after any spill of blood or other potentially infectious materials; and at the end of the work shift if the surface may have become contaminated since the last cleaning.

(B) Protective coverings, such as plastic wrap, aluminum foil, or imperviously-backed absorbent paper used to cover equipment and environmental surfaces, shall be removed and replaced as soon as feasible when they become overtly contaminated or at the end of the workshift if they may have become contaminated during the shift.

(C) All bins, pails, cans, and similar receptacles intended for reuse which have a reasonable likelihood for becoming contaminated with blood or other potentially infectious materials shall be inspected and decontaminated on a regularly scheduled basis and cleaned and decontaminated immediately or as soon as feasible upon visible contamination.

(D) Broken glassware which may be contaminated shall not be picked up directly with the hands. It shall be cleaned up using mechanical means, such as a brush and dust pan, tongs, or forceps.

(E) Reusable sharps that are contaminated with blood or other potentially infectious materials shall not be stored or processed in a manner that requires employees to reach by hand into the containers where these sharps have been placed.

(iii) Regulated Waste.

(A) Contaminated Sharps Discarding and Containment.

(1) Contaminated sharps shall be discarded immediately or as soon as feasible in containers that are:

(i) Closable;
(ii) Puncture resistant;
(iii) Leakproof on sides and bottom; and
(iv) Labeled or color-coded in accordance with paragraph (g)(1)(i) of this standard.

(2) During use, containers for contaminated sharps shall be:

(i) Easily accessible to personnel and located as close as is feasible to the immediate area where sharps are used or can be reasonably anticipated to be found (e.g., laundries);
(ii) Maintained upright throughout use; and
(iii) Replaced routinely and not be allowed to overfill.

(3) When moving containers of contaminated sharps from the area of use, the containers shall be:

(i) Closed immediately prior to removal or replacement to prevent spillage or protrusion of contents during handling, storage, transport, or shipping;

(ii) Placed in a secondary container if leakage is possible. The second container shall be:

(A) Closable;
(B) Constructed to contain all contents and prevent leakage during handling, storage, transport, or shipping; and
(C) Labeled or color-coded according to paragraph (g)(1)(i) of this standard.

(4) Reusable containers shall not be opened, emptied, or cleaned manually or in any other manner which would expose employees to the risk of percutaneous injury.

(B) Other Regulated Waste Containment.

(1) Regulated waste shall be placed in containers which are:

(i) Closable;
(ii) Constructed to contain all contents and prevent leakage of fluids during handling, storage, transport or shipping;
(iii) Labeled or color-coded in accordance with paragraph (g)(1)(i) this standard; and
(iv) Closed prior to removal to prevent spillage or protrusion of contents during handling, storage, transport, or shipping.

(2) If outside contamination of the regulated waste container occurs, it shall be placed in a second container. The second container shall be:

(i) Closable;
(ii) Constructed to contain all contents and prevent leakage of fluids during handling, storage, transport or shipping;
(iii) Labeled or color-coded in accordance with paragraph (g)(1)(i) of this standard; and
(iv) Closed prior to removal to prevent spillage or protrusion of contents during handling, storage, transport, or shipping.

(C) Disposal of all regulated waste shall be in accordance with applicable regulations of the United States, States and Territories, and political subdivisions of States and Territories.

(iv) Laundry.

(A) Contaminated laundry shall be handled as little as possible with a minimum of agitation.

(1) Contaminated laundry shall be bagged or containerized at the location where it was used and shall not be sorted or rinsed in the location of use.

(2) Contaminated laundry shall be placed and transported in bags or containers labeled or color-coded in accordance with paragraph (g)(1)(i) of this standard. When a facility utilizes Universal Precautions in the handling of all soiled laundry, alternative labeling or color-coding is sufficient if it permits all employees to recognize the containers as requiring compliance with Universal Precautions.

(3) Whenever contaminated laundry is wet and presents a reasonable likelihood of soak-through of or leakage from the bag or container, the laundry shall be placed and transported in bags or containers which prevent soak-through and/or leakage of fluids to the exterior.

(B) The Company shall ensure that employees who have contact with contaminated laundry wear protective gloves and other appropriate personal protective equipment.

(C) When a facility ships contaminated laundry off-site to a second facility which does not utilize Universal Precautions in the handling of all laundry, the facility generating the contaminated laundry must place such laundry in bags or containers which are labeled or color- coded in accordance with paragraph (g)(1)(i).

(e) HIV and HBV Research Laboratories and Production Facilities.

(1) This paragraph applies to research laboratories and production facilities engaged in the culture, production, concentration, experimentation, and manipulation of HIV and HBV. It does not apply to clinical or diagnostic laboratories engaged solely in the analysis of blood, tissues, or organs. These requirements apply in addition to the other requirements of the standard.

(2) Research laboratories and production facilities shall meet the following criteria:

(i) Standard Microbiological Practices. All regulated waste shall either be incinerated or decontaminated by a method such as autoclaving known to effectively destroy blood-borne pathogens.

(ii) Special Practices.

(A) Laboratory doors shall be kept closed when work involving HIV or HBV is in progress.

(B) Contaminated materials that are to be decontaminated at a site away from the work area shall be placed in a durable, leakproof, labeled or color-coded container that is closed before being removed from the work area.

(C) Access to the work area shall be limited to authorized persons. Written policies and procedures shall be established whereby only persons who have been advised of the potential biohazard, who meet any specific entry requirements, and who comply with all entry and exit procedures shall be allowed to enter the work areas and animal rooms.

(D) When other potentially infectious materials or infected animals are present in the work area or containment module, a hazard warning sign incorporating the universal biohazard symbol shall be posted on all access doors. The hazard warning sign shall comply with paragraph (g)(1)(ii) of this standard.

(E) All activities involving other potentially infectious materials shall be conducted in biological safety cabinets or other physical-containment devices within the containment module. No work with these other potentially infectious materials shall be conducted on the open bench.

(F) Laboratory coats, gowns, smocks, uniforms, or other appropriate protective clothing shall be used in the work area and animal rooms. Protective clothing shall not be worn outside of the work area and shall be decontaminated before being laundered.

(G) Special care shall be taken to avoid skin contact with other potentially infectious materials. Gloves shall be worn when handling infected animals and when making hand contact with other potentially infectious materials is unavoidable.

(H) Before disposal all waste from work areas and from animal rooms shall either be incinerated or decontaminated by a method such as autoclaving known to effectively destroy bloodborne pathogens.

(I) Vacuum lines shall be protected with liquid disinfectant traps and high-efficiency particulate air (HEPA) filters or filters of equivalent or superior efficiency and which are checked routinely and maintained or replaced as necessary.

(J) Hypodermic needles and syringes shall be used only for parenteral injection and aspiration of fluids from laboratory animals and diaphragm bottles. Only needle-locking syringes or disposable syringe-needle units (i.e., the needle is integral to the syringe) shall be used for the injection or aspiration of other potentially infectious materials. Extreme caution shall be used when handling needles and syringes. A needle shall not be bent, sheared, replaced in the sheath or guard, or removed from the syringe following use. The needle and syringe shall be promptly placed in a puncture-resistant container and autoclaved or decontaminated before reuse or disposal.

(K) All spills shall be immediately contained and cleaned up by appropriate professional staff or others properly trained and equipped to work with potentially concentrated infectious materials.

(L) A spill or accident that results in an exposure incident shall be immediately reported to the laboratory director or other responsible person.

(M) A biosafety manual shall be prepared or adopted and periodically reviewed and updated at least annually or more often if necessary. Personnel shall be advised of potential hazards, shall be required to read instructions on practices and procedures, and shall be required to follow them.

(iii) Containment Equipment.

(A) Certified biological safety cabinets (Class I, II, or III) or other appropriate combinations of personal protection or physical containment devices, such as special protective clothing, respirators, centrifuge safety cups, sealed centrifuge rotors, and containment caging for animals, shall be used for all activities with other potentially infectious materials that pose a threat of exposure to droplets, splashes, spills, or aerosols.

(B) Biological safety cabinets shall be certified when installed, whenever they are moved and at least annually.

(3) HIV and HBV research laboratories shall meet the following criteria:

(i) Each laboratory shall contain a facility for hand washing and an eye wash facility which is readily available within the work area.

(ii) An autoclave for decontamination of regulated waste shall be available.

(4) HIV and HBV production facilities shall meet the following criteria:

(i) The work areas shall be separated from areas that are open to unrestricted traffic flow within the building. Passage through two sets of doors shall be the basic requirement for entry into the work area from access corridors or other contiguous areas. Physical separation of the high-containment work area from access corridors or other areas or activities may also be provided by a double-doored clothes-change room (showers may be included), airlock, or other access facility that requires passing through two sets of doors before entering the work area.

(ii) The surfaces of doors, walls, floors and ceilings in the work area shall be water resistant so that they can be easily cleaned. Penetrations in these surfaces shall be sealed or capable of being sealed to facilitate decontamination.

(iii) Each work area shall contain a sink for washing hands and a readily available eye wash facility. The sink shall be foot, elbow, or automatically operated and shall be located near the exit door of the work area.

(iv) Access doors to the work area or containment module shall be self-closing.

(v) An autoclave for decontamination of regulated waste shall be available within or as near as possible to the work area.

(vi) A ducted exhaust-air ventilation system shall be provided. This system shall create directional airflow that draws air into the work area through the entry area. The exhaust air shall not be recirculated to any other area of the building, shall be discharged to the outside, and shall be dispersed away from occupied areas and air intakes. The proper direction of the airflow shall be verified (i.e., into the work area).

(5) Training Requirements. Additional training requirements for employees in HIV and HBV research laboratories and HIV and HBV production facilities are specified in paragraph (g)(2)(ix).

(f) Hepatitis B Vaccination and Post-exposure Evaluation and Follow-up.

(1) General.

(i) The Company shall make available the hepatitis B vaccine and vaccination series to all employees who have occupational exposure, and post-exposure evaluation and follow-up to all employees who have had an exposure incident.

(ii) The Company shall ensure that all medical evaluations and procedures including the hepatitis B vaccine and vaccination series and post-exposure evaluation and follow up, including prophylaxis, are:

(A) Made available at no cost to the employee;

(B) Made available to the employee at a reasonable time and place;

(C) Performed by or under the supervision of a licensed physician or by or under the supervision of another licensed healthcare professional; and

(D) Provided according to recommendations of the U.S. Public Health

Service current at the time these evaluations and procedures take place, except as specified by this paragraph (f).

(iii) The Company shall ensure that all lab-oratory tests are conducted by an accredited laboratory at no cost to the employee.

(2) Hepatitis B Vaccination.

(i) Hepatitis B vaccination shall be made available after the employee has received the training required in paragraph (g)(2)(vii)(I) and within 10 working days of initial assignment to all employees who have occupational exposure unless the employee has previously received the complete hepatitis B vaccination series, antibody testing has revealed that the employee is immune, or the vaccine is contraindicated for medical reasons.

(ii) The Company shall not make participation in a prescreening program a prerequisite for receiving hepatitis B vaccination.

(iii) If the employee initially declines hepatitis B vaccination but at a later date while still covered under the standard decides to accept the vaccination, the Company shall make available hepatitis B vaccination at that time.

(iv) The Company shall assure that employees who decline to accept hepatitis B vaccination offered by the Company sign the statement in Appendix A.

(v) If a routine booster dose(s) of hepatitis B vaccine is recommended by the U.S. Public Health Service at a future date, such booster dose(s) shall be made available in accordance with section (f)(1)(ii).

(3) Post-exposure Evaluation and Follow-up. Following a report of an exposure incident, the Company shall make immediately available to the exposed employee a confidential medical evaluation and follow-up, including at least the following elements:

(i) Documentation of the route(s) of exposure, and the circumstances under which the exposure incident occurred;

(ii) Identification and documentation of the source individual, unless the Company can establish that identification is infeasible or prohibited by state or local law;

(A) The source individual's blood shall be tested as soon as feasible and after consent is obtained in order to determine HBV and HIV infectivity. If consent is not obtained, the Company shall establish that

legally required consent cannot be obtained. When the source individual's consent is not required by law, the source individual's blood, if available, shall be tested and the results documented.

(B) When the source individual is already known to be infected with HBV or HIV, testing for the source individual's known HBV or HIV status need not be repeated.

(C) Results of the source individual's testing shall be made available to the exposed employee, and the employee shall be informed of applicable laws and regulations concerning disclosure of the identity and infectious status of the source individual.

(iii) Collection and testing of blood for HBV and HIV serological status;

(A) The exposed employee's blood shall be collected as soon as feasible and tested after consent is obtained.

(B) If the employee consents to baseline blood collection, but does not give consent at that time for HIV serologic testing, the ample shall be preserved for at least 90 days. If, within 90 days of the exposure incident, the employee elects to have the baseline sample tested, such testing shall be done as soon as feasible.

(iv) Post-exposure prophylaxis, when medically indicated, as recommended by the U.S. Public Health Service;

(v) Counseling; and

(vi) Evaluation of reported illnesses.

(4) Information Provided to the Healthcare Professional.

(i) The Company shall ensure that the health-care professional responsible for the employee's Hepatitis B vaccination is provided a copy of this regulation.

(ii) The Company shall ensure that the healthcare professional evaluating an employee after an exposure incident is provided the following information:

(A) A copy of this regulation;

(B) A description of the exposed employee's duties as they relate to the exposure incident;

(C) Documentation of the route(s) of exposure and circumstances under which exposure occurred;
(D) Results of the source individual's blood testing, if available; and

(E) All medical records relevant to the appropriate treatment of the employee including vaccination status which are the Company's responsibility to maintain.

(5) Healthcare Professional's Written Opinion. The Company shall obtain and provide the employee with a copy of the evaluating healthcare professional's written opinion within 15 days of the completion of the evaluation.

(i) The healthcare professional's written opinion for Hepatitis B vaccination shall be limited to whether Hepatitis B vaccination is indicated for an employee, and if the employee has received such vaccination.

(ii) The healthcare professional's written opinion for post-exposure evaluation and follow up shall be limited to the following information:

(A) That the employee has been informed of the results of the evaluation; and

(B) That the employee has been told about any medical conditions resulting from exposure to blood or other potentially infectious materials which require further evaluation or treatment.

(iii) All other findings or diagnoses shall remain confidential and shall not be included in the written report.

(6) Medical Recordkeeping. Medical records required by this standard shall be maintained in accordance with paragraph (h)(1) of this section.

(g) Communication of Hazards to Employees.

(1) Labels and Signs.

(i) Labels.

(A) Warning labels shall be affixed to containers of regulated waste, refrigerators and freezers containing blood or other potentially infectious material; and other containers used to store, transport or ship blood or other potentially infectious materials, except as provided in paragraph (g)(1)(i)(E), (F) and (G).

(B) Labels required by this section shall include the following legend:

(C) These labels shall be fluorescent orange or orange-red or predominantly so, with lettering and symbols in a contrasting color.

(D) Labels shall be affixed as close as feasible to the container by string, wire, adhesive, or other method that prevents their loss or unintentional removal.

(E) Red bags or red containers may be substituted for labels.

(F) Containers of blood, blood components, or blood products that are labeled as to their contents and have been released for transfusion or other clinical use are exempted from the labeling requirements of paragraph (g).

(G) Individual containers of blood or other potentially infectious materials that are placed in a labeled container during storage, transport, shipment or disposal are exempted from the labeling requirement.

(H) Labels required for contaminated equipment shall be in accordance with this paragraph and shall also state which portions of the equipment remain contaminated.

(I) Regulated waste that has been decontaminated need not be labeled or color-coded.

(ii) Signs.

(A) The Comp 

the entrance to work areas specified in pa HBV Research Laboratory and Production Fa ar the following legend:

(Name of the Infectious Agent)
(Special requirements for entering the area)
(Name, telephone number of the laboratory
director or other responsible person.)

(B) These signs shall be fluorescent orange-red or predominantly so, with lettering and symbols in a contrasting color.

(2) Information and Training.

(i) The Company shall ensure that all employees with occupational exposure participate in a training program which must be provided at no cost to the employee and during working hours.

(ii) Training shall be provided as follows:

(A) At the time of initial assignment to tasks where occupational exposure may take place;

(B) Within 90 days after the effective date of the standard; and

(C) At least annually thereafter.

(iii) For employees who have received training on bloodborne pathogens in the year preceding the effective date of the standard, only training with respect to the provisions of the standard which were not included need be provided.

(iv) Annual training for all employees shall be provided within one year of their previous training.

(v) The Company shall provide additional training when changes such as modification of tasks or procedures or institution of new tasks or procedures affect the employee's occupational exposure. The additional training may be limited to addressing the new exposures created.

(vi) Material appropriate in content and vocabulary to educational level, literacy, and language of employees shall be used.

(vii) The training program shall contain at a minimum the following elements:

(A) An accessible copy of the regulatory text of this standard and an explanation of its contents;

(B) A general explanation of the epidemiology and symptoms of bloodborne diseases;

(C) An explanation of the modes of transmission of bloodborne pathogens;

(D) An explanation of the Company's exposure control plan and the means by which the employee can obtain a copy of the written plan;

(E) An explanation of the appropriate methods for recognizing tasks and other activities that may involve exposure to blood and other potentially infectious materials;

(F) An explanation of the use and limitations of methods that will prevent or reduce exposure including appropriate engineering controls, work pratices, and personal protective equipment;

(G) Information on the types, proper use, location, removal, handling, decontamination and disposal of personal protective equipment;

(H) An explanation of the basis for selection of personal protective equipment;

(I) Information on the hepatitis B vaccine, including information on its efficacy, safety, method of administration, the benefits of being vaccinated, and that the vaccine and vaccination will be offered free of charge;

(J) Information on the appropriate actions to take and persons to contact in an emergency involving blood or other potentially infectious materials;

(K) An explanation of the procedure to follow if an exposure incident occurs, including the method of reporting the incident and the medical follow-up that will be made available;

(L) Information on the post-exposure evaluation and follow-up that the employer is required to provide for the employee following an exposure incident;

(M) An explanation of the signs and labels and/or color coding required by paragraph (g)(1); and

(N) An opportunity for interactive questions and answers with the person conducting the training session.

(viii) The person conducting the training shall be knowledgeable in the subject matter covered by the elements contained in the training program as it relates to the workplace that the training will address.

(ix) Additional Initial Training for Employees in HIV and HBV Laboratories and Production Facilities. Employees in HIV or HBV research laboratories and HIV or HBV production facilities shall receive the following initial training in addition to the above training requirements.

(A) The Company shall assure that employees demonstrate proficiency in standard microbiological practices and techniques and in the practices and operations specific to the facility before being allowed to work with HIV or HBV.

(B) The Company shall assure that employees have prior experience in the handling of human pathogens or tissue cultures before working with HIV or HBV.

(C) The Company shall provide a training program to employees who have no prior experience in handling human pathogens. Initial work activities shall not include the handling of infectious agents. A progression of work activities shall be assigned as techniques are learned and proficiency is developed. The Company shall assure that employees participate in work activities involving infectious agents only after proficiency has been demonstrated.

(h) Recordkeeping.

(1) Medical Records.

(i) The Company shall establish and maintain an accurate record for each employee with occupational exposure, in accordance with 29 CFR 1910.20.
(ii) This record shall include:

(A) The name and social security number of the employee;

(B) A copy of the employee's hepatitis B vaccination status including the dates of all the hepatitis B vaccinations and any medical records

relative to the employee's ability to receive vaccination as required by paragraph (f)(2);

(C) A copy of all results of examinations, medical testing, and follow up procedures as required by paragraph (f)(3);

(D) The Company's copy of the healthcare professional's written opinion as required by paragraph (f)(5); and

(E) A copy of the information provided to the healthcare professional as required by paragraphs (f)(4)(ii)(B), (C) and (D).

(iii) Confidentiality. The Company shall ensure that employee medical records required by paragraph (h)(1) are:

(A) Kept confidential; and

(B) Not disclosed or reported without the employee's express written consent to any person within or outside the workplace except as required by this section or as may be required by law.

(iv) The Company shall maintain the records required by paragraph (h) for at least the duration of employment plus 30 years in accordance with 29 CFR 1910.20.

(2) Training Records.

(i) Training records shall include the following information:

(A) The dates of the training sessions;

(B) The contents or a summary of the training sessions;

(C) The names and qualifications of persons conducting the training; and

(D) The names and job titles of all persons attending the training sessions.

(ii) Training records shall be maintained for 3 years from the date on which the training occurred.

(3) Availability.

(i) The Company shall ensure that all records required to be maintained by this section shall be made available upon request to the Assistant Secretary and the Director for examination and copying.

(ii) Employee training records required by this paragraph shall be provided upon request for examination and copying to employees, to employee representatives, to the Director, and to the Assistant Secretary.

(iii) Employee medical records required by this paragraph shall be provided upon request for examination and copying to the subject employee, to anyone having written consent of the subject employee, to the Director, and to the Assistant Secretary in accordance with 29 CFR 1910.20.

(4) Transfer of Records.

(i) The Company shall comply with the requirements involving transfer of records set forth in 29 CFR 1910.20(h).

(ii) If the Company ceases to do business and there is no successor Company to receive and retain the records for the prescribed period, the Company shall notify the Director, at least three months prior to their disposal and transmit them to the Director, if required by the Director to do so, within that three month period.

APPENDIX A TO §1910.1030
HEPATITIS B VACCINE DECLINATION

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

continue to have occupational exposure to blood or other potentially infectious materials and I want to be vaccinated with hepatitis B vaccine, I can receive the vaccination series at no charge to me.

Signature _____ Date _____

Carpentry & Lumber Handling

Policy:

Personnel performing duties in carpentry and lumber handling are potentially exposed to a wide variety of hazards in many different environments and locations. Potential hazards include exposures to flammable and combustible adhesives, dusts, hazardous noise, eye hazards, working at heights above ground level, lifting hazards, electric and pneumatic power tools, and working with unfinished material which could expose them to splinters. Many tasks are performed in areas of high pedestrian traffic; therefore, an additional

hazard of possible distraction from the job task arises. Potential physical and health hazards can be effectively controlled by proper work procedures and controls, and by using required personal protective equipment.

Procedures:

Personal protective equipment worn while operating machinery, equipment, and saws within the shop and on job sites normally consists of eye protection, safety-toe shoes, and hearing protection. Other safety related personal protective equipment are dust masks where workers are exposed to dust at the point of operation. The Safety and Health Manager shall be consulted to determine the need for dust masks.

Hard hats are required on job sites where the potential exists from being struck by falling object(s), e.g., roofing and construction.

Workers shall not leave a woodworking machine running unattended nor shall they attempt to clear, clean, or repair the machine while it is operating.

When maintenance is necessary, the machine shall be completely shut down, its control switches locked and tagged in the "OFF" position.

Supervisors shall ensure that periodic inspections are accomplished on all shop equipment.

Chips or dust shall never be removed from machinery by hand. Machine guards shall not be removed or made inoperative except for authorized maintenance. When guards are removed during machine repair, power control switches shall be locked in the "OFF" position and properly tagged. The machine shall remain locked until the guards are replaced.

Safety Precautions:

Table Saw Operations-

Keep hands out of the line of cut when feeding table saws. Use a push stick when close to the blade.

Adjust saw to expose the least amount of saw blade above table and material being cut.

Always stand out of line of stock being ripped.

Hold stock being cut against a gauge when cutting with a circular table saw.

Always use the appropriate saw for the cut (it would be unsafe to rip with a crosscut saw or to crosscut with a rip saw).

Avoid crosscutting long boards on a table saw.

Never adjust the saw or fence gauge while the saw is operating.

Designate the line of cut on the table top with a permanent mark when setting the gauge of a table saw without removing the guards.

Always use a brush or stick to clean or scrape sawdust from a saw.

Ventilation Systems:

Application-

Machines that develop fine dust or other airborne contaminants shall be equipped with effective industrial exhaust ventilation. In shops where small numbers of installed machines are not continuously in operation, portable collection systems may be used.

Exhaust Ducts and Pipes-

These shall be constructed and sized to minimize clogging. They shall discharge into an enclosed container.

Refuse-

Refuse shall be removed daily in all operations that are not required to have an exhaust system or where the refuse cannot be handled by an exhaust system.

Storage and Handling of Lumber:

Storage areas for lumber and other building materials can be potentially hazardous. For example, when lumber is stored upright, precautions shall be taken to prevent it from falling into aisles or passageways. Lumber stored in tiers shall be stacked, blocked, and interlocked and the stacks shall be limited in height so they are stable and secure against sliding or collapse. Furthermore, storage areas shall be kept free of accumulations of materials that constitute tripping, fire, or explosion hazards.

When heavy stock cannot be safely handled by workers, suitable mechanical lifting devices shall be used.

Gloves shall be worn by workers to reduce injury potential to the hands from splinters or from being pinched between the stacks. The accidental movement of the stacked material can cause serious injuries. Caution shall be taken not to disturb other tiers when removing partial stacks for use.

Manual handling is relatively safe if the proper lifting and carrying positions are used. Balanced handling is the key to safe handling.

Chemical Safety Plan- HAZCOM for Non Laboratories

Purpose:

This Hazard Communication requires the Company to provide information about the hazardous chemicals that employees will be exposed to, chemical product labels and other forms of warning, material safety data sheets related to the chemicals, appropriate training, and a written hazard communication program. The Safety and Health Manager has the specific responsibility for implementing the plan. Supervisors of employees have the responsibility to insure the Safety Plan is carried out. The Safety and Health Manager is also responsible for providing consultation and specific training when needed.

Remember: This standard applies to those employees who do not work in a laboratory. (Employees that DO work in a laboratory, are covered by standards on the 5th page of this chapter.)

Supervisors who have employees who work in areas where hazardous chemicals are stored, handled or used are responsible for:

(1) creating and maintaining an inventory of all hazardous chemicals;
(2) ensuring proper labeling of all hazardous chemicals;
(3) acquiring and maintaining material safety data sheets for all hazardous chemicals located in the work area;
(4) informing employees of
    (i) any operations in their work area where hazards chemicals are present, and
    (ii) the location and availability of the written hazard communication program, the chemical inventory, and material safety data sheets; and training employees about hazardous chemicals used in the work area.

Hazardous Chemicals Inventory:

Supervisor(s), or his/her designee, is required to maintain a list of all hazardous chemicals known to be present in each work area (e.g. shop area, section, etc.) and to update the list as necessary. This inventory list must identify each hazardous chemical by the primary name on the label AND the manufacturer or distributor of the chemical. The inventory list must be kept in the work area and accessible to anyone requesting it. A suggestion is in a 3 ring binder, with the cover clearly labeled "**HAZARDOUS CHEMICALS**.

This inventory shall list all hazardous chemicals found in the work area. This is to include:

(1) laboratory chemicals
(2) janitorial supplies

(continued) This inventory shall list all hazardous chemicals found in the work area. This is to include:

(3) compressed gases
(4) cleaning products
(5) materials found in the maintenance departments (such as lubricating oils, solvents, etc.)
(6) specialty chemicals used by ANYONE!.

Labeling Requirements:

Supervisors must ensure that all hazardous chemicals in his/her area of responsibility are properly labeled. Labels should list at least the chemical identity, appropriate hazard warnings and the name and address of the manufacturer, importer or other responsible party. Portable containers of working solutions must be labeled appropriately unless they are intended for immediate use by the employee who prepares it. The contents of all vessels (containing chemicals or products such as cleaning solutions) must be identified by name on the container.

Chemicals that are manufactured by the Company and distributed outside of the work center that it was manufactured in, will be labeled in accordance with the OSHA Hazard Communication Standard [29 CFR Part 1910.1200(f)(1-5)] if they contain hazardous chemicals in concentrations greater than one percent (or 0.1% for carcinogens). It is the responsibility of the Company laboratory or manufacturing entity synthesizing the product to develop this label.

Chemicals stored in bulk quantities, pipelines, and storage tanks are required to be adequately labeled. Storage tanks or drums can be labeled collectively rather than labeling individual containers if they are not removed from the labeled area and if the hazards are the same. It is the responsibility of the Company laboratory or manufacturing entity synthesizing the product to develop this label.

Material Safety Data Sheets (MSDS):

Supervisors are responsible for acquiring and updating material safety data sheets for all hazardous chemicals found in their work area. The material safety data sheets should be reviewed (before using the chemical) and kept in the work area so that they are readily accessible to all.

To obtain specific material safety data sheets, the supervisor shall procure them from the Safety and Health Manager.

Only the most current MSDS for a hazardous chemical from the same manufacturer will be kept on file. All Supervisors will check the date of all MSDS's and use the most current one for each chemical, while discarding all other out of date MSDS's. To obtain further information or assistance in interpreting Material Safety Data Sheets, contact the Safety and Health Manager.
A Material Safety Data Sheet must be developed and sent with those products that are synthesized by the Company, and distributed outside of the Centers in accordance with the OSHA Hazard Communication Standard [29 CFR Part 1910.1200(f)(1-5)] if they contain hazardous chemicals in concentrations greater than one percent (or 0.1% for carcinogens). It is the responsibility of the Company laboratory synthesizing the product to develop and distribute the Material Safety Data Sheet.

Employee Training and Information:

A. Training

It is the responsibility of Supervisors to recognize when training is needed for his/her employees and to arrange for such training. Supervisors are not responsible to provide any training (in the sense that he must develop and present the training program) but rather must recognize the need for training and arrange for his employees to receive it.

This training is available in several formats:

- A presentation arranged or presented by the local Safety Committee

•A video presentation from the Company library
•A presentation arranged or presented by the Safety and Health Manager or staff
•A presentation arranged or presented by the Supervisor

Employees must be trained on the proper safeguards, safe use, and physical and health hazards of hazardous chemicals used on the job before beginning work with those chemicals or whenever a new hazardous chemical or procedure is introduced into their work area. Also, it is recommended that employees receive annual training updates.

Training will include at least the following topics:

- Physical and health hazards of chemicals in the work area;
- Methods and observation techniques used to detect the presence or release of a hazardous chemical;
- How to lessen or prevent exposure to these hazardous chemicals through usage of controls, work practices and personal protective equipment;
- How to use material safety data sheet information;
- How to read and understand labels; and
- Contingency plans for medical and chemical accident response.

All training shall be documented by recording the training session subject(s), date, attendees, and providing a copy of the outline for the training session. The Supervisor shall maintain these records and provide copies of all records to the Safety and Health Manager.

B. New Employees

Information about the Company's Hazard Communication Program will be disseminated to all new employees in the Employee Safety Handbook (page 17). All new employees must be trained by their supervisor about hazardous chemicals in their work area at the time of their initial assignment and whenever a new hazard is introduced into the work area.

Non-routine Tasks:

Employees performing non-routine tasks can be exposed to chemicals from unusual and unsuspected sources. Written procedures shall be developed for every non-routine task by the supervisor of the employees who will perform the task. The information will include chemical hazards associated with the performance of the tasks and appropriate protective measures required to perform the task safely. The procedures shall be included in the local copy of the Hazard Communication Program. The Safety and Health Manager will provide advice and guidance upon request.

Concrete and Masonry Construction

Background:

Concrete is composed of cement, sand, aggregate (sized stones), and water. When mixed in the correct amounts, concrete is a stable and versatile building medium which can be used in a variety of applications ranging from roads, bridges and buildings, to septic tanks and even countertops for household use. The versatility in building application is accomplished by altering the proportions of air and other variables in the mixture. Strengthening materials such as re-bar, fiberglass strands, and plastic rods are then added.

Scope and application: This chapter sets forth requirements to protect all construction employees from the hazards associated with concrete and masonry construction operations performed in workplaces covered under 29 CFR Part 1926. In addition to the requirements in Subpart Q, other relevant provisions in Parts 1910 and 1926 apply to concrete and masonry construction operations.

Definitions: The following definitions apply to this chapter.

(1) "Bull float" means a tool used to spread out and smooth concrete before it has taken it's initial set. Normally a large, magneseum or aluminum tool that is affixed to hand poles and is pushed back and forth across the horizontal surface of wet concrete.
(2) "Formwork" means the total system of support for freshly placed or partially cured

concrete, including the mold or sheeting (form) that is in contract with the concrete as well as all supporting members including shores, re-shores, hardware, braces, and related hardware.
(3) "Lift slab" means a method of concrete construction in which floor, and roof slabs are cast on or at ground level and, using jacks, lifted into position.
(4) "Limited access zone" means an area alongside a masonry wall, which is under construction, and which is clearly demarcated to limit access by employees.
(5) "Precast concrete" means concrete members (such as walls, panels, slabs, columns, and beams) which have been formed, cast, and cured prior to final placement in a structure.
(6) "Reshoring" means the construction operation in which shoring equipment (also called reshores or reshoring equipment) is placed, as the original forms and shores are removed, in order to support partially cured concrete and construction loads.
(7) "Shore" means a supporting member that resists a compressive force imposed by a load.
(8) "Vertical slip forms" means forms which are jacked vertically during the placement of concrete.
(9) "Jacking operation" means the task of lifting a slab (or group of slabs) vertically from one location to another (e.g. from the casting location to a temporary (parked) location, or from a temporary location to another temporary location, or to its final location in the structure), during the construction of a building/structure where the lift-slab process is being used.

General Requirements:

It is the policy of the Company that all concrete pour operations be conducted under the direct supervision of a competent supervisor. This includes an on site pre-safety briefing to all employees, inspection of forms, bracing and troughs, and the inspection of all Personal Protective Equipment that will be used during the operation

(a) Construction loads. No construction loads shall be placed on a concrete structure or portion of a concrete structure unless the employer determines, based on information received from a person who is qualified in structural design, that the structure or portion of the structure is capable of supporting the loads.

(b) Reinforcing steel. All protruding reinforcing steel, onto and into which employees could fall, shall be guarded to eliminate the hazard of impalement.

(c) Post-tensioning operations.

> **(1)** No employee (except those essential to the post-tensioning operations) shall be permitted to be behind the jack during tensioning operations.
> **(2)** Signs and barriers shall be erected to limit employee access to the post-tensioning area during tensioning operations.

(d) Riding concrete buckets. No employee shall be permitted to ride concrete buckets.

(e) Working under loads.

(1) No employee shall be permitted to work under concrete buckets while buckets are being elevated or lowered into position.
(2) To the extent practical, elevated concrete buckets shall be routed so that no employee, or the fewest number of employees, are exposed to the hazards associated with falling concrete buckets.

(f) Personal protective equipment. No employee shall be permitted to apply a cement, sand, and water mixture through a pneumatic hose unless the employee is wearing protective head and face equipment.

Responsibilities:

Management

Ensure all equipment is routinely serviced and maintained in a safe condition

Conduct periodic on-site inspection of operations

Provide operation and safety training for affected employees

Ensure access to operation areas are controlled

Supervisors

Provide continuous operation safety observation and control

Provide immediate corrective training for all unsafe acts

Conduct pre-pour inspections

Employees

Follow all safety and operational procedures

Wear all Personal Protective Equipment during the concrete operation to include,

Rubber gloves and boots

Face Shields or goggles

Hard Hats

Immediately notify supervisor of all unsafe condition

Supervisor Oversight Requirements:

Conduct a safety meeting with the workers at the beginning of each shift to review that hazards that each person may encounter and give instructions for hazard elimination and/or protection.

Inspect all tools and equipment at least daily before use.

Workers mixing dry contents of concrete, or making saw cuts or other dust raising actions with concrete, may be exposed to dust inhalation. Workers should use approved respiratory protection when exposed to silica dust above the threshold limits. Implement dust control measures during sawing, grinding and mixing operations.

Ensure backup alarms work on all equipment and/or require all equipment to be escorted into position. Keep workers out of the backing-up path of mixing trucks.

Be aware of the swing radius of the concrete chutes, pinch points and the handling of chutes. Fingers caught in chute pinch points may be amputated.

Permit one person trained with standard crane hand signals to signal the crane operator swinging the cement bucket. Ensure the swing path of the cement bucket is NOT over any personnel.

Check for overhead power lines and avoid contact with float handles, pump booms and other tools and equipment.

If electrical lines are too close for safe float and finish work, the concrete pour should be reconfigured to avoid potential contact hazards.

Protect all moving parts of batch plants, mixers, portable mixers and other equipment with the appropriate safety guards or barriers. Keep fingers, hands, loose clothing and hair away from pinch and catch points.

Prior to workers entering mixing drums, batch plants, excavations, storage bins or other similar spaces:

Determine the confined space requirements. If the space is considered to be a confined space by OSHA definition, then follow approved confined space procedures.

Use proper Lockout-Tagout (LOTO) procedures when cleaning, performing maintenance and repairing batch plants, mixers and other equipment.

Inspect all hand-held electrically powered tools and cords before use and keep them Circuit Interrupters (GFCIs).

Provide and require the use of approved fall protection when workers are exposed to a fall greater than six(6) feet or more.

Use approved tied-off ladders and stairs to access all excavations and elevated heights.

Review Material Safety Data Sheets (MSDS) with the employees concerning the ingredients of the concrete, both the basic and additive ingredients, and other items such as curing compounds and sealants.

Secure the work area to keep the curious members of the public and other untrained personnel out. The risk of injury increases dramatically when your workers are distracted by outside hazards.

Facilities and Equipment:

(a) Bulk cement storage.

(1) Bulk storage bins, containers, and silos shall be equipped with the following:

(i) Conical or tapered bottoms; and
(ii) Mechanical or pneumatic means of starting the flow of material.

(2) No employee shall be permitted to enter storage facilities unless the ejection system has been shut down, locked out, and tagged to indicate that the ejection system is not to be operated.

(b) Concrete mixers. Concrete mixers with one cubic yard (.8 m^3) or larger loading skips shall be equipped with the following:

(1) A mechanical device to clear the skip of materials; and

(2) Guardrails installed on each side of the skip.

(c) Power concrete trowels. Powered and rotating type concrete troweling machines that are manually guided shall be equipped with a control switch that will automatically shut off the power whenever the hands of the operator are removed from the equipment handles.

(d) Concrete buggies. Concrete buggy handles shall not extend beyond the wheels on either side of the buggy.

(e) Concrete pumping systems.

(1) Concrete pumping systems using discharge pipes shall be provided with pipe supports designed for 100 percent overload.

(2) Compressed air hoses used on concrete pumping system shall be provided with positive fail-safe joint connectors to prevent separation of sections when pressurized.

(f) Concrete buckets.

(1) Concrete buckets equipped with hydraulic or pneumatic gates shall have positive safety latches or similar safety devices installed to prevent premature or accidental dumping.

(2) Concrete buckets shall be designed to prevent concrete from hanging up on top and the sides.

(g) Tremies. Sections of tremies and similar concrete conveyances shall be secured with wire rope (or equivalent materials in addition to the regular couplings or connections.

(h) Bull floats. Bull float handles, used where they might contact energized electrical conductors, shall be constructed of nonconductive material or insulated with a nonconductive sheath whose electrical and mechanical characteristics provide the equivalent protection of a handle constructed of nonconductive material.

(i) Masonry saws.

(1) Masonry saws shall be guarded with a semicircular enclosure over the blade.

(2) A method for retaining blade fragments shall be incorporated in the design of the semicircular enclosure.

(j) Lockout/Tagout Procedures.

(1) No employee shall be permitted to perform maintenance or repair activity on equipment (such as compressors, mixers, screens or pumps used for concrete and masonry construction activities) where the inadvertent operation of the equipment could occur and cause injury, unless all potentially hazardous energy sources have been locked out and tagged.

(2) Tags shall read **Do Not Start** or similar language to indicate that the equipment is not to be operated.

Requirements For Cast-In-Place Concrete

(a) General requirements for formwork.

(1) Formwork shall be designed, fabricated, erected, supported, braced and maintained so that it will be capable of supporting without failure all vertical and lateral loads that may reasonably be anticipated to be applied to the formwork. Formwork which is designed, fabricated, erected, supported, braced and maintained in conformance with the Appendix to this section will be deemed to meet the requirements of this paragraph.

(2) Drawings or plans, including all revisions, for the jack layout, formwork (including shoring equipment), working decks, and scaffolds, shall be available at the jobsite.

(b) Shoring and reshoring.

(1) All shoring equipment (including equipment used in reshoring operations) shall be inspected prior to erection to determine that the equipment meets the requirements specified in the formwork drawings.

(2) Shoring equipment found to be damaged such that its strength is reduced to less than that required shall not be used for shoring.

(3) Erected shoring equipment shall be inspected immediately prior to, during, and immediately after concrete placement.

(4) Shoring equipment that is found to be damaged or weakened after erection, such that its strength is reduced, shall be immediately reinforced.

(5) The sills for shoring shall be sound, rigid, and capable of carrying the maximum intended load.

(6) All base plates, shore heads, extension devices, and adjustment screws shall be in firm contact, and secured when necessary, with the foundation and the form.

(7) Eccentric loads on shore heads and similar members shall be prohibited unless these members have been designed for such loading.

(8) Whenever single post shores are used one on top of another (tiered), the employer shall comply with the following specific requirements in addition to the general requirements for formwork:

(i) The design of the shoring shall be prepared by a qualified designer and the erected shoring shall be inspected by an engineer qualified in structural design.
(ii) The single post shores shall be vertically aligned.
(iii) The single post shores shall be spliced to prevent misalignment.
(iv) The single post shores shall be adequately braced in two mutually perpendicular directions at the splice level. Each tier shall also be diagonally braced in the same two directions.

(9) Adjustment of single post shores to raise formwork shall not be made after the placement of concrete.

(10) Reshoring shall be erected, as the original forms and shores are removed, whenever the concrete is required to support loads in excess of its capacity.

(c) Vertical slip forms.

(1) The steel rods or pipes on which jacks climb or by which the forms are lifted shall be:

(i) Specifically designed for that purpose; and
(ii) Adequately braced where not encased in concrete.

(2) Forms shall be designed to prevent excessive distortion of the structure during the jacking operation.

(3) All vertical slip forms shall be provided with scaffolds or work platforms where employees are required to work or pass.

(4) Jacks and vertical supports shall be positioned in such a manner that the loads do not exceed the rated capacity of the jacks.

(5) The jacks or other lifting devices shall be provided with mechanical dogs or other automatic holding devices to support the slip forms whenever failure of the power supply or lifting mechanism occurs.

(6) The form structure shall be maintained within all design tolerances specified for plumbness during the jacking operation.

(7) The predetermined safe rate of lift shall not be exceeded.

(d) Reinforcing steel.

(1) Reinforcing steel for walls, piers, columns, and similar vertical structures shall be adequately supported to prevent overturning and to prevent collapse.

(2) Employers shall take measures to prevent unrolled wire mesh from recoiling. Such measures may include, but are not limited to, securing each end of the roll or turning over the roll.

(e) Removal of formwork.

(1) Forms and shores (except those used for slabs on grade and slip forms) shall not be removed until the employer determines that the concrete has gained sufficient strength to support its weight and superimposed loads. Such determination shall be based on compliance with one of the following:

(i) The plans and specifications stipulate conditions for removal of forms and shores, and such conditions have been followed, or
(ii) The concrete has been properly tested with an appropriate ASTM standard test method designed to indicate the concrete compressive strength, and the test results indicate that the concrete has gained sufficient strength to support its weight and superimposed loads.

(2) Reshoring shall not be removed until the concrete being supported has attained adequate strength to support its weight and all loads in place upon it.

Requirements For Precast Concrete:

(a) Precast concrete wall units, structural framing, and tilt-up wall panels shall be adequately supported to prevent overturning and to prevent collapse until permanent connections are completed.

(b) Lifting inserts which are embedded or otherwise attached to tilt-up precast concrete members shall be capable of supporting at least two times the maximum intended load applied or transmitted to them.

(c) Lifting inserts which are embedded or otherwise attached to precast concrete members, other than the tilt-up members, shall be capable of supporting at least four times the maximum intended load applied or transmitted to them.

(d) Lifting hardware shall be capable of supporting at least five times the maximum intended load applied or transmitted to the lifting hardware.

(e) No employee shall be permitted under precast concrete members being lifted or tilted into position except those employees required for the erection of those members.

Requirements For Lift-Slab Construction Operations:

(a) Lift-slab operations shall be designed and planned by a registered professional engineer who has experience in lift-slab construction. Such plans and designs shall be implemented by the employer and shall include detailed instructions and sketches indicating the prescribed method of erection. These plans and designs shall also include provisions for ensuring lateral stability of the building/structure during construction.

(b) Jacks/lifting units shall be marked to indicate their rated capacity as established by the manufacturer.

(c) Jacks/lifting units shall not be loaded beyond their rated capacity as established by the manufacturer.

(d) Jacking equipment shall be capable of supporting at least two and one-half times the load being lifted during jacking operations and the equipment shall not be overloaded. For the purpose of this provision, jacking equipment includes any load bearing component which is used to carry out the lifting operation(s). Such equipment includes, but is not limited, to the following: threaded rods, lifting attachments, lifting nuts, hook-up collars, T-caps, shearheads, columns, and footings.

(e) Jacks/lifting units shall be designed and installed so that they will neither lift nor continue to lift when they are loaded in excess of their rated capacity.

(f) Jacks/lifting units shall have a safety device installed which will cause the jacks/lifting units to support the load in any position in the event any jack/lifting unit malfunctions or loses its lifting ability.

(g) Jacking operations shall be synchronized in such a manner to ensure even and uniform lifting of the slab. During lifting, all points at which the slab is supported shall be kept within 1/2 inch of that needed to maintain the slab in a level position.

(h) If leveling is automatically controlled, a device shall be installed that will stop the operation when the 1/2 inch tolerance set forth in paragraph (g) of this section is exceeded or where there is a malfunction in the jacking (lifting) system.

(i) If leveling is maintained by manual controls, such controls shall be located in a central location and attended by a competent person while lifting is in progress. The competent person must be experienced in the lifting operation and with the lifting equipment being used.

(j) The maximum number of manually controlled jacks/ lifting units on one slab shall be limited to a number that will permit the operator to maintain the slab level within specified tolerances of paragraph (g) of this section, but in no case shall that number exceed 14.
(k)

(1) No employee, except those essential to the jacking operation, shall be permitted in the building/structure while any jacking operation is taking place unless the building/structure has been reinforced sufficiently to ensure its integrity during erection. The phrase "reinforced sufficiently to ensure its integrity" used in this paragraph means that a registered professional engineer, independent of the engineer who designed and planned the lifting operation, has determined from the plans that if there is a loss of support at any jack location, that loss will be confined to that location and the structure as a whole will remain stable.

(2) Under no circumstances, shall any employee who is not essential to the jacking operation be permitted immediately beneath a slab while it is being lifted.

(3) For the purpose of paragraph (k) of this section, a jacking operation begins when a slab or group of slabs is lifted and ends when such slabs are secured (with either temporary connections or permanent connections).

(l) When making temporary connections to support slabs, wedges shall be secured by tack welding, or an equivalent method of securing the wedges to prevent them from falling out of position. Lifting rods may not be released until the wedges at that column have been secured.

(m) All welding on temporary and permanent connections shall be performed by a certified welder, familiar with the welding requirements specified in the plans and specifications for the lift-slab operation.

(n) Load transfer from jacks/lifting units to building columns shall not be executed until the welds on the column shear plates (weld blocks) are cooled to air temperature.

(o) Jacks/lifting units shall be positively secured to building columns so that they do not become dislodged or dislocated.

(p) Equipment shall be designed and installed so that the lifting rods cannot slip out of position or the employer shall institute other measures, such as the use of locking or blocking devices, which will provide positive connection between the lifting rods and attachments and will prevent components from disengaging during lifting operations.

Requirements For Masonry Construction:

(a) A limited access zone shall be established whenever a masonry wall is being constructed. The limited access zone shall confirm to the following:

(1) The limited access zone shall be established prior to the start of construction of the wall.

(2) The limited access zone shall be equal to the height of the wall to be constructed plus four feet, and shall run the entire length of the wall.

(3) The limited access zone shall be established on the side of the wall which will be unscaffolded.

(4) The limited access zone shall be restricted to entry by employees actively engaged in constructing the wall. No other employees shall be permitted to enter the zone.

(5) The limited access zone shall remain in place until the wall is adequately supported to prevent overturning and to prevent collapse unless the height of wall is over eight feet, in which case, the limited access zone shall remain in place until the requirements of paragraph (b) of this section have been met.

(b) All masonry walls over eight feet in height shall be adequately braced to prevent overturning and to prevent collapse unless the wall is adequately supported so that it will not overturn or collapse. The bracing shall remain in place until permanent supporting elements of the structure are in place.

Confined Spaces

Policy:

It is the policy of the Company to protect the health and welfare of all employees whose work assignments may require entering or working in permit-required confined spaces. Only persons with appropriate aptitudes and physical competence shall be employed in confined space work. Training of selected persons to carry out confined space work shall include:

- Emergency entry and exit procedures
- Use of appropriate respiratory protective equipment
- First aid, including Cardio-Pulmonary Resuscitation (CPR)
- Lock Out and Isolation procedures
- The use of safety equipment
- Rescue drills
- Fire protection
- Communications
- Aspects essential for maintaining the safety of the breathing environment
- Recognition of any hazards specific to the operation/activity.

Purpose:

To establish the policy and procedures regarding Management and employee response and actions to a working in confined spaces. Working in confined spaces can lead to injury or even death if adequate precautions are not taken. Only trained persons may enter or work in confined spaces.

Confined spaces can include storage tanks, process vessels, boilers, silos, storage bins, pits, and pipes, sewers, tunnels and shafts. Any place of work where the atmosphere is liable to be contaminated at any time by dust, fumes, mist, vapor, gas or other harmful substance, or is liable at any time to be oxygen deficient is defined as a confined space. When any work area is not subject to good natural ventilation, people can be readily exposed to harmful vapors. They can then suffer lack of oxygen, and collapse as a result. People entering the same space to rescue colleagues may become the next victims.

The Company will ensure that our employees are protected from the potential hazards involved in entering confined spaces. We will make every effort to comply with the OSHA Permit-Required Confined Space Standard (CFR 1910.146) and to exceed those requirements when necessary to ensure the safety of our workers.

For the purposes of this program the following definitions will apply:

Confined Space - A confined space has limited or restricted means of entry or exit, is large enough for an employee to enter and perform assigned work, and is not designed for continuous occupancy by the employee. These spaces may include, but are not limited to, underground vaults, manholes, tanks, storage bins, pit areas, vessels, and silos.

Permit-Required Confined Space - A "permit-required confined space" is one that meets the definition of a confined space and has one or more of these characteristics:

(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 that might cause an entrant to be trapped or asphyxiated by inwardly converging walls or by a floor that slopes downward and tapers to a smaller cross section
(4) Contains any other recognized serious safety or health hazards.

Definitions:

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

b. Attendant means an individual stationed outside one or more permit spaces who monitors the authorized entrants and who performs all attendant's duties assigned in the employer's permit space program.

c. Authorized entrant means an employee who is authorized by the employer to enter a permit space.

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

e. Confined space means that:

- It is large enough and so configured that an employee can bodily enter and perform assigned work; and

• Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry.); and

• Is not designed for continuous employee occupancy.

f. Double block and bleed means the closure of a line, duct, or pipe by closing and locking or tagging two in-line valves and by opening and locking or tagging a drain or vent valve in the line between the two closed valves.

g. Emergency means any occurrence (including any failure of hazard control or monitoring equipment) or event internal or external to the permit space that could endanger entrants.

h. Engulfment means the surrounding and effective capture of a person by a liquid or finely divided (flowable) solid substance that can be aspirated to cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.

i. Entry means 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.

j. Entry permit (permit) means the written or printed document that is provided by the employer to allow and control entry into a permit space and that contains the information specified in paragraph (g) of this section.

k. Entry supervisor means the person (such as the employer, foreman, or crew chief) responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required by this section.

NOTE: An entry supervisor also may serve as an attendant or as an authorized entrant, as long as that person is trained and equipped as required by this section for each role he or she fills. Also, the duties of entry supervisor may be passed from one individual to another during the course of an entry operation.

l. Hazardous atmosphere means an atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (that is, escape unaided from a permit space), injury, or acute illness from one or more of the following causes:

1.Flammable gas, vapor, or mist in excess of 10 percent of its lower flammable limit (LFL);

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.

l. Hazardous atmosphere means (continued)

3. Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent;

NOTE: An atmospheric concentration of any substance that is not capable of causing death, incapacitation, impairment of ability to self-rescue, injury, or acute illness due to its health effects is not covered by this provision.

4. Any other atmospheric condition that is immediately dangerous to life or health.

NOTE: For air contaminants for which OSHA has not determined a dose or permissible exposure limit, other sources of information such as Material Safety Data Sheets that comply with the Hazard Communication Standard, §1910.1200, published information and internal documents can provide guidance in establishing acceptable atmospheric conditions.

m. Host employer means any employer who arranges to have the employees of another employer (contractor) perform work for them. Our Company is the host employer for the on-site Operations Maintenance Contractor who may also be a host employer.

n. Hot work permit means the employer's written authorization to perform operations (for example, riveting, welding, cutting, burning, and heating) capable of providing a source of ignition.

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

NOTE: Some materials - hydrogen fluoride gas and cadmium vapor, for example - may produce immediate transient effects that, even if severe, may pass without medical attention, but are followed by sudden, possible fatal collapse 12 - 72 hours after exposure. The victim "feels normal" from recovery from transient effects until collapse. Such materials in hazardous quantities are considered to be "immediately" dangerous to life or health.

p. Inerting means the displacement of the atmosphere in a permit space by a noncombustible gas (such as nitrogen) to such an extent that the resulting atmosphere is noncombustible.

NOTE: This procedure produces an IDLH oxygen-deficient atmosphere.

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

r. Line breaking means the intentional opening of a pipe, line, or duct that is or has been carrying flammable, corrosive, or toxic material, an inert gas, or any fluid at a volume, pressure, or temperature capable of causing injury.

s. Non-permit confined space means 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.

t. Oxygen-deficient atmosphere means an atmosphere containing less than 19.5 percent oxygen by volume.

u. Oxygen-enriched atmosphere means an atmosphere containing more than 23.5 percent oxygen by volume.

v. Permit-required confined space (permit space) means a confined space that has one or more of the following characteristics:

1.Contains or has a 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-sections; or

4.Contains any other recognized serious safety or health hazard.

w. Permit-required confined space program (permit space program) means the employer's overall program for controlling, and, where appropriate, for protecting employees from, permit space hazards and for regulating employee entry into permit spaces.

x. Permit system means the employer's written procedure for preparing and issuing permits for entry and for returning the permit space to service following termination of entry.

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

z. Rescue service means the personnel designated to rescue employees from permit spaces.

aa. Retrieval system means the equipment (including a retrieval line, chest or full-body harness, wristlets, if appropriate, and a lifting device or anchor) used for non-entry rescue of persons from permit spaces.

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

> NOTE: Testing enables employers both to devise and implement adequate control measures for the protection of authorized entrants and to determine if acceptable entry conditions are present immediately prior to, and during, entry.

References:

American National Standards Institute "Safety Requirements for Working in Tanks and other Confined Spaces".

NIOSH "Criteria for a Recommended Standard...Working in Confined Spaces."

U.S. Department of Labor, OSHA regulations, 29 CFR 1910.146, "Permit-Required Confined Spaces."

Identification and Evaluation of Confined Spaces:

An inspection of the Company's premises has identified the following spaces as confined spaces and permit-required confined spaces:

Confined Spaces: (Insert a list of all spaces below meeting the definition of a confined space)

Permit-Required Confined Spaces: (Insert a list of all spaces below that meet the definition of a permit-required confined space)

All Permit-Required Confined Spaces have been marked with warning signs reading:

"Danger - Permit-Required Confined Space - Authorized Entrants Only".

Procedure:

Work involving entry to a confined space must be planned. An assessment of likely hazards should be made prior to commencing the work. Precautions must be taken to avoid exposure to harmful substances or oxygen deficient atmospheres. Some thought should also be given to handling possible emergencies.

ENTRY INTO PERMIT-REQUIRED CONFINED SPACES:

Prior to entry into any permit-required confined space, the employee's supervisor will issue a permit that specifies the location, type, and duration of the work to be done, and the date. The permit will certify that all existing hazards have been evaluated by the supervisor and that necessary protective measures have been taken for the safety of workers. It will provide documentation of the atmospheric testing that has been done. It will assign entry and attendant duties to specific persons.

Before issuing an entry permit, the employee's supervisor will be responsible for the following:

Identify all hazards and potential hazards associated with the confined space, such as the danger of explosion, asphyxiation, toxic gases/fumes, engulfment or entrapment, electrical or mechanical hazards, etc.

Isolate the space from potential hazards, if possible, to provide for safe entry.

Purge, inert, flush, ventilate to eliminate atmospheric hazards.

Provide external barriers and warning signs.

Perform pre-entry oxygen, flammable gas and toxicity air tests. All test results are to be recorded on the entry permit. If potential hazards cannot be isolated, continuous monitoring is required. If potential hazards can be isolated, periodic monitoring is required.

Provide at least one trained attendant outside of each confined space that will be entered.

Ensure that rescue and emergency services and equipment are in place as noted in this policy.

Ensure that all required equipment is provided, maintained and properly used. This includes air monitoring equipment, forced air ventilation equipment, communications equipment, personal protective equipment (PPE), lighting, external barriers and warning signs, ladders, and rescue equipment.

If hazardous conditions are detected during entry, employees will immediately leave the space and the supervisor will determine the cause of the hazardous atmosphere and take corrective actions before allowing re-entry.

RESCUE & EMERGENCY SERVICES:

If proper protective measures are taken to eliminate and control any possible hazards in the confined space (i.e., ventilation, purging, monitoring, lock out/tag out, etc.), rescue operations should not be necessary. Nonetheless, the Company will be prepared for the worst case scenario.

An attendant for the confined space will have access to a telephone and know the proper procedure for alerting the proper personnel in the event of an emergency, including the fire department, paramedics, police, and others as necessary.

Provisions will be made and equipment provided to ensure timely extraction of an unconscious or injured worker from the confined space. This will include a body harness with a lifeline attached to a tripod and rescue winch. Under no circumstances is the attendant to enter the space to effect rescue; rescue operations must be left to trained personnel.

Training:

Employees involved with permit-required confined space work will be trained to assure the knowledge, understanding, and skills necessary for the safe performance of their duties. Foremen will be trained in the identification and evaluation of confined space hazards and in the proper precautions to be taken to assure safe entry and work in confined spaces. Employees entering confined spaces will be trained in the hazards and potential hazards involved and how to protect themselves from those hazards. They will be trained to never enter a confined space until a permit is issued and they have been authorized to enter by the foreman. Attendants will be trained in their duties and responsibilities and the actions to be taken in the event of an emergency.

Employees will receive a written certification following their training to document that they have been properly trained in their respective duties and the hazards and safety precautions involved in confined space entry.

Contractors:

a. When the Company arranges to have employees of another employer (contractor) perform work that involves permit space entry, the host employer shall:

i. Inform the contractor that the workplace contains permit spaces and that permit space entry is allowed only through compliance with a permit space program meeting the OSHA regulations;

ii. Apprise the contractor of the elements, including the hazards identified and the host employer's experience with the space, that make the space in question a permit space;

iii. Apprise the contractor of any precautions or procedures that the host employer has implemented for the protection of employees in or near permit spaces where contractor personnel will be working;

iv. Coordinate entry operations with all contractors (including on-site contractors), when any combination of host employer personnel and/or contractor personnel will be working in or near permit spaces, as required by paragraph (f-8); and

v. Debrief the contractor at the conclusion of the entry operations regarding the permit space program followed and regarding any hazards confronted or created in permit spaces during entry operations.

b. In addition to complying with the permit space requirements that apply to all employers, each contractor who is retained to perform permit space entry operations shall:

i. Obtain any available information regarding permit space hazards and entry operations from the host employer;

ii. Coordinate entry operations with the host employer, when both host employer personnel and contractor personnel will be working in or near permit spaces, as required; and

iii. Inform the host employer of the permit space program that the contractor will follow and of any hazards confronted or created in permit spaces, either through a debriefing or during the entry operation.

Sample Permit #1
Confined Space Entry Permit

Date and Time Issued: _____ Date and Time Expires: _____
Job site/Space I.D.: _____ Job Supervisor:_____
Equipment to be worked on: _____ Work to be performed: _____

Stand-by personnel: _____ _____ _____

1. Atmospheric Checks: Time _____
Oxygen _____%
Explosive _____% L.F.L.
Toxic _____PPM

2. Tester's signature: _____

3. Source isolation (No Entry):	N/A	Yes	No
Pumps or lines blinded,	( )	( )	( )
disconnected, or blocked	( )	( )	( )

4. Ventilation Modification:	N/A	Yes	No
Mechanical	( )	( )	( )
Natural Ventilation only	( )	( )	( )

5. Atmospheric check after isolation and Ventilation:
Oxygen _____% > 19.5 %
Explosive _____% L.F.L < 10 %
Toxic _____PPM < 10 PPM H(2)S
Time _____
Testers signature: _____

6. Communication procedures: _____
_____

7. Rescue procedures: _____
_____
_____
_____

8. Entry, standby, and back up persons:	Yes	No
Successfully completed required training?	( )	( )
Is it current?	( )	( )

9. Equipment:	N/A	Yes	No
Direct reading gas monitor - tested	( )	( )	( )
Safety harnesses and lifelines for entry and standby persons	( )	( )	( )
Hoisting equipment	( )	( )	( )
Powered communications	( )	( )	( )
SCBA's for entry and standby			

persons	( )	( )	( )
Protective Clothing	( )	( )	( )
All electric equipment listed Class I, Division I, Group D and Non-sparking tools	( )	( )	( )

10. Periodic atmospheric tests:

Oxygen	____%	Time ____	Oxygen	____%	Time ____
Oxygen	____%	Time ____	Oxygen	____%	Time ____
Explosive	____%	Time ____	Explosive	____%	Time ____
Explosive	____%	Time ____	Explosive	____%	Time ____
Toxic	____%	Time ____	Toxic	____%	Time ____
Toxic	____%	Time ____	Toxic	____%	Time ____

We have reviewed the work authorized by this permit and the information contained here-in. Written instructions and safety procedures have been received and are understood. Entry cannot be approved if any squares are marked in the "No" column. This permit is not valid unless all appropriate items are completed.

Permit Prepared By: (Supervisor)_____
Approved By: (Unit Supervisor)_____
Reviewed By (Cs Operations Personnel) :

_____ _____
(printed name) (signature)

This permit is to be kept at the job site. Return job site copy to Safety Office following job completion.

Copies: White Original (Safety Office)-- Yellow (Unit Supervisor)-- Hard (Job site).

Sample Permit #2
Confined Space Entry Permit

PERMIT VALID FOR 8 HOURS ONLY. ALL COPIES OF PERMIT WILL REMAIN AT JOB SITE UNTIL JOB IS COMPLETED

Date: _____ Site Location and Description _____
PURPOSE OF ENTRY

_____
SUPERVISOR(S) in charge of crews Type of Crew Phone #

_____

_____

COMMUNICATION PROCEDURES

_____

RESCUE PROCEDURES (PHONE NUMBERS AT BOTTOM)

_____

_____

* BOLD DENOTES MINIMUM REQUIREMENTS TO BE COMPLETED AND REVIEWED PRIOR TO ENTRY*

REQUIREMENTS COMPLETED	DATE	TIME
Lock Out/De-energize/Try-out	____	____
Line(s) Broken-Capped-Blanked	____	____
Purge-Flush and Vent	____	____
Ventilation	____	____
Secure Area (Post and Flag)	____	____
Breathing Apparatus	____	____
Resuscitator - Inhalator	____	____
Standby Safety Personnel	____	____
Full Body Harness w/"D" ring	____	____
Emergency Escape Retrieval Equip	____	____
Lifelines	____	____
Fire Extinguishers	____	____
Lighting (Explosive Proof)	____	____
Protective Clothing	____	____
Respirator(s) (Air Purifying)	____	____
Burning and Welding Permit	____	____

Note: Items that do not apply above, enter N/A in the blank.

RECORD CONTINUOUS MONITORING RESULTS EVERY 2 HOURS

****CONTINUOUS MONITORING****

Permissible _____

TEST(S) TO BE TAKEN	Entry Level	
PERCENT OF OXYGEN	19.5% to 23.5%	___ ___ ___ ___ ___ ___ ___ ___
LOWER FLAMMABLE LIMIT	Under 10%	___ ___ ___ ___ ___ ___ ___ ___
CARBON MONOXIDE	+35 PPM	___ ___ ___ ___ ___ ___ ___ ___
Aromatic Hydrocarbon	+ 1 PPM * 5PPM	___ ___ ___ ___ ___ ___ ___ ___
Hydrogen Cyanide	(Skin) * 4PPM	___ ___ ___ ___ ___ ___ ___ ___
Hydrogen Sulfide	+10 PPM *15PPM	___ ___ ___ ___ ___ ___ ___ ___
Sulfur Dioxide	+ 2 PPM * 5PPM	___ ___ ___ ___ ___ ___ ___ ___

Ammonia *35PPM ___ ___ ___ ___ ___ ___ ___ ___

* Short-term exposure limit: Employee can work in the area up to 15 minutes.
+ 8 hr. Time Weighted Avg.: Employee can work in area 8 hrs (longer with appropriate respiratory protection).

REMARKS:_____

GAS TESTER NAME & CHECK #	INSTRUMENT(S) USED	MODEL &/OR TYPE	SERIAL &/OR UNIT #
_____	_____	_____	_____
_____	_____	_____	_____

SAFETY STANDBY PERSON IS REQUIRED FOR ALL CONFINED SPACE WORK

Safety Standby Person(s)	CHECK #	CONFINED SPACE ENTRANT(S)	CHECK#	CONFINED SPACE ENTRANT(S)	CHECK #
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

SUPERVISOR AUTHORIZING –ALL CONDITIONS SATISFIED_____

DEPARTMENT/PHONE _____

AMBULANCE _____ FIRE _____

Safety Coordinator _____

USE OF CORRIDORS AND OUTSIDE WALKWAYS

Policy and Purpose:

The Company will ensure that corridors in all buildings and outside walkways be maintained in such a manner that they are free of obstructions.

Fire codes and building regulations establish requirements for safe and adequate means of egress from buildings during emergencies. A fundamental principle of these codes and regulations is to maintain an exit path (i.e., corridors) which is free of obstructions and hazards. This principle is usually interpreted as prohibiting the storage of materials or operation of equipment in building corridors, even though corridor widths are greater than code-specified minimum widths.

This section establishes Company policy for the safe use of corridors in buildings occupied by Company employees. The intent of this policy is to ensure that corridors provide for:

- a readily apparent, safe and adequate means by which building occupants may exit a building in the event of a fire or other serious emergency;
- adequate access and use by emergency personnel;
- the safe movement of people during normal daily use of the building; and
- the safe transportation of goods and materials.

Responsibility:

a. Supervisor

1.Ensures that all employees under his/her direction are aware of and conform to this policy.

2.Ensures that corridors and outside walkways in the vicinity of his/her workplace and staff are free of obstructions and are not used for storage unless prior written authorization is issued by the Safety and Health Manager.

b. Employee

1.Uses appropriate areas and locations for the storage of equipment/supplies that will not impede safe movement of material or personnel.

2.Completes all necessary forms and follows procedures for submitting surplus or excess equipment.

c. Safety and Health Manager

1. Enforces the corridor and outside walkway policy.

2. Provides guidance or interpretation of the provisions of this policy.

3. Conducts periodic inspections of Company corridors for the purpose of advising each Supervisor of conditions requiring corrective action.

4. Approves/disapproves requests for exceptions under this policy.

General Provisions:

Corridors, hallways and outside walkways, aside from serving as passageways for personnel, equipment and supplies, function as avenues for building evacuation in the

event of fire or other emergencies, quick admission of emergency personnel, and as convenient sites for fire alarm boxes, extinguishers, safety showers, eyewash stations, and other emergency equipment.

a. No equipment or material shall be placed or stored in any corridor or outside walkway without first obtaining written permission from the Health and Safety Branch.

b. When exceptions are granted, no material shall be located in such a manner which blocks or impedes access to doorways or other exits, telephone and electrical switch gear panels, safety showers, fire extinguishers, or fire alarm boxes.

c. Compressed gas cylinders, empty or full, shall not be stored in any corridor.

d. Items to be disposed of by the janitorial service should not be placed in corridors until the late afternoon, just prior to the end of the normal work day. They should be clearly marked as "TRASH".

e. No hazardous material (i.e., chemicals, radioactive materials) or hazardous wastes shall be placed or stored in corridors. Yellow bags are reserved for hazardous wastes and should never be placed in the corridors.

f. Surface mounted fire extinguishers, bulletin or chalkboards, or similar items may extend into the clear space; however, displays which extend into the clear space by more than 4 inches are not permitted. Items shall have no sharp edges which could cause injury.

Laboratory Carts-

This policy is not intended to prohibit the temporary use of the occasional laboratory cart which may be quickly moved by the occupants in order to provide full access. Carts shall be restricted to one side of the corridor. The same side shall be utilized on each floor throughout the building. Ideally the carts should be located on the interior corridor wall. Carts shall be returned to the lab at the end of each day.

Elevator Lobbies-

While elevator lobbies represent considerable unused space, these areas are a part of the path leading to the stairwell exits and are not to be used for general storage.

Exceptions-

a. Permanent - Any request for a permanent exception to the provisions of this policy shall be in the form of a memorandum to the Safety and Health Manager. The memorandum shall identify the specific items(s) for which the exception is requested (including the size, if appropriate); the proposed storage/use location; and the reason why the policy requirement should be

waived. The Safety and Health Manager will approve or disapprove in writing. Any appeals should be made to the Company President.

b. Temporary - Where a temporary exception is needed for storage in corridors or walkways due to alterations or scheduled moves, a request for temporary exception (not to exceed 30 days) shall be in the form of a memorandum from the responsible individual to the Safety and Health Manager.

The memorandum should identify the specific item(s); the length of time for storage; and the reason why the items cannot be retained in their present location. The Safety and Health Manager will approve/deny the request.

Penalties:

Material or equipment found in violation of the provisions of this issuance will be subject to removal from the building by authorized personnel. All confiscated items will be removed to the warehouse or other location and released only on a written request by the Safety and Health Manager.

Abandoned Property:

a. Abandoned property is defined as any property which is in an inappropriate location and has no known user. It can cause space, security, and safety problems.

b. Supervisors are responsible for keeping abandoned property from cluttering corridors and building areas. Company Management officials may require that abandoned property be moved when it impedes the normal flow of traffic, creates a hazard, or for other reasons.

Abandoned Property: (continued)

c. Abandoned property to be moved will be identified with a sticker or form that indicates the property will be removed within one week if not claimed by the owner. Individuals marking abandoned property for movement must coordinate with the Safety and Health Manager concerning the safety of the abandoned property.

Marshaling Storage Area and Loading Docks:

a. The loading docks are for loading and unloading trucks. The docks are not to be used for the storage of materials. Materials left on the dock shall be subject to removal if they impede movement of supplies and/or personnel egress from the building.

b. The Marshaling Area is used for temporary storage and arranging materials and supplies for delivery and as a permanent location for emergency freezers. It shall not be used for long term storage.

Crane & Hoist Safety

Purpose:

Many types of cranes, hoists, and rigging devices are used at the Company for lifting and moving materials. It is the Company's policy is to maintain a safe workplace for its employees; therefore, it cannot be overemphasized that only qualified and licensed individuals shall operate these devices.

The safety rules and guidance in this chapter apply to all operations at the Company that involve the use of cranes and hoists installed in or attached to buildings and to all Company employees, supplemental labor, and subcontractor personnel who use such devices.

Responsibilities:

Supervisors are responsible for:

- Ensuring that employees under their supervision receive the required training and are certified and licensed to operate the cranes and hoists in their areas.

Providing training for prospective crane and hoist operators. This training must be conducted by a qualified, designated instructor who is a licensed crane and hoist operator and a full-time employee.
Evaluating crane and hoist trainees using the Crane Safety Checklist and submitting the Qualification Request Form to the Safety Office to obtain the operator's license.
Ensuring that hoisting equipment is inspected and tested monthly by a responsible individual and that rigging equipment is inspected annually.

Crane and Hoist Operators are responsible for:

Operating hoisting equipment safely.
Conducting functional tests prior to using the equipment.
Selecting and using rigging equipment appropriately.
Having a valid operator's license on their person while operating cranes or hoists.
Participating in the medical certification program, as required.
Equipment will not be operated within 10 feet of energized electrical transmission lines or distribution lines.
Ensuring that a fire extinguisher, rated at least 5 BC, shall be located in the cab of the crane

Maintenance Department is responsible for:

Performing annual maintenance and inspection of all Company cranes and hoists that are not covered by a program with maintenance responsibility.
Conducting periodic and special load tests of cranes and hoists.
Maintaining written records of inspections and tests, and providing copies of all inspections and test results to facility managers and building coordinators who have cranes and hoists on file.
Inspecting and load testing cranes and hoists following modification or extensive repairs (e.g., a replaced cable or hook, or structural modification.)
Scheduling a non-destructive test and inspection for crane and hoist hooks at the time of the periodic load test, and testing and inspecting before use new replacement hooks and other hooks suspected of having been overloaded. The evaluation, inspection, and testing may include, but are not limited to visual, dye penetrant, and magnetic particle techniques referenced in ASME B30.10 (Hooks, Inspection and Testing.)
Maintaining all manuals for cranes and hoists in a central file for reference.

Safety Department is responsible for:

Conducting training for all Crane & Hoist Operators

Issuing licenses to Crane and Hoist Operators
Periodically verifying monthly test and inspection reports.
Interpreting crane and hoist safety rules and standards.

Safe Operating Requirements:

All workers who use any Company crane or hoist shall have an operator's license. The Company issues licenses for authorized employees who have been specifically trained in crane and hoist operations and equipment safety.

Crane and Hoist Operators

To be qualified as a Crane and Hoist Operator, the candidate shall have received hands-on training from a licensed, qualified crane and hoist operator designated by the candidate's supervisor. Upon successful completion of training, the licensed crane and hoist operator and the candidate's supervisor will fill out and sign the Qualification Request Form and Crane Safety Checklist and send them to the Safety Office for approval. The candidate will be issued a license upon approval by the Safety Manager. Crane and Hoist Operators must renew their license every three years by satisfying the requirements described above.

Crane and Hoist Safety Design Requirements:

Following are the design requirements for cranes and hoists and their components:

The design of all commercial cranes and hoists shall comply with the requirements of ASME/ANSI B30 standards and Crane Manufacturer's Association of America standards (CMAA-70 and CMAA-74). The Company's fabricated lifting equipment shall comply with the requirements in Chapter 2.2 (Lifting Equipment) of Mechanical Engineering Design Safety Standards (latest edition).
All crane and hoist hooks shall have safety latches.
Hooks shall not be painted (or re-painted) if the paint previously applied by the manufacturer is worn.
Crane pendants shall have an electrical disconnect switch or button to open the main-line control circuit.
Cranes and hoists shall have a main electrical disconnect switch. This switch shall be in a separate box that is labeled with lockout capability.
Crane bridges and hoist monorails shall be labeled on both sides with the maximum capacity.
Each hoist-hook block shall be labeled with the maximum hook capacity.
Directional signs indicating N-W-S-E shall be displayed on the bridge underside, and a corresponding directional label shall be placed on the pendant.

A device such as an upper-limit switch or slip clutch shall be installed on all building cranes and hoists. A lower-limit switch may be required when there is insufficient hoist rope on the drum to reach the lowest point.
All cab and remotely operated bridge cranes shall have a motion alarm to signal bridge movement.
All newly installed cranes and hoists, or those that have been extensively repaired or rebuilt structurally, shall be load tested at 125% capacity prior to being placed into service. If an overload device is installed, a load test to the adjusted setting is required.
Personnel baskets and platforms suspended from any crane shall be designed in accordance with the specifications in 29 CFR 1926.550(g).

General Safety Rules:

Operators shall comply with the following rules while operating the cranes and hoists:

Do not engage in any practice that will divert your attention while operating the crane.
Respond to signals only from the person who is directing the lift, or any appointed signal person. Obey a stop signal at all times, no matter who gives it.

Operators shall comply with the following rules (continued):

Do not move a load over people. People shall not be placed in jeopardy by being under a suspended load. Also, do not work under a suspended load unless the load is supported by blocks, jacks, or a solid footing that will safely support the entire weight.
Have a crane or hoist operator remain at the controls or lock open and tag the main electrical disconnect switch.
Ensure that the rated load capacity of a crane's bridge, individual hoist, or any sling or fitting is not exceeded. Know the weight of the object being lifted or use a dynamometer or load cell to determine the weight.
Check that all controls are in the OFF position before closing the main-line disconnect switch.
If spring-loaded reels are provided to lift pendants clear off the work area, ease the pendant up into the stop to prevent damaging the wire.
Avoid side pulls. These can cause the hoist rope to slip out of the drum groove, damaging the rope or destabilizing the crane or hoist.
To prevent shock loading, avoid sudden stops or starts. Shock loading can occur when a suspended load is accelerated or decelerated, and can overload the crane or hoist.
When completing an upward or downward motion, ease the load slowly to a stop.

Operation Rules:

Pre-operational Test

At the start of each work shift, operators shall do the following steps before making lifts with any crane or hoist:

1. Test the upper-limit switch. Slowly raise the unloaded hook block until the limit switch trips.
2. Visually inspect the hook, load lines, trolley, and bridge as much as possible from the operator's station; in most instances, this will be the floor of the building.
3. If provided, test the lower-limit switch.
4. Test all direction and speed controls for both bridge and trolley travel.
5. Test all bridge and trolley limit switches, where provided, if operation will bring the equipment in close proximity to the limit switches.
6. Test the pendant emergency stop.
7. Test the hoist brake to verify there is no drift without a load.
8. If provided, test the bridge movement alarm.
9. Lock out and tag for repair any crane or hoist that fails any of the above tests.

Moving a Load

Center the hook over the load to keep the cables from slipping out of the drum grooves and overlapping, and to prevent the load from swinging when it is lifted. Inspect the drum to verify that the cable is in the grooves.
Use a tag line when loads must traverse long distances or must otherwise be controlled. Manila rope may be used for tag lines.
Plan and check the travel path to avoid personnel and obstructions.
Lift the load only high enough to clear the tallest obstruction in the travel path.
Start and stop slowly.
Land the load when the move is finished. Choose a safe landing.
Never leave suspended loads unattended. In an emergency where the crane or hoist has become inoperative, if a load must be left suspended, barricade and post signs in the surrounding area, under the load, and on all four sides. Lock open and tag the crane or hoist's main electrical disconnect switch.

Parking a Crane or Hoist

Remove all slings and accessories from the hook. Return the rigging device to the designated storage racks.
Raise the hook at least 2.1 m (7 ft) above the floor.
Store the pendant away from aisles and work areas, or raise it at least 2.1 m (7 ft) above the floor.

Place the emergency stop switch (or push button) in the OFF position.

Rigging:

General Rigging Safety Requirements

Only select rigging equipment that is in good condition. All rigging equipment shall be inspected annually; defective equipment is to be removed from service and destroyed to prevent inadvertent reuse. The load capacity limits shall be stamped or affixed to all rigging components.

Company policy requires a minimum safety factor of 5 to be maintained for wire rope slings. The following types of slings shall be rejected or destroyed:

Nylon slings with
- Abnormal wear.
- Torn stitching.
- Broken or cut fibers.
- Discoloration or deterioration.

The following types of slings shall be rejected or destroyed (continued):

Wire-rope slings with
- Kinking, crushing, bird-caging, or other distortions.
- Evidence of heat damage.
- Cracks, deformation, or worn end attachments.
- Six randomly broken wires in a single rope lay.
- Three broken wires in one strand of rope.
- Hooks opened more than 15% at the throat.
- Hooks twisted sideways more than 10deg. from the plane of the unbent hook.

Alloy steel chain slings with
- Cracked, bent, or elongated links or components.
- Cracked hooks.
- Shackles, eye bolts, turnbuckles, or other components that are damaged or deformed.

Rigging a Load

Do the following when rigging a load:

- Determine the weight of the load. Do not guess.
- Determine the proper size for slings and components.
- Do not use manila rope for rigging.

Make sure that shackle pins and shouldered eye bolts are installed in accordance with the manufacturer's recommendations.
Make sure that ordinary (shoulderless) eye bolts are threaded in at least 1.5 times the bolt diameter.
Use safety hoist rings (swivel eyes) as a preferred substitute for eye bolts wherever possible.
Pad sharp edges to protect slings. Remember that machinery foundations or angle-iron edges may not feel sharp to the touch but could cut into rigging when under several tons of load. Wood, tire rubber, or other pliable materials may be suitable for padding.
Do not use slings, eye bolts, shackles, or hooks that have been cut, welded, or brazed.
Install wire-rope clips with the base only on the live end and the U-bolt only on the dead end. Follow the manufacturer's recommendations for the spacing for each specific wire size.
Determine the center of gravity and balance the load before moving it.
Initially lift the load only a few inches to test the rigging and balance.

Crane Overloading:

Cranes or hoists shall not be loaded beyond their rated capacity for normal operations. Any crane or hoist suspected of having been overloaded shall be removed from service by locking open and tagging the main disconnect switch. Additionally, overloaded cranes shall be inspected, repaired, load tested, and approved for use before being returned to service.

Working at Heights on Cranes or Hoists:

Anyone conducting maintenance or repair on cranes or hoists at heights greater than 1.8 m (6 ft) shall use fall protection. Fall protection should also be considered for heights less than 1.8 m. Fall protection includes safety harnesses that are fitted with a lifeline and securely attached to a structural member of the crane or building or properly secured safety nets.

Use of a crane as a work platform should only be considered when conventional means of reaching an elevated worksite are hazardous or not possible. Workers shall not ride a moving bridge crane without an approval from the Safety Office, which shall specify the following as a minimum:

Personnel shall not board any bridge crane unless the main disconnect switch is locked and tagged open.
Personnel shall not use bridge cranes without a permanent platform (catwalk) as work platforms. Bridge catwalks shall have a permanent ladder access.

Personnel shall ride seated on the floor of a permanent platform with approved safety handrails, wear safety harnesses attached to designated anchors, and be in clear view of the crane operator at all times.
Operators shall lock and tag open the main (or power) disconnect switch on the bridge catwalk when the crane is parked.

Hand Signals

Signals to the operator shall be in accordance with the standard hand signals unless voice communications equipment (telephone, radio, or equivalent) is used. Signals shall be discernible or audible at all times. Some special operations may require addition to or modification of the basic signals. For all such cases, these special signals shall be agreed upon and thoroughly understood by both the person giving the signals and the operator, and shall not be in conflict with the standard signals.

Inspection, Maintenance, and Testing:

All tests and inspections shall be conducted in accordance with the manufacturers recommendations.

Monthly Tests and Inspections

All in-service cranes and hoists shall be inspected monthly and the results documented on the Company's Crane and Hoist Inspection Form

Defective cranes and hoists shall be locked and tagged "out of service" until all defects are corrected. The inspector shall initiate corrective action by notifying the facility manager or building coordinator.

Annual Inspections

The Maintenance Department shall schedule and supervise (or perform) annual preventive maintenance (PM) and annual inspections of all cranes and hoists. The annual PM and inspection shall cover

Hoisting and lowering mechanisms.
Trolley travel or monorail travel
Bridge travel.
Limit switches and locking and safety devices.
Structural members.
Bolts or rivets.

Sheaves and drums.
Parts such as pins, bearings, shafts, gears, rollers, locking devices, and clamping devices.
Brake system parts, linings, pawls, and ratchets.
Load, wind, and other indicators over their full range.
Gasoline, diesel, electric, or other power plants.
Chain-drive sprockets.
Crane and hoist hooks.
Electrical apparatus such as controller contractors, limit switches, and push button stations.
Wire rope.
Hoist chains.

Load Testing:

Newly installed cranes and hoists shall be load tested at 125% of the rated capacity by designated personnel.
Slings shall have appropriate test data when purchased. It is the responsibility of the purchaser to ensure that the appropriate test data are obtained and maintained.
Re-rated cranes and hoists shall be load tested to 125% of the new capacity if the new ratingis greater than the previous rated capacity.
Fixed cranes or hoists that have had major modifications or repair shall be load tested to125% of the rated capacity.
Cranes and hoists that have been overloaded shall be inspected prior to being returned to service.
Personnel platforms, baskets, and rigging suspended from a crane or hoist hook shall be load tested initially, then re-tested annually thereafter or at each new job site.
All cranes and hoists with a capacity greater than 2722 kg (3 tons) should be load tested every four years to 125% of the rated capacity. Cranes and hoists with a lesser capacity should be load tested every eight years to 125% of the rated capacity.
All mobile hoists shall be load tested at intervals to be determined by [ ].

Records:

The Maintenance Department shall maintain records for all cranes, hoist and rigging equipment.

Crane & Hoist Operator License

Operator's name: _____ Employee No: _____

Job Title_____ Dept./Div.: _____

SUPERVISORS please note that by completing and signing this form, you are certifying that the operator

1. Is required to operate a crane or hoist as part of his/her job assignment.

2. Has completed Crane Operation & Safety Training on _____

3. Has had on-the-job training for a period of ____ months operating a crane or hoist under supervision.

4. Has been evaluated using the Safety Checklist and Is capable of operating a crane or hoist and making lifts safely.

Supervisor: _____ _____

Forward the completed form to Safety Office for approval.
Attach Safety Checklist.

Safety Office Approval: _____ Date: _____

Safety Checklist for Crane and Hoist Operator Qualification

A licensed operator, certified to operate the type of equipment for which the new operator is being evaluated, shall complete this checklist by initialing each item in the space provided to indicate that the new operator has demonstrated knowledge in the particular area or by marking "NA" for items that do not apply. Both the licensed operator and new operator's supervisor shall sign the completed checklist.

Operator's Name: _____ Date completed: _____

_____ 1. Describe the difference between a bridge crane and a hoist. (A bridge crane operates on two tracks; a hoist operates on a single monorail track.)

_____ 2. Why is a bridge crane more versatile than a hoist? (The bridge crane has 4-way horizontal movement, while a hoist has only 2-way horizontal movement.)

_____ 3. What are the components of a bridge crane? (Bridge, trolley, hoist drum, hoist cables, hoist block and hook, pendant, stops, bumpers, and limit switches.)

_____4. What are the standard markings used on a bridge crane control pendant? (Raise, lower, trolley east, trolley west, bridge north, bridge south, on/off switch.)

_____ 5. Why are on/off switches required on control pendants? (For emergency stops in the event that any of the pendant controls fails.)

_____ 6. If a crane's bridge, trolley, and hoist have more than one speed, describe the proper lifting procedures. (Start with the slowest speed and progressively Increase to the highest.)

_____7. Explain the term "drum overlapping," as it pertains to a bridge crane, and the primary cause of overlapping. (The hoist cables will not lie properly in the grooves on the hoist drum If the operator does not center the hook over the load and start lifting the load from an angle.)

_____8. When should a bridge crane be checked for drum overlapping? (Prior to each use.)

_____ 9. How many wraps of wire must still be on the hoist drum when the hoist hook reaches the lowest working level in the work area? (No less than two lull wraps of wire must be left on the hoist drum.)

_____ 10. Which hoists are required to have upper-limit switches, and how often these switches should be tested? (All motor-driven bridge cranes and hoists are required to have upper-limit switches, and they must be tested each day the crane Is used.)

_____ 11. When are lower-limit switches required? (1n any area that has lower working levels (e.g., pits). Hoists that do not have enough wire on the drum to lower the hook to the lowest level and maintain at least two full wraps of wire on the drum must be fitted with lower- limit switches.)

_____ 12. Should limit switches be depended upon to stop the hoist movement? (Never. Limit switches are installed for safety only, and no operator should depend upon them for normal stopping.)

_____ 13. Where is the main electric disconnect for the bridge crane or hoist located? (Normally, a separate disconnect switch is located in a wall-mounted box with lockout capability.)

_____ 14. What are the proper procedures for cranes found to be defective (e.g., the upper-limit switch does not operate, a pendant control fails, the hoist does not hold the load)? (Report the defect to the supervisor Immediately, lock out and tag the crane's main electrical disconnect switch, report the defect to Maintenance Department

_____ 15. Are movement alarms required on pendant-operated bridge cranes? (Alarms are not required; however, if a crane Is fitted with a movement alarm, it must be maintained in working condition.)

_____ 16. Is a written, signed inspection report required for all bridge cranes and hoists, and who should complete that report? (The inspection Is completed monthly by a responsible individual assigned by the supervisor and documented on the Monthly Inspection Report Form

_____ 17. Explain the action required if there is a hoist brake drift when the hoist stops with a load suspended. (There should be no hoist drift; if there is, the brake is not holding and should be reported to the Maintenance Department

____ 18. Why is the hook always centered over the load? (To prevent drum overlapping and stress on the hoist and lifting fixtures.)

____ 19. At what height should a load be lifted when it Is being moved. (Only lift a load high enough to clear all obstructions in its path. Never move a load over personnel or costly equipment.)

____ 20. When it is permissible to leave a load suspended on a crane hook, and who should be notified If mechanical problems prevent landing the load? (It is never permissible to leave a load suspended. The load must be landed and the slings removed from the hook. If there are mechanical problems, the maintenance department must be notified.)

____ 21. Describe the procedures for parking a crane. (Remove all accessories from the hook, raise the hook 2..l m (7 ft) above the floor level, store the pendant clear off work areas or aisles or 2.1 m above the floor level if the crane is fitted with a pendant-retracting reel, and place the stop switch in the OFF

position.)

_____ 22. Can a person work under a suspended load? (Never. Unless the load Is supported by blocks or jacks.)

_____ 23. Can operators exceed the maximum capacity of a crane or hoist? (An operator shall never exceed the maximum capacity marked on both sides of the bridge or monorail for a hoist.)

_____ 24. What is the minimum safety factor for slings? (The safety factor for slings is 5 to 1.)

_____ 25. What precautions should be taken when using wire-rope slings or synthetic-webbing slings? (Protect the slings from sharp edges by using padding. This Is especially important when using synthetic-webbing slings.)

_____ 26. Explain the proper procedure to follow If a synthetic sling is too short. (Use a shackle to join the two slings together. Never tie a knot In a sling, as this will weaken it considerably.)

____ 27. What precautions should be taken when using eye bolts as lifting fixtures? (Ordinary eye bolts should only be used for straight pulls and must have a minimum of 1-1/2 times the bolt diameter threaded into the load. Shoulder-type eye bolts must have the shoulder tightly secured against a flat surface. The safe working load of an eye bolt decreases rapidly as the angle of the pull increases. Safety hoist or swivel rings are preferred and recommended.)

_____ 28. Describe the proper installation procedures for wire-rope clips. (The saddle of the clip must always rest on the part of the wire that will hold the load and take the stress. The U-bolt part of the clip must rest against the dead end of the rope. The nuts must be tightened with a torque wrench to the clip manufacturer's settings.)

_____ 29. What effect will a kink in a wire rope cause? (A kink weakens the wire considerably. Any wire rope with a kink must be cut up and discarded to prevent reuse.)

Licensed Crane and Hoist Operator:_____

Supervisor: _____

Electrical Installations, Equipment, and Electric Safety

Policy:

All electrical work will be conducted in a manner consistent with existing regulations and with good standard practices. This section establishes standards for electrical operations. Because electrical work has the potential for personnel electrocution and the potential hazard of catastrophic property damage, extreme caution must be exercised when working with electricity and electrical equipment. Electrical equipment can also cause fire because of its potential as an ignition source for causing fire or explosion.

Fire is frequently caused by short circuits, overheating equipment and failure of current limiters, thermal sensors, and other safety devices. Explosions may occur when flammable liquids, gases, and dusts are exposed to ignition sources generated by electrical equipment.

Requirements:

1. Electrical installations and utilization equipment will be in accordance with the current edition of the National Electrical Code, National Fire Protection Association (NFPA 70); American National Standards Institute (ANSI) Standard C1. This code will also apply to every replacement, installation, or utilization equipment.

2. Equipment or facilities designed, fabricated for, and intended for use by Company personnel will be procured to meet the requirements of the National Electric Code.

3. Frames of all electrical equipment, regardless of voltage shall be grounded.

4. Exposed non-current carrying metal parts of electrical equipment that may be come energized under abnormal conditions shall be grounded in accordance with the National Electrical Code.

5. Wires shall be covered wherever they are joined, such as: outlets, switches, junction boxes, etc.

6. Parts of electrical equipment which in ordinary operation produce arcs, sparks, etc., shall not be operated or used in explosive atmospheres or in close proximity to combustible materials.

7. Equipment connected by flexible extension cords shall be grounded either by a 3-wire cord or by a separate ground wire (except double insulated equipment).

8. Ground fault circuit interrupters (GFCI) shall be used on all 120-volt, single-phase, 15- and 20-ampere receptacle outlets at job sites when the receptacles are not a part of the permanent wiring of the building or structure. Receptacles on a two wire, single-phase portable or vehicle-mounted generator rated not more than 5 kilowatt, where the circuit conductors of the generator are insulated from the generator frame and all or the grounded surfaces, need not be protected with GFCI's.

Inspections:

Supervisors will insure that work areas are inspected for possible electrical hazards.

Sufficient workspace shall be provided and maintained around electric equipment to permit safe operations and maintenance of such equipment.

Responsibilities:

a. Supervisors

1. All work hazards must be anticipated and all safeguards utilized.

2. Ensures that all employees are properly trained and instructed in the safe operation of electrical equipment and aware of all hazards associated with the use of these electrical devices.

3. Initiates any necessary administrative action required to enforce safety practices.

4. Requests assistance from Company Management regarding equipment operation which require unique safety practice instructions.

b. Employees

1.Follows the Company's electrical safety policies and procedures and instructions of responsible Supervisors and the Safety and Health Manager.

2.Brings to the attention of the supervisor and/or Health and Safety Branch potential hazardous situations such as discrepancies between instruction, procedures, policies and manual, faulty equipment, misapplication of device, etc.

3.Electrical equipment known to be malfunctioning must be repaired or replaced before use. The repair must be initiated as soon as possible after the malfunction is noted.

c. Safety and Health Manager

1. Assists supervisors in defining hazardous operations, designating safe practices and selecting proper application of devices.

2. When necessary, obtains from the principle supervisor, standard operating procedure for electrical equipment and devices in use.

c. Safety and Health Manager (continued)

3. In coordination with Company Management and other supervisors, reviews and approves standard operating procedures.

4. Evaluates potential electrical hazards during facility inspections to insure compliance with existing Company policy and other safety guidelines.

5. Requests support from Company Management on hardware and equipment testing, tagging out of unserviceable equipment, and taking corrective action where necessary.

3. Electrical Safety Practices

The following practices are to be followed by all employees:

a. Individual

1. The user is responsible for obtaining necessary tools and safety equipment from the designated storage area, checking it for discrepancies, returning it to storage in good condition and identifying any faulty equipment to his/her supervisor. It shall be the Supervisor's immediate responsibility to replace any faulty safety equipment and notify the Safety and Health Manager.

2. Eye protection is required during any electronic or electrical hardware repair, installation and/or open front operation.

3. Electrical safety shoes, long sleeve non-polyester, low flammability shirts and insulating gloves will be worn when operating or testing 600 volt or higher equipment.

4. Protective apron will be worn over polyester or other highly flammable clothing during soldering operations.

b. Laboratory Requirements

1. All electrical and electronic laboratory equipment must be inspected for electrical hazards before using.

2. All electrical equipment must be grounded through power cords, frame grounding and/or grounding through wiring in conduit system. NOTE: Some power tools and instruments are now double insulated and do not require or need three pronged plugs. Contact the Safety and Health Manager where the discrepancy or hazard exists.

b. Laboratory Requirements (continued)

3. Laboratory equipment will be kept clear of electrical panelboards with the following clearances: 36 inches for 120/208 volts and 42 inches for 277/480 volts and up to 600 volt equipment.

4. Operation of panelboard circuit breakers by laboratory personnel is prohibited except in case of personal emergency.

5. Switching devices which are tagged and locked shall not be operated until tag is removed by issuer.

6. When work is to be performed on electrical equipment, care must be taken to make sure the electrical source is turned off, rendered inoperative, tagged and locked. (Re: Lock out/Tag out). Working on live parts of 50 volts or more shall not be done except in an emergency and with proper procedure and/or qualified "Buddy" with appropriate safety equipment.

7. Extension cords are intended only for temporary use with portable appliances, tools, and similar equipment that are not normally used at one specific location. Extension cords are not to be used as a substitute for fixed wiring.

c. Emergency Procedures

In the event of a medical emergency (shock etc.) contact a member of Management, contact local Emergency Rescue Units (911), and direct Emergency Rescue Units to the scene. If there is a person nearby who has received First Aid/CPR training, he/she should be contacted immediately to give assistance.

d. Emergency Removal or Tag and Lock

In the event of an emergency in which the person responsible for removing the tag and lock cannot be located, the General Foreman may remove the device in the presence of a member of the Health and Safety Branch. Details for removal are given in the Lock out/Tag out Policy

e. Hazards

The extreme hazard of electrical equipment is the potential for personnel electrocution from contacting energized systems. Electrical equipment can also cause catastrophic

property damage because of its potential as an ignition source for causing fire or explosion.

D. Control of Hazardous Energy (Lock-Out/Tag-Out)

The procedures specified in this section comply with the requirements for the isolation or control of hazardous energy sources set forth in the OSHA standard (29 CFR 1910.147 – proposed). The accidental release of energy during maintenance work can and frequently does cause severe injuries, amputations, and death. Energy can be present in the form of electricity, potential energy (due to gravity) stored in elevated masses, chemical corrosivity, chemical toxicity, or pressure.

The only exceptions (allowed by OSHA to these requirements) are those situations involving "hot tap" operations. For this exception to be valid, Company personnel involved must demonstrate that the continuity of services is essential, that shutdown of the energy source is impractical, and that documented (written) procedures and special equipment have been implemented that will provide proven effective protection.

These procedures apply to all maintenance or installation operations conducted on Company premises.

1.Tag-out Devices

Tags affixed to energy isolating devices are warning devices that do not provide the physical restraint on those devices that a lock would provide. Any tag so attached to an energy isolating device must not be removed without authorization of the person attaching it, and it must never be bypassed, ignored, or otherwise defeated. Tags must be legible and understandable in order to be effective. Tags must be made of materials which will withstand environmental conditions encountered in the workplace. When utilized, tags must be securely attached to energy isolating devices so that they cannot be inadvertently or accidentally detached during use. Tag-out devices must be substantial enough to prevent inadvertent or accidental removal.

Tag-out devices must warn against hazardous conditions if the machine or equipment is energized and must include appropriate warnings such as:

•DO NOT START •DO NOT ENERGIZE

•DO NOT OPEN •DO NOT OPERATE •DO NOT CLOSE

2. Lock-out Devices

Lockout devices and practices vary by nature and function. Several effective lockout devices and practices are listed as follows:

a. Padlocks. Key operated padlocks are recommended and should be assigned individually.

2. Lock-out Devices

Several effective lockout devices and practices are listed as follows: (continued)

b. Multiple lock adapters will enable more than one worker to place their own padlock on the isolating device to guarantee that the machine or equipment will remain deactivated until each and every employee completes their own task, and only then will the last padlock be removed.

c. Chains or other commercially available devices should be used to prevent valves from being opened or, in some cases, closed. The principle of multiple lock adapters still applies even when chains or other devices are used on operations requiring more than one employee.

3. Procedures

a. General

If energy-isolating devices are not capable of being locked out, they must be modified so that they are capable of being locked out whenever major replacement, repair, renovation, or modification of the machine or equipment takes place. Whenever new machines or equipment are installed, energy-isolating devices for such machines or equipment must be designed to accept a lockout device.

If an isolating device cannot be locked out for any reason, then additional steps must be taken to assure full employee protection such as removing fuses, blocking switches, blanking off lines, etc.

If the machine or equipment is not capable of being locked out, a tag-out procedure must be documented and utilized. The tag-out procedure must provide full employee protection equivalent to a lockout system. For full employee protection, when a tag-out device is used on an energy-isolating device, the device must be attached at the same location that the lockout device would have been attached, and must demonstrate that the tag-out device will provide a level of safety that is equivalent to that of a lockout system.

b. Plug/Cord and Hose-Connected Type Equipment

When servicing or installing plug/cord or hose connected electrical, pneumatic, or hydraulically powered equipment, the cord or hose shall be disconnected from the equipment to be worked on, prior to starting the work. A tag warning against reconnecting the plug or hose shall be affixed to the plug or hose end.

Any stored energy (e.g., capacitor voltage, hydraulic pressure) shall be safely released prior to the start of maintenance or installation work.

c. Electrically Powered Equipment

Electrically powered equipment shall be de-energized and their source of electricity manually disconnected from them prior to the removal of protective covers or the start of other maintenance or installation work. It is important to recognize that locking and tagging on/off switches is often not sufficient to prevent accidental start up or prevent voltage from being present in the equipment. If the equipment is not wired properly (i.e., the polarity is reversed) or the switch is of the single pole type, voltage can be present even if the operating switch is in the off position. For these reasons, manual disconnects must be placed in the off position and/or the equipment's power fuses removed from the motor control center.

The lock-out/tag-out procedure is as follows:

a. Each person working on the circuit or piece of equipment shall place a padlock and warning tag on the electrical isolation device (e.g., disconnect switch).
b. Each person working on the circuit or piece of equipment shall attempt to energize or start the piece of equipment prior to starting work. Each on/off switch capable of energizing the equipment must be "tried."
c. If the try step reveals that the equipment is capable of being energized, the proper disconnects must be located and locked out and the try step repeated.
d. As each person completes his or her task, they shall remove their padlock and tag from the energy isolating device.
e. All protective covers or panels shall be securely re-attached prior to energizing the equipment after work is completed. In the event that protective covers must be removed to make adjustments on energized equipment, appropriate guards must be constructed and attached in such a manner as to prevent employee contact with live circuitry capable of causing human injury. Such guards must be of durable construction, adequate to prevent injurious contact, and remain in place at all times that the equipment is energized.

• Chemical and/or Pressurized Lines

Prior to working on any pressurized line or a line containing a toxic, flammable, reactive, or corrosive material, the following procedure must be implemented:

a. The line to be serviced must have two block valves upstream of the work area or device to be serviced or installed, placed in the closed position and tagged. The bleed valve (between the two block valves) shall be opened and tagged so that leakage of the valve upstream would be readily obvious. The line shall be depressurized or drained in a safe manner. Lines shall be broken in such a manner as to release pressure away from the employee. All solids or liquids drained shall be safely collected. This procedure is called "double block and bleed."

Prior to working on any pressurized line or a line containing a toxic, flammable, reactive, or corrosive material, the following procedure must be implemented: (continued)

b. If it is possible for pressure or line material to enter the work area from more than one direction, the line in each direction of travel shall be "double blocked and bled" as described above.

c. In the event that "double block and bleed" procedures are infeasible (i.e., the line is not provided with adequate valving), alternative measures shall be implemented. One alternate measure is to place a solid "blind" in a flange located between the available upstream valve and the work area. If blinds are used they shall be sufficiently corrosion and pressure-resistant to ensure that if the valve leaks, the blind will stop the material or pressure from reaching the work area.

• Stored Mechanical Energy

In situations where equipment to be worked on has stored mechanical energy (e.g., in a flywheel or drop hammer), the stored energy must be released or blocked in a safe manner before starting maintenance or installation work. Effective blocking practices may include the installation of safety blocks or adequate supports. Under no circumstances will "bumper jacks" or "scissor jacks" be considered to be adequate blocks.

E. Training

The purpose in providing training to employees is to ensure that they understand the purpose and function of the lock-out/tag-out program and procedures, and that they have the knowledge and skills required for the safe application, usage, and removal of energy controls.

1. Personnel who work around electrical equipment but who do not perform a primary duty of electrical system installation or maintenance will be briefed by their supervisor on the hazards of electricity and the proper precautions to observe.

2. Each authorized employee who will use a lock-out/tag-out procedure must receive training in the recognition of applicable hazardous energy sources, the type and magnitude of the energy available in the workplace, and the methods and means necessary for isolation and control.

1. Employees must be retrained whenever there is a change in their job assignment; a change in machines, equipment, or processes that present a new hazard; or when there is a change in the lock-out/tag-out procedures.

Ergonomics

Purpose:

This program covers all jobs where there are work related, musculoskeletal disorder hazards. The purpose of this program is to effectively eliminate or control Work-related Musculoskeletal Disorders (WMSD) and hazards by providing management leadership and employee involvement in the identification and resolution of hazards and by providing training, medical management and evaluation as an on-going process.

Ergonomics is the science of fitting jobs to people. People vary enormously in height, weight, in physical strength, in ability to handle information and in many otherways. Ergonomics uses information about human abilities, attributes and limitations to ensure that our equipment, work and workplaces allow for these variations.

The Company's goal is to reduce employee injuries and illnesses, absenteeism, employee turnover, and to increase Company productivity and quality.

Employees are highly encouraged to bring their concerns to supervisors and management. Feed back from employees is an important means of identifying ergonomic hazards. When an WMSD is identified, the Safety and Health Manager will provide a response and recommended action within 48 hours of receiving notification of the hazards or condition.

Program Elements:

1. Management Leadership & Employee Participation
2. Hazard Identification & Information
3. Job Hazard Analysis & Control
4. Training
5. Medical Management
6. Program Evaluation
7. Records

Element 1: Management Leadership & Employee Involvement

Management will:

(1) Assign & communicate responsibilities for setting up and managing the ergonomics program. Managers and employees must know what is expected of them and how they are held accountable for meeting those responsibilities.

(2) Provide those persons with the authority, resources, information and training necessary to meet their responsibilities.

(3) Examine existing policies and practices to ensure they encourage reporting and do not discourage reporting.

(4) Identify at least one person to:

(i) Receive and respond promptly to reports about signs and symptoms of

WMSDs, WMSD hazards and recommendations

(ii) Take action, where required, to correct identified problems

(5) Communicate regularly with employees about the program and their concerns about WMSDs. This shall be accomplished through safety and health committees, postings on employee bulletin boards and routine safety training meetings.

Employees will be provided:

(1) A way to report signs and symptoms of WMSDs and WMSD hazards, and to make recommendations about appropriate ways to control them. Reporting procedures include notification of immediate supervisor, ergonomic suggestion forms and medical management forms. Any one of these methods constitute a means of reporting and will require action on the part of the Safety and Health Manager.

(2) Prompt responses to their reports and recommendations. 48 hour response will be provided for all reports of WMSDs and WMSD hazards..

(3) Access to information about the ergonomics program. This program is available to all employees for review.

(4) Ways to become involved in developing, implementing and evaluating:

(i) Job hazard analysis and control. This is accomplished by participation on safety & health committees, suggestions for supervisors & management, review and comment on existing job hazard analysis and other appropriate means of communication.

(ii) Training. Feedback from employees on the quality and usefulness of ergonomic training will be reviewed by the program administrator to be used for training modifications to improve effectiveness.

(iii) The effectiveness of the program and control measures. Safety & Health Committees are the primary means of employee involvement in this area. Additionally, all comments, recommendations and suggestions will be forwarded to the program administrator for action and response comment.

Element 2: Hazard Identification & Information

Hazard Identification is accomplished by:

(1) Reports (written or verbal), WMSD symptoms, and hazards or control recommendations from employees and supervisors.

(2) Review of existing safety & health records for WMSDs and WMSD hazards.

(3) Routine facility safety & health inspections by management and supervisors

Employee Information-

For those current and new employees in manufacturing operations, manual handling operations, and other jobs with WMSDs, the following information will be provided.:

(1) How to recognize the signs and symptoms of WMSDs, and the importance of early reporting of signs and symptoms

(2) Hazards that are reasonably likely to be causing or contributing to WMSDs

(3) How to report signs and symptoms of WMSDs and WMSD hazards, and make recommendations

Information Methods include, but are not limited to, information sheets, videotapes, or classes. Information will be provided in a way that employees are able to understand. Employees will be given an opportunity to ask questions, receive answers, and be provided information in the languages employees use and at levels they comprehend.

Element 3: Job Hazard Analysis & Control

Job Hazard Analysis-

The purpose of Job Hazard Analysis is to identify WMSD hazard elements to provide information for effective control measure. When WMSD hazards are identified, a full JHA will be conducted and control measures implemented to eliminate or control the hazards to the extent feasible. NOTE: The purpose of job hazard analysis is to pinpoint the cause of the problem. If the cause is obvious, the Company may move directly to controlling the WMSD hazards without conducting all of the steps of job hazard analysis. Job Hazard Analysis will include the following steps:

(1) Make a list of (or a representative sample of):

(i) Employees in the problem job; and

(ii) Employees who perform the same physical work activities but in another job. This is called a similar job. If employees in a similar job are

exposed to the same WMSD hazards as employees in the problem job, the similar job also is a problem job. You must expand your ergonomics program to include that job and those employees;

(2) Ask those employees:

(i) Whether they are experiencing signs or symptoms of WMSDs;

(ii) Whether they are having difficulties performing the physical work activities of the job, and

(iii) Which physical work activities they associate with the problem;

(3) Observe employees performing the job in order to identify job factors that need to be evaluated; and

(4) Evaluate those job factors to determine which ones are reasonably likely to be causing or contributing to the problem.

Job Hazard Control Measures-

Successful control measure include the following either separately or in combination. NOTE: Where solutions are obvious and the hazards may be eliminated quickly, implementation of controls is permitted without following all of the steps of the control process. Interim control measures may be implemented, if practical, until permanent control measures are in place.

The Control Measure Process involves:

(1) Identification, evaluation and implementation of feasible control measures (interim and permanent) to control the WMSD hazards. This includes prioritizing the control of WMSD hazards, where necessary.

(2) Tracking progress in controlling the WMSD hazards, particularly if prioritizing of control of the hazards is necessary.

(3) Communication of results of the job hazard analysis to other areas of the workplace (e.g., procurement, human resources, maintenance, design, and engineering) whose assistance may be needed to successfully control the WMSD hazard.

(4) Identification of hazards when equipment is changed, re-designed or purchased and when change occurs in processes or facilities.

Control Methods

(1) Engineering Controls, where feasible, are the preferred method for controlling WMSD hazards. Engineering controls are the physical changes to jobs that control exposure to WMSD hazards. Engineering controls act on the source of the hazard and control employee exposure to the hazard without relying on the employee to take self-protective action or intervention. Examples of engineering controls for WMSD hazards include changing, modifying or redesigning the following:

Workstations
Tools
Facilities
Equipment
Materials
Processes

(2) Work Practice Controls are controls that reduce the likelihood of exposure to WMSD hazards through alteration of the manner in which a job or physical work activities are performed. Work practice controls also act on the source of the hazard. However, instead of physical changes to the workstation or equipment, the protection work practice controls provide is based upon the behavior of managers, supervisors and employees to follow proper work methods. Work practice controls include procedures for safe and proper work that are understood and followed by managers, supervisors and employees. Examples of work practice controls for WMSD hazards include:

a. Safe and proper work techniques and procedures that are understood and followed by managers, supervisors and employees.
b. Conditioning period for new or reassigned employees.
c. Training in the recognition of MSS hazards and work techniques that can reduce exposure or ease task demands and burdens.

(3) Administrative Controls are procedures and methods, typically instituted by the employer, that significantly reduce daily exposure to WMSD hazards by altering the way in which work is performed. Examples of administrative controls for WMSD hazards include:

Employee rotation
Job task enlargement
Adjustment of work pace (e.g., slower pace)
Redesign of work methods
Alternative tasks
Rest breaks

(4) Personal Protective Equipment (PPE) may be used as an interim

control, but will not be used as a permanent control where other controls are feasible. PPE used for this purpose will be provide it at no cost to employees.

Continuing Control Process

After implementation of feasible permanent controls, the possibility exists that WMSD may continue or re-occur. In these cases the following steps will be taken.

(1) Promptly check out employee reports of signs and symptoms of WMSDs to determine whether medical management is needed.

(2) Promptly identify and analyze the WMSD hazards, and develop a plan for controlling them

(3) Track progress in implementing the plan and measure success in eliminating or reducing WMSDs further; and

(4) Continue to look for solutions for the problem job and implement feasible ones as soon as possible.

Element 4: Training

Training will be provided to

(1) All employees in problem jobs, and all employees in similar jobs that have been identified as problem jobs;

(2) Their supervisors; and

(3) All persons involved in setting up and managing the ergonomics program.

Training Topics

For	Employees must understand
Employees in problem jobs, employees in similar jobs that are problem jobs, and their supervisors	How to recognize WMSD signs and symptoms, and the importance of early reporting. How to report WMSD signs, symptoms and hazards, and make recommendations. WMSD hazards in their jobs and the general measures they must follow to control WMSD hazards. Job-specific controls and work practices that have

	been implemented in their jobs. The ergonomics program and their role in it. The requirements of this standard
Persons involved in setting up and managing the ergonomics program	The ergonomics program and their role in it. How to identify, evaluate and implement measures to control WMSD hazards. How to identify and analyze WMSD hazards. How to evaluate the effectiveness of ergonomics programs.

Training Frequency

For	Training will be provided
Employees in problem jobs, employees in similar jobs that are problem jobs, and their supervisors	When the program is first set up in their jobs. When they are initially assigned to problem jobs. After control measures are implemented in their jobs. Periodically as needed (i.e., significant changes to the job, new WMSDs or WMSD hazards are identified in the job, unsafe work practices observed) and at least every 3 years.
Persons involved in setting up and managing the ergonomics program	When they are initially assigned to setting up and managing the ergonomics program. Periodically as needed (i.e., program deficiencies revealed in evaluation, significant changes in ergonomics program) and at least every 3 years.

Element 5: Medical Management

The Company will make available prompt and effective medical management whenever an employee has a WMSD. (This means that when an employee reports signs or symptoms of a WMSD. All reports will be processed to determine whether medical management is necessary). Medical management, including recommended work restrictions, will be provided at no cost to the employee. Medical treatment protocols for WMSDs will be established by the health care professions.

Reports of WMSDs

(1) When reports of WMSDs are made, employees will be provided with prompt access to health care professionals (HCPs) for effective evaluation, treatment

and follow up; and

(2) Information will be provided to HCPs to help ensure medical management is effective, and

(3) Written medical opinion will be obtained from the HCP and the employee will be promptly provided a copy.

Information to be provided to the health care professional-

(1) Descriptions of the employee's job and hazards identified in the hazard analysis,

(2) Descriptions of available changes to jobs or temporary alternative duty to fit the employee's capabilities during the recovery period,

(3) A copy of this program and OSHA standard, with medical management requirements pointed out; and

(4) Opportunities to conduct workplace walkthroughs.

Health care professional written opinion-

(1) The HCP's written opinion must contain:

(i) The work-related medical conditions related to the WMSD reported;

(ii) Recommended work restrictions, where necessary, and follow-up for the employee during the recovery period;

(iii) A statement that the HCP has informed the employee about results of the evaluation and any medical conditions resulting from exposure to WMSD hazards that require further evaluation or treatment; and

(iv) A statement that the HCP has informed the employee about other physical activities that could aggravate the WMSD during the recovery period.

(2) To the extent permitted and required by law, employee privacy and confidentiality will be maintained regarding medical conditions identified during the medical management process. HCPs will be instructed not to reveal in the written opinion or in any other communication with you specific findings, diagnoses or information that is not related to WMSD hazards in the employee's job.

Work Restriction Policy-

(1) Work restrictions recommended for the employee will be provided during the recovery period;

(2) The employee's total normal earnings, seniority, rights and benefits will be maintained when work restrictions are prescribed or are voluntarily provided by the company; and

(3) Necessary periodic follow-ups with the HCP will be provided for the employee during the recovery period.

Continuance of Work Restrictions Policy-

Employee's total normal earnings, seniority, rights and benefits will be maintained when work restrictions are recommended by the HCP or voluntarily provided by the company until the first of the following occurs:

(1) The employee is recovered and able to return to the job, OR

(2) Effective measures are implemented that control WMSDs hazards to the extent the job does not pose risk of harm to the employee even during the recovery period; OR

(3) There is a final medical determination that the employee is permanently unable to return to the job, OR

(4) 6 months have passed.

Compensation Policy-

Direct compensation (total normal earnings, seniority, rights and benefits) may be reduced by the amount an employee receives during the work restriction period from any of the following:

(1) Workers' compensation payments for lost earnings

(2) Payments for lost earnings from a compensation or insurance program that is publicly-funded or funded by the company

(3) Income from employment with another employer made possible by virtue of the work restrictions.

Element 6: Program Evaluation

Evaluation of the ergonomics program and controls will be conducted periodically, and at least every 3 years, to ensure effective administration and management and compliance with regulatory requirements.

Program Evaluation Process-

The following procedures will be used to evaluate the effectiveness of the ergonomics program and control measures.

(1) Monitoring of program activities to ensure that all the elements of your ergonomics program are functioning.

(2) Selection and implementation of effectiveness measures, both activity and outcome measures, to evaluate the program and the controls to ensure that

they are in compliance with regulatory requirements.

(3) Establishment of baseline measurements to provide a starting point for measuring the effectiveness of the program and the controls.

Program Evaluation Findings

All program deficiencies found will be corrected promptly.

Examples of Activity Measures	Examples of Outcome Measures
Plan to implement ergonomics program has been developed. Number of employee reports and recommendations. Average time between employee reports and your response. Length of time since the last review of safety and health records. Number of hazards identified. Number of employees who have received ergonomics information. Number of jobs analyzed. Number of jobs awaiting analysis. Number of employees interviewed for job analyses and remaining to be interviewed. Number of symptom surveys conducted. Number of jobs controlled.	Number of OSHA recordable MSDs. Reported symptoms of WMSDs WMSD incidence rates per job title. Number of workers' compensation claims. Number of lost-workdays WMSDs. Average lost workdays per WMSD. Severity rate of WMSDs. Symptom survey results. Annual medical costs for WMSDs. Average medical costs per WMSD. Annual workers' compensation costs. Average workers' compensation costs per WMSD.
Examples of Activity Measures (cont.)	**Examples of Outcome Measures (cont.)**
Number of job changes made. Number of employees trained and waiting to be trained. Number of worker hours devoted to the ergonomics program. Annual expenditures on program and controls.	

Element 7: Records

Written records of the program will be maintained if:

(1) There is more than one worksite or establishment in which this job is performed

by employees; OR

(2) The job involves more than one level of supervision; OR

(3) The job involves shift work.

Records and Retention Requirements-

The following table lists the required records and retention periods

Required Records	Retention Period
Employee reports and company responses	3 years
Results of job hazard analysis Plans for controlling WMSD hazards Evaluations of program and controls	3 years or until replaced by updated record
Medical management records	The duration of the injured employee's employment plus 3 years

NOTE: Other regulatory requirements for record keeping of the Access to Employee Exposure and Medical Records Standard (29 CFR 1910.1020) will be followed in addition to the requirements of this program

Definition of Terms

Administrative controls are procedures and methods, typically instituted by the employer, that significantly reduce daily exposure to WMSD hazards by altering the way in which work is performed. Examples of administrative controls for WMSD hazards include:

Employee rotation	Redesign of work methods
Job task enlargement	Alternative tasks
Adjustment of work pace (e.g., slower pace)	Rest breaks

Exercise programs (e.g., stretching) are not prohibited, but they are not administrative controls under the OSHA standard.

Effectiveness measures are the indicators used to assess whether an ergonomics program and controls are successfully controlling WMSD hazards and reducing the number and severity of WMSDs. Effectiveness measures include both activity and outcome measures.

Activity measures are indicators used to measure interim accomplishments in building and maintaining an ergonomics program. These measures are used to assess the functioning of the various activities in your program (e.g., number of hazards identified, number of employees trained).

Outcome measures are indicators used to quantitatively assess long-term success of the program and interventions that have been put into place (e.g., number of lost workdays, number of hazards controlled, severity of WMSDs).

Engineering controls are physical changes to jobs that control exposure to WMSD hazards. Engineering controls act on the source of the hazard and control employee exposure to the hazard without relying on the employee to take self-protective action or intervention. Examples of engineering controls for WMSD hazards include changing, modifying or redesigning the following:

Workstations	Equipment
Tools	Materials
Facilities	Processes

Ergonomics is the science of fitting jobs to people. Ergonomics encompasses the body of knowledge about physical abilities and limitations as well as other human characteristics that are relevant to job design. Ergonomic design is the application of this body of knowledge to the design of the workplace (i.e., work tasks, equipment, environment) for safe and efficient use by workers. Good ergonomic design makes the most efficient use of worker capabilities while ensuring that job demands do not exceed those capabilities.

Health care professionals are persons educated and trained in the delivery of health care services who are operating within the scope of their license, registration, certification, or legally authorized practice when they are performing the medical management requirements of this standard.

Job factors are workplace conditions and physical work activities that must be considered when conducting a job hazard analysis in order to determine whether WMSD hazards are present in a job. This standard covers the following job factors:

THIS PROGRAM COVERS THESE JOB FACTORS	INCLUDING THESE COMPONENTS OF JOB FACTORS
Physical demands of the work tasks or job	Force Repetition Work postures Duration

	Local contact stress
Workstation layout and space	Work reaches Work heights Seating Floor surfaces Contact stress
Equipment used and objects handled	Size and shape Weight and weight distribution Handles and grasp surfaces Vibration
Environmental conditions	Cold and heat Glare (as related to awkward postures)
Work organization	Work-recovery cycles Work rate Task variability

Known hazard means hazards in your workplace that you know are reasonably likely to cause or contribute to a WMSD. The following are known hazards covered by the OSHA ergonomic standard**:**

WMSD hazards identified in insurance reports.

WMSD hazards identified in consultant reports.

WMSD hazards identified in prior OSHA inspections.

WMSD hazards identified in self audits.

WMSD hazards identified and communicated to you by HCPs.

Accepted WMSD workers' compensation claims.

Manual handling operations are physical work activities meeting these criteria:

(1) They involve **lifting/lowering, pushing/pulling**, or **carrying**; **AND**

(2) They involve exertion of considerable force because the particular load is heavy **OR** the cumulative total of the loads during a workday is heavy (i.e., substantial loads); **AND**

(3) These manual handling work activities are a significant part of the employee's regular job duties.

Manufacturing operations cover a range of jobs that are directly involved in producing durable and non-durable goods. Manufacturing production jobs involve working supervisors and all non-supervisory employees who engage in fabricating, processing, assembling, and other services closely associated with manufacturing production. In this standard, manufacturing operations are limited to those that meet these criteria:

(1) They are performed in **manufacturing industries**; **AND**

(2) They are **production jobs** performed by employees and their supervisors in those industries; **AND**

(3) The production work activities are a significant part of the employee's regular job duties.

While each job must be considered on the basis of its actual duties, the following table lists job categories that typically fall inside and outside this definition:

EXAMPLES OF MANUFACTURING PRODUCTION JOBS	EXAMPLES OF JOBS THAT TYPICALLY ARE NOT MANUFACTURING PRODUCTION JOBS
Assembly line jobs producing: Products (durable and non-durable) Subassemblies Components and parts Paced assembly line jobs (assembling and disassembling) Piecework assembly jobs (assembling and disassembling) and	Administrative personnel Clerical staff Supervisors and managers who do not perform production job Technical staff (e.g., engineering, product development) Analysts and programmers Sales and marketing

other time critical assembly jobs Product inspection jobs (e.g., testers, weighers) Meat, poultry, and fish cutting and packing Bindery jobs Machine operation Machine loading/unloading Apparel construction jobs Food preparation assembly line jobs Commercial baking jobs Cabinetmaking Tire building Warehouse jobs in manufacturing facilities Rework specialists Maintenance personnel	Buyers/procurement Customer service employees Mail room Security guards Cafeteria personnel Grounds personnel (gardeners, grounds keepers) Jobs in power plant in manufacturing facility Janitors

NOTE: Some jobs that are not manufacturing production jobs may still be manual handling jobs under this program or the OSHA standard.
Medical management is the process for assuring that employees with WMSDs are provided with the following at no cost to employees:

A mechanism for early reporting of signs and symptoms of WMSDs;

Early assessment of reports;

Access to prompt and effective evaluation, treatment and follow-up by HCPs;

Work restrictions recommended by HCPs;

Medical management also includes the process of communicating with HCPs. Medical management does not include establishing specific medical treatments for WMSDs. Medical treatment protocols and procedures are established by the health care professions.

Musculoskeletal disorders (MSDs) are injuries and disorders of the muscles, nerves, tendons, ligaments, joints, cartilage and spinal disks. Examples of MSDs include:

Carpal tunnel syndrome Epicondylitis	Tendinitis Rotator cuff tendinitis De Quervains' disease

Synovitis	Carpet layers knee
Muscle strains	Trigger finger
Raynaud's phenomenon	Low back pain
Sciatica	

No cost to employees means that training, medical management and other requirements of this standard are provided to employees free of charge and while they are "on the clock."

Periodically means that a process or activity, such as records review or training, is performed on a **regular basis** which is appropriate for the conditions in the workplace. Periodically also means that the process or activity is conducted **as needed,** such as when significant changes are made in your workplace.

Personal protective equipment (PPE) are interim control devices worn or used while working to protect employees from exposure to WMSD hazards. In this standard, PPE includes items such as gloves and knee pads.

Physical work activities are the physical demands, exertions or functions of the task or job.

Problem job is any job in which you must set up a full ergonomics program, including job hazard analysis. The following are problem jobs in this standard:

(1) A manufacturing or manual handling job where a known hazard exists or a WMSD is reported; **AND**

(2) Any other job in your workplace where a WMSD is reported; **AND**

(3) A similar job in which employees are exposed to the same WMSD hazard as employees in a problem job.

Representative sampling is a strategy to adequately characterize exposure of a group of employees (i.e., employees in a problem job) by analyzing the exposure of a subset of that group rather than all members of the group. The employees selected for representative sampling analysis must be those who are reasonably believed to have the greatest exposure to WMSD hazards in the problem job, including each workshift, to correctly characterize and not underestimate the exposure of any employee in the problem job.

Resources mean the provisions necessary to develop, implement and maintain an effective ergonomics program. Resources include monetary provisions (e.g., equipment to perform job hazard analysis, training materials, controls) as well as other provisions (e.g., time to conduct job hazard analysis or review safety and health records).

Safety and health records are information generated at or for your workplace. Records include, for example, OSHA 200 logs, workers' compensation claims, WMSD-related medical reports and infirmary logs, employee reports of WMSDs or WMSD hazards, and insurance or consultant reports prepared for your workplace.

Signs (of WMSDs) are objective physical findings that are the basis for an OSHA recordable MSD. Examples of signs of WMSDs include:

Decreased range of motion	Swelling
Decreased grip strength	Cramping
Loss of function	Redness/loss of color
Deformity	

Similar jobs are jobs that involve the same physical work activities as a problem job, even if they are not defined by the same title or classification.

Symptoms (of WMSDs) are physical indications that your employee may be developing an WMSD. Symptoms can vary in their severity depending on the amount of exposure the employee has had. Often symptoms appear gradually as muscle fatigue or pain at work that disappears during rest. Usually symptoms become more severe as exposure continues (e.g., tingling continues when your employee is at rest, numbness or pain makes it difficult to perform the job, and finally pain is so severe that the employee is unable to perform physical work activities).

Examples of symptoms WMSDS include:

Numbness	Tingling
Burning	Aching
Pain	Stiffness

Temporary alternative duty jobs are assignments given to employees with WMSDs during the recovery period until the health care provider releases the employee from work restrictions.

Work practice controls are controls that reduce the likelihood of exposure to WMSD hazards through alteration of the manner in which a job or physical work activities are performed. Work practice controls also act on the source of the hazard. However, instead of physical changes to the workstation or equipment, the protection work practice controls provide is based upon the behavior of managers, supervisors and employees to follow proper work methods. Work practice controls include procedures for safe and proper work that are understood and followed by managers, supervisors and employees. Examples of work practice controls for WMSD hazards include:

Safe and proper work techniques and procedures that are understood and followed by managers, supervisors and employees.

Conditioning period for new or reassigned employees.

Training in the recognition of MSD hazards and work techniques that can reduce exposure or ease task demands and burdens.

Work-related means that the physical work activities or workplace conditions in the job are reasonably likely to be causing or contributing to a reported MSD. For this standard, an MSD is work-related if:

(1) **WMSD hazards** are present in a job where an MSD has been reported; **AND**

(2) The hazards are reasonably likely to cause or contribute to the **type** of MSD reported; **AND**

(3) A **significant part** of the employee's **regular job duties** involves exposure to these WMSD hazards (i.e., not incidental exposure).

Work restrictions are any limitation placed on the manner in which an employee with an WMSD performs a job during the recovery period. Work restrictions include modifications and restrictions to the employee's current job, such as limiting or reducing the intensity or duration of exposure; and reassignment to temporary alternative duty jobs. Work restrictions also include complete removal from the workplace.

WMSD hazards are workplace conditions or physical work activities that cause or are reasonably likely to cause or contribute to an WMSD.

Excavation and Trenching Program

Excavation

Background:

Excavation cave-ins cause serious and often fatal injuries to workers in the United States. An analysis by OSHA of workers' compensation claims suggests that excavation cave-ins caused about 1,000 work-related injuries each year. Of these, about 140 result in permanent disability and 75 in death. Thus, this type of incident is a major cause of deaths associated with work in excavations and accounts for nearly 1% of all annual work-related deaths in the nation.

Policy:

OSHA standards require that walls and faces of all excavations in which workers are potentially exposed to danger from moving ground be guarded by a shoring system, safe sloping of the ground, or equivalent means of protection such as trench shield or boxes. In addition, OSHA standards require additional shoring and bracing procedures when excavations or trenches are located adjacent to previously backfilled excavations or where excavations are subjected to vibrations from railroad or highway traffic, the operation of machinery, or other sources.

As an obvious first step in preventing any injury or fatality in the future, the Company concludes that all such excavation operations shall be done only in full compliance with existing OSHA standards.

Therefore, the Company requires that the following procedures are observed and will be followed without exception:

- The Company will have all utilities marked before digging. The Company will call utility companies and shut off all electricity, gas, and water pipes in the trench.
- Shoring systems or sloping of the walls be used in all excavations 5 to 20 feet deep in any type of soil, except solid, stable rock.
- Appropriate shoring, shielding, or sloping requirements for all excavations deeper than 20 feet shall be determined by an engineer qualified to make these determinations.
- Materials must not be placed four feet or less from the edge of the excavation.
- Stop logs or barriers will be placed where vehicles and /or equipment that operate near the excavation do not accidentally fall into the excavation.
- Dirt generated from the excavated hole will not be stockpiled closer than 6 feet from the open hole

Trenches

Background:

Most trenches are dug to lay pipe, utilities, or place footings. It is easy to try to work fast in a trench and get out without taking safety steps. Each year, more than 40 construction workers are killed in trenches.

The Hazards:

A trench is a confined space with many special problems. Most deaths in trenches are from cave-ins. Other risks are falls, electrocution, being struck by falling objects, and bad air. Bad air can hurt your breathing, help cause a fire, or poison you. Many workers die trying to rescue other workers.

Policy:

OSHA has special rules to protect workers in trenches. Employees will follow the OSHA rules unless:

- The trench is in stable rock, or
- The trench is less than 5 feet deep and the Company Supervisor/Manager finds no reason to expect a cave-in.

A Company Supervisor/ Manager will inspect a trench:

- Before every shift
- If bad air is expected — such as, the trench is in a sewer or near a dump or stored chemicals
- After anything that can increase hazards, such as:
    - Every rainstorm
    - The trench wall moves, causing cracking, scaling, or bulging
    - A heavy load near the trench moves or gets heavier.

Before Employees enter a trench they shall:

- Have it inspected by the Company's Supervisor/Manager.

- Make sure all equipment is in good condition. This includes water pumps and ventilators.

- Have a way to get out fast, like a ladder, if the trench is 4 feet deep or more.

The Company will have all utilities marked before digging. The Company will call utility companies and shut off all electricity, gas, and water pipes in the trench. Employee's will use a boom near overhead power lines. If they must operate a boom, they shall ask the Company Supervisor/Manager to make sure power has been cut off and the lines have been grounded.

If bad air is expected, the Company Supervisor/Manager will have a rescue plan and rescue equipment on the job site. If bad air is expected, the Company Supervisor/Manager must test the air to meet the below OSHA Standards:

- The air must have 19.5 to 23.5% oxygen.
- Substances that can burn or explode — like gasoline or methane — should be at less than 20% of the lower explosive limit (or lower flammability limit).
- Check the air for toxics like chlorine, carbon monoxide, sewer gases, and hydrogen sulfide. These toxics can kill. (Carbon monoxide has no smell. Hydrogen sulfide smells like rotten eggs).

The Company Supervisor/Manager will decide if blowers can keep the air safe.

The Company Supervisor/Manager will also check the soil. This check helps the Company Supervisor/Manager choose the right worker-protection system:

• A trench can be in stable rock, or type A, type B, or type C soil. Stable rock and type A soils are the safest. Most soils are type B. Sand and trenches with water are type C soils.
• Water in a trench means workers are in danger.
• Clay can be type A, B, or C soil; it depends on how much water is in the clay. (**Many cave-ins happen in clay, because people think it looks safe**)

Trench Work Procedures:

The following procedures will be followed while digging trenches:

Sloping, benching, or shoring will be performed to help prevent cave-ins.

Keep the spoil pile 2 feet or more from the edge of the trench.

Prevent materials, rocks, or soil from falling into the trench; use barriers, if needed.

The Company Supervisor/Manager should test the air as often as needed to make sure it is safe.

IF A TRENCH CAVES IN:

Get out of the trench. Call 911 (or emergency services). Help your co-workers from outside the trench, if you can.

Never go into a trench that is caving in or has bad air — even to rescue co-workers. You can be killed.

DAILY EXCAVATION CHECKLIST

Client		**Date**	
Project Name		**Approximate Temp.**	
Project Location		**Approximate Wind Direction**	
Job Number		**Safety Rep**	
Excavation Depth and Width		**Soil Classification**	
Protective System Used			
Activities in Excavation			
Competent Person			

Excavation > 4 feet deep? ___Yes ___No. If YES, fill out a Confined Space Permit PRIOR to ANY person entering the excavation.

NOTE: Trenches over 4 feet in depth are considered excavations. Any items marked NO on this form MUST be remediated prior to any employees entering the excavation.

YES	NO	N/A	DESCRIPTION
			GENERAL
			Employees protected from cave-ins & loose rock/soil that could roll into the excavation
			Spoils, materials & equipment set back at least 2 feet from the edge of the excavation
			Engineering designs for sheeting &/or manufacturer's data on trench box capabilities on site
			Adequate signs posted and barricades provided
			Training (toolbox meeting) conducted w/ employees prior to entering excavation

YES	NO	N/A	UTILITIES
			Utility company contacted & given 24 hours notice &/or utilities already located & marked
			Overhead lines located, noted and reviewed with the operator
			Utility locations reviewed with the operator, & precautions taken to ensure contact does not occur
			Utilities crossing the excavation supported, and protected from falling materials
			Underground installations protected, supported or removed when excavation is open
			WET CONDITIONS
			Air in the excavation tested for oxygen deficiency, combustibles, other contaminants
			Ventilation used in atmospheres that are oxygen rich/deficient &/or contains hazardous substances
			Ventilation provided to keep LEL below 10 %
			Emergency equipment available where hazardous atmospheres could or do exist
			Safety harness and lifeline used
			Supplied air necessary (if yes, contact safety department)
			ENTRY & EXIT
			Exit (i.e. ladder, sloped wall) no further than 25 feet from ANY employee
			Ladders secured and extend 3 feet above the edge of the trench
			Wood ramps constructed of uniform material thickness, cleated together @ the bottom
			Employees protected from cave-ins when entering or exiting the excavation

KEEP 1 COPY OF EACH DAILY EXCAVATION CHECKLIST ON SITE FOR THE PROJECT DURATION, AND FORWARD THE ORIGINAL TO THE SAFETY MANAGER

Fall Protection Plan

Policy:

It is the policy of the Company to take all practical measures possible to prevent employees from being injured by falls from heights. The Company will take all necessary steps to eliminate, prevent, and control fall hazards. The Company will comply fully with the OSHA Fall Protection standard (CFR 1926, Subpart M, Fall Protection).

This policy will follow the OSHA standard for potential falls from heights of 4 feet and mores. First consideration will be given to the elimination of fall hazards. If a fall hazard cannot be eliminated, effective fall protection will be planned, implemented, and monitored to control the risks of injury due to falling.

All personnel exposed to potential falls from heights will be trained to minimize their exposures. Fall protection equipment will be provided and used by all employees. Managers will be responsible for implementation of a fall protection plan for each job site.

Fall Hazard Identification and Evaluation Responsibilities:

The Manager/foreman on each job site will be responsible for identifying fall hazards on their job site. The Manager/foreman will evaluate each situation or work procedure where employees may be exposed to a fall of 4 feet or more. The Manager/foreman will be responsible for developing a plan to eliminate the exposures, if possible, or to select the appropriate fall protection systems and/or equipment.

Examples of Situations Requiring Fall Protection:

The following are examples of situations were fall protection will be required. This listing is by no means complete, and there are many other situations where a fall of 4 feet or more is possible. It should be noted that ladders and scaffolding are not included in this list. They are covered by other OSHA standards and other requirements of our safety program.

Wall Openings

Any employee working near a wall opening (including those with chutes attached) where the outside bottom edge of the wall opening is 4 feet or more from a lower level, or the wall opening is less than 39 inches (1.0 meter) above the walking/working surface below, will be protected from falling by the use of a guardrail system, a safety net system, or a personal fall arrest system.

Holes

Personal fall arrest systems, covers, or guardrail systems shall be erected around holes (including skylights) that are more than 4 feet above lower levels.

Examples of Situations Requiring Fall Protection: (continued)

Leading Edges

Each employee who is constructing a leading edge 4 feet or more above lower levels shall be protected by guardrail systems, safety net systems, or personal fall arrest systems.

Excavations

Each employee at the edge of an excavation 4 feet or more deep shall be protected from falling by guardrail systems, fences, barricades, or covers. Where walkways are provided to permit employees to cross over excavations, guardrails are required on the walkway if it is 4 feet or more above the excavation.

Form-work and Reinforcing Steel

For employees, while moving vertically and/or horizontally on the vertical face of reinforcing bar (rebar) assemblies built in place, fall protection is not required when employees are moving. OSHA considers the multiple hand holds and foot holds on rebar assemblies as providing similar protection as that provided by a fixed ladder. Consequently, no fall protection is necessary while moving point to point for heights below 24 feet. An employee will be provided with fall protection when climbing or otherwise moving at a height more than 24 feet, the same as for fixed ladders.

Hoist Areas

Each employee in a hoist area shall be protected from falling 4 feet or more by guardrail systems or personal fall arrest systems. If guardrail systems (chain gate or guardrail) or portions thereof must be removed to facilitate hoisting operations, as during the landing of materials, and a worker must lean through the access opening or out over the edge of the access opening to receive or guide equipment and materials, that employee must be protected by a personal fall arrest system.

Overhand Bricklaying and Related Work

Each employee performing overhand bricklaying and related work 4 feet or more above lower levels shall be protected by guardrail systems, safety net systems, or personal fall arrest systems, or shall work in a controlled access zone. All employees reaching more than 10 inches (25 cm) below the level of a walking/working surface on which they are working shall be protected by a guardrail system, safety net system, or personal fall arrest system.

Examples of Situations Requiring Fall Protection: (continued)

Precast Concrete Erection and Residential Construction

Each employee who is 4 feet or more above lower levels while erecting precast concrete members and related operations such as grouting of precast concrete members and each employee engaged in residential construction, shall be protected by guardrail systems, safety net systems, or personal fall arrest systems.

Ramps, Runways, and Other Walkways

Each employee using ramps, runways, and other walkways shall be protected from falling 4 feet or more by guardrail systems.

Low-slope Roofs

Each employee engaged in roofing activities on low-slope roofs with unprotected sides and edges 4 feet or more above lower levels shall be protected from falling by guardrail systems, safety net systems, personal fall arrest systems or a combination of a warning line system and guardrail system, warning line system and safety net system, warning line system and personal fall arrest system, or warning line system and safety monitoring system. On roofs 50 feet or less in width, the use of a safety monitoring system without a warning line system is permitted.

Steep Roofs

Each employee on a steep roof with unprotected sides and edges 4 feet or more above lower levels shall be protected by guardrail systems with toeboards, safety net systems, or personal fall arrest systems.

Controlled Access Zones

A Controlled access zone is a work area designated and clearly marked in which certain types of work (such as overhand bricklaying) may take place without the use of conventional fall protection systems—guardrail, personal arrest or safety net—to protect the employees working in the zone.

Controlled access zones are used to keep out workers other than those authorized to enter work areas from which guardrails have been removed. Where there are no guardrails, masons are the only workers allowed in controlled access zones.

Controlled access zones, when created to limit entrance to areas where leading edge work and other operations are taking place, must be defined by a control line or by any other means that restrict access.

Controlled Access Zones (continued)

Control lines shall consist of ropes, wires, tapes or equivalent materials, and supporting stanchions, and each must be:

Flagged or otherwise clearly marked at not more than 6-foot intervals with a high-visibility material

Rigged and supported in such a way that the lowest point (including sag) is not less than 39 inches from the walking/working surface and the highest point is not more than 45 inches --nor more than 50 inches when overhand bricklaying operations are being performed—from the walking/working surface

Strong enough to sustain stress of not less than 200. Control lines shall extend along the entire length of the unprotected or leading edge and shall be approximately parallel to the unprotected or leading edge.

Control lines will be connected on each side to a guardrail system or wall.

When control lines are used, they shall be erected not less than 6 feet nor more than 25 feet from the unprotected or leading edge, except when precast concrete members are being erected. In the latter case, the control line is to be erected not less than 6 feet nor more than 60 feet or half the length of the member being erected, whichever is less, from the leading edge.

Controlled access zones when used to determine access to areas where overhand bricklaying and related work are taking place are to be defined by a control line erected not less than 10 feet nor more than 15 feet from the working edge. Additional control lines must be erected at each end to enclose the controlled access zone. Only employees engaged in overhand bricklaying or related work are permitted in the controlled access zones.

On floors and roofs where guardrail systems are not in place prior to the beginning of overhand bricklaying operations, controlled access zones will be enlarged as necessary to enclose all points of access, material handling areas, and storage areas.

On floors and roofs where guardrail systems are in place, but need to be removed to allow overhand bricklaying work or leading edge work to take place, only that portion of the guardrail necessary to accomplish that day's work shall be removed.

Fall Protection Systems:

When there is a potential fall of 4 feet or more, the Company will utilize one or more of the following means of providing protection:

Guardrail Systems

Guardrail systems must meet the following criteria. Toprails and midrails of guardrail systems must be at least one-quarter inch nominal diameter or thickness to prevent cuts and lacerations. If wire rope is used for toprails, it must be flagged at not more 6 feet intervals with a high-visibility material. Steel and plastic banding will not be used as toprails or midrails. Manila, plastic, or synthetic rope used for toprails or midrails must be inspected as frequently as necessary to ensure strength and stability.

The top edge height of toprails, or (equivalent) guardrails must be 42 inches plus or minus 3 inches, above the walking/working level. When workers are using stilts, the top edge height of the top rail, or equivalent member, must be increased an amount equal to the height of the stilts.

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

Other structural members, such as additional midrails and architectural panels, shall be installed so that there are no openings in the guardrail system more than 19 inches.

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

Midrails, screens, mesh, intermediate vertical members, solid panels, and equivalent structural members shall be capable of withstanding a force of at least 150 pounds

applied in any downward or outward direction at any point along the midrail or other member.

Guardrail systems shall be surfaced to protect workers from punctures or lacerations and to prevent clothing from snagging.

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

Guardrail Systems

When guardrail systems are used at hoisting areas, a chain, gate or removable guardrail section must be placed across the access opening between guardrail sections when hoisting operations are not taking place.

At holes, guardrail systems must be set up on all unprotected sides or edges. When holes are used for the passage of materials, the hole shall have not more than two sides with removable guardrail sections. When the hole is not in use, it must be covered or provided with guardrails along all unprotected sides or edges.

If guardrail systems are used around holes that are used as access points (such as ladderways), gates must be used or the point of access must be offset to prevent accidental walking into the hole.

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

Personal Fall Arrest Systems:

These consist of an anchorage, connectors, and a body belt or body harness and may include a deceleration device, lifeline, or suitable combinations. If a personal fall arrest system is used for fall protection, it must do the following:

Limit maximum arresting force on an employee to 900 pounds when used with a body belt

Limit maximum arresting force on an employee to 1,800 pounds when used with a body harness

Be rigged so that an employee can neither free fall more than 4feet nor contact any lower level

Bring an employee to a complete stop and limit maximum deceleration distance an employee travels to 3.5 feet

Have sufficient strength to withstand twice the potential impact energy of an employee free falling a distance of 4 feet or the free fall distance permitted by the system, whichever is less.

The use of body belts for fall arrest is prohibited and a full body harness is be required.

Personal fall arrest systems must be inspected prior to each use for wear damage, and other deterioration. Defective components must be removed from service.

Positioning Device Systems:

These body belt or body harness systems are to be set up so that a worker can free fall no farther than 2 feet. They shall be secured to an anchorage capable of supporting a least twice the potential impact load of an employee's fall or 3,000 pounds, whichever is greater.

Safety Monitoring Systems:

When no other alternative fall protection has been implemented, the Company shall implement a safety monitoring system. The Company will appoint a competent person to monitor the safety of workers and shall ensure that the safety monitor:

Is competent in the recognition of fall hazards;

Is capable of warning workers of fall hazard dangers and in detecting unsafe work practices;

Is operating on the same walking/working surfaces of the workers and can see them;

Is close enough to work operations to communicate orally with workers and has no other duties to distract from the monitoring function.

Mechanical equipment shall not be used or stored in areas where safety monitoring systems are being used to monitor employees engaged in roofing operations on low-sloped roofs.

No worker, other than one engaged in roofing work (on low-sloped roofs) or one covered by a fall protection plan, shall be allowed in an area where an employee is being protected by a safety monitoring system.

All workers in a controlled access zone shall be instructed to promptly comply with fall hazard warnings issued by safety monitors.

Safety Net Systems:

Safety nets must be installed as close as practicable under the walking/working surface on which employees are working and never more than 30 feet (9.1 meters) below such levels. Defective nets shall not be used. Safety nets shall be inspected at least once a week for

wear, damage, and other deterioration. Safety nets shall be installed with sufficient clearance underneath to prevent contact with the surface or structure below.

Items that have fallen into safety nets including—but not restricted to, materials, scrap, equipment, and tools—must be removed as soon as possible and at least before the next work shift.

Warning Line Systems:

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

Flagged at not more than 6-foot intervals with a high-visibility material;

Rigged and supported so that the lowest point including sag) is no less than 34 inches from the walking/working surface and its highest point is no more than 39 inches from the walking/working surface.

Stanchions, after being rigged with warning lines, shall be capable of resisting, without tipping over, a force of at least 16 pounds applied horizontally against the stanchion, 30 inches above the walking/working surface, perpendicular to the warning line and in the direction of the floor, roof, or platform edge;

The rope, wire, or chain shall have a minimum tensile strength of 500 pounds and after being attached to the stanchions, must support without breaking the load applied to the stanchions as prescribed above.

Shall be attached to each stanchion in such a way that pulling on one section of the line between stanchions will not result in slack being taken up in the adjacent section before the stanchion tips over.

Warning lines shall be erected around all sides of roof work areas. When mechanical equipment is being used, the warning line shall be erected not less than 6 feet from the roof edge parallel to the direction of mechanical equipment operation, and not less than 10 feet from the roof edge perpendicular to the direction of mechanical equipment operation.

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

Covers:

Covers located in roadways and vehicular aisles must be able to support at least twice the maximum axle load of the largest vehicle to which the cover might be subjected. All other covers must be able to support at least twice the weight of employees, equipment, and

materials that may be imposed on the cover at any one time. To prevent accidental displacement resulting from wind, equipment, or workers' activities, all covers must be secured. All covers shall be color coded or bear the markings "HOLE" or "COVER."

Protection From Falling Objects:

When guardrail systems are used to prevent materials from falling from one level to another, any openings must be small enough to prevent passage of potential falling objects. No materials or equipment except masonry and mortar shall be stored within 4 feet of working edges. Excess mortar, broken or scattered masonry units, and all other materials and debris shall be kept clear of the working area by removal at regular intervals.

During roofing work, materials and equipment shall not be stored within 6 feet of a roof edge unless guardrails are erected at the edge, and materials piled, grouped, or stacked near a roof edge must be stable and self-supporting.

Training:

Employees will be trained in the following areas:

(a) The nature of fall hazards in the work area;

(b) The correct procedures for erecting, maintaining, disassembling, and inspecting fall protection systems;

(c) The use and operation of controlled access zones and guardrail, personal fall arrest, safety net, warning line, and safety monitoring systems;

(d) The role of each employee in the safety monitoring system when the system is in use;

(e) The limitations on the use of mechanical equipment during the performance of roofing work on low-sloped roofs;

(f) The correct procedures for equipment and materials handling and storage and the erection of overhead protection; and,

(g) The Employees' role in fall protection plans.

Safety Harness Inspection Report

JOBSITE	Date	Inspector's Name

Harness Make/ Model	MFG.'S SERIAL NUMBER	HARNESS WEBBING OR LEATHER	ALL STITCHING	RIVETS & EYELETS	D-RINGS, BUCKLES & TONGUE	BODY PAD (IF APPL.)	LANYARDS	SAFETY LATCH / HOOK	CERTIFICATION OR DATA TAG

0 = YES - OK

X = NO - REPLACE

Ensure Harness is COLOR-CODED with the appropriate tape marker

FORWARD TO SAFETY DIRECTOR AT _____

Fire Safety Plan

Purpose:

The purpose of the Fire Safety Plan is to prevent potential injuries and deaths, and to protect the Company's property from damage or loss due to fire. This plan includes fire prevention, building exits, fire extinguishing, emergency evacuation, and employee training.

This plan will be reviewed with all new employees when they begin their job and with all employees when the plan is changed.

Fire Prevention:

Our first line of defense against fire is to prevent it in the first place. It is the responsibility of all employees to prevent fires. All employees will be appraised of the potential fire hazards in their work area and will be trained in safe work procedures and practices. Employees are expected to follow proper procedures to prevent fires and to notify their supervisor or other management personnel if they observe any condition that could lead to the ignition of a fire or could increase the spread of a fire.

The following are some general fire prevention practices and procedures that will be followed:

All ignition sources (i.e., open flames, cutting torches, spark producing equipment, electric motors, heating equipment, etc.) will be controlled. All contact of ignition sources with combustible and flammable materials will be avoided. All employees will keep all combustible materials at least five feet from such ignition sources and all flammable liquids at least twenty feet away.

Extensive use of electrical extension cords should be avoided. Any damaged or frayed electrical wiring, equipment cords, extension cords, etc. will be removed from service immediately and replaced or repaired.

Any use of flammable liquids will be done in a manner that prevents spills, and prevents the flammable liquid or its vapor or spray from coming into contact with any ignition source. All flammable liquids will be stored in proper flammable liquid storage containers and kept in the proper storage cabinets.

Housekeeping and storage practices are critical to preventing fires. Any combustible materials will be stored in neat stacks with adequate aisle space provided to prevent the easy spread of fire and to allow for access to extinguish any fire that may start. Trash, scrap, and other unnecessary combustibles must be cleaned up immediately and placed in proper disposal containers.

Smoking is restricted to designated areas.

Company Fire Exits:

Each area of the building/work site has at least two means of escape and are to be used in a fire emergency. The location of exits and the path of egress (escape) will be shown on maps (and posted throughout the building as necessary).

Fire exit doors will not be blocked or locked during business hours in order to prevent their emergency use (when employees are within the building).

Exit routes from the work site will be clear and free of obstructions. All exits are marked with signs designating exits from the premises.

Fire Extinguishers:

Each area of the Company will have a full complement of the proper type of fire extinguisher for the fire hazards present. All fire extinguishers will be inspected annually by a fire protection equipment company and tagged with the date of inspection. If a fire extinguisher is used or discharged for any reason, it will be removed from service and replaced with another properly charged fire extinguisher while it is being recharged.

Employees who are expected or anticipated to use fire extinguishers will be instructed on the hazards of fighting fires, how to properly operate the fire extinguishers available, and what procedures to follow in alerting others to the fire emergency. These employees will only attempt to extinguish small incipient fires. If a fire cannot be immediately and easily extinguished with a fire extinguisher, the employees will evacuate the building. They will not try to fight the fire! All employees who are not trained and designated to fight fires are to immediately evacuate the premises at the first sign of fire or initiation of the fire alarm and are prohibited from using an extinguisher and re-entering the premises.

Emergency Fire Evacuation:

If any employee discovers a fire or smoke, the employee will immediately pull the nearest fire alarm box. If there is time and it is safe to do so, the employee will contact a member of Management to report the fire. Management will then make an announcement over the public address system that all employees and customers are to evacuate the building. Management will then call 911 and report the fire to the fire department.

If a fire alarm sounds or a fire is otherwise announced, all employees (except those designated and trained to use fire extinguishers) are expected to immediately exit the premises by proceeding to the nearest exit in an orderly fashion. If the nearest exit is blocked by fire or smoke, the employees should proceed to an alternate exit. There should be no running, shouting, pushing, etc. A calm orderly evacuation is the safest for all concerned.

Emergency Fire Evacuation: (continued)

Upon exiting the building, all employees and personnel are to proceed to the designated meeting area(s) away from the building, so as not to hamper access by fire fighters, and in order to be accounted for. The designated meeting area(s) for our building is:

_____

(Insert the location(s) where employees are to meet outside the building)

Supervisors and managers will account for all of their employees to ensure that no one is still in the building and unaccounted for.

Where needed, special procedures for helping physically impaired employees will be established. This will be done on a case by case basis when the employee is first hired or when the physical impairment first occurs.

Employee Training:

All new employees will receive fire prevention and emergency evacuation training when they are hired. All employees will also receive refresher training and a review of this plan on an annual basis.

The Company will hold fire drills and will include a practice evacuation of the building at least annually. These drills will be used to evaluate employee response and behavior and will help us determine where more training is needed.

Those employees who are designated and authorized to use fire extinguishers to fight small fires will receive training in the proper use of extinguishers, how to extinguish a fire, the hazards involved in fighting fires, when not to fight a fire, and when to evacuate the area.

The Safety and Health Manager administers the Company's fire prevention and life safety inspection programs. This includes reviewing all new building construction and renovations to ensure compliance with applicable state, local, and national fire and life safety standards.

Fire prevention measures propose to reduce the incidence of fires by eliminating opportunities for ignition of flammable materials.

Flammable and Combustible Materials:

Substitution-

> Flammable liquids sometimes may be substituted by relatively safe materials in order to reduce the risk of fires. Any substituted material should be stable and nontoxic and should either be nonflammable or have a high flashpoint.

Storage -

Flammable and combustible liquids require careful handling at all times. The proper storage of flammable liquids within a work area is very important in order to protect personnel from fire and other safety and health hazards.

1) Cabinets

Not more than 120 gallons of Class I, Class II, and Class IIIA liquids may be stored in a storage cabinet. Of this total, not more than 60 gallons may be Class I and II liquids. Not more than three such cabinets (120 gallons each) may be located in a single fire area except in an industrial area.

2) Storage Inside Buildings.

Where approved storage cabinets or rooms are not provided, inside storage will comply with the following basic conditions:

a. The storage of any flammable or combustible liquid shall not physically obstruct a means of egress from the building or area.

b. Containers of flammable or combustible liquids will remain tightly sealed except when transferred, poured or applied. Remove only that portion of liquid in the storage container required to accomplish a particular job.

c. If a flammable and combustible liquid storage building is used, it will be a one-story building devoted principally to the handling and storing of flammable or combustible liquids. The building will have 2-hour fire-rated exterior walls having no opening within 10 feet of such storage.

d. Flammable paints, oils, and varnishes in 1 or 5 gallon containers, used for building maintenance purposes, may be stored temporarily in closed containers outside approved storage cabinets or room if kept at the job site for less than 10 calendar days.

Ventilation -

Every inside storage room will be provided with a continuous mechanical exhaust ventilation system. To prevent the accumulation of vapors, the location of both the makeup and exhaust air openings will be arranged to provide, as far as practical, air movement directly to the exterior of the building and if ducts are used, they will not be used for any other purpose.

Elimination of Ignition Sources-

All nonessential ignition sources must be eliminated where flammable liquids are used or stored. The following is a list of some of the more common potential ignition sources:

• Open flames, such as cutting and welding torches, furnaces, matches, and heaters-these sources should be kept away from flammable liquids operations. Cutting or welding on flammable liquids equipment should not be performed unless the equipment has been properly emptied and purged with a neutral gas such as nitrogen.
• Chemical sources of ignition such as d.c. motors, switched, and circuit breakers-these sources should be eliminated where flammable liquids are handled or stored. Only approved explosion-proof devices should be used in these areas.
• Mechanical sparks-these sparks can be produced as a result of friction. Only nonsparking tools should be used in areas where flammable liquids are stored or handled.
• Static sparks-these sparks can be generated as a result of electron transfer between two contacting surfaces. The electrons can discharge in a small volume, raising the temperature to above the ignition temperature. Every effort should be made to eliminate the possibility of static sparks. Also proper bonding and grounding procedures must be followed when flammable liquids are transferred or transported.

Removal of Incompatibles -

Materials that can contribute to a flammable liquid fire should not be stored with flammable liquids. Examples are oxidizers and organic peroxides, which, on decomposition, can generate large amounts of oxygen.

Flammable Gases-

Generally, flammable gases pose the same type of fire hazards as flammable liquids and their vapors. Many of the safeguards for flammable liquids also apply to flammable gases, other properties such as toxicity, reactivity, and corrosivity also must be taken into account. Also, a gas that is flammable could produce toxic combustion products.

Fire Extinguishers:

A portable fire extinguisher is a “first aid” device and is very effective when used while the fire is small. The use of fire extinguisher that matches the class of fire, by a person who is well trained, can save both lives and property. Portable fire extinguishers must be

installed in workplaces regardless of other fire fighting measures. The successful performance of a fire extinguisher in a fire situation largely depends on its proper selection, inspection, maintenance, and distribution.

Classification of Fires and Selection of Extinguishers-

Fires are classified into four general categories depending on the type of material or fuel involved. The type of fire determines the type of extinguisher that should be used to extinguish it.

1) Class A fires involve materials such as wood, paper, and cloth which produce glowing embers or char.

2) Class B fires involve flammable gases, liquids, and greases, including gasoline and most hydrocarbon liquids which must be vaporized for combustion to occur.

3) Class C fires involve fires in live electrical equipment or in materials near electrically powered equipment.

4) Class D fires involve combustible metals, such as magnesium, zirconium, potassium, and sodium.

Extinguishers will be selected according to the potential fire hazard, the construction and occupancy of facilities, hazard to be protected, and other factors pertinent to the situation.

Location and Marking of Extinguishers-

Extinguishers will be conspicuously located and readily accessible for immediate use in the event of fire. They will be located along normal paths of travel and egress. Wall recesses and/or flush-mounted cabinets will be used as extinguisher locations whenever possible.

Extinguishers will be clearly visible. In locations where visual obstruction cannot be completely avoided, directional arrows will be provided to indicate the location of extinguishers and the arrows will be marked with the extinguisher classification.

Location and Marking of Extinguishers- (continued)

If extinguishers intended for different classes of fire are located together, they will be conspicuously marked to ensure that the proper class extinguisher selection is made at the time of a fire. Extinguisher classification markings will be located on the front of the shell above or below the extinguisher nameplate. Markings will be of a size and form to be legible from a distance of 3 feet.

Condition of Fire Extinguishers-

Portable extinguishers will be maintained in a fully charged and operable condition. They will be kept in their designated locations at all times when not being used. When extinguishers are removed for maintenance or testing, a fully charged and operable replacement unit will be provided.

Mounting and Distribution of Extinguishers-

Extinguishers will be installed on hangers, brackets, in cabinets, or on shelves. Extinguishers having a gross weight not exceeding 40 pounds will be so installed that the top of the extinguisher is not more than 3-1/2 feet above the floor.

Extinguishers mounted in cabinets or wall recesses or set on shelves will be placed so that the extinguisher operating instructions face outward. The location of such extinguishers will be made conspicuous by marking the cabinet or wall recess in a contrasting color which will distinguish it from the normal décor.

Extinguishers must be distributed in such a way that the amount of time needed to travel to their location and back to the fire does not allow the fire to get out of control. OSHA requires that the travel distance for Class A and Class D extinguishers not exceed 75 feet. The maximum travel distance for Class B extinguishers is 50 feet because flammable liquid fires can get out of control faster that Class A fires. There is no maximum travel distance specified for Class C extinguishers, but they must be distributed on the basis of appropriate patterns for Class A and B hazards.

Inspection and Maintenance of Extinguishers

Once an extinguisher is selected, purchased, and installed, it is the responsibility of the Safety and Health Manager to oversee the inspection, maintenance, and testing of fire extinguishers to ensure that they are in proper working condition and have not been tampered with or physically damaged.

Fire Safety Inspections and Housekeeping:

First line Supervisors and the Safety and Health Manager are responsible for conducting work site surveys at least annually. These surveys should include observations of work site safety and housekeeping issues and should specifically address proper storage of chemicals and supplies, unobstructed access to fire extinguishers, and emergency evacuation routes. Also, they should determine if an emergency evacuation plan is present in work areas and that personnel are familiar with the plan.

Emergency Egress:

Every exit will be clearly visible, or the route to it conspicuously identified in such a manner that every occupant of the building will readily know the direction of escape from any point. At no time will exits be blocked.

Any doorway or passageway which is not an exit or access to an exit but which may be mistaken for an exit, will be identified by a sign reading "Not An Exit" or a sign indicating it actual use (i.e., "Storeroom"). Exits and accesses to exits will be marked by a readily visible sign. Each exit sign (other than internally illuminated signs) will be illuminated by a reliable light source providing not less than 5 foot-candles on the illuminated surface.

Facilities Design Review:

Facilities will be designed in a manner consistent with health and safety regulations and standards of good design. Company Management, together with Safety and Health Manager, will ensure that there is appropriate health and safety review of facility concepts, designs, and plans. A formal design review process is currently in place for all new construction efforts.

Occupant Emergency Plan for Persons with Disabilities:

The first line supervisor is assigned the responsibility to assist Persons with Disabilities under their supervision. An alternate assistant will be chosen by the supervisor. The role of the two assistants is to report to their assigned person, and to either assist in evacuation or assure that the Persons with Disabilities is removed from danger.

- Supervisors, alternates, and the person with a disability will be trained by the Safety and Health Manager on available escape routes and methods.
- A list of persons with disabilities is kept in the Office of Health and Safety. This list is updated by the Safety and Health Manager and the Office of Personnel Management.
- Visitors who have disabilities will be assisted in a manner similar to that of Company employees. The Host of the person with disabilities will assist in their evacuation.

Emergencies Involving Fire:

Fire Alarms-

In the event of a fire emergency, a fire alarm will sound for the building.

Evacuation Routes and Plans-

Each facility shall have an emergency evacuation plan. All emergency exits shall conform to NFPA standards.

Should evacuation be necessary, go to the nearest exit or stairway and proceed to an area of refuge outside the building. Most stairways are fire resistant and present barriers to smoke if the doors are kept closed.

Do not use elevators. Should the fire involve the control panel of the elevator or the electrical system of the building, power in the building may be cut and you could be trapped between floors. Also, the elevator shaft can become a flue, lending itself to the passage and accumulation of hot gases and smoke generated by the fire.

Emergency Coordinators-

Emergency Coordinators will be responsible for verifying personnel have evacuated from their assigned areas.

Fire Emergency Procedures-

If you discover a fire:

1. Activate the nearest fire alarm.

2. Notify the fire department by dialing 911. Give your location, the nature of the fire, and your name.

3. Notify the Manager on duty and other occupants.

4. Notify the Safety and Health Manager.

Fight the fire ONLY if:

1.The fire department has been notified of the fire, AND

2.The fire is small and confined to its area of origin, AND

3.You have a way out and can fight the fire with your back to the exit, AND

4.You have the proper extinguisher, in good working order, AND know how to use it.

5. If your are not sure of your ability or the fire extinguisher's capacity to contain the fire, leave the area.

If you hear a fire alarm:

1. Evacuate the area. Close windows, turn off gas jets, and close doors as you leave.

2. Leave the building and move away from exits and out of the way of emergency operations.

3. Assemble in a designated area.

4. Report to the Manager/monitor so he/she can determine that all personnel have evacuated your area.

5. Remain outside until competent authority (Physical Security, Safety and Health Manager, or your supervisor) states that it is safe to re-enter.

Evacuation Routes

1.Learn at least two escape routes, and emergency exits from your area.

2.Never use an elevator as part of your escape route.

3.Learn to activate a fire alarm.

4.Learn to recognize alarm sounds.

5.Take an active part in fire evacuation drills.

Flammable Liquids

Purpose:

Proper Storage and use of flammable liquids can significantly reduce the possibility of accidental fires and injury to employees. To minimize risk to life and properly, the requirements of NFPA 30 & 321 and OSHA Standard 1910.106 have been implemented. MSDS for flammable liquids are kept in the Safety and Health Office and at each storage location.

Responsibilities:

Management

Provide proper storage for flammable liquids

Ensure proper training is provided to employees who work with flammable liquids

Ensure containers are properly labeled

Supervisors

Provide adequate training in the use and storage of flammable liquids

Monitor for proper use and storage

Keep only the minimum amount required on hand

Ensure MSDS are current for all flammable liquids

Employees

Follow all storage and use requirements

Report deficiencies in storage and use to supervisors

Immediately report spills to supervisors

Hazard Control:

Engineering Controls-

Properly designed flammable storage areas

Ventilated Storage areas

Grounding Straps on Drums and dispensing points

Administrative Controls-

Designated storage areas

Limiting amount of flammable liquids in use and storage

Employee Training

Limited & controlled access to bulk storage areas

Posted Danger, Warning and Hazard Signs

Definitions :

Flammable Liquid - a liquid with a flashpoint below 100^0F

Class IA - flashpoint below 73^0F and boiling point below 100^0F

Class IB - flashpoint below 73^0F and boiling point above 100^0F

Class IC - flash at or above 73^0F and below 100^0F

Combustible Liquids - a liquid having a flash point at or above 100^0 F.

Class II Combustibles - Flashpoint above 100^0F and below 140^0F

Class III Combustibles - Flashpoint at or above 140^0F

Subclass IIIA - flashpoint at or above 140^0F and below 200^0F

Subclass IIIB - flashpoint at or above 200^0F

Substitution

Flammable liquids sometimes may be substituted by relatively safe materials in order to reduce the risk of fires. Any substituted material should be stable and nontoxic and should either be nonflammable or have a high flashpoint.

Storage & Usage of Flammable Liquids

Flammable and combustible liquids require careful handling at all times. The proper storage of flammable liquids within a work area is very important in order to protect personnel from fire and other safety and health hazards.

Storage of Flammable liquids shall be in NFPA approved flammable storage lockers or in low value structures at least 50 feet from any other structure. Do not store other combustible materials near flammable storage areas or lockers

Bulk drums of flammable liquids must be grounded and bonded to containers during dispensing

Portable containers of gasoline or diesel are not to exceed 5 gallons

Safety cans used for dispensing flammable or combustible liquids shall be kept at a point of use.

Appropriate fire extinguishers are to be mounted within 75 feet of outside areas containing flammable liquids, and within 10 feet of any inside storage area for such materials.

Storage rooms for flammable and combustible liquids must have explosion-proof light fixtures

Bulk storage of gasoline or diesel are kept in above ground tanks. Tank areas are diked to contain accidental spills. Tanks shall be labeled IAW NFPA guidelines. All tank areas shall be designated no smoking - no hot work - no open flame areas.

No Flame Zones – No hotwork or smoking is permitted in flammable or combustible liquid storage areas.

The maximum amount of flammable liquids that may stored in a building are:

20 gallons of Class IA liquids in containers

100 gallons of Class IB, IC, II, or III liquids in containers

500 gallons of Class IB, IC, II, or III liquids in a single portable tank.

Usage of Flammable Liquids

Flammable liquid transfer areas are to be separated from other operations by distance or by construction having proper fire resistance.

When not in use flammable liquids shall be kept in covered containers.

Class I liquids may be used only where there are no open flames or other sources of ignition within the possible path of vapor travel.

Flammable or combustible liquids shall be drawn from or transferred into vessels, containers, or portable tanks within a building only through a closed piping system, from safety cans, by means of a device drawing through the top, or from a container or portable tanks by gravity through an approved self-closing valve. Transferring by means of air pressure on the container or portable tanks shall be prohibited.

Maintenance and operating practices shall be in accordance with established procedures which will tend to control leakage and prevent the accidental escape of flammable or combustible liquids. Spills shall be cleaned up promptly.

Combustible waste material and residues in a building or unit operating area shall be kept to a minimum, stored in covered metal receptacles and disposed of daily.

Rooms in which flammable or combustible liquids are stored or handled by pumps shall have exit facilities arranged to prevent occupants from being trapped in the event of fire.

Inside areas in which Class I liquids are stored or handled shall be heated only by means not constituting a source of ignition, such as steam, hot water or forces central systems located away from the area.

Cabinets

Not more than 120 gallons of Class I, Class II, and Class IIIA liquids may be stored in a storage cabinet. Of this total, not more than 60 gallons may be Class I and II liquids. Not more than three such cabinets (120 gallons each) may be located in a single fire area except in an industrial area.

Containers

The capacity of flammable and combustible liquid containers will be in accordance with the below table.

Maximum allowable capacity of containers and portable tanks

	Flammable Liquids		Combustible Liquids		
Container	**1A**	**1B**	**1C**	**II**	**III**
Glass or approved plastic1	1 pt[2]	1 qt[2]	1 gal	1 gal	1 gal
Metal (Other than DOT drums)	1 gal	5 gal	5 gal	5 gal	5 gal
Safety Cans	2 gal	5 gal	5 gal	5 gal	5 gal
Metal drums (DOT specifications)	60 gal	60 gal	60 gal	60 gal	60 gal
Approved portable tanks	660 gal	660 gal	660 gal	660 gal	660 gal

(1) Nearest metric size is also acceptable for the glass and plastic
(2) One gallon or nearest metric equivalent size may be used if metal and labeled with their contents.

Storage Inside Buildings

Where approved storage cabinets or rooms are not provided, inside storage will comply with the following basic conditions:

The storage of any flammable or combustible liquid shall not physically obstruct a means of egress from the building or area.

Containers of flammable or combustible liquids will remain tightly sealed except when transferred, poured or applied. Remove only that portion of liquid in the storage container required to accomplish a particular job.

If a flammable and combustible liquid storage building is used, it will be a one-story building devoted principally to the handling and storing of flammable or combustible liquids. The building will have 2-hour fire-rated exterior walls having no opening within 10 feet of such storage.

Flammable paints, oils, and varnishes in 1 or 5 gallon containers, used for building maintenance purposes, may be stored temporarily in closed containers outside approved storage cabinets or room if kept at the job site for less than 10 calendar days.

Ventilation

Every inside storage room will be provided with a continuous mechanical exhaust ventilation system. To prevent the accumulation of vapors, the location of both the makeup and exhaust air openings will be arranged to provide, as far as practical, air movement directly to the exterior of the building and if ducts are used, they will not be used for any other purpose.

Designated Flammable Storage Areas are:

1.

2.

3.

Fleet Motor Vehicle Safety Program

Policy:

A. Motor vehicles shall be acquired, maintained and utilized in support of Company objectives, in the minimum quantity required and in the most practical and economical manner consistent with program requirements, safety considerations, fuel economy, and applicable laws and regulations.

B. The Company shall designate a Fleet Manager to be responsible for the motor equipment operations and to serve as a single point of contact for issues, information and reports on motor equipment.

C. Each Fleet Manager will maintain vehicle use records including home-to-work usage.

D. No employee shall use a Company vehicle for transportation between their home and place of employment without the expressed written approve of the Fleet Manager.

Scope:

The Fleet Motor Vehicle Safety Program applies to all locations where Company vehicles are operated. These include the following Company operated vehicles:

1) Company Cars and Vans
2) Company pool cars and vans
3) Company delivery vehicles and trucks

Definitions:

A. “Fleet Manager” means the official designated to oversee the motor vehicle operations of the Company

B. "Dual Purpose Vehicle" means a motor vehicle designed to transport both passengers and cargo such as Broncos, Cherokees, Blazers, etc.

C. "Company vehicle" means any vehicle owned or leased by the Company.

D. "Motor vehicle" means any equipment, self-propelled or drawn by mechanical power, designed to be operated principally on highways in the transportation of property or passengers.

E. "Passenger motor vehicle" means any vehicle whose primary purpose is to transport passengers (sedans, station wagons, ambulances, buses, and passenger vans).

Responsibilities:

Fleet Managers-

Each local Company Office Manager, which operates motor vehicles, shall designate in writing a local motor vehicle manager who shall be responsible for directing the operation of the motor vehicle fleet, and shall:

A. Operate the fleet in accordance with applicable laws and regulations, and Company and local directives;

B. Ensure that an adequate system of records including logs of home-to-work usage are established and maintained;

C. Perform and document reviews at least annually of assignments to individuals or organizational components to determine if continued assignment is justified;

D. Perform and document an annual review of motor vehicle utilization statistics to identify underutilized motor vehicles.

E. Rotate motor vehicles between high and low mileage assignments; and

F. Perform documented trend analyses of the annual costs of the motor vehicle fleet and review present operations and new requirements for the purpose, where feasible and cost effective, of establishing alternative sources for the motor

vehicle fleet operation, e.g., pooling arrangements, shuttle bus service, taxicabs, and joint utilization by several groups.

G. Assure the maintenance of individual motor vehicle use records, such as trip tickets or vehicle logs, showing sufficiently detailed information to evaluate appropriateness of assignment and adequacy of use being made. If one-time use is involved, such as assignments from motor pools, the individual's trip records must, as a minimum, identify the motor vehicle and show the name of the operator, dates, destination, time of departure and return, and mileage;

Authorized Use of Company Vehicles:

A. Vehicles assigned to or purchased or leased by the Company are intended for official business. Company motor vehicles are not provided for the convenience of Company employees. Company vehicles should only be used when it is:

(1) the least costly method of transportation available (considering the value of employee time and actual transportation costs) or

(2) when no other practical method of transportation is available considering the mission to be performed; the location; and any equipment needed to be transported to support the mission.

B. Common carriers (air, rail, and bus) shall be used in lieu of transportation by motor vehicle, unless the use of the motor vehicle is clearly more economical and practicable, and in the government's interest, such as:

(i) The employee's itinerary requires a number of stops and the scheduled arrival and departure of public transportation does not coincide with the timetable of the itinerary, resulting in undue loss of Company time;

(ii) It is necessary to provide considerable amount of equipment with the employee;

(iii) The nature of the employee's work necessitates the use of transportation at a time of day or week when it would be highly impracticable to use public transportation; or

(iv) Such officers and employees are continually engaged in work affecting Company operations, and the use of a common carrier is impracticable and not in the best interest of the Company.

C. Each employee of the Company is responsible for providing their own transportation to the work place. Transporting an employee between home and work is not an official use of a Company vehicle.

D. Any officer or employee who willfully uses or authorizes the use of a vehicle for other than official business is subject to reprimand and /or termination.

Use of Company Vehicles Between Residence and Place of Employment:

A. Employees are expected to provide their own transportation between residence and place of employment including for overtime. Inconvenience, awkwardness with a car pool arrangement, or difficulties with a personal vehicle do not justify furnishing government transportation.

B. Approval of the use of Company vehicles between residence and place of employment

Only the Fleet Manager may approve the use of Company vehicles between residence and place of employment. The approval process for the use of vehicles between residence and place of employment will be different based on the reason for approval.

Employees engaged in field work will be approved on the basis of positions. Each office requesting approval of vehicle use between residence and place of employment for employees engaged in field work shall submit justification, in memorandum form, to the Fleet Manager. This justification shall include the position title and series, number of employees affected, name and title of person requesting approval, dates, location of official duty station, frequency and duration of the field work, and justification for the use of the vehicles.

After the initial justification for each position has been approved, the requesting office should reassess and resubmit justification every year.

If a position is approved for the use of a vehicle between residence and place of employment based on field work, the approval is only in effect when an employee is actually engaged in field work and should not be interpreted as authorization to use the vehicle at anytime other than when conducting field work.

C. Documentation of home-to-work transportation

Each employee using a vehicle between his or her residence and place of employment will maintain a record identifying the vehicle used (license plate number), destination, starting and ending mileage and purpose of trip. This record will be turned into the Fleet Manager monthly. The record(s) shall be maintained together with the request for and approval of the use of a government vehicle between residence and place of employment. These records shall be readily available for audit until disposed of according to established records management procedures.

Motor Vehicle Operator Instructions:

Supervisors shall inform all operators of Company vehicles concerning:

A. The statutory requirement that Company motor vehicles shall be used only for official purposes;

B. Personal responsibility for safe driving and operation of Company motor vehicles, and for compliance with Federal, State, and local laws and regulations including any penalties incurred for violations thereof, and all accident reporting requirements;

C. The penalties for unauthorized use of government motor vehicles;

D. The prohibition against picking up strangers or hitchhikers and limitations on the transportation of non-official passengers;

E. The proper care, control and use of Company credit cards;

F. Mandatory use of seat belts by each occupant operating or riding in a government motor vehicle;

G. Any other duties and responsibilities assigned to motor vehicle operators with regard to the use, care, operation, and maintenance of government motor vehicles;

H. Their potential income tax liability when they use a Company motor vehicle for transportation between home and place of employment;

I. The prohibition against smoking in government vehicles; and

J. Protection for Company employees under the Torts Claim Act (28 USC 2671) when acting within the scope of their employment.

Maintenance Guidelines:

A. Whenever practicable and cost effective, commercial service facilities shall be utilized for the maintenance of motor vehicles.

B. Individual vehicle maintenance records shall be kept to provide records of past repairs, as a control against unnecessary repairs and excessive maintenance, and as an aid in determining the most economical time for replacement.

C. One-time maintenance and repair limitations shall be established by the Fleet Manager for Company owned vehicles and for commercially leased vehicles if not specified in the lease. To exceed repair limitations, approval of the Fleet Manager is required.

Reporting Motor Vehicle Accidents:

All motor vehicle accidents shall be reported to the Fleet Manager. Accidents which have been determined to be the fault of the Company motor vehicle operator shall be reviewed

by the employee's Supervisor and a copy of the results shall be provided to the Fleet Manager.

Company Credit Cards:

A. All motor vehicle operators shall be provided with appropriate instructions regarding the use and protection of credit cards against theft and misuse.

B. In the event a credit card is lost or stolen, reasonable precautions shall be taken to minimize the opportunity of purchases being made by unauthorized persons. The Accounting Office Manager shall be notified immediately of the loss or theft and to be on the alert for any unauthorized bills.

Truck and Vehicle Driver Qualifications:

Purpose:

To establish the policy and procedures that will insure all Company truck and vehicle drivers are qualified to operate Company trucks and vehicles safely. Any employee that is authorized to operate a Company truck or vehicle must meet all requirements of the Federal Highway Administration and State Government Regulations. Employees that are assigned to operate any kind of vehicle that has a gross combination weight rating of 26,000 or more pounds are required to have a current, valid Commercial Driver's License (CDL), issued by the state.

Qualifications:

The following lists the MINIMUM qualifications which must be met (and maintained) by any employee assigned to drive a Company truck or vehicle:

1. Applicants must be at least 21 years of age.

2. Applicants must be able to read, speak and write fluently in English.

3. Applicants must understand highway traffic signs and signals

4. Applicants must be able to respond to official inquiries and to make written entries on reports and records

5. Is physically qualified to operate a motor vehicle and has no movement limitations concerning their arms, legs, foot, head, waist, back, hands or fingers.

6. Has no established medical history that would interfere with their ability to operate a motor vehicle to include:

   a) Myocardial infarction, coronary difficulty, or any heart condition
   b) Diabetes
   c) Respiratory dysfunction
   d) High Blood Pressure
   e) Epilepsy
   f) Mental, nervous, or other functional or psychiatric disorder
   g) Arthritis, neuromuscular, or vascular disease

7. Has the visual acuity and binocular vision of at least 20/40 (with or without corrective lenses), and the field of vision of at least 70 degrees in each eye.

8. Does not have an average hearing loss in the better ear greater than 40 decibels at 500 Hz, 1000 Hz, and 2000 Hz with or without a hearing aid.

9. Has passed a pre-employment drug test.

10. Does not use drugs that fall into the following categories: opiate, hallucinogenic, depressant, or stimulants.

11. Have a valid Commercial Driver's License

12 12. Has furnished a list of all motor vehicle accidents AND convictions that have occurred in the last 3 years.

13. Has successfully completed a Company monitored road test.

14. Has completed a Company written examination.

15. A background investigation of the applicant's driving record and employment record over the past three years have been completed.

Forklift and Motorized Industrial Trucks

Policy:

All Company employees required to operate a powered industrial truck and/or forklift must be trained to operate the equipment. Motorized industrial trucks and forklifts are a

vital and necessary tool that enable the Company to conduct its business efficiently and safely.

Powered industrial trucks are defined as forklifts, platform lift trucks, power sweepers, motorized pallet jacks and all other motorized vehicles used on the Company's premises. The Company will insure that all industrial trucks are inspected daily for safety and mechanical operability. Any industrial truck found to be defective or unsafe will not be used until the defect or unsafe condition is repaired/remedied.

Employee Certification:

Employees must meet the following requirements before they are "certified" to operate a powered industrial truck:

18 Years of age
Is physically qualified to operate the industrial truck and has no movement limitations concerning their arms, legs, foot, head, waist, back, hands or fingers.
Has an established medical history that would interfere with their ability to operate the industrial truck to include:

a) Epilepsy
b) Mental, nervous, or other functional or psychiatric disorder
c) Arthritis, neuromuscular, or vascular disease

Has the visual acuity and binocular vision of at least 20/40 (with or without corrective lenses), and the field of vision of at least 70 degrees in each eye.
Does not have an average hearing loss in the better ear greater than 40 decibels at 500 Hz, 1000 Hz, and 2000 Hz with or without a hearing aid.
Has passed a pre-employment drug test.
Does not use drugs that fall into the following categories: opiate, hallucinogenic, depressant, or stimulants.
Has a valid drivers license
Complete the "Industrial Truck" written Certification Examination of 70% or better
Perform a minimum of X hours "On-the-Job Training" in operating an industrial truck.

The Supervisor will provide on-the-job training about how to physically operate the powered industrial truck and additional supervised training as necessary.

The Supervisor will discuss with and instruct the employee so that the employee can gain an understanding of the following key elements:

Basic operation of the industrial truck to include its major components, principals of loading, load capacity, operating "nuances", etc.

Maintenance and inspection of the industrial truck

Starting and operating the truck- parking, turning, load traveling, stacking, backing up, etc.

Refueling procedures

Personal Protective Equipment- seat belt, safety shoes, hard hat, gloves, etc.

On-the-Job Coach

Provides on-the-job (hands on training) of X hours about how to physically operate the powered industrial truck. This training will be divided into specific areas listed below:

Pre-Operation and Inspection of Powered Industrial Trucks
Proper start-up and mastery of controls
Maneuvering Skills
Safety procedures
Re-fueling or re-charging
Actually operating the truck in working situations

Once the employee completes the minimum training time, shown consistent safe operating skills, and has demonstrated the ability to handle the equipment, the On-the-Job coach certifies the employee according to the Truck Operator Performance Test.

Industrial Truck
Written Certification Examination

_____ _____
Employee's Name **Date**

(*Place the Related Examination Here*)

Industrial Truck Operator Performance Test

_____ _____

Employee's Name **Date**

(*Place the Related Performance Test Here*)

I certify that _____ is qualified to operate a _____
Authorizing Signature _____ Title: _____
Date: _____

DAILY CHECKLISTS FOR POWERED INDUSTRIAL TRUCKS

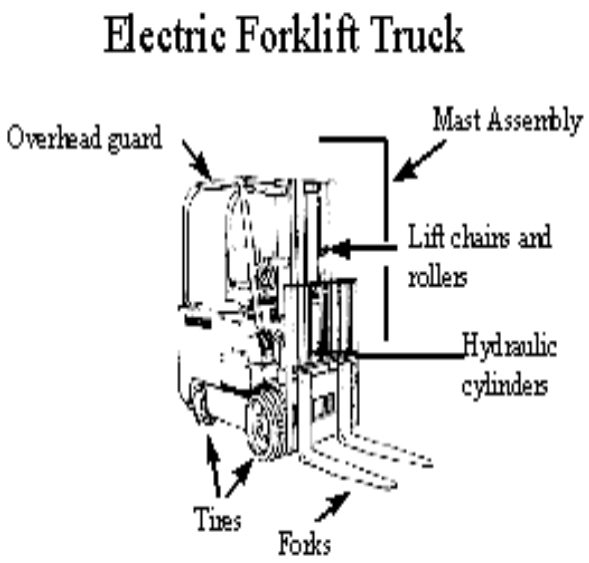
DAILY INSPECTION CHECKLIST
Electric Forklift Truck

KEY OFF Procedures

- The vehicle inspection
  - Overhead guard
  - Hydraulic cylinders
  - Mast assembly
  - Lift chains and rollers
  - Forks
  - Tires
- Examine the battery
- Check the hydraulic fluid level

KEY ON Procedures

- Check the gauges
  - Hour meter
  - Battery discharge indicator
- Test the standard equipment
  - Steering
  - Brakes
  - Front, tail, and brake lights
  - Horn
- Safety seat (if equipped)
- Check the operation of load-handling attachments



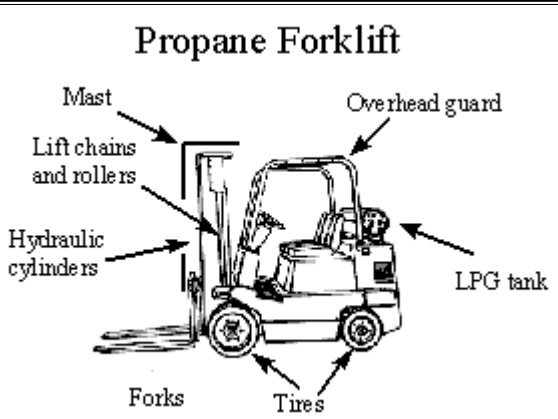
DAILY INSPECTION CHECKLIST
Propane Forklift Truck

KEY OFF Procedures

- The vehicle inspection
  - Overhead guard
  - Hydraulic cylinders
  - Mast assembly
  - Lift chains and rollers
  - Forks
  - Tires
  - LPG tank and locator pin
  - LPG tank hose
  - Gas gauge

DAILY INSPECTION CHECKLIST
Propane Forklift Truck (continued)

KEY OFF Procedures (continued)

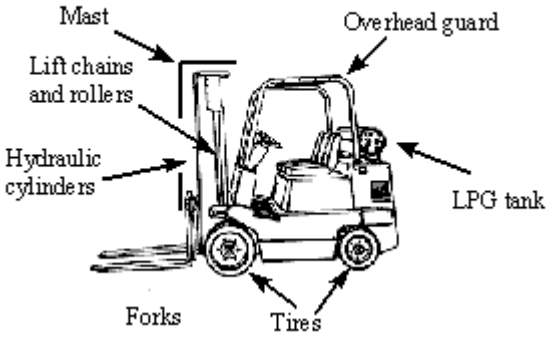


- Check the engine oil level
- Examine the battery
- Check the hydraulic fluid level
- Check the engine coolant level

KEY ON Procedures
- Test the front, tail, and brake lights

ENGINE RUNNING Procedures
- Check the gauges
  - Oil pressure indicator lamp
  - Ammeter indicator lamp
  - Hour meter
  - Water temperature gauge
- Test the standard equipment
  - Steering
  - Brakes
  - Horn
- Safety seat (if equipped)
  - Check the operation of the load-handling attachments
- Check the transmission fluid level

Propane Forklift



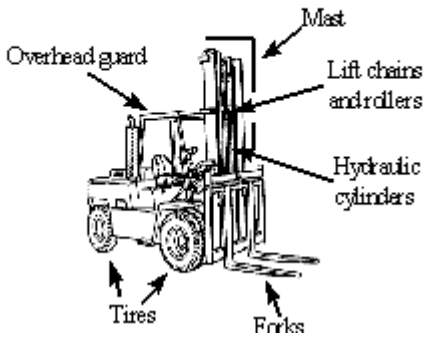
DAILY INSPECTION CHECKLIST
Yard Forklift Truck

KEY OFF Procedures

The vehicle inspection
- Overhead guard
- Hydraulic cylinders
- Mast assembly
- Lift chains and rollers
- Forks
- Tires
- LPG tank and locator pin
- LPG tank hose
- Gas gauge

KEY OFF Procedures (continued)
- Check the engine oil level
- Examine the battery
- Inspect the hydraulic fluid level
- Check the engine coolant level

Yard Forklift



KEY ON Procedures

Test the standard equipment

- Front, tail, and brake lights
- Fuel gauge (if diesel)
- Windshield wiper
- Heater

ENGINE RUNNING Procedures

Check the gauges

- Oil pressure indicator lamp
- Ammeter indicator lamp
- Ammeter
- Hour Meter
- Water Temperature Gauge

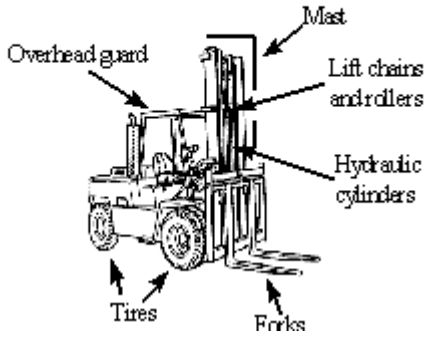
Test the standard equipment

- Steering
- Brakes
- Horn
- Safety seat (if equipped)

Check the operation of load-handling attachments

Check the transmission fluid level

Yard Forklift



GENERIC CHECKLIST FOR POWERED INDUSTRIAL TRUCKS

Overhead Guard - Are there broken welds, missing bolts, or damaged areas?

Hydraulic Cylinders - Is there leakage or damage on the lift, tilt, and attachment functions of the cylinders?

Mast Assembly - Are there broken welds, cracked or bent areas, and worn or missing stops?

Lift Chains and rollers - Is there wear or damage or kinks, signs of rust, or any sign that lubrication is required?

Is there squeaking?

Forks - Are they cracked or bent, worn, or mismatched?

Is there excessive oil or water on the forks?

Tires - What do the tires look like?

Are there large cuts that go around the circumference of the tire?

Are there large pieces of rubber missing or separated from the rim?

Are there missing lugs?

Is there bond separation that may cause slippage?

Battery Check - Are the cell caps and terminal covers in place?

Are the cables missing insulation?

Hydraulic Fluid - Check level?

Gauges - Are they all properly working?

Steering - Is there excessive free play?
If power steering, is the pump working?

Brakes - If pedal goes all the way to the floor when you apply the service brake, that is the first indicator that the brakes are bad. Brakes should work in reverse, also.
Does the parking brake work? The truck should not be capable of movement when the parking brake is engaged.

Lights - If equipped with lights, are they working properly?

Horn - Does the horn work?

Safety seat - if the truck is equipped with a safety seat is it working?

Load Handling Attachments - Is there hesitation when hoisting or lowering the forks, when using the forward or backward tilt, or the lateral travel on the side shift?

Is there excessive oil on the cylinders?

Propane Tank - Is the tank guard bracket properly positioned and locked down?

Propane Hose - Is it damaged? It should not be frayed, pinched, kinked, or bound in any way.
Is the connector threaded on squarely and tightly?

Propane Odor - If you detect the presence of propane gas odor, turn off the tank valve and report the problem.

Engine Oil - Check levels.

Engine Coolant - Visually check the level. Note: Never remove the radiator cap to check the coolant level when the engine is running or while the engine is hot. Stand to the side and turn your face away. Always use a glove or rag to protect your hand.

Transmission Fluid - Check levels?

Windshield Wipers - Do they work properly?

Seat Belts - Do they work?

Safety Door - (found on stand up rider models) Is it in place?

Safety Switch - (found on stand up riding tow tractors) Is it working?

Hand guards - (found on stand up riding tow tractors, walking pallet trucks, walking transtackers) Are they in place?

Tow Hook - Does it engage and release smoothly?
Does the safety catch work properly?
Control Lever - Does the lever operate properly?

Safety Interlock - (found on order pickers) If the gate is open, does the vehicle run?

Gripper Jaws - (found on order pickers) Do the jaws open and close quickly and smoothly?

Work Platform - (found on order pickers) Does the platform raise and lower smoothly?

Food Service

Purpose:

In many work environments, employees can make a big difference- in positive as well as negative ways. This is especially true in food service, where any worker can introduce a sanitation or safety hazard at any point in the food production process. Most food borne illnesses are caused by bacteria or other microorganisms spread by workers. In addition to human suffering, an outbreak of food borne illness can result in a damaged reputation as

well as financial loss. By its nature, the food service environment is full of hazards to employees' safety. Knives, slicers, grinders, glass, hot surfaces and liquids, and wet or greasy floors are only a few of the risks food service workers face everyday. Fortunately, most accidents also involve human error and, therefore, can be prevented.

The Company will ensure that proper safety procedures are implemented to prevent food borne illnesses and injuries to employees to customers.

Responsibilities:

When it comes to food safety, *every* activity is significant. So is *every* worker. The importance of the individual in maintaining a safe and sanitary food service operation cannot be over-emphasized.

On any given day, *every food service employee* has many opportunities to cause sanitation and safety problems- and to prevent them. The vast majority of these encounters may go unnoticed, whether or not the employees' actions are appropriate. A false sense of security may prevail until a seemingly minor, harmless action results in catastrophe.

a. Food Service Safety Manager is responsible for protecting the customers by serving safe and wholesome food. To accomplish this, the Food Service Safety Manager will educate and motivate every employee in the proper procedures of safe food preparation and handling. In addition, the Food Service Safety Manager must recognize factors in the workplace that has accident potential.

   The Food Service Safety Manager shall also:

   Make and provide frequent inspections of the facility.
   Monitor the work methods, hygiene, and attire of employees.
   Maintain good personal hygiene, attire, and work habits.
   Identify and dispose of potentially hazardous foods.
   Maintain a record keeping system to document how food flows through the food service process, from purchasing through service.

   The Food Service Safety Manager shall also (continued):

   Inspect, date, and label food when it is received.
   Store foods in sanitary conditions.
   Ensure the facility is maintained in a clean and sanitized condition.
   Prepare, handle, cook, and serve foods safely and according to Company policy.
   Ensuring safe working conditions. Any unsafe equipment or material shall be tagged and rendered inoperative or physically removed from its place of operation.

Permit only qualified personnel to operate equipment and machinery according to safe work practices.
Providing necessary protective equipment to employees.
Ensuring that tools, machinery, and equipment are properly maintained, used, cleaned and sanitized.
Taking immediate action to correct any violation of safety rules observed or reported to them.
Maintain appropriate and current Material Safety Data Sheets (MSDS).
Keep a current inventory of all hazardous materials.
Training all employees in the proper use of fire extinguishers, and evacuation procedures.
Training all employees on the use of the Heimlich maneuver.
Keep samples of all potentially hazardous foods served in the facility in the refrigerator or freezer for 48 hours. Constantly dispose of old samples as new samples are added. (Samples shall be labeled with contents and date, and marked with "DO NOT USE").

b. Employees

Good hygiene and safe work practices shall be followed by all employees. Employees shall be thoroughly trained in the proper storage, preparation, serving, and disposal of food. Employees shall also be trained in the safe use of equipment, machines, and tools. Only employees who have been trained and those undergoing supervised on-the-job training (OJT) shall be allowed to use food service equipment, machines, and tools.

Employee responsibilities:

Complying with all Company safety policies and procedures
Maintain good personal hygiene, attire, and work habits.
Wear all protective equipment
Ensure the facility is maintained in a clean and sanitized condition.
Identify and dispose of potentially hazardous foods.

Employee responsibilities (continued):

Store foods in sanitary conditions.
Prepare, handle, cook, and serve foods safely and according to Company policy.
Complies with OSHA standards, Company policies and good safe practices when using fixed and portable machinery, tools, equipment and hand held equipment.
Cleans up when finished using portable machinery, tools, equipment and hand held equipment.
Shall know how to use fire extinguishers, and Company evacuation procedures.
Maintains the portable machinery, tools, equipment and hand held equipment and work area in an orderly and safe manner.

Properly trains new users of equipment for which he/she is responsible.
Shares responsibility with the supervisor for maintaining sanitized working conditions and procedures.
Will not use or permit use of defective portable machinery, tools, equipment and hand held equipment in disrepair. Malfunctioning equipment and damaged hand tools will be reported and repair made before using the equipment or tools. If repairs are not possible the equipment or tools will be discarded.

Food Service Hazards

The food service environment is filled with potential dangers to both customers and the food service workers themselves. The five hazards common to any food service environment are:

Food Borne Illness
Pest Problems
Chemical Contaminants
Physical Contaminants
On-the-Job Injuries

Food Borne Illness

Commonly referred to as food poisoning, food borne illness is caused by foods that are harmful to the human body. These harmful organisms invade the food service environment in several ways:

1. **Food** may contain harmful organisms when it is received or may be contaminated during preparation and serving.
2. **People** may spread organisms from their bodies to food by touching, coughing, or sneezing.
3. **Unsanitary facilities and equipment** may spread organisms to people and/or food.
4. **Disease-spreading pests**, such as mice, roaches, or flies may be attracted to overcrowded or dirty food storage areas.

Bacterial growth depends on five factors:

1) **Food-** Bacteria feed on protein and carbohydrates. Any food that contains these ingredients can promote the growth of infectious bacteria and is therefore potentially hazardous. The U.S. Public Health Service classifies the following foods as potentially hazardous:

Any food that consists in whole or in part milk or milk products
Shell eggs
Meats, poultry, fish, shellfish, edible crustacean (shrimp, lobster, crab, etc.), oysters, and other sea food

Baked or boiled potatoes
Tofu or other soy protein foods
Plant foods that have been heat treated
Raw seed, sprouts, or synthetic ingredients

2) **Moisture-** Bacteria need water for growth and development. Because they cannot take in solids, bacteria get their nutrients from water solutions. Most fresh foods contain the ideal amount of water for bacterial growth. Sugar products, cereal products, dried fruits, jams, and jellies have low moisture levels and are resistant to bacteria.

   It is possible to lower the amount of moisture in food through freezing, dehydrating, adding sugar or salt, or cooking. Bacteria cannot grow in foods low in moisture, however they remain alive and can be potentially hazardous when moisture is added in cooking. For example, dry foods such as beans, pasta, and rice become vulnerable to bacteria when cooked.

3) **Time** and 4) **Temperature-** The temperature range between 40 degrees F. and 140 degrees F. is known as the temperature danger zone. Holding food in the "temperature danger zone" is one of the primary causes of food borne illness outbreaks. From thawing to serving, the maximum time a potentially hazardous food should be left in the "temperature danger zone" is 4 hours.

5) **Acidity vs. Alkalinity (pH)-** Bacteria grow best in foods that are neutral or slightly acidic, in the pH range of 4.6 to 7.0. Lowering the pH of foods by adding acidic ingredients (vinegar, fruit juices, etc.) may render them non-potentially hazardous. This is not a foolproof prevention method, however.

Avoid Cross-Contamination- One of the most common causes of food borne illness is cross-contamination: the transfer of bacteria from food to food, hand to food, or equipment to food.

Food to Food: Raw, contaminated ingredients may be added to foods, or fluids from raw foods may drip into foods that receive no further cooking. A common mistake is to leave thawing meat on a top shelf in the refrigerator where it can drip down onto prepared foods stored below.

Hand to Food: Bacteria are found throughout the body- in the hair, on the skin, in clothing, in the mouth, nose, and throat, in the intestinal tract, and on scabs or scars from skin wounds. These bacteria often end up on the hands

where they can easily spread to food. People can also pick up bacteria by touching raw food, then transfer it to cooked or ready-to-eat food.

Equipment to Food: Bacteria may pass from equipment to food that has touched contaminated food is then used to prepare other food without proper cleaning and sanitizing. For example, cross-contamination can occur when surfaces used for cutting raw poultry are then used to cut foods that will be eaten raw, such as fresh vegetables.

Coverings such as plastic wrap and holding and serving containers can also harbor bacteria that can spread to food. A can opener or food slicer can also become a source of cross-contamination if not properly sanitized between use.

Pest Problems

Pests such as roaches, flies, and rodents can become a problem in any environment where food and supplies are stored, prepared, or served. Pests carry disease and bring filth into the food service environment. Keeping facilities clean and in good repair can go a long way toward preventing pest infestation.

By its nature, the food service environment is prone to problems with pests. Pests may be brought in while food and other supplies are delivered, or they may enter the building through gaps in floors or walls. Good sanitation and maintenance is the key to preventing pest infestation.

In the food service environment, the three biggest pests are roaches, flies, and rodents.

Roaches live and breed in holes, damp places, behind boxes, and in seams in bags and folds of paper. They like any place that's dark, warm, moist, and hard to clean. Roaches' hairy legs are full of debris and disease-causing organisms such as bacteria, fungi, parasite eggs, and viruses. One female cockroach produces*millions* of offspring in her lifetime.

Since roaches generally search for food at night, seeing one in the daytime is a sign of major infestation. Other signs of infestation include:

A strong. oily odor.
Feces that look like large grains of pepper.
Brown, dark brown, dark red, or black capsule-shaped egg cases.

Flies can enter a building through holes the size of a pinhead, and can contaminate food with their mouths, footpads, hair, or feces. One female can produce thousands

of offspring in one breeding season. Because flies feed on human and animal wastes and garbage, they can transport a wide range of food borne illnesses.

Flies are attracted to places protected from the wind, and to edges such as garbage can rims. They lay eggs in warm, decaying material protected from sunlight, and are fond of human waste areas. In warm summer weather, flies can mature from larvae to adults in only 6 days.

Rodents carry many disease-causing organisms and parasites. In fact, one fecal dropping can contain *several million* bacteria. When rodents leave excrement, urine, and other filth on food products and around the facility, these organisms can be easily transmitted to people.

Rodents are prolific breeders, producing as many as 50 offspring in a life span of 1 year. They tend to hide during the day, but can be spotted by tell-tale signs. These signs include the following:

Droppings
Gnawing
Tracks on dusty surfaces
Nesting materials
Holes

Preventing Pests will be performed by locking them out, and keeping them locked out by doing the following:

Openings or cracks in walls and floors will be filled with putty, plastic wood, or similar product.
All windows, doors, and openings shall have screens.
Self–closing doors that open outward will be installed on all facilities.
Food supplies will be inspected before storing or using, and the below storage procedures will be followed:
- Food will be kept in labeled containers approved for food storage.
- Food or containers will not be stored directly on the floor.
- Food that is infested will be removed and destroyed.
- The proper temperature in storage areas will be maintained.

The Food Service Safety Manager shall ensure that all storerooms and work areas are cleaned and sanitized. The Food Service Safety Manager shall also ensure that employees do the following:

Clean up spills immediately, and quickly remove crumbs and other food scraps.
Place all garbage in garbage cans that are non-absorbent and easy to sanitize and have tight-fitting lids.
Dispose of garbage properly and promptly.
Dispose of mop and cleaning-bucket water properly.
Keep all supplies clean, dry, and properly stored.

The Food Service Safety Manager shall ensure the facility has the following characteristics:

The floors, walls, and ceilings are free of dirt, litter, and moisture.
The exhaust fans and hoods are clean and operate properly
All types of storage areas- the dry storage room, the refrigerators, and the freezers- are in excellent condition.
NO food or package damage or spoilage and NO bulging or leaking can goods shall be stored in the Company facilities.
Cleaning supplies and chemicals are stored AWAY from food supply areas.
Restrooms are convenient, sanitary, and adequately stocked.
Garbage is kept away from food preparation areas.
Garbage containers are leak-proof, waterproof, pest-proof, durable, and easy to clean and sanitize.

In the event of infestation, the Food Service Safety Manager shall contact a local professional pest control service immediately. Pesticides and poisons are no substitutes for good maintenance.

Chemical Contaminants

Food service establishments use a variety of chemicals for cleaning and sanitizing as well as for pest control. While these chemicals can be instrumental in maintaining a safe and sanitary facility, if handled inappropriately they can also contaminate food and make people sick. Employees who handle hazardous chemicals also risk injury due to personal exposure. Therefore, only properly trained employees shall handle hazardous chemicals, and safety equipment (goggles and gloves) shall be worn.

Hazardous chemicals include:

Sanitizers and Detergents
Pesticides
Whitening agents

Polishes
Caustics
Cleaning and drying agents

Handling and storing chemicals properly are the two key factors in preventing chemical-related illness and injury.

To prevent chemical contamination, employees will:

Store chemicals in original containers away from food. This will prevent accidental misuse as well as leakage into food.
Wash hands thoroughly after working with chemicals.
Wash fresh fruits and vegetables with plain water. Also, scrub thick-skinned produce with a brush to remove any pesticides.
Monitor procedures used by pest control operators to ensure pesticides do not contaminate food.
Limit access to chemicals to authorized personnel.
Make sure labels clearly display chemical hazards.

Metals are another potential source of contamination. Highly acid foods react with metals during cooking or storage. To below precautions will be followed:

DO NOT USE...galvanized containers with acidic foods like lemonade, tomato products, and salad dressing.
USE…metal containers and metallic items only for their intended uses (for example, do not use refrigerator shelves as grills).
AVOID…enamelware, which can chip and expose underlying metal.

Physical Contaminants

Physical contaminants include dirt, hair, nail polish flakes, broken glass and crockery, nails, staples, metal fragments. And bits of packaging materials. They may be present in food when it is received or may fall into food during the handling process. Because physical hazards are easily seen, they are commonly reported by customers.

Proper attire and other simple precautions can prevent most physical contamination

To prevent physical contamination, employees will**:**

Use commercial scoops -not glasses- to scoop ice.
Store toothpicks and non-edible garnishes in places that are below food storage and preparation areas.
Place shields on lights.
Clean can openers regularly.

Remove staples, nails, etc. from boxes when food is received
DO NOT repair equipment temporarily with items that could fall into food. (For example, do not use a hair pin in place of a cotter pin).
DO NOT wear nail polish
DO NOT store food in containers or bags that are not approved for food storage.

On-the-Job Injuries

There are many hazards to personal safety inherent to food service environments. By staying alert to hazards, paying attention to the job, and using safe practices when handling equipment, employees can protect themselves against injury. Lack of attention to these hazards can cause a variety of on-the-job accidents. These accidents include such things as:

Burns
Cuts
Electrical Shock
Strains
Slips and Falls
Fires
Choking
Exposure to Hazardous Chemicals

Burns

There are many ways employees can be burned in a food service environment unless they're very careful. Burns can result from contact with hot surfaces, such as grills, ovens, burners, fryers, and other heating equipment.

Burns can also be caused by escaping steam, or by hot food or drinks that are splattered, splashed, or spilled.

To prevent burns, employees shall:

Use thick, dry pot holders or mitts, and stir food with long handled spoons or paddles.
Turn on hot water faucets cautiously. Wear insulated rubber gloves for rinse water that is 170 degrees F.

Follow instructions for the use of cooking equipment – particularly steam equipment. All steam is to be expelled from steamers before opening the door.
Lift cooking lids and similar equipment away from themselves to avoid burns from steam.
To avoid splattering, kettles will not be filled too full.
Avoid allowing food to boil over.
Ensure food is DRY before placing it in a fryer.
Point pan handles away from traffic, but within reach, to avoid knocking over other pans.
Remove cooked foods immediately from cooking surfaces.
Do not crowd cooking surfaces with hot pans.
Allow oil to cool and use extreme caution when cleaning fryers.
Use caution when removing hot pans from the oven. Wear insulated gloves or mitts, and be certain no one is in the removal path.
Do not wear clothing that may drape onto a hot spot and catch on fire.

Cuts

Just as food service workers need to take precautions to prevent being burned, they also need to be careful not to get cut. And, it's not just knives that can caus trouble. Workers can also hurt themselves – or their co-workers- with sharp edges of equipment and supplies or with broken glass. Nails and staples used in food packaging can also be dangerous.

To prevent cuts, employees shall:

Use appropriate tools (not bare hands) to pick up and dispose of broken glass. Immediately place broken glass into a separate, clearly marked garbage container.
Take care when cutting rolls of kitchen wrap with the serrated cutter.
Be careful with can openers and the edges of open cans. *Never* use a knife to open cans or to pry items loose.
Use a pusher to feed food into a grinder.
Turn off and unplug slicers and grinders when removing food and cleaning.
Use guards on grinders and slicers.
Replace equipment blades as soon as they are cleaned.
Be aware that *left-handed people* need to take extra care when working with slicers and similar equipment. This is because the safety features on this equipment are designed for right-handed people.

Keep knives sharp.
Never leave knives or equipment in the bottom of a sink.
Carry knives by the handle with the tip pointed away from you. *Never try to catch a falling knife.*
Slice, do not hack.
Cut away from yourself on a cutting board.
Store knives and other sharp tools in special places when not in use.
Wash dishes and glasses separately to help prevent them from being crushed by heavier objects and breaking in the dishwasher or sink.
Do not stack glasses or cups inside one another.
Watch for nails, staples, and protruding sharp edges while unpacking boxes and crates.

Electrical Shock

With the variety of electrical equipment used in food service, electrical shock is a common concern.

To prevent electrical shock, employees shall:

Properly ground all electrical equipment.
Replace all worn and frayed electrical cords.
Use electrical equipment only when hands are dry.
Unplug equipment before cleaning and servicing.
Locate electrical switches and breakers to permit rapid shut-down in the event of an emergency.

Strains

Carrying equipment or food items that are too heavy can result in strains to the arms, legs, or back.

To prevent strains, employees shall:

Store heavy items on lower shelves.
Use dollies or carts when moving objects that are too heavy to carry.
To move objects from one area to another, use carts with firm shelves and properly operating wheels or casters.
Don't carry too many objects at one time: instead, use a cart.
Don't try to lift heavy objects by themselves.
Use proper lifting techniques. Bend from the knees and not the back.

Slips and Falls

Anyone who slips and falls on the floor can be badly hurt.

To prevent slips and falls, employees shall:

Clean up wet spots and spills immediately.
Let people know when floors are wet. Use signs that signal caution and prominently display them.
Wear shoes that have non-slip soles.
Do not stack boxes or other objects too high.
Keep items such as boxes, ladders, step stools, and carts out of the paths of traffic.

Fires

More fires occur in food service than in any other type of operation. Fire extinguishers should be available in all areas where fires are likely, especially in the kitchen near grills and deep fryers. Fire extinguishers shall not be kept so close to equipment that they will be inaccessible in the event of a fire.

All employees shall be trained in avoiding fires as well as in the use of fire extinguishers, what to do during a fire, and evacuation procedures.

Choking

Anyone can choke on food. An important part of food service is being alert to customers. All food service employees shall be trained on the use of the Heimlich maneuver.

What to Look For, and What to Do…

If the person can talk, cough, or breathe, do not interfere in any way.
If a person has both hands to the throat and cannot speak or cough, it is likely he or she is choking and needs your help, action must be taken immediately. Use the Heimlich maneuver and call for help immediately.

Exposure to Hazardous Chemicals

Improper exposure to cleaning agents, chemical pesticides, and chemical sanitizers may cause poisoning or injury to the skin. To protect workers from exposure to hazardous materials, special precautions need to be taken.

To prevent improper exposure to hazardous chemicals:

Only properly trained employees shall handle hazardous chemicals.
Employees wear the proper non-porous gloves and eye goggles when working with sanitizing agents and other cleaners.
Employees have safety equipment to use when working with hazardous chemicals.

In case of exposure, employees shall follow the instructions printed in the Material Safety Data Sheet (MSDS) kept on file at the food service facility.

Sanitary Practices

Equipment Sanitation

To keep equipment free of harmful levels of bacteria or other contaminants, it's necessary to clean and sanitize all surfaces that will come into contact with food. This is especially urgent after any possible contamination.

Employees shall:

Remove any visible food and soil from pans, utensils, cookware, and other food-contact surfaces, then properly sanitize them.
Sanitize tables, stoves, sinks, peelers, choppers, mixers, and cooking utensils after each use. This also applies to equipment used to clean other food-contact surfaces.
Rags and sponges shall be properly sanitized between uses to prevent cross-contamination.

Heat and Chemical Sanitizing

Heat or chemicals can be used to reduce the number of bacteria to acceptable levels. This is also true for certain other harmful microorganisms.

Heat sanitizing involves exposing equipment to high heat for an adequate length of time.

This may be done *manually* by immersing equipment into water maintained at a temperature of 170 degrees F. to 195 degrees F. for at least 30 seconds, or in a *dishwashing machine* that washes at 150 degrees F. and rinses at 180 degrees F.

Chemical sanitizing can be accomplished by immersing an object in, or wiping it down with a bleach or sanitizing solution.

For bleach, use ½ ounce or 1 tablespoon of 5% bleach per gallon of water. Chemical sanitizers are regulated by the EPA, and manufacturers must follow strict labeling requirements about what concentration to use, data on minimum effective ness, and warnings of possible health hazards. Because sanitizing agents become less effective as they kill bacteria and are exposed to air, it is important to test the sanitizing solution frequently. Chemical test strips are available for testing the strength of the sanitizing solution.

Sanitizing Portable Equipment

To properly clean and sanitize portable equipment, a sink with three separate compartments (for cleaning, rinsing, and sanitizing) shall be used. There shall also be a separate area for scraping and rinsing of food and debris into a garbage container or disposer before washing, and separate drain boards for clean and soiled items.

To sanitize a piece of portable equipment, employees shall:

Clean and sanitize sinks and work surfaces.
Scrape and rinse food into garbage or disposal. Pre-soak items, such as silverware, as necessary.
In the first sink, immerse the equipment in a clean detergent solution at about 120 degrees F. Use a brush or a cloth to loosen and remove any visible soil.
Rinse in the second sink using clear, clean water between 120 degrees F. and 140 degrees F. to remove all traces of food, debris, and detergent.

Sanitize in the third sink by immersing items in hot water at 170 degrees for 30 seconds, or in a chemical sanitizing solution for 1 minute. Cover all surfaces of the equipment with hot water or sanitizing solution.
If soap suds disappear in the first compartment or remain in the second, if the water temperature cools, or if the water in any compartment becomes dirty and cloudy, empty the compartment and refill it.
Air dry. Wiping can re-contaminate equipment and can remove the sanitizing solution from surfaces before it has finished working.
Make certain all equipment is dry before putting it into storage

Sanitizing In-Place Equipment

Larger and immobile equipment shall also be washed, rinsed, and sanitized.

To sanitize a piece of portable equipment, employees shall:

Unplug electrically powered equipment (such as meat slicers).
Remove fallen food particles and scraps.
Wash, rinse, and sanitize any removable parts using the manual immersion method described in steps 3 through 5 above.

To sanitize a piece of portable equipment, employees shall (continued):

Wash the remaining food-contact surfaces and rinse with clean water.
Wipe down with a chemical sanitizing solution mixed according to the manufacturer's directions.
Wipe down all non-food contact surfaces with a sanitized cloth, and allow all parts to air dry before reassembling. Sanitize cloth before and during sanitizing by rinsing it in the sanitizing solution.
Re-sanitize the external food-contact surfaces of the parts that were handled during reassembling.
Scrub wooden surfaces, such as cutting boards, with a detergent solution and a stiff-bristled nylon brush, then rinse in clear, clean water, and wipe down with a sanitizing solution after every use.

Personal Hygiene

Although we may be unaware of them, bacteria are present on and in our bodies. They're also on our clothing and on common items that we handle regularly, such as money, pens,

and pencils. These bacteria can easily spread to food. The personal hygiene, attire, and general good habits of food service workers play a crucial role in keeping these bacteria away from the food they prepare and serve.

All employees shall:

Bath daily.
Washing hair frequently. Oily, dirty hair can carry and hold huge numbers of bacteria.
Keeping fingernails clean and trimmed. Long or ragged fingernails harbor bacteria and are difficult to keep sanitary. In addition, long or false fingernails can break off and finger polish can chip off into food.
Treating and bandaging wounds and open sores. Cover bandages on the hands with waterproof, disposable, plastic gloves.
Washing hands thoroughly following any activity through which they may come into contact with bacteria.
Washing hands before putting on gloves or changing into a new pair.
Changing gloves frequently and as necessary.

Hand washing is perhaps the most critical aspect of good personal hygiene in food service. Workers should wash their hands with soap and warm water for 20 seconds. When working with food, they should wash gloved hands as often as bare hands.

Appropriate Dress

Every food service worker shall wear an appropriate, clean uniform. The uniform shall be made of a material that can withstand hot water or bleach sanitizing during laundering. In addition, because jewelry is difficult to keep clean and become caught in machinery or on sharp objects, food service employees should wear minimal jewelry, if any. Employees shall not wear dangling necklaces, pins, bracelets, earrings, or large ornate rings.

All employees shall also:

Change uniforms as often as necessary to prevent bacteria on soiled clothing from spreading to the hands and then to food.
Wear gloves whenever handling food or surfaces that make contact with food.
Wash hands before putting on gloves and when changing into a new pair.
Change gloves frequently and as necessary.
Wear a hair net or cap to keep hair and dandruff from falling into food.
Wear comfortable, low-heeled, closed-toe shoes with soles that prevent slipping. These shall not be canvas shoes because canvas may allow hot spills to seep through.
Make sure a doormat or cleaning brush is available, so shoes may be cleaned before entering the kitchen.

Personal Habits

Even when we feel healthy, our bodies can be full of potentially harmful bacteria. *Staphylococci* abound on the hair and skin, in the mouth, throat and nose, and around cuts, pimples, and burns. Bad habits such as scratching the scalp, running fingers through the hair, or touching a pimple or open sore provide easy transport for bacteria onto food.

While working with or near food, **food service employees shall avoid**:

Coughing or sneezing into food or hands.
Scratching the head or fixing hair.
Touching clothes or skin
Wiping the mouth or nose with fingers.
Smoking, chewing gum, or eating in non-designated areas
Nibbling on food in food preparation or service areas.
Failing to wash hands as needed
Washing hands in sinks used to prepare foods.
Tasting food with hands or spoons used for cooking
Touching with bare hands the food-contact surfaces of glassware and tableware.

Never taste any food of animal origin when it's raw or being cooked!

Response to Food Borne Illness

In the event the Company or employees receives reports of food borne illness, the Food Service Safety Manager respond to these reports by doing the following:

1. **Take Charge and Remain Calm.** Don't panic. Keep an "investigative" head. There are a lot of reasons why the individual(s) may not be feeling well other than eating the food prepared for them. Remaining calm will enable you to respond rationally and systematically to the situation, and may help keep everyone from overreacting also.

2. **Talk to your supervisor immediately.** To avoid panic and "sympathy symptoms", ensure no one discusses the problem with anyone except yourself and upper management. Stop rumors and all discussion regarding the situation.

3. **Preserve evidence.** Samples of all potentially hazardous foods served in the facility shall be kept in the refrigerator or freezer for 48 hours. If possible, also save the container, wrapping, and any metal clips used on the original package to help you track down the vendor that supplied the food in question. Wrap samples securely in a heavy plastic bag. Label them with contents and date, mark them "DO NOT USE", and store them where they will not be mistaken for edible food.

4. **Gather Information.** Write down the name, phone number, address of anyone who is experiencing symptoms.

   Find out the date and time he or she ate your food, and what they ate *besides* your food. Also find out if anything tasted bad. Determine what time those affected got sick and what symptoms they are experiencing. Begin tracing the handling of all items on the menu, in case there is indeed a food borne illness:

   What was on the menu? Were there any potentially hazardous foods served such as egg salad, tuna salad, or ham?
   How were the foods handled before and during preparation? Check the temperature charts on the freezer and refrigerator.

   Ask staff how long the foods were in the preparation process. Were they prepared in small batches and then refrigerated quickly? Were all foods kept in the "temperature safety zone" (below 40 degrees or above 140 degrees) during preparation?

5. **Report your results.** Report all the information you have gathered to your supervisor whether it is a good report or not.

   If you have found a particular area that could have caused the illness, your supervisor can be more alert to a potential problem.
   If a problem is identified, you or your supervisor shall report this to the local health department.

6. **Secure treatment immediately.** People with symptoms of food borne illness should seek professional medical care immediately, particularly if symptoms are severe, or if the victim as quite young, pregnant, elderly, or has chronic illness.

   It is important that victims drink liquids to replace fluids lost through any episodes of diarrhea or vomiting. However, be careful not to diagnose, interpret symptoms, or suggest treatments or remedies.

General Shop and Work Area Safety

Policy:

Accepted safety and health precautions will be practiced in the use of general shop machines, fixed and portable power tools, and other hand held equipment so that all employees using such equipment will be protected against personal injury. It is also Company policy to institute practices which will minimize the danger of injury to non-operators or user personnel who may be in the area and to minimize the risk to visitors.

Responsibilities:

Supervisors must recognize those factors in the workplace with accident potential. The supervisor shall provide frequent inspections of job sites, work methods, and materials/equipment used. Any unsafe equipment/material shall be tagged and rendered inoperative or physically removed from its place of operation. The supervisor shall permit only qualified personnel to operate equipment and machinery according to safe work practices.

a. Supervisors

1. Ensuring safe working conditions
2. Providing necessary protective equipment

3.Ensuring that required guards and protective equipment are provided, used, and properly maintained.

4.Ensuring that tools and equipment are properly maintained and used.

5.Planning the workload and assigning employees to jobs which they are qualified to perform. Ensuring that the employees understand the work to be done, the hazards that may be encountered, and the proper procedure for doing the work safely.

6.Taking immediate action to correct any violation of safety rules observed or reported to them.

7.Ensuring workers exposed or potentially exposed to hazardous chemicals/materials have access to appropriate Material Safety Data Sheets (MSDS).

8.Of a shop or any area where fixed or portable powered or unpowered machines and tools are located, is responsible for being familiar with all procedures for safe use and guarding of machines, personal protective equipment required, shielding against possible injury to other employees or visitors. Enforces safe practices.
9.Trains new employees by providing and requiring manuals to be studied, personally instructing and requesting the assistance of veteran employees already familiar with required safety precautions.

10. Posts signs indicating the use of powered machines by "Authorized Personnel Only" and requires the employees under his/her supervision to assist in the enforcement of this policy. No one is allowed to use fixed or portable powered shop machines or welding equipment without sufficient training to the supervisors satisfaction.

11. Designates a person to be responsible for general management of a specific shop area and notifies the Safety and Health Manager of the person selected.

12. Designates a qualified person to be responsible for each major fixed, powered machine or tool, posts the name on or near the apparatus, and notifies the Safety and Health Manager accordingly.

13. Coordinates with the Safety and Health Manager to plan and conduct safety meetings with employees as often as needed and warranted. Topics to be discussed at each session will be selected to fit current operations and any unsafe trends. Leads the discussion and encourages each employee to participate. May assign one employee on a rotating basis to make a short presentation of the topic to get discussion started.

14. Provides appropriate marking of shop floor areas to identify restricted work areas or "approved operator only" yellow floor lines.

15. Makes periodic inspections of shop areas and other industrial areas. Notes all deficiencies and initiates corrective actions.

16. Ensures that all painting operations or other operations are conducted in well ventilated areas. Asks assistance from the Safety and Health Manager in making this determination and to provide necessary protective equipment and respirators, when appropriate.

b. Employees

Employees shall be thoroughly trained in the use of protective equipment, guards, and safeguards for chemicals and safe operation of equipment, machines, and tools they use or operate. Only employees who have been trained and those undergoing supervised on-the-job training (OJT) shall be allowed to use shop equipment, machines, and tools.

Employees responsibilities:

1.Complies with OSHA standards, Company policies and good safe practices when using fixed and portable power tools, equipment and hand held equipment.

2.Cleans up when finished using equipment.

3. Maintains the tools, equipment and work area in an orderly and safe manner.

4. Properly trains new users of equipment for which he/she is responsible.

5. Shares responsibility with the supervisor for identifying and marking shop floor areas.

6. Will not use or permit use of defective equipment or tools in disrepair. Malfunctioning equipment and damaged hand tools will be reported and repair made before using the equipment or tools. If repairs are not possible the equipment or tools will be discarded.

c. Safety and Health Manager

1.Ensures OSHA standards, Company policies and good safe practices are carried out.

2. Assists supervisor and employee in defining hazards and designating safe practices.

3. Conducts routine and periodic inspection of shop areas for compliance to OSHA standards and NIEHS policies.

4.Conducts periodic inspections of employees hand tools and portable power tools.

5.Assists the supervisor in planning and conducting safety meetings.

General Shop and Work Area Safety:

A. Shop Procedures:

a. All portable and fixed powered shop machines and tools will be equipped with approved guarding devices. Guards are to be in place while using the machine. Equipment must also be properly electrically grounded before use.

A. Shop Procedures: (continued)

b. Proper personal protective equipment will be provided (safety glasses, goggles, shields) and used during grinding or other work that may produce flying particles (e.g. drill press, power saws, etc.). Company approved dust respirators will be used for work that produces airborne dust particles. Eye protection is required during electrical or electronic hardware repair, installation and/or open front operation.

c. Approved face, eye and body protection will be used during any burning or welding operation. Also, sufficient shielding that provides protection to others in the immediate area will be used.

d. No flammable materials (paints, solvents, chemicals, etc.) will be stored within the immediate area of any burning or welding operation. Flammable materials must be stored in OSHA and Company approved cabinets.

e. Any employee using portable fixed tools (drill press, jig or band saw, etc.) must not wear loose clothing. Anyone with long hair must tie back the hair or wear acceptable hair protection while operating equipment. All stock must be clamped down (attempting to hold stock with hands will not be permitted).

f. Before any employee performs service or maintenance on a machine or equipment where the unexpected energizing, start up or release of stored energy could occur and cause injury, the machine or equipment shall be made safe. This will be accomplished by locking out and tagging out energy isolating devices, and otherwise disabling the machines or equipment. (see Lockout/Tagout Policy).

g. Clean-up after using powered equipment or hand tools must be done immediately following use of the power tool.

h. Before any work is started in an area posted with a "Radioactive Materials" label, the supervisor or the Safety and Health Manager will be contacted for instructions so that the work may be safely performed.

i. Before any work is started in an area designated as "Restricted" (e.g. high hazard, carcinogens, etc.,) the area must be inspected by the Safety and Health Manager and permission to proceed given to the supervisor.

j. Before any work is started in any laboratory area, a request will be made to the Laboratory Supervisor, principal investigator and/or Safety and Health Manager to ensure that there will be no danger from hazardous materials in the immediate area of work.

A. Shop Procedures: (continued)

k. All burning or welding operations outside the shops area requires a Hot Work permit from the Safety and Health Manager.

l. Good housekeeping will be maintained in the shop area. Material will be stored in such a manner that there is no danger from sliding, falling or presenting a hazard by striking against or cutting. Scrap stock must be cleaned from floor and work benches following each job or at the end of each day.

B. Personal Protective Equipment

Personal protective equipment (PPE) is not a substitute for engineering controls or feasible work or administrative procedures. While these controls are being implemented, or if it has been determined that control methods are not feasible, personal protective equipment is required whenever there are hazards that can do bodily harm through absorption, inhalation, or physical contact. This equipment includes respiratory and hearing protective devices, special clothing, and protective devices for the eyes, face, head, and extremities. All PPE shall be of a safe design and constructed for the work to be performed and shall be maintained in a sanitary and reliable condition.

1. Eye Protection

Eye protection is required when there is a possibility of injury from chemicals or flying particles. Examples of operation requiring the use of eye protection include, but are not limited to:

- Chipping, grinding, and impact drilling.
- Breaking concrete, brick, and plaster.
- Welding or helping in welding of any type.
- Cleaning with compressed air.

•Tinning or soldering lugs or large joints.
•Riveting, grinding, or burning metals.
•Handling chemicals, acids, or caustics.

2. Face shields shall be thoroughly washed with soap and water before being worn by another person.

3.Hearing Protection

Appropriate hearing protection shall be used where employees are in designated hazardous noise areas with operating noise sources, or using tools or equipment which are labeled as hazardous noise producers. The Office of Health and Safety shall be contacted for noise level surveys and guidance on the type of hearing protection required.

4. Hand Protection

a. Rubber protective gloves shall be worn by personnel working in battery shops or where acids, alkalies, organic solvents, and other harmful chemicals are handled.

b. Electrical worker's gloves are designed and shall be used to insulate electrical workers from shock, burns, and other electrical hazards. These gloves shall NOT be the only protection provided and will never be used with voltages higher than the insulation rating of the gloves.

c. Multi-use gloves shall be worn to protect the hands from injuries caused by handling sharp or jagged objects, wood, or similar hazard-producing materials. These gloves are usually made of cloth material with chrome leather palms and fingers or synthetic coating. All-leather gloves are also acceptable.

5. Foot Protection

Non-skid shoes shall be worn where floors may be wet or greasy. Where there is reasonable probability of foot or toe injury from impact and compression forces, safety footwear shall be worn.

6. Respiratory Protection

There are various airborne hazards, e.g., organic vapors, particulates, fumes, etc., that personnel may encounter and respiratory protection may be required. The Safety and Health Manager shall be consulted for guidance on the type of protection required.

7. Head Protection

Hard hats shall be worn by all personnel working below other workers and in areas where sharp projections or other head hazards exist.

8. Body Protection

Natural or synthetic rubber or acid-resisting rubberized cloth aprons shall be worn by personnel handling irritating or corrosive substances. Aprons shall normally be worn with acid sleeves and gloves for greater body protection against skin injuries.

9. Insulated Matting

Insulating matting shall be used by workers for additional resistance to shock where potential shock hazards exist, such as:

- Areas where floor resistance is lowered due to dampness.
- Areas where high voltages (above 600 bolts) may be encountered.
- Areas with electrical repair or test benches.

10.Other

a. Shop supervisors shall ensure that shop personnel use the protective clothing and equipment that will protect them from hazards of the work they perform. It is the responsibility of workers to keep their PPE in a clean, sanitary state of repair and use the equipment when required.

b. Workers shall keep their hands and face clean, change clothes when they are contaminated with solvents, lubricants, or fuels, and keep their hands and soiled objects out of their mouth. No food or drink shall be brought into or consumed in areas exposed to toxic materials, chemicals, or shop contaminants. Workers shall wash their hands before eating or smoking after exposure to any contaminant.

c. Workers shall not wear rings, earrings, bracelets, wristwatches, or necklaces in the vicinity of operating machinery and power tools. Additionally, long full beards, unrestrained long hair, and loose clothing can become caught in tools or machinery and cause serious personal injury. Highly combustible garments or coveralls made of material such as nylon shall not be worn in or around high temperature equipment or operations such as boiler operations, welding, and any other work with open flame devices.

C. Shop Layout

Proper layout, spacing, and arrangement of equipment, machinery, passageways, and aisles are essential to orderly operations and to avoid congestion.

1.Equipment and machinery shall be arranged to permit an even flow of materials. Sufficient space should be provided to handle the material with the least possible interference from or to workers or other work being performed. Machines should be placed so it is not necessary for an operator to stand in a passageway or aisle. Additionally, machine positioning should allow for easy maintenance, cleaning, and

removal of scrap. Clear zones shall be established and should be of sufficient dimensions to accommodate typical work. Marking of machine clear zones may be yellow or yellow and black hash-marked lines, 2 to 3 inches wide. Machines designed for fixed locations shall be securely anchored. If pieces of stock to be worked exceeds workplace/clear zone floor markings, rope/stanchions may be used to temporarily extend the workplace. Machines with shock mounting pads shall be securely anchored and installed according to manufacturer's instructions.

2. Passageways/aisles shall be provided and marked to permit the free movement of employees bringing and removing material from the shop. These passageways are independent of clear zones and storage spaces. They shall be clearly recognizable.

C. Shop Layout (continued)

3. Where powered materials handling equipment (forklift) is used, facility layout shall provide enough clearance in aisles, on loading docks, and through doorways to permit safe turns. Aisles shall be at least 3 feet wider than the widest vehicle used or most common material being transported.

D. Illumination

Adequate illumination shall be provided to ensure safe working conditions.

1.Portable lamps shall have UL approved plugs, handles, sockets, guards, and cords for normal working conditions.

2.For work in boilers, condensers, tanks, turbines, or other grounded locations that are wet or may cause excessive perspiration, a low voltage lighting system should be used, either from a battery system or low-voltage lighting unit. In situations where these lighting systems are not available, a vapor-proof 110 volt lighting system shall be used.

3.Flashlights for use near energized electrical equipment and circuitry shall have insulated cases.

4.At least 50 foot-candles of illumination shall be provided at all work stations. However, fine work may require 100 foot-candles or more. This can be obtained with a combination of general lighting plus supplemental lighting.

E. Exits and Exit Markings

1.Every exit shall have "EXIT" in plain legible letters not less than 6 inches high with the strokes of the letters not less than three-quarters of an inch wide.

2.Doors, passageways, or stairways which are neither exits nor ways to an exit (but may be mistaken for an exit) shall be clearly marked "NOT AN EXIT" or by a sign indicating their actual use, for example: "STORAGE ROOM" or "BASEMENT."

3.When the direction to the nearest exit may not be apparent to an occupant, an exit sign with an arrow indicating direction shall be used.

4.Exit access shall be arranged so it is unnecessary to travel toward any area of high hazard potential in order to reach the nearest exit (unless the path of travel is effectively shielded by suitable partitions or other physical barriers).

E. Exits and Exit Markings (continued)

5.Exit signs shall be clearly visible from all directions of egress and shall not be obstructed at any time. If occupancy is permitted at night, or if normal lighting levels are reduced at times during working hours, exit signs shall be suitably illuminated by a reliable light source.

6.A door from a room to an exit or to a way of exit access will be the side-hinged swinging type. It will swing out in the direction of travel if 50 or more persons occupy the room or the exit is from an area of high hazard potential.

7.Areas around exit doors and passageways shall be free of obstructions. The exit route shall lead to a public way. No lock fastening device shall be used to prevent escape from inside the building.

8.Where occupants may be endangered by the blocking of any single exit due to fire or smoke, there shall be at least two means of exit remote from each other.

9.Exits, exterior steps, and ramps shall be adequately lighted to prevent mishaps. Separate lighting will not be required if street or other permanent lighting gives at least one foot-candle of illumination on the exit, steps, or ramp.

F. Housekeeping

Good housekeeping shall be maintained in all shops, yards, buildings, and mobile equipment. Supervisors are responsible for good housekeeping in or around the work they are supervising. As a minimum, the following requirements shall be adhered to:

1.Material shall not be placed where anyone might stumble over it, where it might fall on someone, or on or against any support unless the support can withstand the additional weight.

2.Aisles and passageways shall be kept clear of tripping hazards.

3.Nails shall be removed from loose lumber or the points turned down.

4.Ice shall be removed from all walkways and work areas where it may create a hazard or interfere with work to be done. If ice cannot be removed readily, sand or other approved materials shall be applied.

F. Housekeeping (continued)

5.Trash and other waste materials shall be kept in approved receptacles. Trash shall not be allowed to accumulate and shall be removed and disposed of as soon as practicable, at least once per shift (or more often if needed).

6.Disconnect switches, distribution panels, or alarm supply boxes shall not be blocked by any obstruction which may prevent ready access.

7.Machinery and equipment shall be kept clean of excess grease and oil and (operating conditions permitting) free of excessive dust. Pressure gauges and visual displays shall be kept clean, visible, and serviceable at all times. Drip pans and wheeled or stationary containers shall be cleaned and emptied at the end of each shift.

G. Fire Prevention

All shop services personnel shall receive fire prevention training as part of their general training.

1.Supervisors in charge of operations where fuels, solvents, or other flammable liquids are used shall be constantly alert for hazards and unsafe acts. Fuels such as gasoline shall never be used to clean floors or clothing, and open solvent or gasoline containers shall not be kept near electrical equipment. The use of low flashpoint petroleum solvents shall be avoided whenever possible. Open flames, open element heaters, equipment not properly grounded, and nonexplosion-proof electrical equipment used in the presence of flammable or combustible liquids shall be avoided.

2.Fire extinguishers of at least 20 BC or greater rating shall be installed in shop areas. The number of extinguishers depends upon the size and layout of the facility. Fire extinguishers shall meet the following OSHA requirements:

a. Be kept fully charged and in their designated area.
b. Be located along normal paths of travel.
c. Not be obstructed or obscured from view.
d. Be visually inspected at least monthly to ensure that they:

1.Are in their designated places.

2.Have not been tampered with or actuated.

3.Do not have corrosion or other impairments.

4.Are accessible and not obstructed.

2. Fire extinguishers shall meet the following OSHA requirements: (continued)

d. Be visually inspected at least monthly to ensure that they:

5.Be examined at least yearly and/or recharged or repaired to ensure operability and safety.

6.Be hydrostatically tested.

7.Be placed so the maximum travel distance, unless there are xtremely hazardous conditions, does not exceed 75 feet for Class A or 50 feet for Class B locations.

3.Supervisors shall ensure that employees remove construction debris and rubbish from the job site upon completion of the job, or daily if extended beyond one day. Hazardous materials shall not be left at job sites unless properly stored. Work being performed on job sites shall not endanger building occupants (e.g., exits blocked, fire alarm devices disconnected, etc.).

H. Material Storage

All unnecessary accumulation of materials and supplies in the shop area shall be avoided. The presence of unnecessary material in the shop could cause such incidents as tripping, falling, or slipping. This could be especially hazardous around equipment that is in operation. The only material in the shop area shall be that actually in work. The only place that materials should accumulate in quantity are in storerooms and material holding areas.

1.The storage of materials shall not, of itself, create a hazard. Materials stored in tiers shall be stacked, strapped, blocked or interlocked, and limited in height so they are stable and secure against sliding or collapse. Storage racks shall have sufficient capacity to bear the loads imposed on them.

2.Stored materials shall not obstruct fire extinguishers, alarm boxes, sprinkler system controls, electrical switch boxes, machine operations, emergency lighting, first aid or emergency equipment, or exits.

3.Heavy materials and equipment should be stored low and close to the ground or floor to reduce the possibility of injury during handling.

4.All passageways and storerooms shall be maintained clean, unobstructed, dry, and in sanitary condition. Spills will be promptly removed.

5.Where mechanical handling equipment, such as lift trucks are used, safety clearance shall be provided for aisles at loading docks, through doorways, and wherever turns or passages must be made. No obstructions that could create a hazard are permitted in aisles.

I. Use of Tools

1. Handtools

a. Incidents at the job site involving hand tools are usually the result of misuse. Hand tools are precision tools capable of performing many jobs when used properly. Prevention of incidents involving hand tools on the job site becomes a matter of good instruction, adequate training, and proper use.

b. Hand tool safety requires that the tools be of good quality and adequate for the job. All tools shall be kept in good repair and maintained by qualified personnel.

c. Racks, shelves, or tool boxes shall be provided for storing tools which are not in use.

d. When personnel use hand tools while they are working on ladders, scaffolds, platforms, or work stands, they shall use carrying bags for tools which are not in use. Workers shall not drop tools.

2. Supervisors shall frequently inspect all hand tools used in the operation under their supervision. Defective tools shall be immediately removed from service. Some common tool defects are:

a. Handles

When handles of hammers, axes, picks, or sledges become cracked, split, broken, or splintered, they shall be immediately replaced. Tool handles shall be well-fitted and securely fastened by wedges or other acceptable means.

Wedges, always used in pairs, shall be driven into the handle when repairing a sledgehammer or maul, to prevent the head from accidentally flying off if the handle shrinks.

b. Tangs

Files, wood chisels, and other tools with tangs shall be fitted and used with suitable handles covering the end of the tang. Ends of the handles shall not be used for pounding or tapping.

c. Mushroom Heads

Cold chisels, punches, hammers, drift pins, and other similar tools have a tendency to mushroom from repeated poundings. They shall be dressed down as soon as they begin to crack and curl.

1.When dressing tools, a slight bevel of about three-sixteenths of an inch shall be grounded around the head. This will help prevent the heads from mushrooming.

2.When tool heads mushroom, the material is highly crystallized and, with each blow of the hammer, fragments are likely to break off.

3. Portable Power Tools

Portable power tools increase mobility and convenience but are frequently more hazardous to use than their stationary counterparts. Personnel who are required to use portable power tools in their work shall be thoroughly trained in safe operating practices. Safe operating procedure shall be set up for each type of tool consistent with the manufacturer's instructions.

J. Use of Compressed Air Sources

1.Compressed air has the appearance of a relatively harmless gas. However, to avoid accidents, compressed air must be used correctly. The improper or inadvertent connection of items not designed for shop air pressure, i.e., equipment, storage vessels, or containers, to a shop air supply may cause serious personal injury and more than likely will damage the item being connected.

2.The maximum air pressure approved for general use in the shops and laboratories is 30 psi (pounds per square inch). This pressure is sufficient for most shop and laboratory operations and is not significantly hazardous. Use discretion and good judgement when using compressed air, even at this low pressure.

3.The following rules and practices are suggested to avoid personal injury, equipment damage, and potential environmental impact:

a. All personnel assigned to shops with air compressors shall be familiar with compressor operating and maintenance instructions.

b. Compressed air is not to be used to blow dirt, chips, or dust from clothing.
c. Air compressors shall be maintained strictly in accordance with the manufacturer's instructions.
d. Do not use compressed air to transfer materials from containers when there is a possibility of exceeding the safe maximum allowable working pressure of the container.
e. The maximum working pressure of compressed air lines shall be identified in psi. Pipeline outlets shall be tagged or marked showing maximum working pressure immediately adjacent to the outlet.
f. Do not use compressed air to transfer materials from standard 55-gallon drums. Use a siphon with a bulk aspirator on a pump.

WARNING

It is dangerous to pressurize any container not designed for that purpose.

g. Never use compressed air where particles can be accelerated by the air stream.
h. Do not use compressed air to clean machinery or parts unless absolutely necessary. Where possible, use a brush. If necessary, use a minimum pressure and provide barriers or clean the area of personnel. Wear goggles to protect your eyes.
i. Never apply compressed air to any part of a person's body.
j. Do not use a compressed air line that does not have a pressure regulator for reducing the line pressure.
k. Keep the hose length between tool housing and the air source as short as possible.
l. Where possible, attach a short length of light chain between the hose and the housing on air-operated tools. This keeps the hose from whipping should the hose-tool coupling separate.
m. Inspect air supply and tool hoses before using. Discard and label unfit hoses. Repair hoses where applicable.
n. Turn valve off and vent pressure from a line before connecting or disconnecting it. Never work on a pressurized line.
o. Do not connect air supply respirators or supplied-air suits to the compressed air supply system of any building. Such compressed air is unsafe to breathe.
p. Do not attach pneumatic tools, process, or control instruments to breathing air lines. The potential contamination to personnel and systems is hazardous.

K. Rooftop Work

If the rooftop to be worked on is not provided with an adequate guardrail, the following procedures shall apply:

•No employee shall come within 10 feet of the roof's edge without wearing a lifebelt or harness securely attached to a securely anchored rope or line, with the entire system being capable of supporting a minimum dead weight of 5,400 pounds.
•No employee shall work on the rooftop if the windspeed exceeds 20 miles per hour.

L. Shoring and Trenching

The walls and faces of excavations and trenches over 5 feet, where workers may be exposed to danger, shall be guarded by a shoring system, sloping of the ground, or some other equivalent means. Trenches less than 5 feet deep with hazardous soil conditions also shall be effectively protected.

The following guidelines are provided:

1. Appropriate trench boxes and/or shields may be used in lieu of shoring or sloping.

2. Tools, equipment, an excavated material shall be kept 2 feet or more from the lip of the trench. Where employees are required to be in or work in trenches 4 feet deep or more, an adequate means of exit such as ladders or steps shall be provided within 25 feet of travel and used.

3. Daily inspections shall be made of trenches and excavations by the supervisor in charge to ensure adequate slopes, shoring and bracing, and that there is no evidence of possible slides or cave-ins. More frequent inspections may be necessary as work progresses or after inclement weather conditions, such as rain, or where loose compacted or unstable materials are present.

4. Workers shall take extra care when hand excavating in close proximity to utilities to preclude interruption of services an personnel injury and/or equipment damage which can result from breaking electrical, gas, and steam lines.

M. Barricades

Whenever a common area is disturbed by maintenance, repair, or construction operations and presents a hazard to personnel working in or near, or traveling through the area, care shall be taken to warn these personnel and other engineering services personnel of the potential hazard. Appropriate barriers shall be erected around excavations, open manholes, open electrical panels, etc., whenever they are to be left unattended.

Hearing Conservation Program

Introduction:

Evidence is well established that worker exposure to noise of sufficient intensity and duration can result in hearing damage. Noise-induced hearing loss rarely results from just one exposure; it can progress unnoticed over a period of years. Initial noise-induced hearing loss occurs at the higher frequencies where the consonant portion of speech is found, making communications difficult.

Engineering controls such as mufflers on heavy equipment exhausts or on air release valves are required where possible. If engineering solutions cannot reduce the noise, administrative controls such as increasing the distance between the noise source and the worker or rotation of jobs between workers in the high noise area should be used if possible.

Noise exposure is often not constant and is difficult to control with either engineering or administrative solutions. Hearing protection is often the only choice available.

Employees will be given the opportunity to select hearing protective devices from a variety of suitable ones provided by the Safety and Health Manager. In all cases the chosen hearing protectors shall have a Noise Reduction Ratio (NRR) high enough to reduce the noise at the ear drum to 85 dB(A) or lower.

Audiometric testing will be provided by the Company's physician to all employees with exposure to noise levels of 80 dB(A) or greater.

Area noise monitoring will be conducted by the Safety and Health Manager using a sound level meter to determine the need for personnel monitoring or engineering controls. If any work areas register levels of 80 dB(A) or greater, personnel monitoring will be conducted. Personnel monitoring is accomplished by using noise dosimeters which are worn by employees for their full work shift. The cumulative noise dose for the employee is then read at the end of their work shift.

Policy:

It is the policy of the Company to provide employees with a safe and healthful working environment. This is accomplished by utilizing facilities and equipment that have all feasible safeguards incorporated into their design. When effective engineering controls are not feasible, or when they are being initiated, administrative controls will be used when and where possible followed by the use of personal protective equipment.

The primary goal of the Company's Hearing Conservation Program is to reduce, and eventually eliminate hearing loss due to workplace noise exposures. The program includes the following elements:

a. Work environments will be surveyed to identify potentially hazardous noise levels and personnel at risk.
b. Environments that contain or equipment that produces potentially hazardous noise should, wherever it is technologically and economically feasible, be modified to reduce the noise level to acceptable levels.
c. Where engineering controls are not feasible, administrative controls and/or the use of hearing protective devices will be employed.
d. Periodic hearing testing will be conducted to monitor the effectiveness of the hearing conservation program. Early detection of temporary threshold shifts will allow further protective action to be taken before permanent hearing loss occurs.
e. Education is vital to the overall success of a hearing conservation program. An understanding by employees of the permanent nature of noise-induced hearing loss, the Company hearing conservation program, and the employee's responsibilities under the program are all essential for program effectiveness.

Responsibilities:

Safety and Health Manager-

The Safety and Health Manager is responsible for developing, implementing, and administering the Company Hearing Conservation Program. Additional responsibilities include:

1. Identification of work areas and equipment within Company facilities where noise levels equal or exceed 80 dBA.
2. Identification, through personnel monitoring, of Company employees whose noise exposure level equals or exceeds an 8-hour TWA (Time-Weighted Average) of 80 dBA. Notification of employee exposure measurements is sent to the Safety and Health Manager to be included in employees' medical files.
3. Annual remonitoring of identified at-risk employees.
4. Resurvey of work areas and equipment where noise levels exceed 80 dBA every 2 years.
5. Training of employees in the need for, proper use and care of hearing protection devices.
6. Identification of noise control measures (including engineering and administrative controls) and recommendations.

The Safety and Health Manager is also responsible for coordinating and scheduling health and safety training courses and seminars. The Safety and Health Manager also maintains documentation of the training courses presented in accordance with the Safety Program requirements.

Supervisors-

It is the responsibility of Supervisors to ensure that all of their employees exposed to noise levels equal to or greater than 80 dBA have access to appropriate hearing protective devices in the work area. Supervisors are also responsible for enforcing the use of hearing protective devices and engineering and administrative controls in designated noise hazardous areas.

Employees-

Employees are responsible for wearing and maintaining hearing protective devices as instructed. Employees exposed to excessive levels of noise must also participate in annual training programs and the medical surveillance program which includes audiometric testing.

NOISE EVALUATION AND SURVEILLANCE PROCEDURES

Identification of Hazardous Noise Areas-

The Safety and Health Manager will identify work areas within Company facilities where noise levels equal or exceed 80 dBA. Records shall be maintained by the Safety and Health Manager and updated at least every two years to determine if any alteration in noise levels has occurred. Those areas where the noise levels are below 80 dBA will not be routinely monitored. Identification of hazardous noise areas and equipment and any subsequent noise monitoring will be conducted by the Safety and Health Manager.

Signs will be posted at the entrance to any work area where noise levels exceed 80 dBA, requiring anyone entering the area to wear proper hearing protection. Personnel who work in these areas shall have hearing protection supplied to them, shall be instructed in its proper use, and be required to wear this equipment when in these identified areas. It is the responsibility of the area supervisor to ensure that these precautions are maintained.

Equipment which produces noise levels greater than 80 dBA, or 120 dB peak sound pressure levels shall also be appropriately labeled.

Noise Measurements and Exposure Assessments

In order to effectively control noise it is necessary that the noise be accurately measured according to standard procedures and that the measurements be properly evaluated against accepted criteria. All noise monitoring will be conducted in accordance with established standard operating procedures.

The monitoring of employees for noise exposure is made up of two parts, area and personal monitoring. Area measurements are generally obtained first. If noise levels are at or above 80 dBA, personal monitoring using dosimeters is then performed. Sample data sheets will be used to record monitoring data for both area and personal noise monitoring results.

Area Measurements

In an area survey, measurements of environmental noise levels are recorded using a sound level meter to identify work areas where employees' exposures may be above hazardous levels, and where more thorough exposure monitoring may be needed. Area monitoring is conducted using a calibrated sound level meter set to the A scale, slow response. Within the area of interest, several different locations will be measured. Typical measurement locations would include:

- In the hearing zone at the employee's normal work location.
- Next to the noise source(s).
- At the entrance(s) to the work area.
- At other locations within the area where the employee might spend time working.

A rough sketch of the area will be included with the results showing the locations where the noise readings were obtained.

If the noise levels are below 80 dBA on a time-weighted average basis in the area, no further routine monitoring will be required for that area. Should any of the noise measurements equal or exceed 80 dBA, records shall be maintained as to the noise levels recorded, where they were taken, and the source(s) of the noise. These records shall be updated at least once every two years to determine if any changes have occurred that would warrant remonitoring of exposed personnel. If any of the measurements equal or exceed a noise level of 80 dBA, employees who work in or near the high noise area or equipment shall have their noise exposure determined through personnel monitoring using dosimeters.

Personnel Monitoring

Determination of the noise exposure level will be accomplished using calibrated noise dosimeters. Each employee to be monitored will have a dosimeter placed on him/her at the beginning of his/her normal work shift with the microphone placed in the "hearing zone". The dosimeter will be worn for the full duration of the work shift while the employee performs his/her normal work routine. At the end of the work shift, the dosimeter will be removed and information printed out as soon as possible. Background information will be collected from each employee detailing job description, unusual job activities, etc., for the time period sampled. Those

employees whose noise exposure equals or exceeds 80 dBA on an 8-hour TWA (Time-Weighted Average) will be referred to the Safety and Health Manager for inclusion in the Hearing Conservation Medical Surveillance Program.

Remonitoring of Hazardous Noise Areas

All areas where noise levels equal or exceed 80 dBA shall be remonitored at least every two years. Employees who work for extended periods of time (>2 hours) in the high noise areas and where their 8-hour TWA (Time-Weighted Average) equals or exceeds 80 dBA will be monitored every year to determine their personal noise exposure.

Whenever an employee exhibits a standard threshold shift, as determined by the Safety and Health Manager, the employee's work place shall be remonitored to identify and ameliorate the cause.

Remonitoring Due to Changes

Any area with noise levels that equal or exceed 80 dBA shall also be remonitored whenever a change in production process, equipment, or controls increase the noise exposure such that additional employees are exposed to noise levels at or above 80 dBA on a time-weighted average basis. Areas where the noise levels have dropped below 80 dBA due to alterations in equipment, controls or process changes shall be eliminated from the monitoring program.

NOISE CONTROL METHODS

Engineering and Administrative Controls

The primary means of reducing or eliminating personnel exposure to hazardous noise is through the application of engineering controls. Engineering controls are defined as any modification or replacement of equipment, or related physical change at the noise source or along the transmission path that reduces the noise level at the employee's ear. Engineering controls such as mufflers on heavy equipment exhausts or on air release valves are required where possible.

Engineering and Administrative Controls (continued)

Administrative controls are defined as changes in the work schedule or operations which reduce noise exposure. If engineering solutions cannot reduce the noise, administrative controls such as increasing the distance between the noise source and the worker or rotation of jobs between workers in the high noise area should be used if possible.

The use of engineering and administrative controls should reduce noise exposure to the point where the hazard to hearing is eliminated or at least more manageable.

Personal Protective Equipment

Hearing protective devices (ear plugs, muffs, etc.) shall be the permanent solution only when engineering or administrative controls are considered to be infeasible or cost prohibitive. Hearing protective devices are defined as any device that can be worn to reduce the level of sound entering the ear. Hearing protective devices shall be worn by all personnel when they must enter or work in an area where the operations generate noise levels of:

- Greater than 80 dBA sound levels, or
- 120 dB peak sound pressure level or greater

Types of Hearing Protective Devices Hearing protective devices include the following:

a. Insert Type Earplugs

A device designed to provide an air-tight seal with the ear canal. There are three types of insert earplugs – premolded, formable, and custom earplugs.

1. Premolded Earplugs

Premolded earplugs are pliable devices of fixed proportions. Two standard styles, single flange and triple flange, come in various sizes, and will fit most people. Personnel responsible for fitting and dispensing earplugs will train users on proper insertion, wear, and care. While premolded earplugs are reusable, they may deteriorate and should be replaced periodically.

2. Formable

Formable earplugs come in just one size. Some are made of material which, after being compressed and inserted, expands to form a seal in the ear canal. When properly inserted, they provide noise attenuation values that are similar to those from correctly fitted premolded earplugs. Individual units may procure approved formable earplugs. Supervisors must instruct users in the proper use of these earplugs as part of the annual education program.

2. Formable Earplugs (continued)

Each earplug must be held in place while it expands enough to remain firmly seated. A set of earplugs with a cord attached is available. These earplugs may be washed and therefore are reusable, but will have to be replaced after two or three weeks or when they no longer form an airtight seal when properly inserted.

3.Custom Molded Earplugs

A small percentage of the population cannot be fitted with standard premolded or formable earplugs. Custom earplugs can be made to fit the exact size and shape of the individual's ear canal. Individuals needing custom earplugs will be referred to an audiologist.

b. Earmuffs

Earmuffs are devices worn around the ear to reduce the level of noise that reaches the ear. Their effectiveness depends on an air tight seal between the cushion and the head.

Selection of Hearing Protective Devices

Employees will be given the opportunity to select hearing protective devices from a variety of suitable ones provided by the Office of Health and Safety. In all cases the chosen hearing protectors shall have a Noise Reduction Ratio (NRR) high enough to reduce the noise at the ear drum to 80 dBA or lower.

Issuance of Hearing Protective Devices

The issuance of hearing protective devices is handled through the Safety and Health Manager. The Safety and Health Manager will issue and fit the initial hearing protective devices (foam inserts, disposables). Instruction on the proper use and care of earplugs and earmuffs will be provided whenever HPDs (hearing protective devices) are dispensed. Personnel requiring earmuffs in addition to earplugs will be informed of this requirement and educated on the importance of using proper hearing protection. The Safety and Health Manager will dispense ear muffs when necessary and will maintain a supply of disposable earplugs.

Use of Hearing Protective Devices

a. Always use and maintain HPDs as originally intended and in accordance with instructions provided.
b. Earmuff performance may be degraded by anything that compromises the cushion-to-circumaural flesh seal. This includes other pieces of personal protective equipment such as eyewear, masks, faceshields, and helmets.

Maintenance of Hearing Protective Devices

a. Reusable earplugs, such as the triple flange or formable devices should be washed in lukewarm water using hand soap, rinsed in clean water, and dried thoroughly before use. Wet or damp earplugs should not be placed in their containers. Cleaning should be done as needed.
b. Earmuff cushions should be kept clean. The plastic or foam cushions may be cleaned in the same way as earplugs, but the inside of the muff should not get wet. When not n use, ear muffs should be placed in open air to allow moisture that may have been absorbed into the cups to evaporate.

Hearing Protection Performance Information

The maximum of sound attenuation one gets when wearing hearing protection devices is limited by human body and bone conduction mechanisms. Even though a particular device may provide outstanding values of noise attenuation the actual noise reductions may be less because of the noise surrounding the head and body

bypasses the hearing protector and is transmitted through tissue and bone pathways to the inner ear.

The term “double hearing protection” is misleading. The attenuation provided from any combination earplug and earmuff is not equal to the sum of their individual attenuation values.

MEDICAL SURVEILLANCE

Notification

Upon identification of employees whose 8-hour TWA (Time-Weighted Average) equals or exceeds 80 dBA, the Safety and Health Manager will recommend to the employee’s Supervisor, in writing, of the need to enroll certain employee(s) in the Hearing Conservation Medical Surveillance Program. Information supplied to the Safety and Health Manager will include the employee(s) name, supervisor’s name, telephone number, and the noise levels recorded in the employee’s work area, including dosimetry data. It will be the responsibility of the Supervisor to enroll his/her employee in the Hearing Conservation Medical Surveillance Program.

In work locations where either through administrative or engineering controls, noise levels are found to have fallen such that the employee’s 8-hour TWA is below 80 dBA, the Safety and Health Manager shall notify the employee’s Supervisor, by memo, that the employees working in that area are no longer required to be enrolled in the Hearing Conservation Program. The final decision as to an employee’s enrollment status will be left with the Company Physician.

The results of area and personal remonitoring shall be forwarded to the Clinic upon completion of the noise surveys.

Any personnel experiencing difficulty in wearing assigned hearing protection (i.e., irritation of the canals, pain) will be advised to immediately report this to their supervisor and make arrangements to go to the Company Physician for evaluation as soon as possible.

Audiometric Testing

The Company Physician has the responsibility for administering the Audiometric Testing Program portion of the Company Hearing Conservation Program. The object of the audiometric testing program is to identify workers who are beginning to lose their hearing and to intervene before the hearing loss becomes worse. Audiometric testing will be provided to all employees with exposure to noise levels of 80 dBA or greater. Annual retesting will be performed for all personnel enrolled in the Hearing Conservation Medical Surveillance Program.

TRAINING

The training and education program will provide information about the adverse effects of noise and how to prevent noise-induced hearing loss. At a minimum, all training will cover the following topics:

a. Noise-induced hearing loss;
b. Recognizing hazardous noise;
c. Symptoms of overexposure to hazardous noise;
d. Hearing protection devices – advantages and limitations.
e. Selection, fitting, use, and maintenance of HPDs.
f. Explanation of noise measurement procedures.
g. Hearing conservation program requirements.

Employees will also be provided with copies of the OSHA noise standard (29 CFR 1910.95) and other handouts describing the Company Hearing Conservation Program.

Company employees shall be encouraged to use hearing protective devices when they are exposed to hazardous noise during activities at home; e.g., from lawn mowers, chain saws, etc.

All personnel identified for inclusion in the hearing conservation program should receive a minimum of one hour of initial instruction in the requirements of the program. Ideally this will be done when hearing protection is dispensed.
Appropriate refresher training annually thereafter and will be provided by the immediate supervisor. Supervisors will be provided annual training by the Office of Health and Safety.

Supervisors must contact the OHS Training Activity (x2146) to schedule training for new personnel assigned to work in noisy environments and for retraining of current personnel.

PROGRAM EVALUATION

Periodic program evaluations will be conducted to assess compliance with federal and state regulations and Company Program requirements. Both the monitoring and audiometric testing portions of the Company Hearing Conservation Program will be reviewed annually to assure its quality and effectiveness.

An evaluation of the Program, including wearer acceptance, appraisal of protection afforded, and field audits of hearing protection use and record keeping will be conducted at least annually. Items to be considered include:

a. Standard operating procedures
b. Training records and course content for supervisors and employees.

c. Maintenance of HPDs (hearing protection devices)
d. Field audits of HPD use
e. Review of recorded threshold shifts on OSHA log.

The findings of the Company Hearing Conservation Program evaluation will be documented, and this documentation will list plans to correct faults in the program and set target dates for the implementation of the plans.

RECORDKEEPING

All non-medical records (ex., work area and equipment surveys) will be maintained for a period of five years. Results of hearing tests and medical evaluations performed for hearing conservation purposes as well as noise exposure documentation shall be recorded and shall be a permanent part of an employee's health record.

All personnel who routinely work in designated hazardous noise areas shall be identified and a current roster of such personnel shall be maintained and by the Safety and Health Manager, and updated periodically.

NOISE

Supervisors and exposed workers must become aware of and understand about the adverse effects of noise and how to prevent noise-induced hearing loss. People exposed to hazardous noise must take positive action, if progressive permanent hearing loss is to be prevented. Each exposed worker and supervisor should know the following.

A. Noise exposure may result in permanent damage to the auditory system and there is no medical or surgical treatment for this type of hearing loss. Though the use of a hearing aid may provide some benefit, normal hearing will not be restored. Many people don't realize loud sounds can cause hearing loss. Furthermore, in its initial stages, the person may not notice a problem since noise-induced hearing loss is invisible, painless, and occurs in the high frequencies. It is dangerous to ignore the temporary characteristics of noise-induced hearing loss (such as ringing or buzzing in the ears, excessive fatigue, etc.).

B. Each person should know how to recognize hazardous noise even if a noise survey has not been conducted an/or warning signs posted. Recognizing and understanding the adverse effects of off-duty noise exposures is also important. The best rule to follow is: "If you have to shout at arms length (approximately three feet) to talk face-to-face, you are probably being exposed to hazardous levels of noise."

C. Preventing noise-induced hearing loss is accomplished by reducing both the time and intensity of exposure. Reducing exposure time is accomplished by avoiding any unnecessary exposure to loud sound. Reducing intensity is usually accomplished by wearing personal hearing protection. Each person must be able to properly wear and care for the particular type of hearing protection selected. Speech communication is difficult in high intensity noise. However, most people don't realize it's easier to understand speech if hearing protection is worn in a hazardous noise environment. Hearing protection reduces the noise and the level of speech, resulting in a more favorable listening level. Hearing protection reduces the intensity of frequencies above the speech range; thus, reducing the noise and accentuating speech. People who claim wearing hearing protection makes it difficult to hear speech are probably in noise levels less than 85 dBA or have already developed a hearing loss.

D. Each person must know how to tell if they have been overexposed to loud sound. Overexposure may occur even while wearing hearing protection. Earplugs and/or earmuffs alone may not be enough protection. Each time a temporary threshold shift (TSS) occurs, a certain degree of permanent loss results. The recognizable symptoms of overexposure are described as "dullness in hearing or ringing in the ears."

Heating Systems and Boiler Plant Maintenance

Policy:

Written operating procedures and detailed checklists for operator guidance shall be posted in all equipment rooms. It is important that all functions be included, whether manual or automatic. The basic objectives or safe boiler operations are:

1.Require the minimum number of manual operations.

2.Standardize routine operation procedures for normal start-up and on-line operation. Ensure the use of interlocks to minimize improper operating sequences and to stop sequences when conditions are not proper for continuation. Establish and rigidly enforce purge procedures with necessary interlocks.

Procedures:

Boiler Operations and Safety

Water Level-

Water in boilers shall be checked and kept at proper levels. Water columns shall be monitored to ensure connections are clear and water returns to the

proper level in the gauge glass when drain valves are closed. When water is not visible in the gauge glass, all stresses on the boiler shall be gradually reduced.

In boilers fired by fuels burned in suspension (fuel oil, gas, or pulverized coal), stop the fire immediately, shut off all air flow, close steam outlet valve, and shut off feed water supply. Proceed as in a normal shutdown. Inspect the boiler thoroughly, including a hydrostatic test, before returning it to service.

Lighting Gas and Oil Fired Furnaces-

Before lighting gas and oil fired furnaces, boilers and breeching shall be ventilated to remove explosive vapors. Burners shall not be lighted if there is oil on the floors or combustion chamber, around the burners, or in front of the boilers. If the flame of a gas or oil-fired burner goes out, the fuel shall be immediately cut off and the furnace passages ventilated before it is re-lit.

Boiler Operations and Safety (continued)

Cleaning and Maintenance Procedures

Whenever a boiler is taken out of service for a prolonged period, it should be cleaned promptly and inspected for defects by an authorized boiler inspector. For boilers in continuous service, planned and scheduled boiler shut-downs for preventive maintenance if far safer than risking an extensive shutdown caused by boiler failure. At least once a year, the boiler, the flame safeguard supervisory system, and other safety controls shall be inspected during a scheduled shutdown by an authorized boiler inspector who is accompanied by the area supervisor. Defective parts shall be repaired or replaced. For inspection, boilers shall be cool, handholes and manholes open, and the boiler shall have been ventilated. Adequate lighting and protective equipment for work in the boiler should be provided.

Proper and convenient drain connections shall be provided for draining boilers. Unobstructed floor drains, properly located in the boiler room, facilitate proper cleaning. Infrequently used drains should have water poured into the traps, as required based on local conditions, to prevent the entrance of sewer gases and odors into the boiler room. If there is a possibility of freezing, an antifreeze mixture should be used in the drain traps.

When cleaning a boiler, employees shall wear protective clothing, hats, goggles, heavy leather-palm gloves, safety shoes, and approved respirator and hearing protectors if conditions warrant.

Steam Piping and Valve Maintenance-

All 4-inch and larger steam valves or main steam valves to any building shall be operated only by qualified heat systems personnel.

High pressure steam valves located in confined areas shall not be turned off until the valve controlling the steam is turned off at the main steam plant. After the valve in the confined area has been closed, the valve in the steam plant may be reopened to distribute steam to other areas.

When a valve in any confined area is to be opened, the operator shall close the main valve at the steam plant before opening the steam valve in the confined area. The operator shall ensure that all pressure has been bled off prior to opening the steam valve in the confined area. The operator shall open the steam valve in the confined area and move away from the confined area before the main valve at the steam plant may be reopened.

Steam Piping and Valve Maintenance- (continued)

Routine operations, maintenance, and repair in steam pits and other confined areas may be accomplished on electric circuits, controls, motors, pumps, receivers, condensate lines, and vent fans while steam pressure is in the steam line, providing conditions and temperatures are acceptable. However, no operational changes, repair, or maintenance shall be accomplished on steam lines while there is steam pressure on the lines.

Operating personnel shall open drain valves and remove water from the steam line prior to opening a high pressure steam valve. Operating personnel shall familiarize themselves with the location of these drain valves to ensure that the water accumulations are drained from the distribution lines.

When bypass lines and valves are installed around a high pressure steam valve, the bypass valve shall be opened first. When the steam line becomes heated or the steam pressure equalized on both sides of main steam valve, the main steam valve may then be opened.

All high pressure steam valves shall be opened very slowly and everyone shall remain at a safe distance while valve positions are being changed.

When dismantling a valve for maintenance, the worker shall ensure pressure has been relieved through all possible means. The valve body shall be checked for a removable plug to relieve pressure. Bolts shall be carefully

removed. Personnel shall never position their body over the valve or in line with the direction of travel, in case the bonnet blows.

Maintenance of Vaults, Manholes, and Tanks-

All enclosed areas shall be considered hazardous until tested. They will be tested with oxygen deficiency and combustible gas indicators prior to entry.

Atmospheres containing 19.5 percent or less of oxygen by volume should not be entered without the use of an air supplied respirator.

Only manhole cover hooks or other methods approved for this purpose shall be used when removing or replacing manhole covers. When replaced, the covers shall be properly seated. The bearing surfaces shall be free from dirt or ice which might prevent proper seating of the cover.

Personnel shall enter and leave manholes or vaults only by means of a ladder; they will not step on cables, cable hangers, or pipes.

Maintenance of Vaults, Manholes, and Tanks- (continued)

Personnel shall not throw tools or materials into or out of manholes or vaults. They will use canvas buckets, hand lines, or other approved methods for lowering and removing tools and equipment.

Working on energized equipment is especially hazardous in subsurface structures and will be performed by an electrician.

When a manhole or vault is open, at least one member of the crew shall be stationed at the surface to act as a safety observer and take appropriate actions in case of emergency.

Cool vests or other heat reducing equipment should be made available to workers who enter vaults or manholes under high heat conditions (e.g., steam leak repair).

Central Heating Plants:

Boiler Safety-

As a minimum, each boiler shall be equipped with steam and water gauges, gauge cocks, safety and blow-off valves, and low water cutoff devices. Safety valve inspections shall be as outlined in the National Board Inspection Code published by the National Board of Boiler and Pressure Vessel Inspectors. Boiler feed lines shall be equipped with check and cutoff valves placed as close as possible to each boiler. Water gauge glasses, less than 15 feet from the floor or water tender's platform, will

be carefully guarded to prevent accidents resulting from breakage or blowouts. High-pressure gauge glasses will be drawn down on each shift. Low-pressure gauge glasses will be checked at least weekly.

Pressure gauges shall be inspected and tested every 12 months by heating plant personnel.

No boiler shall be operated unless equipped with a safety valve, calibrated to the boiler manufacturer's recommendations unless normal boiler operating pressures are changed. In the latter case, the maximum operating pressure then becomes the controlling factor on safety valve selection. NO other valves, shall be placed between the safety valve and the boiler or between the safety valve and the end of its discharge pipe. Safety valves shall be manually tested on steam or hot water systems at least monthly for proper operation. If it is not practical to test safety valves every month for high temperature hot water boilers, the valves should be removed from the boiler, tested, and reset (if required) at a properly equipped safety relief valve testing facility by the valve manufacturer or by a certified ASME shop. Valves should be tested and reset at least once a year for high temperature hot water boilers.

Boiler Safety- (continued)

When applicable, spark arresters shall be installed on boiler stacks to prevent flying sparks.

No boiler shall be operated at pressures higher than determined safe by the most recent boiler inspection. Boilers shall not be operated at greater pressures than those specified on the manufacturer's stamped instructions. The lowest of these two pressures will govern boiler operation. The instruction stamped by manufacturers on boilers shall not be covered or obliterated.

If safety valves do not pop when pressures rise above valve settings, or the valves cannot be opened by hand when tested, the boiler shall be taken out of service until the valves have been repaired or replaced.

When fires are banked, boiler tenders shall make certain that draft is sufficient to prevent accumulations of flammable gases.

When a boiler is returned to full operation, all external drains between the boiler and main header shall be left open until the boiler is on the line, The stop valve shall be kept closed until boiler pressure is equal to that in the steam main. The stop valve shall then be gradually opened; if no jars or disturbances occur in the line, the valve may be opened completely. If jarring or rumbling occurs during cutting-in, the stop valve shall be closed immediately.

Steam shall be introduced into cold pipes very slowly until they have warmed enough to preclude damage.

Boiler tenders shall stand to one side when opening fire doors to protect themselves against flarebacks.

When not in use, all boiler room tools shall be stored in suitable racks, Tool racks shall be constructed and located so personnel cannot accidentally touch hot surfaces or knock tools from racks while passing by.

Adjustments shall not be made to valves or valves removed to increase discharge pressure.

Hoistways, driving machinery, conveyors, worm gears, and reciprocating pumps shall be properly guarded.

Boiler Water Treatment Tanks:

Some of the chemicals used to treat boiler water are hazardous and shall be handled properly. The following safety precautions shall be observed:

Acids-

Tests for chemical residuals involve small quantities of acid. The risk is small if spillage is avoided and bottles containing acid are not broken.

Greater risks are involved in the handling of sulfuric acid in the hydrogen-zeolite, demineralizing, and direct-acid treatment processes. Observe the following precautions when handling sulfuric acid:

Do not permit diluted or strong sulfuric acid to come in contact with the eyes, skin, or clothing.

Always wear full face shields, chemical safety, goggles, neoprene gloves, and a neoprene apron.

Never add water or caustic solutions to concentrated acid since a violent reaction will result.

Ensure supervisor observes all cleaning and repairing of tanks.

Observe instructions about entering and cleaning tanks, including-

Wash down spills with plenty of water. Never use combustibles such as cloths, sawdust, or other organic materials to mop up spilled sulfuric acid. Neutralize spills with soda ash before washing down.

In the event of accidental contact, remove all contaminated clothing immediately and wash affected areas with water for at least 15 minutes. Have medical personnel examine affected areas to determine if further treatment is necessary.

Caustic Soda-

Never add water to caustic soda (the proper method is to add caustic soda to water) because sufficient heat may be generated to cause the solution to boil and spatter. Personnel may be injured if they come in contact with the spattering, since caustic soda has a marked corrosive action on body tissue. Injury to the upper respiratory tract and lung tissue can result if the dust or concentrated mist from caustic soda is inhaled.

Caustic Soda- (continued)

Never store food or eat near caustic soda or in the work area where it is handled.

Do not depend upon creams or ointments for protection from caustic soda.

Ensure that all personnel exposed to caustic soda wear full face shield, close-fitting chemical safety glasses, neoprene gloves, apron, and coveralls which fit snugly at neck and wrist.

Application of Chemicals-

Always drain the feeder before introducing chemicals into it. Before opening the drain valve, close all pressure connections to the feeder to prevent injury to the operator from hot water or chemicals.

Never place dry chemicals in a chemical feeder or pump. This practice plugs the chemical feed lines in a short time.

Wherever possible, mix chemicals at floor level to minimize the possibility of injury to eyes and face.

Check specifications, temperature, pressure, and materials of construction of piping, valves, and pumps, to determine whether they can be used safely with the chemicals.

Safety Equipment:

Inspect all safety equipment regularly, including safety eyewash and shower, to ensure that they are in working condition at all times. Post operating instructions at the emergency

eyewash fountain and the safety shower. Periodically instruct personnel in the use of these facilities.

Chemical Storage and Handling:

Store all large quantities of chemicals used for boiler or condensate water treatment in locations where accidental spills will be contained and where drainage will not be hazardous to personnel or the environment.

Conspicuously post warning and handling instructions where use of toxic chemicals are necessary.

Chemical Storage and Handling:(continued)

Train personnel who handle chemicals in safe chemical handling practices.

Practice neutralization and containment techniques and disposal instructions. Consult with the Office of Health and Safety as needed.

Chemical Laboratories:

Ensure that chemical testing laboratories associated with water treatment have operable mechanical ventilation, when required.

Maintain chemical test kits and test instructions in a current and usable state.

Conspicuously post appropriate warning instructions.

Train personnel who conduct chemical tests in use of the chemicals and hazards involved.

Housekeeping & Material Storage

Purpose:

Attention to general cleanliness, storage and housekeeping can prevent numerous accidents. This chapter covers items not discussed in other areas and is not intended to cover all specific housekeeping requirements. Good housekeeping efforts are a part of the company fire prevention and accident prevention program.

Management and Employee Responsibility:

All Employees share the responsibility for maintaining good housekeeping practice and following the established housekeeping procedures. The Manager, Supervisors, Safety Coordinator and Safety Committee will be responsible to monitor housekeeping as part of their facility safety inspection procedures, note any hazards or areas of non-compliance, initiate clean-up procedures and provide follow-up. Management has the additional responsibility to provide disciplinary action when necessary to reinforce compliance with this program.

Smoking Policy:

Smoking is not permitted inside buildings and/or within 50 feet of material storage. This includes all offices, rest rooms, locker rooms, production floor, storage areas, coolers, etc. Smoking is permitted outside in designated areas and in the Smoking Section of authorized break areas before work, after work and during breaks. To prevent fires and keep the grounds neat and orderly, all cigarette/cigar ashes and butts are to be disposed in the provided butt cans or ash-trays only.

Department and Area Housekeeping Procedures:

Office areas are to be kept neat and orderly. The following general rules apply to prevent injuries and maintain a professional appearance.

1. All aisles, emergency exits, fire extinguishers, etc., will be kept clear (a minimum of three feet of either side) of material storage (temporary and permanent) at all times.

2. Storage areas will be maintained orderly at all times. When supplies are received, the supplies will be stored properly.

3. Spills will be cleaned-up immediately and wastes disposed of properly.

4. All waste receptacles will be lined with a plastic trash bag to avoid direct contact while handling. Custodial Employees will use rubber gloves and compaction bar when handling wastes.

5. Keep file and desk drawers closed when not attended to avoid injuries. Open only one drawer at a time to prevent tipping of file cabinets.

6. At the end of the business day, turn off all office equipment (area heaters, lamps, coffee-maker, PCs, etc.) and lights to save energy and prevent fires. All space heaters be un-plugged at the end of the day to assure they have been turned-off.

Production areas will be kept neat and orderly, during operations and as follows:

1. All aisles, emergency exits, fire extinguishers, eye wash stations, etc., will be kept clear (a minimum of three feet in front of and to either side) of product storage, material storage, fork trucks and pallet jacks at all times.

2. Spills will be cleaned up immediately.

3. All process leaks will be reported to supervision and maintenance for immediate repair and clean-up.

4. Utility Employees will be responsible to keep aisles and work floors clear of excessive debris and waste materials during shift operation, between breaks and at shift change when necessary or directed by supervision; however, all Employees are responsible to communicate slippery floors to supervision for immediate clean-up.

5. All refuse and waste materials will be placed in the recognized waste containers for disposal.

Rest rooms, locker rooms and cafeteria are provided as a convenience for all Employees.

The following rules will apply:

1. Employees are expected to clean-up after themselves as a common courtesy to fellow Employees.

2. Flammable materials (fire works, explosives, gasoline, etc.) may not stored in lockers or brought on company property.

3. Personal food item will not be stored in lockers or cafeteria overnight.

4. All waste receptacles will be lined with a plastic trash bag to avoid direct contact while handling and Custodial Employees will use rubber gloves and compaction bar when handling wastes.

5. All refuse and waste materials will be placed in the recognized waste containers for disposal.

Maintenance Areas:

1. All aisles, emergency exits, fire extinguishers, etc., will be kept clear (a minimum of three feet of either side) of material storage (temporary and permanent) at all times.

2. Storage Areas will be maintained orderly at all times:

a. Pipe stock stored horizontally on racks and sorted by size

b. Metal stock stored horizontally on racks and sorted by size

c. Sheet metal stock stored vertically in racks and sorted by type

d. All fittings, etc., stored in bins on shelves and sorted by type and use

e. All flammables stored in OSHA-approved Fire Cabinets and self-closingcans where necessary

3. Spills will be cleaned-up immediately by the person responsible and wastes disposed properly.

4. All refuse and waste materials will be placed in the recognized waste containers for disposal.

Grounds:

The grounds surrounding the Company are an extension of the work place. Grounds that are kept neat and orderly show pride by the Company for Employees, customers and neighbors to enjoy.

The following general rules will apply:

1. All trash will be discarded only in the waste containers provided.

2. Park only in the designated assigned area.

3. The Maintenance Department will be responsible for grounds keeping (mowing, trimming, etc.) as needed. Maintenance will also establish procedures for ice/snow removal, when necessary, prior to operations each day.

Material Storage :

Proper storage procedures are required for dry, raw materials, finished product flammables and compressed gases storage to prevent fires, keep exits and aisles clear and avoid injuries and illnesses. General rules for material storage are as follows:

Materials and Finished Products Storage

1. Materials may not be stored any closer than 18 inches to walls or sprinkler heads. A minimum of 3 feet side clearance will be maintained around doorways and emergency exits. Passageways and aisle will be properly marked and a minimum of six feet in width. Materials, fork lifts, pallet jacks, etc., may not be stored in aisles or passageways.

2. Aisles and passageways will be kept clear of debris. All spills of materials will be immediately cleaned-up by the person responsible.

3. All platforms and racks will have maximum load capacity displayed. The weight of stored material will not exceed the rated load capacity.

Flammable Storage

1. All flammables will be stored in OSHA-approved flammable storage cabinets or stored outside (at least 50 feet from any structure)

2. Fuels, solvents and other flammables (not stored in original shipping containers) will be stored in OSHA-approved self-closing containers with flame arresters. Flammables may not be stored in open containers (open parts baths, etc.).

3. Flammable storage areas will be kept dry and well ventilated. No storage of combustible materials, open flames or exposed electrical components are permitted in the flammable storage area.

4. Flammable or combustible materials may not be stored in electrical rooms. Electrical rooms must be kept clean and dry at all times.

Compressed Gas Storage Safety

1. Gas Cylinder Shipment Receiving
2. Inspect bottle for defects & proper marking/labels
3. Ensure stamped date on bottle has not expired
4. Inspect valve assembly and adapter thread area
5. Ensure MSDS is on file or with shipment
6. Follow MSDS requirements for storage
7. Gas Cylinder Storage
8. Cylinder cap securely in place when not in use.
9. Marked with contents and if empty/full.
10. Stored up-right and secured to a stationary structure in an shaded and well ventilated area.
11. Cylinders not stored within 50 feet of exposed electrical components or combustible materials.

12. Cylinders are protected from accidental rupture.
13. Chemically reactive gases not stored within 50 feet of each other.
14. Gas Cylinder Movement
15. Must be secured to a cart or cylinder trolley
16. Cap securely fastened
17. Gas Cylinder Usage

Compressed Gas Storage Safety (continued):

18. Inspect valve adapter threads.
19. Inspect all fasteners, hoses & regulators prior to hooking up to cylinder.
20. Use only for approved purposes.
21. Use in up-right position.
22. Fasten cylinder to structure or cart.
23. Regulators must be of same rated pressure as cylinder
24. Keep cylinder valve shut when not in use; don't depend on regulators

Laboratory Health and Safety

Policy:

Company laboratories require hazard containment of biological, radiological, chemical and/or physical hazards. Policies and procedures relevant to most laboratory situations will be defined in this chapter. Policies and procedures relevant to a specific situation or program (e.g. radiation, chemical, hygiene, and blood-borne pathogens) will be defined in separate chapters.

The Company's laboratory safety program depends on every employee's participation and cooperation. Noncompliance with safety precautions not only endangers the individual, but often compromises the health and safety of fellow workers and the surrounding community. This will result in loss of experimental integrity and property damage.

Responsibilities:

The Safety and Health Manager is responsible for ensuring that all laboratory activities are conducted in a manner that presents the least possible hazard to employees and the surrounding community.

The Laboratory Supervisor will report to the Safety and Health Manager, and will ensure that all safety policies and regulations are enforced and that necessary safety equipment is available in the laboratory. The Laboratory Supervisor's responsibilities include:

- Identification of hazards and assessment of the risks associated with operations;
- Ensuring that individual employees are aware of hazards and of the precautions they should take in carrying out their assigned tasks;
- Selection of proper laboratory safety practices and engineering controls necessary to minimize personal injury or property damage;
- Selection of appropriate preventive medical practices, serologic monitoring, and immunization protocols, and inform individual employees the rationale for their selection;
- Providing instruction and training programs for personnel in the practices and techniques required for their assigned tasks and laboratory operations;
- Maintaining a laboratory procedure notebook;

•Ensuring that necessary safety equipment is available in the laboratory, used when required, and adequately maintained;

•Establishing and periodically reviewing emergency procedures for accidental spills and any overt exposure to hazardous substances;

The Laboratory Supervisor's responsibilities include: (continued)

•Arranging for immediate medical attention for injured personnel and reporting of incidents as required;

•Complying with all policies and procedures as outlined in this manual.

Each Employee's responsibilities include:

•Complying with all Company safety policies and procedures;

•Maintaining awareness of the risks associated with assigned duties;

•Taking all necessary and appropriate safety precautions relevant to performance of duties;

•Becoming familiar with emergency procedures prior to accidental spills, overt personal exposures, fire, etc.;

•Reporting unsafe conditions or practices to the Laboratory Supervisor or Safety and Health Manager;

•Reporting all incidents resulting in injury or exposure to hazardous agents to the Laboratory Supervisor or Safety and Health Manager.

Control of Hazardous Areas:

A. Controlled Access

Certain areas within the Company’s facilities have been designated restricted and access will be controlled. To prevent unauthorized personnel from entering restricted areas, a written authorization will be issued to each person needing access to a controlled area, and security keys will be provided to authorized personnel only..

Laboratory Supervisors must approve all written authorizations. Security keys are issued by the Laboratory Supervisor. Security keys will be returned to Laboratory Supervisor on reassignment or termination.

B. Visitors in Laboratory Areas

1.Policy

a.Children under 12 years of age are not permitted into any laboratory at any time.

b. Each Laboratory Supervisor is responsible for the safety of adult visitors to his or her laboratory, including ensuring that immunization, training, issuance of personal

protective equipment, paper work completion, and other requirements have been met.

2. Rules and Procedures

a. Maintenance personnel must not be left unattended without the prior approval of the Laboratory Supervisor.

b. Doors to restricted areas must not be propped open to allow visitor access.

c. Visitors may be required to obtain an identification badge from the Safety and Health Manager.

Hazard Warning Signs and Labels:

Hazard identification signage has four distinct categories:

NOTICE – states a policy related to safety of personnel or protection or property but is not for use with a physical hazard.

CAUTION – indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury.

WARNING – indicates a potentially hazardous situation that, if not avoided, will result in death or serious injury.

DANGER – indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury.

Hazard Identification General Information:

Prominent signs and labels of the following types are generally posted in and adjacent to laboratories:

a) Emergency phone numbers of emergency personnel/ facilities, supervisors, and lab workers;

b) Identity labels, showing contents of containers and associated hazards;

c) Location signs for safety showers, eyewash stations, other safety and first aid equipment, and exits; and

d) Warnings at areas or equipment where special or unusual hazards exist.

Some of the more common hazards found in laboratories that are required to be or should be identified are biohazards, radiation hazards, laser light, chemical hazards, explosive or flammable liquids, cryogenic hazards, compressed gas storage, noise hazards, and UV light.

Posting of Hazard Signs and Labels:

The Laboratory Supervisor is responsible for posting hazard warning signs as necessary and in compliance with the requirements for each type of hazard encountered. Information on proper types of signs and specific requirements for signage should be directed to the Safety and Health Manager.

Sign Posting and Label Rules and Procedures:

a. Signs must be posted only while a hazard exists and must be removed as soon as the source of danger is removed.

b. Hazard warning signs must show the name(s) of the hazard(s) and the investigator, his/her alternate, with their home telephone numbers.

c. The investigator named on the hazard sign will determine when visitors can be allowed in the laboratory.

d. Signs that are to be used permanently must be posted in permanent frames. Contact the Safety and Health Manager for assistance in installation.

e. Signs that are to be posted on a temporary bases (less than one month) may be installed in permanent frames or posted with tape on appropriate surfaces.

f. Hazard warning signs are supplied by the Safety and Health Manager.

Hazard Containment:

A. General

Facility design, safety equipment, and practices for containing laboratory hazards vary according to the nature to the agent/substance, the volume and concentration handled, and the manipulation procedures used.

Hazard containment requirements must be considered case by case and are determined by the needs of the investigator and organization based on experience gained from work conditions, and on relevant guidelines and regulations established by safety experts, committees within and outside the Company, and regulatory and granting agencies.

B. Types of Hazards

- Biological Hazards
- Chemical Hazards
- Radioactive Hazards

C. Ventilation controls

Biological Safety Cabinets (BSCs) and fume hoods are primary containment devices designed to protect workers from exposure to hazards by physical barriers and by directional airflow carrying hazards away from the workers.

1.Biological Safety Cabinet - Description

Biological safety cabinets are ventilated boxes which give the workers a degree of protection against hazardous aerosols generated within. The following terms are used to describe the cabinet features:

- "Total containment or barrier" means the cabinet was designed to permit no hazardous particles to reach the laboratory environment.
- "Partial containment or barrier" means the cabinet was designed to prevent almost all infectious particles from reaching the laboratory environment.
- "Personal protection"means the laboratory worker is protected to some degree from
exposure to hazardous aerosols generated within the cabinet.
- "Product protection" applies to reduction of the risk of contamination of the specimen or culture handled in the cabinet. (Biological safety cabinets supplying HEPA-filtered air to the work area provide product protection; vertical laminar flow supply air reduces the likelihood of cross-contamination.)
- "Air intake" refers to the opening where air enters the cabinet.
- "High efficiency particulate air (HEPA)" filters remove particles at least 0.3 microns in size from an airstream at an efficiency of 99.97 or greater.

2.Cabinet classes

a. Class I cabinets provide partial personnel protection and no product protection and are suitable for handling low-to-moderate risk biohazardous aerosols when product protection is not essential. Small amounts of toxic or flammable chemicals may be used as air is not re-circulated. Cabinets are connected to the building exhaust system and depend on its operation to exhaust air. Air velocity at the front opening is approximately 75 linear feet per minute.

b. Class II cabinets provide both product and partial personnel protection and are designed for the handling of low and moderate-risk biohazards. Type B-2 cabinets do not recirculate any air within the cabinet and are more suitable for handling carcinogens and other hazardous chemicals than either Type A or Type B-1 cabinets. Class II, Type B-1 cabinets may occasionally be used to handle small quantities of toxic and volatile chemicals.

c. Class III Cabinets. Class III biological safety cabinets, or glove boxes, are closed-front, gas-tight boxes. Employees work using impermeable gloves attached to cabinet-front

openings or operating ports. One or two HEPA filters move contaminated air into an exhaust system. The cabinet is maintained under negative pressure compared to the laboratory, and air will tend to enter the cabinet should a leak occur. Class III cabinets provide the highest degree of personnel protection and a clean work environment, and are suitable for use with highly biohazardous agents.

3.Clean Air Cabinets

Clean air cabinets, also called clean benches, sterility hoods, laminar flow hoods or clean air stations, are designed to provide a flow of HEPA-filtered air from the cabinet interior over the work surface, directly towards the operator.

Toxic chemicals, allergens, infectious agents, and other potential airborne hazards must not be handled in clean air cabinets. This is because these cabinets do not protect the operator. These cabinets will be used only for procedures (such as sterile filter assembly and other jobs) requiring product protection. Using clean air cabinets for tissue culture preparation is not recommended because cell cultures may contain infectious agents and allergens.

4.Fume Hoods and Chemical Glove Boxes

Fume hoods or chemical glove boxes should be used when handling chemical hazards. Fume hoods are usually connected to the building laboratory exhaust system and do not operate outside normal working hours.

5.Other Local Exhaust Ventilation Systems

Specialized ventilation systems, such as small, HEPA-filtered enclosures, elephant trunks, and canopy hoods, may be required in certain instances to control fine powders or processes which release heat or vapors which cannot be placed within a conventional chemical fume hood or biological safety cabinet.

Control of Air Flow in Laboratory Areas:

A. Single-pass ventilation is supplied to all laboratory areas, unless otherwise noted.

Doors to laboratories must be kept closed as containment of hazardous materials is partially dependent on proper balance of air flow. Disruption of the positive pressure in the corridor by a laboratory door opened for an extended period of time may result in transmission of airborne materials from the laboratory to the corridor. Doors to autoclave rooms must also be kept closed in order to control odors as well as maintain air balance in the laboratory corridors.

B. Hours of Operation of Air-Handling System

The ventilation systems, including fume hoods and biological safety cabinet exhausts, routinely operate during normal working hours, Monday through Friday. Time of operations may vary by facility. Verify hours of operation with Laboratory Supervisor.

Laboratory workers must not continue to work after regular operating hours of air-handling systems unless prior arrangements have been made with the Laboratory Supervisor in order to maintain ventilation in the area

C. Ventilation Failure

In the event of failure of the laboratory ventilation system:

- Immediately stop working with hazardous agents.
- Contain the hazards.
- Leave the laboratory.
- Notify the Safety and Health Manager at (phone number) _____ and the Laboratory Supervisor at (phone number) _____.

Safe Work Practices:

A. Policy

The following rules and procedures apply to all Company laboratories.

B. Hygiene

1.Mouth pipetting is prohibited.

2.Eating, drinking, chewing gum, smoking, application of makeup or storage of food is prohibited in laboratories.

3.The use of Universal Precautions are required for handling of all human blood and body fluids specimens for hematologic, microbiologic, chemical and serologic testing.

C. Sharp Objects, Syringes and Needle Handling

1.Recapping of needles is prohibited.

2.Disposal of syringes and needles into waste cans, plastic bags, trash baskets or other containers other than as described below is prohibited.

3.Used syringes and needles are to be deposited, without recapping, directly into safety disposal containers; disposable and non-disposable items are to be placed in separate containers. This includes vacutainer holders (complete with attached needle) which are considered a disposable item.

D. Miscellaneous

1.Suction flasks must be properly shielded and trapped.

2.All technical procedures must be performed in ways that minimize the creation of aerosols.

3.Water baths and suction flasks must contain disinfectant if they are used to handle infectious agents.

4.Desk work using writing materials, reference books, and journals must not be done in laboratory areas where these materials could become contaminated with hazardous agents.

Personal Protective Equipment:

A. Laboratory Clothing

1.Employees must wear protective clothing appropriate for agents handled in the laboratory.

2.Impermeable aprons must be used over regular laboratory clothing when handling hot liquids, very cold substances such as liquid nitrogen, or hazardous chemicals such as corrosives.

3.Laboratory coats are not permitted outside of laboratory areas.

4.Lab coats must be laundered or disposed of in an appropriate manner. Home laundering of laboratory coats and other protective clothing is not permitted.

5.Front opening laboratory coats must be worn closed when performing laboratory procedures.

B. Gloves

1.Gloves providing protection against specific chemical agents, extreme temperatures, traumatic injury, and barriers to skin, are available.

2.Proper selection of gloves is important. The Safety and Health Manager compiles information on types of gloves and can provide advice on those best suited for specific purposes.

3.Gloves must discarded after handling chemical and biological hazards.

4.Disposable gloves used to handle biohazards must be discarded into a biohazardous waste receptacle and decontaminated before disposal.

5.Hand washing is required after removal of gloves.

B. Gloves (continued)

6.Reusable gloves must be cleaned or decontaminated and stored in a clean area.

7.Gloves used to handle chemical and biological hazards are potentially contaminated and must be removed before the worker opens refrigerators, incubators, room doors, or answers the telephone.

C. Eye and Face Protection

1.Eye protection and/or face protection must be worn in areas posted as "Eye Hazard Areas". These areas include where:

- Corrosive or caustic materials are handled.
- Explosive materials are handled.
- Hollow glassware is under vacuum or pressure.
- Cryogenic materials are handled.
- Processes can produce aerosols of infectious agents.
- Flying particles may be generated (grinders, mills, power saws, drill presses, lathes, etc.).
- Gas or electrical welding is done.
- Molten metal is used or metal is melted (soldering, leading joints, etc.).

2.OSHA requirements (29 CFR 1910.133)

OSHA regulations require each affected employee to use appropriate eye or face protection when exposed to eye or face hazards from flying particles, molten metal, liquid chemicals, acids or caustic liquids, chemical gases or vapors, or potentially injurious light radiation.

Also, OSHA requires that each affected employee who wears prescription lenses while engaged in operations that involve eye hazards shall wear eye protection that incorporates the prescription in its design, or shall wear eye protection that can be worn over the prescription lenses (goggles, faceshield) without disturbing the proper position of the prescription lenses or the protective lenses.

3.Eye and Face Protective Equipment

Various types of safety face and eye shields, safety glasses, and goggles are used to protect workers from flying fragments, dusts, liquid splashes, aerosols, vapors and gases. They may be used alone or in conjunction with other protective devices such as respirators. Eye protection should conform to American National Standards Institute, Z87.1-1994. Safety and Health Manager will assist in the choice of suitable protective equipment and will provide protective eye and face equipment.

C. Eye and Face Protection (continued)

4.Contact Lenses

Contact lenses do not provide eye protection and may increase risk if exposed to a hazardous agent. The capillary space between the contact lenses and the cornea may trap material present on the surface of the eye. Hazardous agents trapped in this space cannot be washed off the surface of the cornea. If the material in the eye is painful or the contact lens is displaced, muscle spasms will make it very painful to remove the lens. Contact lenses must not be worn

by persons exposed to hazardous chemicals unless goggles and/or face shields are also worn to provide full protection.

5.Prescription Safety Glasses

Workers who wear prescription eyeglasses for general working conditions should obtain prescription safety glasses. Laboratory Supervisors must contact the Safety and Health Manager to prescription safety glasses.

6.Eyewash stations

There should be at least one eyewash facility per laboratory. They may be located at sinks or at any other readily accessible area. Laboratories using strong acids or bases should have an eyewash within 20 feet of the hazard area. An eyewash station should provide a soft stream or spray of aerated water for an extended period of time (15 minutes).

D. Respiratory Protection

1.General Information

The Safety and health Manager will provide respiratory protection for situations where engineering and administrative controls cannot feasibly contain a respiratory hazard. This program includes hazard evaluation, respirator selection, fitting and training, maintenance, medical surveillance, and program evaluation.

2.Procedures

a. Respirators and their use must be approved by the Safety and Health Manager.

b. The Company physician must certify wearers to be physically capable of wearing specified respirator.

c. Respirator wearers must be properly trained and fitted for each specific respirator. The Safety and Health Manager provides training and fit-testing services.

d. Respiratory protection in the form of air-supplied suits is required for biohazard control in Biosafety Level 4 laboratories for work not contained in cabinet-like glove boxes, for some work with chemical hazards, and during hazard clean up where appropriate.

Compressed Gases:

A. General Information

1.Compressed gases in cylinders are hazardous because of the potential energy of compression and because gas may be toxic, flammable, and/or act as an asphyxiant if released in a confined space.

2.The Safety and Health Manager has information available on most of the gases likely to be used in Company laboratories.

3.Compressed gas cylinders must be used and stored whenever possible as directed by the National Fire Protection Association, and in accordance with the Compressed Gas Association, Inc., "Handbook for Handling Compressed Gases," 1990.

B. Toxic Gases

Highly toxic gases may be purchased and used only upon written permission of the Safety and Health Manager. Personnel must notify the Safety and Health Manager, through the Laboratory Supervisor, of intent to work with highly toxic gases prior to the proposed purchase. This will allow time for the necessary safety preparations to be made, and includes arrangements for the proper disposal of hazardous wastes. Small, instead of large, cylinders of toxic gases should be purchased whenever possible.

1.Restricted Toxic Gases

Purchase and use of the following are restricted:

- Boron trifluoride Chlorine
- Chlorine trifluoride Dimethylamine
- Ethylene oxide (other than 12/88 sterilizing mixtures)
- Fluorine
- Hydrogen bromide (hydrobromic acid)
- Hydrogen chloride (hydrochloric acid)
- Hydrogen fluoride (hydrofluoric acid)
- Hydrogen sulfide
- Iodine pentafluoride (liquid shipped in gas-type cylinders)
- Methyl bromide (bromomethane)
- Methyl chloride
- Nitric oxide
- Nitrogen dioxide (nitrogen tetroxide)
- Nitrogen trioxide
- Nitrogen chloride (nitrogen oxychloride)
- Phosgene
- Silicon tetrafluoride (tetrafluorosilane)
- Sulfur dioxide

2.Toxic gases - Purchasing requirements

a. Personnel planning to purchase toxic gas(es) must notify the Safety and Health Manager, through the Laboratory Supervisor, of their intent to work with highly toxic gas(es) prior to the proposed purchase to allow time for necessary safety preparations including arrangements for proper disposal and instructions concerning the availability and use of respirators.

b. The Safety and Health Manager will authorize the purchase of the gas(es). Notice will be sent to the investigator through the supervisor in charge of the laboratory after determining that the gas can be used safely.

c. Clearance to use toxic gas(es) should be requested well in advance of the proposed use. Some of these gases are extremely toxic and may require isolated laboratory space and equipment not immediately available.

C. Flammable gases

Fire and explosive hazards can result when flammable gases such as hydrogen, acetylene, and others are used in confined spaces.

1.If more than one cylinder of highly flammable gas is to be placed in a room, written permission must be obtained from the Safety and Health Manager.

2.When cylinders of flammable gases are kept inside the building, two or more cylinders cannot be manifolded together.

3.Several instruments may be operated from one cylinder.

4.Full reserve cylinders or empty cylinders must not be stored in the laboratory. Empty cylinders will be removed from the laboratory immediately.

5.Cylinder size will be limited to 200 cubic feet.

6.Adapters may be used with written permission of the Safety and Health Manager.

7.Piping must be compatible with the gas, e.g. no copper for acetylene, no plastic tubing in any high pressure portion of a system, etc.

8. Valves on flammable gas cylinders should be closed before the laboratory is vacated at the end of the workday.

9.If a cylinder of toxic or flammable gas is leaking, contact Safety and Health manager, or local fire department immediately. Evacuate the area. Turn off any open flames if the gas is flammable.

10.Display appropriate hazard warning signs when using flammable or toxic gases.

D. Acceptance of cylinders from vendors

1.The contents of cylinders must be identified with decals, stencils, glued or wired-on tags, or other markings on the cylinders. Color codes alone or tags hung around the necks of the cylinders are not acceptable.

2.Cylinders must not be accepted from the vendor unless the valve safety covers are in place and properly tightened

3.Vendors moving cylinders in Company buildings must use hand trucks, carts, or dollies. Cylinders must not be dragged or rolled for distances greater than 3 feet.

4.Compressed Gas Association standard valve assemblages must be used.

E. Storage of cylinders in holding (shipping and receiving) areas.

1.Cylinders should be stored outside or in a separate room designed to meet NFPA standards for storage of compressed gases.

2.Cylinders stored out of doors must be protected from the weather and tampering by a covered and enclosed area providing safe access and adequate security.

3.Full and empty cylinders must be clearly marked and stored separately if possible.

4.Cylinders containing flammable gases should not be stored adjacent to oxidizers.

F. Handling and storage of compressed gas cylinders

1.Laboratory personnel must receive training from the Laboratory Supervisor on storage, handling and hazard precautions prior to using compressed gases.

2.Compressed gas cylinders must not be moved unless the protective valve cover is securely in place. The valve safety covers must be left on the cylinders until they are secured to walls, benches or stable pieces of equipment, or until non-tip bases are attached.

3.Compressed gas cylinders must be moved on cylinder carts, hand trucks, or dollies specifically designed for this purpose. The valve safety covers must be in place and the cylinders secured to the carts during transport.

4.Compressed gas cylinders must never be rolled a distance of greater than 3 feet. Compressed gas cylinders must never be dragged.

5.Cylinders of compressed gas must be secured at all times so they cannot fall. They can be secured with chain or canvas straps.

6.The main valve cylinder should be opened only as far as necessary to produce the required gas flow and closed when the gas is not required.

F. Handling and storage of compressed gas cylinders (continued)

7.Cylinders must be checked for leaks when received in the laboratory.

8.Reserve cylinders must not be stored in the laboratory.

9.Laboratories in which toxic gases are used must be equipped with proper gas masks and respirators. Contact the Safety and Health Manager to determine the need for protective devices.

10.Never attempt to refill empty cylinders.

G. Empty Cylinders

1.Empty cylinders must be labeled as such and promptly removed. Generally, this marking (EMPTY or MT) should be on a large piece of adhesive or masking tape stuck on the cylinder. If the cylinder has a tag wired to the valve that identifies the contents, the bottom half of the tag may be removed to indicate an empty cylinder.

2.A small amount of gas must be left in the cylinder and the cylinder valves must be closed to prevent contamination of the inside of the cylinder.

3.Valve covers and the labels indicating cylinder contents must be in place, prior to removal.

4.Check with the Laboratory Supervisor or the Safety and Health Manager for cylinder removal procedures.

5.Return empty cylinders promptly. Demurrage charges continue until cylinders are returned to the supplier.

6.Cylinders without proper tags or labels must not be used. Label cylinder "contents unknown" and place in the empty stock for return to supplier.

7.Empty cylinders of toxic gases must be disposed of with the assistance of the the Safety and Health Manager.

H. Pressure regulators and needle valves

1.Selection of regulators and needle valves

a. The valve fittings of cylinders used to store different families of gases are specific and will only allow regulators or needle valves to be attached that are safe for use with those gases. Only pressure regulators and needle valves approved for a specific gas may be used.

b. Cylinders must not be purchased or accepted whose fittings do not conform to standards of the National Compressed Gas Association.

H. Pressure regulators and needle valves (continued)

2.Use of regulators and needle valves.

a. Threads, points, and unions must be clean; these surfaces must be inspected before connections are made. Personnel must not attempt to lubricate threads or fittings.

b. When attaching regulators or needle valves, connections must be firmly tightened. Nonadjustable wrenches of the proper size should be used. Pliers or adjustable wrenches, which may damage the brass nuts, should not be used. Leaks at the unions between the regulators and the cylinder valves are usually due to damage to the faces of the connections. The Safety and Health Manager can provide information on appropriate wrenches.

c. Return cylinders with damaged cylinder valve faces to the vendor.

3.After the pressure regulator is attached to the cylinder, turn out the delivery pressure adjusting screws of the regulators until they turn freely.

4.Slowly open the cylinder valves. Avoid standing directly in front of the regulators at this time as the pressure of the cylinders may blow the glass from the front of a faulty gauge.

5.Cylinder valve handles should be left attached to the valves while the cylinders are in use. Cylinder valves that "stick" and do not open when the usual amount of force is applied may be damaged. Return to vendor stating on the cylinders that the valves are stuck.

6.Pressure in full cylinders should be as indicated on the cylinders or labels. Lack of full pressure many indicate leaks at the connections between the cylinders and valve regulators, damaged regulators, or incompletely filled cylinders.

7.Delivery lines should be connected to the low pressure outlet of the regulator valves or to the needle valves. Where low pressure lines are used, their valves should be closed, and the line pressure adjusted (by turning the regulator delivery pressure adjusting screws) until the desired pressures are shown on the delivery pressure gauges.

8.If the gases are not to be used within a 24 hour time period, close the cylinder valves, bleed the lines, and turn back the pressure adjusting screws until they turn freely. Damage to the gauges may result if pressure is left on the gauges during extended periods of nonuse.

I. Leak testing

Leak testing is the use of a solution, such as a soap solution, to observe a leak under pressure by the formation of bubbles as gas escapes from the leak. Compressed gas cylinders are tested for leaks when they are filled; however, leaks have been detected after cylinders have been received.

1.Leak testing method

a. Cylinders should be leak tested both before and after attachment of the regulator.

b. To test for leaks, prepare a soap solution of a few drops of liquid soap in a small squeeze bottle of water.

2.Return of leaking cylinders

a. Leaking cylinders of nontoxic, nonflammable gas may be taken to a loading dock or other place having suitable air flow. Leaking cylinders will be returned to the vendor.

b. Leaks from cylinders of toxic or flammable gases require immediate attention. The area in which a leaking cylinder may require evacuation of

persons in the area. Contact the Safety and Health Manager to obtain assistance.

c. Gas masks and appropriate protective clothing must be worn when attempting to move leaking cylinders of toxic gas.

Safe Use of Laboratory Equipment and Facilities:

1. General Information, Rules, and Procedures

A. Laboratory apparatus must be used only for its designed purpose unless appropriate safety modifications are made. Operating manuals must be consulted for detained operating instructions for individual pieces of equipment.

B. Electrical

1.All electrical equipment used in the laboratory must be grounded. Ground fault circuit interrupters must be used whenever equipment is in a wet environment such as a cold room.

2.Electrical apparatus must be plugged into sockets which can be reached safely, without exposure to hazards.

3.Electrical apparatus used in a fume hood must be plugged in outside the hood.

B. Electrical (continued)

4.Electrical cords must be as short as practical and must be placed in such a way that the risk of tripping or spills is minimized.

5.Extension cords must be avoided. If unavoidable, ascertain that the extension cord is appropriate. Consult the Safety and Health Manager for information.

6.Equipment, including electrical plugs and cords, must be kept in good repair. Electrical equipment must be unplugged before routine parts are replaced or before making internal adjustments.

7.A qualified electrician must make electrical repairs.

8.Non-sparking electrical switches and motors are desirable in laboratory equipment to prevent combustion of flammable vapors.

C. Heating Devices

1.Uncontrolled heat sources such as Bunsen burners and heat guns must not be used near flammable substances and must not be left unattended in the laboratory.

2.Heating devices (i.e. steam baths) which have an inherent cutoff point are safer than those which do not.

3.Hot plates, heating mantles, and other heaters must have enclosed elements and controls with a thermal shut-off safety device.

D. Cryogenic Liquids

Cryogenic liquids are gases that have been transformed into extremely cold refrigerated liquids which are stored at temperatures below –130 degrees F (-90 degrees C). They are normally stored at low pressures in specially constructed, multi-walled, vacuum-insulated containers.

1.Hazards

The potential hazards that accompany cryogenic liquids may result from:

a. Extreme cold can freeze human tissue on contact, and can also cause embrittle-ment of carbon steel, plastics, and rubber.

b. Extreme pressure can result from the rapid vaporization of the refrigerated liquid. This is due to a rising temperature from the leakage of heat into the cryogenic container or systems.

c. Asphyxiation due to displacement of air by escaping liquid and the resultant rapidly expanding gas (in the case of inert gasses).

2.Personnel Safety

Because of the potential hazards resulting from the extremely low temperatures of cryogenic liquids, all personnel handling them must be properly trained in the use of specialized equipment designed for the storage, transfer, and handling of these products.

Heavy leather protective gloves, safety shoes, aprons, and eye protection must be worn to prevent possible contact with the extremely cold surfaces of un-insulated piping, transfer connections, valves, and other equipment, or from the cold liquid or boil-off vapors which may result from spilled or splashed liquid.

Any transfer operations involving open containers such as dewars must be conducted slowly to minimize boiling and splashing of the cryogenic liquid. Such operations must be conducted only in well-ventilated areas to prevent the possible accumulation of inert gas (which can replace the oxygen in the atmosphere and cause asphyxiation).

E. Centrifuges

1.Each centrifuge operator will be instructed on proper operating procedures of the centrifuge including balancing loads, selection of proper rotor, head, cups, and tubes, and use of accessory equipment. Consult the centrifuge operating manual, supervisor, and/or OHS for information and/or assistance.

2.Centrifugation presents a physical hazard in the event of mechanical disruption. Aerosols and droplets may also be generated.

3.The centrifuge operator is responsible for the condition of the machine at the end of each procedure.

4. Operating procedures for each centrifuge must be established by the supervisor in accordance with the procedures outlines in the operating manual, guidelines for centrifugation of infectious agents, chemical hazards and/or radioactive materials, and the location of centrifuge.

5.Rooms where live etiologic agents are centrifuged should be identified with an appropriate hazard warning sign.

6.Centrifuge tubes

a. Plastic centrifuge tubes should be used whenever possible to minimize breakage.

b. Tubes to be used in angle-head centrifuges must never be filled to the point where liquid is in contact with the lip of the tube when it is placed in the rotor, even though the meniscus will be vertical during rotation. When the tube lip is wetted, high G forces drive the liquid past the cap seal and over the outside of the tube.

6.Centrifuge tubes (continued)

c. Nitrocellulose tubes should only be used when clear, without discoloration, and flexible. It is advisable to purchase small lots several times a year rather than one large lot. Storage at 4 degrees Centigrade extends shelf life. Nitrocellulose tubes must not be used in angle-head centrifuges.

d. All centrifuge tubes should be inspected prior to use. Broken, cracked, or damaged tubes should be discarded.

e. Refer to operating manual for selection of appropriate tubes, carrier cups, and rotors.

f. Centrifuges with a lid should be used whenever possible.

7.Carrier cups and rotors

a. Consult the operating manual for proper selection and use of carrier cups and rotors. Do not exceed recommended speeds.

b. Keep centrifuge cups and rotors clean to prevent corrosion. Consult operating manual for instructions.

F. Lasers

Laser-containing equipment has the potential for causing eye and skin damage. Other hazards associated with this type of equipment include exposures to cryogenic coolants and accidental electrocutions.

1.Classification

Lasers are classified according to the American National Standards Institute's (ANSI) "Safe Use of Lasers" laser classification scheme (ANSI Z136.1-1992). The classification scheme is used to describe the potential hazard of a laser or laser system based upon its optical emission intensity. The higher the classification number, the greater the potential hazard.

a. Class I denotes exempt lasers or laser systems that cannot, under normal operating conditions, produce a hazard.

b. Class II denotes low power visible lasers or laser systems which, because of the normal human aversion responses, do not normally present a hazard, but may present potential for hazard if viewed directly for an extended period of time.

c. Class IIa denotes low power visible lasers or laser systems that are not intended for prolonged viewing, and under normal operating conditions will not produce a hazard if viewed directly for period not exceeding 1,000 seconds.

F. Lasers (continued)

1.Classification (continued)

d. Class IIIa denotes lasers or laser systems that normally would not produce a hazard if viewed for only momentary periods with the naked eye. They may present a hazard if viewed using collecting optics.

e. Class IIIb denotes lasers or laser systems that can produce a hazard if viewed directly. This includes intrabeam viewing of specular reflections.

f. Except for the higher power Class IIIb lasers, Class III laser will not produce a hazardous diffuse reflection, that is one where the reflected radiant energy follows Lambert's Law where, in essence, the radiation is reflected over a wide angular range.

g. Class IV denotes lasers or laser systems that can produce a hazard not only from direct or specular reflections, but also from a diffuse reflection. These lasers may also produce fire and skin hazards.

h. Laser classes must be provided by manufacturer for lasers sold after August 1976.

2.Safety Procedures

a. Safety procedures for each laser application will be determined by the Safety and Health Manager.

b. To apply and obtain appropriate laser safety information, procedures, and approval for use submit a memo to the Safety and Health Manager listing the following information:

- •the laser classification,
- •the environment in which the laser is to be used, and
- •the personnel operating, and those in the vicinity of, the laser equipment.

G. Ultraviolet (UV) lights

1.General Information

Ultraviolet radiation includes that portions of the radiant energy spectrum between visible light and X-rays (approximately 3900 to 136 angstrom units). Under certain conditions, including radiation intensity and exposure time, UV radiations may kill certain types of microorganisms, its greatest effectiveness being against vegetative forms. UV light is not a sterilizing agent except in certain exceptional circumstances. It is used only to reduce the number of microorganisms on surfaces and in the air. Factors such as lamp age and just accumulation will contribute to decreased efficiency.

G. Ultraviolet (UV) lights (continued)

2. Radiation Exposure

a. The eyes and skin should not be exposed to direct or strongly reflected UV radiation. The effect of radiation overexposure is determined by such factors as dosage, wave length, portion of the body exposed, and the sensitivity of the individual.

b. Overexposure of the eyes will result in a painful inflammation of the conjunctiva, cornea, and iris. Symptoms will develop 3-9 hours following exposure. There is an unpleasant foreign body sensation accompanied by lacrimation. The symptoms usually disappear in a day or two.

c. Exposure to the skill will produce erythema (reddening) 1-8 hours following exposure.

3. Rules and Procedures

a. A hazard warning sign must be affixed on the doors of laboratories, animal rooms, etc. which have ultraviolet light installations.

b. Adequate eye and skin protection must be worn when working in an irradiated area. Safety glasses with side shields or goggles with solid side

pieces must be worn. Skin protection is afforded by face shields, caps, gloves, gowns, etc.

c. UV lamp surfaces should be cleaned as often as necessary to maximize output.

d. UV lamps used as space and surface sanitizers should be checked regularly and replaced according to the manufacturer's recommendations.

e. Consult with the Safety and Health Manager for information concerning UV lamp use, cleaning, testing, or installation.

H. Microwave ovens

Food for human consumption may not be heated in microwave ovens unless the oven is used solely for that purpose.

1. When melting agar the following precautions must be taken:

a. Explosions may occur when melting agar using a microwave oven.

b. Caps on screw-cap bottles must be completely loosened before the bottles are heating in the microwave oven.

1. When melting agar the following precautions must be taken: (continued)

c. A long-sleeve laboratory coat must be worn when heating agar in a microwave oven.

d. Heat-resistant gloves must be worn to prevent burns and protect the hands in case of an explosion.

e. Face-shields must be used when handling microwave-heated materials.

I. Autoclaves

1. Autoclaves must be operated in accordance with the manufacturer's and laboratory safety manual's instructions.

2. Operating instructions and emergency shutdown procedures must be posted on or immediately adjacent to the autoclave.

3. Responsibility for operation and routine care must be assigned to trained personnel.

4. Eye protection, heat-resistant gloves, and aprons must be worn when loading and unloading a hot autoclave. Opening doors too soon after a run is finished may blow hot fluids and noxious vapors on the operator.

5. Records of each run must be kept.

6.Autoclaves must be checked monthly to assure decontamination effectiveness. Contact the Safety and Health Manager for assistance.

7.Potentially contaminated autoclave condensate must be treated before discarding. Filters should be installed when needed.

Removal or Servicing of Laboratory Equipment:

A. Removal of Laboratory Equipment

•Laboratory equipment must be certified to be free from dangerous chemicals or infectious organisms prior to removal from a laboratory.

•Consult with the Laboratory Supervisor, or the Safety and Health Manager for procedures to take to dispose of or to have equipment serviced.

B. On-Site Servicing of Laboratory Equipment

•Laboratory equipment must be certified to be free from dangerous chemical or infectious organisms prior to on site servicing. Consult with the Laboratory Supervisor, or the Safety and Health Manager for procedures for certification.

B. On-Site Servicing of Laboratory Equipment (continued)

•Consult with the Laboratory Supervisor, standard operating procedures, or the Safety and Health Manager for decontamination procedures.

•Service personnel must also be informed of the biosafety level of the laboratory and any necessary precautions to be taken while working in the laboratory.

•Biosafety Level 3 organisms should not be handled when service personnel are in the laboratory to minimize potential exposure to service personnel.

•Service personnel must not be left alone in a laboratory without approval from the Laboratory Supervisor.

•Service personnel may also ask laboratory personnel to sign a waiver stating that the piece of equipment has been appropriately decontaminated.

Corridors:

Storage of furniture, equipment, or materials is not permitted in office corridors.

A. Policy

Corridors must provide a clear evacuation route in case of emergencies and permit responding emergency personnel unhampered access to all areas.

B. Rules

1.Permission to permanently place any item in a laboratory corridor must be obtained from the Safety and Health Manager. This does not include empty laboratory carts or racks for laboratory coats.

2.Permission may be granted to place the following items in the corridor:

- •Freezers and refrigerators, provided they do not contain Biosafety Level 3 or 4 infectious agents, hazardous chemicals, or radioactive materials.
- •Storage cabinets or racks for laboratory and/or office supplies.
- •Table for break areas.

3.Permission will not be granted unless the need is justified. Lack of space due to poor planning, storage of unused equipment, or inappropriate use of laboratory space does not constitute a justification.

4.The following is prohibited:

- •Storage of hazardous chemicals (flammable, explosive, toxic, corrosive, radioactive, etc.).
- •Storage of Biological Safety Level 3 and/or 4 infections agents.
- •Equipment which presents physical or electrical hazards. •Incubators used to process infectious agents.
- •Cylinders of hazardous compressed gas.
- •Laboratory cart(s) containing infectious wastes or discard pans.
- •Animals or animal carcasses.

C. Criteria for placement of items in corridors

1.A minimum clear corridor width of 44 inches must be maintained at all times.

2.All items must be placed on one side only and, where feasible, the side utilized is the same throughout. Corridors which have alcoves may have equipment on both sides, provided the 44-inch clearance is maintained and the equipment in the alcoves does not extend beyond the boundary of the alcove.

3.A minimum of 18 inches will be maintained between equipment and the latch side of doors along the corridor, and a minimum of 12 inches will be maintained on the hinge side.

4.Equipment must not extend beyond the wall at a corner.

5.Electrically operated equipment must be connected to permanently mounted electrical receptacles. No extension cord may be used.

6.Equipment must not obstruct exit signs, safety equipment such as fire hydrants, hoses, or extinguisher, alarm panel boxes, bulletin boards containing emergency exit route information, electrical panel boxes, etc.

Decontamination and Disposal of Laboratory Wastes:

A. Policy

Infectious and/or toxic materials must be disposed of in a manner that prevents environmental contamination in communities where Company facilities are located and protects laboratorians and maintenance, service, and housekeeping staff from exposure to infectious or toxic materials in the course of their work.

B. Rules

1.All biohazardous materials must be secured in an appropriately marked container (refrigerator, freezer, incubator, etc.) or decontaminated at the end of each workday.

2.All radioactive and hazardous chemical wastes must be disposed of in accordance with established Company procedures. The Safety and Health Manager must be contacted for disposal of these wastes.

3.No laboratory glassware, plastics, etc. may be discarded in a trash receptacle serviced by janitorial personnel.

C. Decontamination of Reusable Items

1.Reusable laboratory wares contaminated with biological or chemical agents must be decontaminated or neutralized prior to reprocessing, recycling, or disposal. This may be done on site in the laboratory or at a central location. Consult the Laboratory Supervisor or the Safety and Health Manager for assistance.

2.Reusable items must be separated from non-reusable disposable items and sharps.

3.Unless otherwise specified, all reusable laboratory wares must be discarded in the pans provided by the Company. The pans must have lids securely fastened with autoclave tape.

4.All pans collected will be autoclaved before disposal and/or use.

5.Add one inch of water to the pan. Place reusable items in the pan. Items must fit within the pan so that a lid may be securely attached with tape. If items are too large for the pan, contact the Laboratory Supervisor for assistance.

6.When the pan is ready for disposal/decontamination, secure the lid and place a room identification sticker on the pan. Unidentified pans will not be processed. Identify contents as "Reusable".

7.Transport the pans, using a cart, to the disposal/decontamination station. Follow the posted procedures; procedures may differ by location.

D. Decontamination of Disposable Laboratory Waste

1.All disposable laboratory ware must be autoclaved prior to disposal, except for items contaminated with hazardous chemicals or radioactive substances. These items require special treatment; consult with the Laboratory Supervisor if you have questions.

D. Decontamination of Disposable Laboratory Waste (continued)

2.Soft, dry items such as disposable gowns, gloves, masks, paper, plastic backed "diapers", etc., may be placed in clear autoclave bags and autoclaved without pans. Prior to closing the bag, add water (about 500 ml), tie the bag loosely with autoclave tape and label with Building and Room number. ANYTHING THAT COULD PUNCTURE A BAG MUST BE PLACED IN A PAN.

3.All other disposable labware, including cultures, media, microtitration trays, pipettes etc. must be placed in pans lined with clear autoclave bags. Several sizes of bags are available, however some bags do not fit readily and must be trimmed or folded outside the pan.

4.Before autoclaving, carefully add approximately 250-500 ml of water (or dilute germicidal solution. Some germicides may produce fumes or objectionable odors. Do not use Bleach!). AVOID SPLASHING.

5.Fold ends of bag, but do not tie. This will allow steam penetration.

6.Replace pan lid. Place proper labels and autoclave tape on end of pan.

7.Autoclave bags should not be used for reusable items such as glassware, or glass syringes. Place these items directly in a pan and cover with a pan lid. Bags sometimes melt, ruining reusable glassware.

E. Disposal of Needles and Sharps

Needles, scalpel blades and other sharps that can easily puncture the skin should be handled with extreme caution.

1.Used, disposable needles and other sharps must be placed in a rigid puncture-resistant disposable container with a lid.

2.Disposable syringes with attached needles must be disposed of as one unit without separation of the needle from the syringe.

3.Needles must not be resheathed, bent, broken, or cut.

4.Adapters used with evacuated tubes must not be reused. Discard needles and adapter as a unit; do not remove needle from adapter.

5.Discard containers for sharps must be clearly labeled as such. Containers must also be identified with users room number. Unidentified containers will not be processed.

F. Disposal of paper wastes.

Many laboratory items are disposable and may be wrapped with plastic or paper, i.e. pipettes, gloves, etc. To avoid disposal of potentially contaminated paper products in the waste receptacles serviced by janitorial personnel, the following procedure is recommended.

1.Place a biohazard discard bag on a stand next to the BSC (biohazard safety container).

2.Discard all paper wrappings into this bag unless the paper is obviously contaminated. Contaminated paper products should be discarded in the discard container placed in the BSC.

3.When the bag is full, securely close the bag opening with a "tie".

4.Place a room identification sticker on the bag.

5.Dispose of the bag as described in laboratory standard operating procedures.

6.Do not place other laboratory items in the bag.

G. Disposal of Hazardous Chemical Wastes

Go to the Chemical Safety Chapter for further information.

Laboratory HAZCOM Chemical Safety Plan

Purpose:

The Occupational Safety and Health Administration (OSHA) has promulgated a final rule entitled Occupational Exposures to Hazardous Chemicals in Laboratories (29 CFR Part 1910.1450). The standard applies to all laboratories that use hazardous chemicals. It specifies that a written Chemical Hygiene Plan must be developed and implemented that includes the necessary work practices, procedures, and policies to ensure that employees are protected from all potentially hazardous chemicals in use in their work area.

The following information constitutes the basis for the written Chemical Hygiene Plan for all Company laboratory employees who work in areas where hazardous chemicals are used. It cannot be considered complete until the Laboratory Supervisor completes all segments (which must contain laboratory specific information, policies, and procedures).

Chemical Hygiene Plan

The following standard operating procedures must be followed by all laboratory workers where laboratory work involves the use of hazardous chemicals.

A. General Requirements

2. Safe Work Practices With Chemicals

    a. Minimize all chemical exposures. Because few laboratory chemicals are without hazards, general precautions for handling all laboratory chemicals should be adopted, along with specific guidelines for particular chemicals as needed. Skin contact with chemicals and inhalation of vapors should be avoided as a cardinal rule.

b. Avoid underestimation of risk. Even for substances of no known significant hazard, exposure should be minimized. For work with substances which present special hazards, special precautions should be taken. One should assume that any mixture will be more toxic than its most toxic component and that all substances of unknown toxicity are toxic. Refer to the Material Safety Data Sheet for specific information about a chemical or product containing hazardous chemicals.

c. Provide adequate ventilation. The best way to prevent exposure to airborne substances is to prevent their escape into the working atmosphere by use of fume hoods and other ventilation devices. One should be familiar with the proper operation and use of a fume hood.

d. Institute a chemical hygiene program. A mandatory chemical hygiene program designed to minimize exposures has been prepared. Its implementation should be a regular, continuing effort, not merely a standby or short-term activity. The recommendations should be followed by all laboratory personnel including employees, guest researchers, students, and visitors.

e. Observe the PELs, TLVs, or RELs. The Permissible Exposure Limits of OSHA, the Threshold Limit Values of the American Conference of Governmental Industrial Hygienists, or Recommended Exposure Limits of the National Institute for Occupational Safety and Health should not be exceeded.

f. Accidents and spills:.

Eye Contact: Promptly flush eyes with water for a prolonged period (at least 15 minutes) and seek medical attention.

Ingestion: Provide emergency medical treatment and contact local Poison Control Center and follow directions.

Skin Contact: Promptly flush the affected area with copious amounts of water and seek medical attention. Remove any clothing that may have chemical contamination to prevent further exposure.

Clean-up: Promptly clean up spills, using appropriate apparel and equipment and proper disposal. See the related MSDS for specific clean-up recommendations.

g. Avoidance of routine exposure. Develop and encourage safe habits and avoid unnecessary exposure to chemicals by any route. Do not smell or taste chemicals. Vent any apparatus which may discharge toxic chemicals (e.g. vacuum pumps, distillation columns) into local exhaust devices. Chemicals should be properly stored and used to prevent exposure. Wear appropriate gloves when the potential for contact with toxic materials exists. Select proper glove material based on the material being handled, the particular hazard involved, and their suitability for the operation being conducted (See Appendix H). Inspect gloves for discoloration, punctures and tears before each use. Wash them before removal, and replace them

periodically. Test positive pressure glove boxes for leaks before use. Do not allow release of toxic substances in cold rooms and warm rooms, since these contain re-circulated air.

h. Choice of chemicals. Use only those chemicals for which the quality of the available ventilation system is appropriate.

i. Eating, smoking, etc. Do not eat, drink, chew gum, or apply cosmetics in areas where laboratory chemicals are present. Wash hands before conducting these activities. Smoking is not allowed in any Company facility. Do not store or consume food or beverages in areas where chemicals are stored, handled, or used. Glassware or utensils which are also used for laboratory operations should not be used with food or beverages. Do not use laboratory refrigerators for storage of food or beverages.

j. Equipment and glassware. Handle and store laboratory glassware with care to avoid damage; do not use damaged glassware. Use extra care with Dewar flasks and other evacuated or pressurized glass apparatus; shield or wrap them to contain chemicals and fragments should implosion occur. Use equipment only for its designed purpose.

k. Personal hygiene. Thoroughly wash hands immediately after working with chemicals.

l. Visitors. No children under 12 years of age are allowed into any laboratory. No pets are allowed in any Company building.

m. Horseplay. Avoid practical jokes or other behavior which might confuse, startle or distract another worker.

n. Mouth pipetting. Do not use mouth suction for pipetting or starting a siphon

o. Personal apparel. Confine long hair and loose clothing. Wear shoes at all times in the laboratory but do not wear sandals, perforated shoes, or high heeled shoes.

p. Laboratory coats. Laboratory coats are intended to prevent contact with the minor chemical splashes and spills encountered in a lab. Lab coats do not significantly resist penetration by organic liquids and should be removed immediately when they become contaminated. Lab coats should be worn in areas where chemicals are handled or used. Lab coats are not permitted in other areas. They must not be worn in public or administrative areas of the building such as the cafeteria and library. Front opening laboratory coats should always be worn closed. Home laundering of laboratory coats and other protective clothing is not permitted.

q. Personal housekeeping. Keep the work area clean and uncluttered. Properly label and store chemicals and equipment; clean up the work area on completion of an operation or at the end of each day.

r. Planning. Seek information and advice about hazards, plan appropriate protective procedures, and plan positioning of equipment before beginning any new operation.

s. Unattended operations. Leave lights on, place an appropriate sign on the door, and provide for containment of toxic substances in the event of a failure of a utility service (such as cooling water) to an unattended operation.

t. Vigilance. Be alert of unsafe conditions and see that they are corrected when detected.

u. Working alone. Avoid working alone in a building; do not work alone in a laboratory if the procedures being conducted are hazardous.

2. The Laboratory Facility

a. Design. The laboratory facility should have:
(1) An appropriate general ventilation system with air intakes and exhausts located so as to avoid re-circulation of contaminated air;
(2) Adequate, well-ventilated stockrooms/storerooms;
(3) Laboratory fume hoods and sinks;
(4) Other safety equipment including eye wash stations and emergency showers; and
(5) Arrangements for waste disposal.

b. Maintenance. Chemical hygiene-related equipment (fume hoods, chemical spill kits, storage cabinets, etc.) should undergo continuing appraisal and be modified or replaced if inadequate.

c. Usage. The work conducted and its scale must be appropriate to the physical facilities available and, especially, to the quality of ventilation.

d. Ventilation.
(1) General laboratory ventilation. This system should: Provide a source of air for breathing and for input to local ventilation devices; it should not be relied on for protection from toxic substances released into the laboratory; ensure that laboratory air is continually replaced, preventing increase of air concentration of toxic substances during the working day; direct air flow into the laboratory from non-laboratory areas and out to the exterior of the building.

(2) Special ventilation areas. Exhaust air from glove boxes and radioactive iodine fume hoods should be passed through scrubbers or other treatment before its release.

(3) Modifications. Any alteration of the ventilation system should be made only if thorough testing indicates that worker protection from airborne toxic substances will continue to be adequate.

(4) Performance. Eight to ten room air changes per hour is normally adequate general ventilation if local exhaust systems such as fume hoods are used as the primary method of control. Doors to the laboratory must be kept closed to ensure correct airflow.

(5) Quality. General air flow should not be turbulent and should be relatively uniform throughout the laboratory, with no high velocity or stagnant air.

(6) Fume Hoods.

(a) The purchase of all laboratory fume hoods requires prior approval by Management.

(b) Airflow into and within the fume hood should not be excessively turbulent; fume hood face velocity should be adequate (typically 80-120 linear feet per minute). Air disturbances at the face of the fume hood should be avoided.

(c) Fume hoods are generally connected to the building exhaust system and do not operate outside normal working hours. Contact the Laboratory Manager to arrange for an extension of operating hours when necessary.

(d) Quality and quantity of ventilation should be evaluated on installation, regularly certified (at least annually), and recertified whenever a change in local ventilation devices is made. Any malfunctions should be reported to the Safety and Health Manager.

(e) Close the fume hood sash when the hood is not in use. Work with the sash at the lowest possible position when using the fume hood.

(f) Fume hoods should be kept clean and uncluttered. Work within the hood at least eight inches back from the front opening.

3. Chemical Procurement, Distribution, and Storage

a. Procurement. Avoid the purchase of unnecessary volumes of chemicals; only order the amount needed. Before a substance is received, information on proper handling, storage, and disposal should be known to those who will be involved.

No container should be accepted without an adequate identifying label. Preferably, all substances should be received in a central location. If a Material Safety Data Sheet has been sent with the package, it should be distributed to the user, and a copy to the Safety and Health Manager.

b. Stockrooms/storerooms. Toxic substances should be segregated in a well-identified area with local exhaust ventilation. Stored chemicals should be examined periodically (at least annually) for replacement, deterioration, and container integrity. Where stockrooms/storerooms exist, these conditions apply: they should not be used as preparation or re-packaging areas, they should be open during normal working hours, and they should be controlled by one person.

c. Distribution. When chemicals are hand carried, the container should be placed in an outside container or bucket. Freight-only elevators should be used if possible.

d. Shipment. Refer shipping questions to the Safety and Health Manager for guidance.

e. Laboratory storage. All incoming containers of hazardous chemicals must have appropriate labels that are not to be removed or defaced. Each container should be labeled as to the date it was received and the date it was opened (as some chemicals form peroxides or other unstable products when stored for relatively short periods of time). Refer to "OSHA List of Hazardous Chemicals" chapter for a list of common laboratory chemicals that may become unstable with time. Amounts permitted should be as small as practical. Storage on bench tops and in fume hoods is inadvisable. Chemicals in the laboratory should be segregated (see "OSHA List of Hazardous Chemicals") and safely stored. Acids, bases, corrosives, and toxics should be separated from one another. Flammable liquids should be kept in NFPA-approved flammable liquid storage. Absolute ethyl alcohol must be stored in locked cabinets. Exposure to heat or direct sunlight should be avoided. Chemicals should not be stored under a sink. Strong acids or bases or unsealed toxic chemicals can be stored in the ventilated base of chemical fume hoods but separation should be provided to prevent cross-mixing. Mild acids and bases such as citric acid and sodium carbonate may be stored with other low-hazard reagents. Open shelves for low-hazard, stable chemicals should be located out of normally traveled routes. The higher shelves should be used for smaller containers of the lowest hazard chemicals. Lecture bottles and full-sized (1A) cylinders of compressed gases will be stored in a ventilated storage area. If gas cylinders are required inside a laboratory, they must be strapped and anchored. The area should have adequate room ventilation to remove leaking gas and easy accessibility for periodic exchange of cylinders.

f. Inventory. The supervisor, or his/her designee, should maintain a list of all hazardous chemicals known to be present in each laboratory and update the list as necessary. Unneeded items should be discarded or identified as surplus (see Section 2, PROPER DISPOSAL OF HAZARDOUS CHEMICAL WASTE). The inventory must identify each hazardous chemical by the primary name on the label and the manufacturer or distributor of the chemical. The inventory must be kept in the laboratory in a suitable format. Substances that are synthesized on Company premises need not be included in this list.

4. Housekeeping, Maintenance, and Inspections

a. Cleaning. Floors should be cleaned regularly.

b. Inspections. Formal housekeeping and chemical hygiene inspections should be held at least quarterly for units which have frequent personnel changes and semiannually for others; informal inspections should be continual.

c. Maintenance. Eye wash stations should be activated for 5-10 minutes on a weekly basis by laboratory personnel. They should be inspected by maintenance personnel at least annually. Emergency showers should be tested by maintenance personnel at least annually. Other safety equipment should be inspected regularly (e.g., every 3-6 months).

d. Passageways. Stairways and hallways should not be used as storage areas. Access to exits, emergency equipment, and utility controls should never be blocked. A minimum of 44 inches must be maintained through all passageways.

5. Protective Apparel and Equipment

a. These procedures, precautions and equipment will be used at all laboratories:

(1) Safety glasses should be worn by everyone who enters an area, including visitors, where chemicals are stored, handled or used. Contact lenses, especially the soft and gas-permeable types, may be hazardous in some laboratory situations. They should be used with caution in laboratories handling chemicals. Contacts have the potential to hold caustic or toxic chemicals on the conjunctiva and may be impossible to remove in an emergency.

(2) Protective apparel compatible with the required degree of protection for substances being handled;

(3) An easily accessible emergency shower;

a. These procedures, precautions and equipment will be used at all laboratories: (continued)

(4) An eye wash station;

(5) A fire extinguisher;

5

(6) Fire alarm and telephone for emergency use should be available nearby; and

(7) Other items designated by the laboratory supervisor.

b. The Company provides respiratory protection for situations where engineering and administrative controls cannot feasibly contain a respiratory hazard.

6. Records

a. Laboratory incident records should be written and retained.

b. Laboratory specific Chemical Hygiene Plan standard operating procedures should be reviewed by the Safety and Health Manager/Safety Committee.

7. Signs and Labels

a. Prominent signs and labels of the following types should be posted:

(1) Emergency telephone numbers of emergency personnel/facilities, supervisors, and laboratory workers;
(4) Identity labels, showing contents of containers (including waste receptacles) and associated hazards;
(5) Location signs for emergency showers, eye wash stations, other safety and first aid equipment, exits and areas where food and beverage consumption and storage are permitted; and
(6) Areas where hazardous materials are handled or stored must be posted with proper hazard warning signs.

8. Spills and Other Laboratory Incidents

a. A written emergency plan should be established and communicated to all personnel; it should include procedures for ventilation failure, evacuation, medical care, reporting, and drills.

b. The supervisor must report all incidents involving hazardous materials which occur within the lab, indicating whether injury or ill health resulted. Incidents occurring in the laboratory must be reported on a Liability Report form.. This form must accompany the person to a Medical Services Clinic.

8. Spills and Other Laboratory Incidents (continued)

c. There should be an alarm system to alert people in all parts of the facility including isolation areas such as walk-in cold rooms.

d. A spill control policy has been be developed and includes consideration of prevention, containment, cleanup, and reporting (see Appendix G).

e. All accidents or near accidents should be carefully analyzed with the results distributed to all who might benefit.

9. Waste Disposal Program

Assure that the plan for each laboratory operation includes plans and training for waste disposal. Indiscriminate disposal of waste chemicals down the drain or by adding them to mixed refuse for landfill burial is unacceptable. See Section 3 of this chapter, "HOW TO PROPERLY DISPOSE OF HAZARDOUS CHEMICAL WASTE". Fume hoods should not be used as a means of disposal for volatile chemicals. Before a worker's employment in the laboratory ends, chemicals for which that person was responsible should be reassigned, properly discarded, or identified as surplus. Disposal by recycling or chemical neutralization should be used when possible. Contact the Safety and Health Manager for details about these procedures for a particular waste.

10. Synthesized Chemicals: If hazardous chemical substances are developed in the laboratory for in-house use, appropriate training should be given to personnel as with any other hazardous chemical. If the chemical produced is a by-product whose composition is not known, it shall be assumed that the substance is hazardous and should be treated in the same manner as other hazardous chemicals.

B. Laboratory Specific Operating Procedures *(Place laboratory specific chemical operating procedures here.)*

II. Reduction of Employee Exposure

Criteria used to determine and implement control measures to reduce employee exposure to hazardous chemicals. These include engineering controls, the use of personal protective equipment and hygiene practices. Particular attention shall be given to the selection of control measures for chemicals that are known to be extremely hazardous.

A. General Requirements

1. Environmental Monitoring: Regular instrumental monitoring of airborne concentrations is not usually justified or practical in laboratories but may be appropriate when testing or redesigning fume hoods or other ventilation devices or when a highly toxic substance is stored or used regularly (e.g., 3 times/week). Monitoring will be conducted if there is reason to believe that exposure levels for that substance routinely exceed the action level. A copy of the results of such monitoring will be sent to the employee and his/her supervisor within 15 days of receipt of the sampling results. The Safety and Health Manager will maintain an official record of the results.

2. Personal protection. Use protective and emergency apparel and equipment appropriate for the procedure and any related hazard.

a. Eye protection. Assure that appropriate eye protection is worn by all persons, including visitors, where chemicals are stored or handled. Contact lenses, especially the soft and gas-permeable types, may be hazardous in some laboratory situations. They should be used with caution in laboratories handling chemicals. Contacts have the potential to hold caustic or toxic chemicals on the conjunctiva and may be impossible to remove in an emergency.

b. Hand protection. Wear appropriate gloves when the potential for contact with toxic materials exists. Select proper glove material based on the substance being handled, the particular hazard involved, and their suitability for the operation being conducted. Inspect gloves for discoloration, punctures and tears before each use. Wash them before removal, and replace them periodically.

c. Respiratory protection. The Safety and Health Manager provides respiratory protection procedures for situations where engineering and administrative controls cannot feasibly contain a respiratory hazard. Anyone whose work may require respirator use should follow the procedures outlined in the Respirator Protection Program. These include hazard evaluation, respirator selection, fitting and training, maintenance, medical surveillance, and program evaluation.

d. Body protection. Laboratory coats or aprons should be worn at all times within the laboratory even if no chemical procedures are being conducted.

B. Laboratory Specific Criteria (*Place laboratory specific criteria for the selection of personal protective equipment for specific chemical procedures, here).*

III. Ventilation Equipment Performance

Protective ventilation equipment such as fume hoods must be properly functioning.

A. General Requirements

1. Chemical fume hoods

a. Certification: The Safety and Health Officer has a program to certify all chemical fume hoods to ensure that they function properly. Quality and quantity of ventilation should be evaluated on installation, regularly certified (at least annually), and recertified whenever a change in local ventilation devices is made. Any malfunctions should be reported to the Safety and Health Officer or local safety authority. Ideally, each fume hood should have a continuous monitoring device to allow convenient confirmation of adequate fume hood performance.

b. Purchase: The purchase of all laboratory fume hoods requires prior approval by the the Safety and Health Officer, or local safety authority.

c. Use: The fume hood is used for operations which might result in release of toxic chemical vapors or dust. As a rule of thumb, use a fume hood or other local ventilation device when working with any volatile substance with a TLV (Threshold Limit Values) of less than 50 parts per million.

d. Work Space: A laboratory fume hood with a minimum of 2.5 linear feet of hood space per person should be provided for every 2 workers if they spend most of their time working with chemicals.

e. Housekeeping: Fume hoods should be kept clean and uncluttered. Keep materials stored in fume hoods to a minimum and do not allow such materials to block vents or air flow.

f. Work Practice: Work within the hood, at least eight inches back from the front opening. Close the fume hood sash when the hood is not in use. Work with the sash at the lowest possible position. Avoid rapid movements at the face of the fume hood.
g. Airflow: Airflow into and within the fume hood should not be excessively turbulent; fume hood face velocity should be adequate (typically 80-120 linear feet per minute).

h. Exhaust: Fume hoods are generally connected to the building exhaust system and do not operate outside normal working hours. Contact the Laboratory Manager to arrange for an extension of operating hours when

necessary. If the fume hood is not connected to the building exhaust system, leave the hood on when it is not in active use if toxic substances are stored in it or if it is uncertain whether adequate general laboratory ventilation will be maintained when it is off.

2. Other ventilation devices. Ventilated storage cabinets, canopy hoods and snorkels should be provided as needed. They are generally connected to the building exhaust system and do not operate outside normal working hours. The Company discourages the use of other types of local ventilation devices such as ductless fume hoods. They can be utilized in a laboratory setting if the chemicals to be used in the fume hood can be effectively captured by the filtration system, if the filtration pack is changed frequently and if the system is properly maintained. These systems should not be used for highly toxic material. Usage of the ductless fume hood is also discouraged because there is no established mechanism to periodically test these units. Therefore, there is no way to determine when the substrate is saturated. Also, the chemical vapor is gradually released into the lab from these filtration substrates, unknowingly exposing the laboratory occupants. All maintenance and upkeep is the responsibility of the user.

Contact the Safety and Health Manager, or local safety authority, for a review of your circumstances before submitting a requisition for this type of equipment. The purchase of all laboratory fume hoods requires prior approval by the Safety and Health Manager, or local safety authority.

B. Laboratory Specific Ventilation Requirements*(Place laboratory specific ventilation requirements, here.)*

IV. Employee Training

A. General Requirements

1. Information and Training Program
    a. Aim: To assure that all individuals at risk are adequately informed about the work in the laboratory, its risks, and what to do if an accident occurs.
    b. Responsibility: It is the responsibility of the supervisor to recognize when training is needed for his/her employees and to arrange for such

training. The supervisor is not responsible to provide any training in the sense that he must develop and present the training program, but rather, the supervisor must recognize the need for training and arrange for his employees to receive it. This training is available in several formats:

(1) A presentation arranged or presented by the local Safety Committee,
(2) A video presentation from the Company library,
(3) A presentation arranged or presented by the Safety and Health
6 Manager, or
7 (4) A presentation arranged or presented by the supervisor.

c. Topics: The training each employee receives shall include all of the following, as they apply to their work area.

(1) OSHA Standard: The contents of the OSHA standard "OCCUPATIONAL EXPOSURES TO HAZARDOUS CHEMICALS IN LABORATORIES" and its appendices;
(2) The Company Chemical Hygiene Plan: The location and availability of the Chemical Hygiene Plan;
(3) Exposure Limits: The permissible exposure limits for OSHA regulated substances or recommended exposure limits for other hazardous chemicals where there is no applicable OSHA standard;
(4) Exposure Symptoms: Signs and symptoms associated with exposures to hazardous chemicals used in the laboratory;
(5) Hazard Reference Materials: The location and availability of known reference material on hazards, safe handling, storage and disposal of hazardous chemicals found in the laboratory including, but not limited to, Material Safety Data Sheets received from the chemical supplier;
(6) Hazard Detection: Methods and observations that may be used to detect the presence or release of a hazardous chemical (such as monitoring conducted by the employer, continuous monitoring devices, visual appearance or odor of hazardous chemicals when being released, etc.);

c. Topics: The training each employee receives shall include all of the following, as they apply to their work area. (continued)

(7) Chemical Hazards: The physical and health hazards of chemicals in the work area; and
(8) Employee Protection: 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.
(9) Emergency and Personal Protection Procedures: Every laboratory worker should know the location and proper use of available protective

apparel and equipment. Some of the full-time personnel of the laboratory should be trained in the proper use of emergency equipment and procedures. Such training as well as first aid instruction should be available to and encouraged for everyone.
(10) Receiving and Stockroom/Storeroom Personnel Protection: Receiving and stockroom/storeroom personnel should know about hazards, handling equipment, protective apparel, and relevant regulations.

d. Frequency of Training: Training should initiate at the time of an employees initial assignment to a work area where hazardous chemicals are present and prior to assignments involving new exposure situations. The training and education program should be a regular, continuing activity--not simply an annual presentation.

e. Literature/Consultation: Literature and consulting advice concerning chemical hygiene should be readily available to laboratory personnel, who should be encouraged to use these information resources. (See Section 6, "TRAINING AIDS AND INFORMATION RESOURCES").

2. Training aids: See SECTION 6 of this Chapter.

B. Laboratory Specific Training Requirements (*Place specific laboratory training requirements here.)*

V. Approval of Laboratory Procedures

The Laboratory Manager/Supervisor should identify circumstances under which a particular laboratory operation, procedure, or activity requires prior approval. The supervisor shall list those activities here. All projects and activities involving hazards at the Company are subject to prior review by the Safety and Health Manager.

VI. Medical Consultation and Examinations

A. General Requirements:

The Company provisions for Medical Consultation and Medical Examinations shall be in accordance with paragraph (g) of the OSHA standard "OCCUPATIONAL EXPOSURES

TO HAZARDOUS CHEMICALS IN LABORATORIES," (29 CFR 1910.1450), reproduced below.

(g) Medical Consultation and Medical Examinations.

(1) The Company shall provide all employees who work with hazardous chemicals an opportunity to receive medical attention, including any follow-up examinations which the examining physician determines to be necessary, under the following circumstances:

(i) Whenever an employee develops signs or symptoms associated with a hazardous chemical to which the employee may have been exposed in the laboratory, the employee shall be provided an opportunity to receive an appropriate medical examination.

(ii) Where exposure monitoring reveals an exposure level routinely above the action level (or in the absence of an action level, the PEL (Permissible Exposure Limits)) for an OSHA regulated substance for which there are exposure monitoring and medical surveillance requirements, medical surveillance shall be established for the affected employee as prescribed by the particular standard.

(iii) Whenever an event takes place in the work area such as a spill, leak, explosion or other occurrence resulting in the likelihood of a hazardous exposure, the affected employee shall be provided an opportunity for a medical consultation. Such consultation shall be for the purpose of determining the need for a medical examination.

(2) All medical examinations and consultations shall be performed by or under the direct supervision of a licensed physician and shall be provided without cost to the employee without loss of pay and at a reasonable time and place.

(3) Information provided to the physician. The employer shall provide the following information to the physician:

(i)The identity of the hazardous chemical(s) to which the employee may have been exposed;

(ii) A description of the conditions under which the exposure occurred including quantitative exposure data, if available

(iii) A description of the signs and symptoms of exposure that the employee is experiencing, if any.

(4) Physician's written opinion.

(i) For examination or consultation required under this standard, the employer shall obtain a written opinion from the examining physician which shall include the following:

(A) Any recommendation for further medical follow-up;
(B) The results of the medical examination and any associated tests;
(C) Any medical condition which may be revealed in the course of the examination which may place the employee at increased risk as a result of exposure to a hazardous chemical found in the workplace; and,
(D) A statement that the employee has been informed by the physician of the results of the consultation or medical examination and any medical condition that may require further examination or treatment.

(ii) The written opinion shall not reveal specific findings of diagnoses unrelated to occupational exposure.

B. Medical Program:

1. Compliance: Regular medical surveillance programs are established to the extent required by regulations. The Safety and Health Manager has the responsibility to administer the medical surveillance programs.

2. Monitoring: Anyone whose work involves regular and frequent use of chemicals that can be harmful to humans (through skin absorption or inhalation) should consult with the Safety and Health Manager, or local safety authority, to determine, on an individual basis, if a regular medical check up is desirable.

Supervisors should give special consideration to the pregnant worker and/or the fetus who may be exposed to hazardous chemicals
Medical monitoring programs currently exist for personnel who work with the following hazardous chemicals/physical agents or in potentially hazardous areas:

(1) asbestos
(2) ethylene oxide
(3) cyanide
(4) pesticides
(5) work requiring the use of a respirator
(6) work requiring the use of hearing protection

3. Responsibility: The Supervisor must ensure that all personnel are aware of hazard(s) and that they will follow appropriate precautions in accordance with Company policies and federal safety and health regulations. The Supervisor must ensure that all appropriate medical precautions recommended by the Safety and Health Manager or the Company physician are followed.

4. First Aid: Personnel trained in first aid should be available during working hours and an emergency room with medical personnel should be nearby.

5. Medical Records: All medical records should be retained by the institution in accordance with the requirements of state and federal regulations.

C. Laboratory Specific Medical Requirements: (*List laboratory specific medical consultations and examinations, here.)*

VII. Personnel Designations

Responsibility for the implementation of the Chemical Hygiene Plan including the assignment of Chemical Hygiene Officers and the establishment of Chemical Hygiene Committees rests at all levels through designated personnel.

A. General Requirements

1. Safety and Health Manager: Ultimately responsible for chemical hygiene within the institution and must, with other administrators, provide continuing support for institutional chemical hygiene.

2. Laboratory Manager: Responsible for chemical hygiene in that unit and the chemical hygiene plan is operative and working.
3. Chemical Hygiene Officers: Responsible for:

a. Working with administrators and other employees to develop and implement appropriate chemical hygiene policies and practices;

b. Monitoring procurement, use, and disposal (including recycling and neutralization) of chemicals used in the lab;

c. Seeing that appropriate audits are maintained;

d. Helping project directors develop precautions and adequate facilities;

e. Knowing the current legal requirements concerning regulated substances; and

f. Seeking ways to improve the chemical hygiene program.

4. Laboratory Supervisor: Responsible for chemical hygiene in the laboratory including,

a. Ensuring that workers know and follow the chemical hygiene rules, that protective equipment is available and in working order, and that appropriate training has been provided;

b. Providing regular, formal chemical hygiene and housekeeping inspections including routine inspections of emergency equipment;

c. Knowing the current legal requirements concerning regulated substances;

d. Determining the required levels of protective apparel and equipment; and

e. Ensuring that facilities, equipment, and training for use of any material being ordered are adequate.

5. Laboratory Worker: Responsible for:

a. Planning and conducting each operation in accordance with the institutional chemical hygiene procedures;

b. Following prescribed safety practices; and

c. Developing good personal chemical hygiene habits.

B. Laboratory Specific Personnel *(List specific personnel responsible for the implementation of the Chemical Hygiene Plan, here.)*

VIII. Particularly Hazardous Substances

A. General Requirements

1. Procedures and Practices

a. Definition: "Particularly hazardous substances" as termed by OSHA include "select carcinogens," reproductive toxins, and substances which have a high degree of acute toxicity. A list of the "select carcinogens" is located in the "OSHA List of Hazardous Chemicals" Chapter. A substance of high acute toxicity is one for which acute or short-term toxicity characterizes the response, e.g. fast-acting substances, irritants, and narcosis producing substances.

Any substance having an oral LD50 in mammals of 50mg or less per kilogram of body weight, an inhalation LC50 in mammals of 100 parts per million (ppm), or a dermal LD50 in mammals of 50mg or less per kilogram of body weight is considered highly toxic.

Examples of substances that are reproductive toxins or have high acute toxicity are located in the "OSHA List of Hazardous Chemicals" Chapter.

b. Designated Areas: Conduct all work and transfers with these substances in a "designated area" - a restricted access fume hood, glove box, or portion of a lab designated for use of highly toxic substances, for which all people with access are aware of the substances being used and necessary precautions. Use and store these substances only in areas of restricted access with special warning signs.

Always use a fume hood (previously evaluated to confirm adequate performance with a face velocity of 80-120 linear feet per minute) or other containment device for procedures which may result in the generation of aerosols or vapors containing the substance; trap released vapors containing the substance; trap released vapors to prevent their discharge with the fume hood exhaust.

c. Personal Protection: Always avoid skin contact by using the proper gloves and long sleeves, and other appropriate protective apparel. Always wash hands immediately after working with these materials.

d. Prevention of Spills and Incidents: Be prepared for accidents and spills. Assure that at least two people are present at all times if a compound in use is highly toxic or of unknown toxicity.

Store breakable containers of these substances in chemically resistant trays, work and mount apparatus above such trays, or cover work and storage surfaces with removable, absorbent, plastic backed paper.

If a major spill occurs outside the fume hood, evacuate the area and contact the Safety and Health Manager or the local safety authority.

e. Non-contamination/Decontamination: Protect vacuum pumps against contamination by scrubbers or HEPA filters and vent them into the fume hood. Decontaminate vacuum pumps or other contaminated equipment, including glassware, in the fume hood before removing them from the designated area. Decontaminate the designated area before normal work is resumed there.

f. Medical Monitoring: If using toxicologically significant quantities of such a substance on a regular basis (e.g. 3 times per week), consult the Company physician concerning desirability of regular medical surveillance.

g. Signs and Labels: Assure that the designated area is conspicuously marked with warning and restricted access signs and that all containers of these substances are appropriately labeled with identity and warning labels.

h. Spills: Assure that contingency plans, equipment, and materials to minimize exposures of people and property are available in case of accident.

i. Storage: Store containers of these chemicals only in a ventilated, limited access area in appropriately labeled, unbreakable, chemically resistant, secondary containers.

j. Glove Boxes: For a negative pressure glove box, the ventilation rate must be at least 2 volume changes/hour and pressure at least 0.5 inches of water. For a positive pressure glove box, thoroughly check for leaks before each use. In either case, trap exit gases or filter them through a HEPA filter and then release them into the fume hood.

k. Waste: See Section 2 of this manual, " PROPER DISPOSAL OF HAZARDOUS CHEMICAL WASTE".

2. Working with Allergens and Embryotoxins

a. Allergens (examples: diazomethane, isocyanates, bichromates): Wear suitable gloves to prevent hand contact with allergens or substances of unknown allergic activity. Wear other protective apparel and equipment, such as respirators, as appropriate.
b. Embryotoxins (examples: organomercurials, lead compounds, formamide): Women of child bearing age should handle these substances ONLY in a fume hood whose satisfactory performance has been confirmed. Appropriate protective apparel must be worn (especially gloves) to prevent skin contact.

Review each use of these materials with the research supervisor and review the continuing uses annually or whenever a procedural change is made.

Store these substances, properly labeled, in an adequately ventilated area in an unbreakable secondary container.

Notify supervisors of all incidents of exposure or spillage and consult the Company physician when appropriate.

B. Laboratory Specific Operating Procedures: *(Place laboratory specific operating procedures for working with particularly hazardous substances, here.)*

Disposal of Hazardous Chemical Waste

The Hazardous Chemical Waste Disposal Program at the Company operates in accordance with the Resource Conservation and Recovery Act (RCRA) and the 1984 Hazardous and Solid Waste Amendments to RCRA.

Hazardous chemical wastes generated at the Company are collected and packed by a licensed hazardous waste contractor. The waste is collected from labs, shops, or other work areas and is transported to the predesignated hazardous waste storage areas. The waste is segregated and stored in the storage areas until it is packed for shipment and transported to a final permitted recycling, treatment, or disposal facility. In accordance with RCRA and the Federal Facilities Compliance Act, all Company personnel who handle hazardous waste must receive training in specific aspects of hazardous waste management procedures. This training is provided by the Safety and Health Manager. Individuals who have met this training requirement may request disposal of their hazardous chemical waste by completing the appropriate "Hazardous Chemical Waste Disposal Label" and attaching it to the container of waste. The information contained on the label includes:

1. Date form completed
2. Source (name, location, organization, phone number)
3. Constituents
4. Container size and approximate amount disposed

The information on the label will be verified by the Laboratory Manager, and is passed on to the chemical waste disposal contractor who makes arrangements with the generator of the waste to pick up the waste. Under the current hazardous chemical waste contract, the contractor conducts pickups one day per _____ .

For more information regarding hazardous chemical waste disposal, contact the Safety and Health Manager, at phone number _____ ..

Ladder Safety

Purpose:

Ladders present unique opportunities for unsafe acts and unsafe conditions. Employees who use ladders must be trained in proper selection, inspection, use and storage. Improper use of ladders has cause a large percentage of accidents in the workplace are of accidents. Use caution on ladders. OSHA reference: (29 CFR 1910.25, 1910.26, and 1910.27).

Hazards:

Falls are the primary hazard associated with the use of ladders. Falls result from a number of unsafe acts and conditions such as:

1) Ladders being set on unstable surfaces.
2) Personnel reaching too far out to the sides.
3) Personnel standing too high to maintain balance.
4) Personnel using defective ladders (e.g., broken rails, rungs, missing hardware).

These hazards are minimized if workers adhere to proper ladder safety practices and if supervisors ensure equipment is used, inspected, and maintained in good condition. Tasks which require frequent use of ladders and involve significant climbing effort must be accomplished by workers capable of the physical exertion required under these conditions.

Procurement:

Portable ladders procured for the Company shall meet the design and construction specification of OSHA 29 CFR 1910.25 for wood ladders and 29 CFR 1910.26 for

metal ladders. Portable ladders constructed of reinforced plastic shall meet the specifications of ANSI A14.5-1974.

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

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

(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 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.

(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 75½ degrees from the horizontal.

(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 at least 250 pounds (114 kg) applied in the middle of the step or rung.

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

(3)

(i) Rungs, cleats, and steps of portable ladders (except as provided below) and fixed adders (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.

(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.

(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.

(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).

(ii) The minimum clear distance between side rails for all portable ladders shall be 11½ inches (29 cm).

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

(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.

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

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

(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.

(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.

(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.

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

(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.

(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 4½ inches (11 cm) is required.

(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.

(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.

(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.

(17) Fixed ladders without cages or wells shall have a clear width to the nearest permanent object of at least 15 inches (38 cm) on each side of the centerline of the ladder.

(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.

(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:

(i) Ladder safety devices; or

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

(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).

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

(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;

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

(iii) Cages shall extend not less than 27 inches (68 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;

(iv) The inside of the cage shall be clear of projections;

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

(vi) Vertical bars shall be spaced at intervals not more than 9½ inches (24 cm) on center horizontally;

(vii) The bottom of the cage shall be at a level not less than 7 feet (2.1 m) nor more 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;

(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.

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

(i) They shall completely encircle the ladder;

(ii) They shall be free of projections;

(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;

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

(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.

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

(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;

(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;

(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;

(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.

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

(i) Mountings for rigid carriers shall be attached at each 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.

(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.

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

(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.

(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).

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

(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.

Use of Ladders:

The following requirements apply to the use of all ladders, including job-made ladders, except as otherwise indicated. The correct procedures for using ladders are as follows

(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.

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

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

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

(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).

(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.

(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.

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

(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.

(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.

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

(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.

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

(12) Ladders shall have nonconductive siderails if they are used where the employee or the ladder could contact exposed energized electrical equipment.

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

(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.
(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.
(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.
(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:

(i) Immediately tagged with "Do Not Use" or similar language.
(ii) Marked in a manner that readily identifies it as defective;
(iii) Or blocked (such as with a plywood attachment that spans several rungs).

(18) Ladder repairs shall restore the ladder to a condition meeting its original design criteria, before the ladder is returned to use.
(19) Single-rail ladders shall not be used.
(20) When ascending or descending a ladder, the user shall face the ladder.
(21) Each employee shall use at least one hand to grasp the ladder when progressing up and/or down the ladder.
(22) An employee shall not carry any object or load that could cause the employee to lose balance and fall.

Care of Ladders:

a) Handle ladders with care. Do not drop, jar or misuse them.
b) Ladders shall be stored in a manner that will provide easy access for inspection and will permit safe withdrawal for use. They shall not be stored in a manner that presents a tripping hazard not where they can fall on someone. They should be stored in a manner that will prevent sagging.
c) Lubricate metal bearings of locks, wheels, pulleys, etc., as required to keep them working.
d) Replace frayed or badly worn rope.
e) Keep safety feet and other parts in good condition to ensure they work.
f) Maintain ladders in good usable condition. Inspect ladders prior to use.
g) Ladders with defects which cannot be immediately repaired, shall be removed from service for repair or destruction, and shall be tagged with a danger tag. Do not attempt to straighten or use a bent ladder made of reinforced plastic.
h) Rungs or steps on metal ladders that are not corrugated, knurled, or dimpled will have skid-resistant materials applied.

Landscape and Grounds Maintenance

Policy:

Landscape and Grounds Maintenance involves the use of various sizes and types of lawnmowers, grass/weed cutting tools, edgers, hedge clippers and other hand tools. The most significant dangers are being struck by the blade or a foreign object thrown by the high speed blades and noise-inducted hearing loss.

Procedures:

1. Personal Protective Equipment and Safeguards

    Workers shall wear face shields or safety goggles or glasses with side shields, safety-toe boots, and hearing protection during the operation of all lawn mowers. Gloves may be worn when using walk-behind mowers. Bump caps should be worn when using a riding or towed mower around tall brush and low handing tree limbs. All mower discharge chutes shall be guarded with shields or approved grass catchers to deflect or stop foreign objects during operation.

2. Operating Practices Applicable to Push, Self-Propelled, and Riding Mowers

    a. Operators shall be trained and qualified to operate the different type(s) of mowers available. Manufacturer's instructions and operating procedures shall be followed.

    b. Prior to mowing, operators shall clear the area to be mowed of all people and inspect for foreign objects, raised sprinkler heads, holes, soft ground, and obstructions.

    c. Mowers shall not be left running unattended. For riding mowers, the engine shall be shut off and all drives disengaged prior to getting off the mower. No riders are

permitted on riding lawn mowers. The engine on push and self-propelled mowers shall be turned off while moving to another job location or while passing over curbs, loose gravel, or other similar obstructions. Power to attachments shall be disengaged on riding or towed mowers while passing over similar obstructions and when travelling over unobstructed areas and roads on the way to the next job site or return to the shop.

d. Mower blades cutting height should normally be set as near to 2 inches as possible. Blades shall never be set lower than 1 ½ inches.

2. Operating Practices Applicable to Push, Self-Propelled, and Riding Mowers (continued)

e. When mowing hills and slopes, operators shall know the special precautions to follow. Slopes, hills, or banks exceeding a 30 degree angle shall be mowed with a push or self-propelled walk-behind mower in a horizontal (across) direction.

f. Electric hedge clippers shall be inspected, cleaned, oiled, and sharpened as required when in use. A grounded power cord shall be used if the tools is not double insulated. The cord shall be inspected before use and daily for condition. The cord shall be kept away from the cutting surface and out from under the feet of the operator. The cutting teeth of the clipper shall not be pointed toward the body of the operator. The unit shall be shut off and unplugged while moving from job to job. Gloves shall be worn when operating hedge clippers. No electric power tool shall be operated in rain, sprinklers, or any kind of precipitation.

3.General Rules for Maintaining Lawn Care Equipment

a. Always refuel with engines off and allow the engine to cool first. Do not permit smoking in the area. Refuel mowers prior to use versus refueling prior to storing inside a building. Complete refueling outside, at least 10 feet away from the building or any open flame.

b. Use boards or ramps to load and unload mowers from vehicles ensuring the engine is off and the spark plug wire is disconnected. Always shut off the fuel supply line when parking mowers inside or outside at the end of the day. As storage space permits, leave 1 to 3 feet separation space between parked gasoline-operated riding mowers.

c. Clean mowers or perform other maintenance on mowers only after turning engine off and disconnecting the spark plug wire.

d. Use manufacturer’s guidelines for operation and use of mowers.

4.Tractor Operations

a. Roll-over protective structures (ROPS) are required on tractors used for landscape maintenance. Seat belts shall be installed on all ROPS-equipped tractors and used whenever the vehicle is in motion.

b. When pulling a load, operators shall hitch only to the draw bar. The draw bar hitch shall be kept at least 13 inches, but less than 17 inches, off the ground.

4. Tractor Operations (continued)

c. When moving a front load, the load shall be kept low to the ground and the rear wheels as level as possible.

d. Operators shall avoid holes and obstacles; both on the ground and overhead. Speed shall be reduced with heavy loads when vision is limited or when operating on rough terrain.

e. When stuck, operators shall try carefully to back out. Increasing engine speed or fastening a post to the rear wheels greatly increases the chances of tipping over backward; therefore, these methods shall not be used. Operators shall get help if needed.

f. Grass shall not be mowed with a tractor on slopes greater than a 4-inch rise or drop per foot of travel. Lower gears shall be used when going down hill and the wheels shall be allowed to control the tractor speed.

g. The engine shall be shut off before the operator dismounts from the tractor or makes adjustments to either the tractor or towed equipment.

h. Riders shall not be allowed on tractors, on the draw bar, or on towed equipment, except where the equipment is specifically designed to allow riders or passengers.

i. Fenders are guards for the worker’s protection. Fenders shall be kept in place at all times.

j. Tractors shall only be left on an incline after the engine has been turned off, gear shift has been placed in park position (or the lowest gear if standard transmission), and the wheels have been braked and blocked. Where possible, tractors shall be parked on level ground.

k. The power take-off guard shall always be in place.

l. Hearing protection and safety-toe shoes shall be worn by the operator, when required. The Safety and Health Manager should be consulted to determine the need for respiratory protection.

5. Flower Bed and Shrub Maintenance

a. Workers shall wear clothing and gloves that will protect their hands and arms from thorns and leaves which may cut or puncture the skin. Dust masks may be required to prevent reactions to fine dust or pollen. Personnel shall not work on flower or shrub beds within 24 hours after application of herbicides.

b. Shovels, hoes, and cultivators shall be kept sharp, used in moist soil, and placed where stepping on the cutting surface will not cause the handle to strike a person.

6. Fertilizer Storage and Handling

a. Fertilizer can become a very combustible material and, at temperatures in excess of 130 degrees F, it may explode. When fertilizers become wet and start to decompose, they give off a gas that will burn. Some fertilizers give off a very toxic gas when burning. No more than 2,500 tons of fertilizer shall be stored in a building unless that building is equipped with an automatic sprinkler system.

b. When spreading fertilizer, pellets shall not be directed toward other personnel. If personnel enter the area, the spreader shall be turned off. Fertilizer spreaders shall be cleaned and lubed daily. Safety glasses and gloves shall be worn during fertilizing spreading operations.

7. Herbicides

The use of herbicides for weed control poses a significant potential safety and health hazard. Herbicides shall be applied per manufacturer’s instructions and used only by certified personnel. Due to the absorption properties of herbicides, coveralls shall be worn during application, in addition to safety goggles and appropriate respiratory protection, as required.

Machinery & Machine Guarding Safety

Policy:

All mechanical motion is potentially hazardous. Motion hazards, such as rotating devices, cutting or shearing blades, in-running nip points, reciprocating parts, linear moving belts and pulleys, meshing gears, and uncontrolled movement of failing parts, are examples of motion and peculiar to any one machine or job operation. Personnel working within areas where they are exposed to machinery or equipment hazards must be aware of the potential for accidents. Machine operators and others are exposed to moving parts and can get clothing or body parts caught in the machinery.

Personnel Training:

Personnel will be trained to:

1. Safely operate each machine they will be required to use

2. To recognize potential accident producing situations, and

3. To know what to do when hazards are discovered.

Only personnel who have been thoroughly trained, or those who are undergoing supervised on-the-job training on the equipment, will be permitted to operate machinery.

Personal Protective Equipment:

Eye protection or face shields will be worn by all personnel within areas where machines are operated.

Loose fitting clothing, neckties, rings, bracelets, or other apparel that may become entangled in moving machinery will not be worn by machine operators or their helpers.

Hair nets or caps will be worn to keep long hair away from moving machinery.

Gloves will not be worn where there is a chance of them being caught in machinery.

Ear plugs or muffs will be used when required for worker protection.

The Safety and Health Manager should be contacted to assist Supervisors in determining personnel protective equipment needs.

Environmental:

Machines designed for fixed locations will normally be securely fastened to the floor or other suitable foundation to eliminate all movement or "walking." Machines equipped with rubber feet, non-skid foot pads, or similar vibration dampening materials will be installed according to the manufacturer's recommendations.

Machines that have the potential of tipping or falling over will be firmly secured.

Machines that develop fine dust and fumes will be equipped with effective exhaust hoods, connected to an effective exhaust system. An interlocking device should be installed to link the machine's power supply and the exhaust system to prevent the operation of machines without the exhaust system operating.

Machines will never be left unattended with the power on unless the worker is operating more than one machine in a battery of machines. In this latter instance, the clear zone will be appropriately marked to include all machines in the group.

No attempt will be made to clean any part of a machine until the moving parts have come to a complete stop. Chips will not be removed from machinery by hand. Hand brushes should be used but compressed air may be used when reduced to less than 30 psi and then only with effective chip guarding and personal protective equipment.

Brushes, swabs, lubricating rolls, and automatic or manual pressure guns will be used by operators to lubricate material, punches, or dies. This equipment will be used so that operators are not required to reach into the point of operation or other hazardous area.

Housekeeping:

Floors will be kept in good repair and free of chips, dust, metal scraps, and other slipping and tripping hazards.

Waste containers will be emptied daily or more often, if necessary, to prevent excessive waste accumulations.

All materials, including usable scrap, will be stored so that they will not present a hazard.

Drip pans will be used whenever equipment must be oiled. Machinery will not be in motion when being lubricated unless lubrication is automatic or a long gravity flow spout is used, enabling the oiler to remain in the clear while performing this task.

Material Handling:

Trucks used for scrap disposal will not be overloaded, and scrap will not extend beyond the ends or sides of trucks.

When materials are of a weight or size which makes manual lifting hazardous, mechanical handling equipment will be used.

Maintenance and Repair:

When maintenance or repair is needed, machines will be completely shut down and the control switch(es) locked and tagged in the "OFF" position.

Cutting tools will be kept sharp and forming tools well dressed and free from accumulations of chips, dust, and other foreign matter. Where two or more cutting tools are used in one cutting head, they will be properly adjusted and balanced.

Damaged cutting tools will be removed from service and will not be used until repaired.

Machine Usage:

Machines will be used only for work within the rated capacity specified by the machine manufacturer.

Machines will be maintained so that while running at full or idle speed, with the largest cutting tool attached, they are free of excessive vibration.

Machines will be completely stopped before attempting to clear jammed work or debris.

No saw blade, cutter head, or tool collar will be placed or mounted on a machine arbor, unless it has been accurately sized and shaped to fit the arbor.

Electrical Safeguards:

The motor "START" button will be protected against accidental/inadvertent operation. "START" buttons will not be wedged for continuous operation.

The wiring and grounding of machinery will be in accordance with the National Electric Code.

Each machine will have a positive electrical disconnect or isolation switch which can be locked out.

Electrically driven machines will be equipped with undervoltage protective systems to preclude automatic restart after either a power failure or other undervoltage condition.

Machine Controls:

Foot pedal mechanisms will be located and guarded so that they cannot be activated by falling objects or other accidental means. A pad with a non-slip contact area will be firmly attached to the pedal.

Controls will be available to the workers at their operating positions so that they do not reach over moving parts of the equipment. Control functions will be identified by printed words and color coding. Controls will not be wedged for continuous operation.

Power controls must have a way of locking out electrical power. Disconnecting or isolating switches will be mounted on a visible side of, or near, the machine and will be used to lock out power to the machine during repairs or adjustments. When the power is locked out, the isolating switch will be tagged.

Machine Guards

Purpose

The Machine Guard Program is designed to protect Employees from hazards of moving machinery. All hazardous areas of a machine shall be guarded to prevent accidental "caught in" situations. References: General Requirements for all Machines (29 CFR 1910.212), Woodworking Machinery (29 CFR 1910.213), Abrasive Wheels (29 CFR 1910.215), Power Presses (29 CFR 1910.217), Power Transmission (29 CFR 1910.219).

Many accidents are caused by machinery that is improperly guarded or not guarded at all. Important factor that must be kept in mind relative to machinery guarding is that no mechanical motion that threatens a worker's safety should be left without a safeguard.

The following areas of machinery will be provided with barriers and/or enclosures that will effectively prevent personnel from coming in contact with moving components:

a) Point of operation exposures such as blades, knives and cutting heads.
b) Power transmission exposures such as belts, pulleys, shaft, gears, etc.
c) Top, bottom and backside exposures, such as the underside of table saws and the wheels on band saws.
d) When a point-of-operation guard cannot be used because of unusual shapes or cuts, jigs or fixtures which will provide equal safety for the operator will be used.
e) Upon completion of an unusual operation, the guard will be immediately replaced.

Whenever a guard is removed for other than an operational requirement, the machine will be shut down and the control switch(es) locked and tagged in the "OFF" position.

Guards will be affixed to the machine. Where possible, the guards will be of the hinged type to enhance maintenance or adjustments.

Responsibilities

Management

Ensure all machinery is properly guarded

Provide training to employees on machine guard rules

Ensure new purchased equipment meets the machine guard requirements prior to use

Supervisors

Train assigned employees on the specific machine guard rules in their areas

Monitor and inspect to ensure machine guards remain in place and functional

Immediately correct machine guard deficiencies

Employees

Do not remove machine guards unless equipment if locked and tagged

Replace machine guards properly

Report machine guard problems to supervisors immediately

Do not operate equipment unless guards are in place and functional

Only trained and authorized employees may remove machine guards

Definition of Terms

1. Guards: Barriers that prevent Employees from contact with moving portions or parts of exposed machinery or equipment which could cause physical harm to the Employees.

2. Enclosures: Mounted physical barriers which prevent access to moving parts of machinery or equipment.

3. Point-of-Operation: The area on a machine or item of equipment, where work is being done and material is positioned for processing or change by the machine.

4. Power Transmission: Any mechanical parts which transmit energy and motion from a power source to the point-of-operation. Example: Gear and chain drives, cams, shafts, belt and pulley drives and rods. NOTE: Components which are (7) feet or less from the floor or working platform shall be guarded.

5. Nip Points: In-Running Machine or equipment parts, which rotate towards each other, or where one part rotates toward a stationery object.

6. Shear points: The reciprocal (back and forth) movement of a mechanical part past a fixed point on a machine.

7. Rotating Motions an exposed mechanism are dangerous unless guarded. Even a smooth, slowly rotating shaft or coupling can grasp clothing or hair upon contact with the skin and force an arm or hand into a dangerous position. Affixed or hinged guard enclosure protects against this exposure.

8. Reciprocating: Reciprocating motions are produced by the back and fourth movements of certain machine or equipment parts. This motion is hazardous, when exposed, offering pinch or shear points to an Employee. A fixed enclosure such as a barrier guard is an effective method against this exposure.

9. Transverse Motions: Transverse motions are hazardous due to straight line action and in-running nip points. Pinch and shear points also are created with exposed machinery and equipment parts operating between a fixed or other moving object. A fixed or hinged guard enclosure provides protection against this exposure.

10. Cutting Actions: Cutting action results when rotating, reciprocating, or transverse motion is imparted to a tool so that material being removed is in the form of chips. Exposed points of operation must be guarded to protect the operator from contact with cutting hazards, being caught between the operating parts and from flying particles and sparks.

11. Shearing Action: The danger of this type of action lies at the point of operation where materials are actually inserted, maintained and withdrawn. Guarding is accomplished through fixed barriers, interlocks, remote control placement (2 hand controls), feeding or ejection.

Machine Guarding Requirements

1. Guards shall be affixed to the machine where possible and secured.

2. A guard shall not offer an accident hazard in itself.

3. The point-of-operation of machines whose operation exposes an Employee to injury shall be guarded.

4. Revolving drums, barrels and containers shall be guarded by an enclosure which is interlocked with the drive mechanism.

5. When periphery of fan blades are less than 7 feet above the floor or working level the blades shall be guarded with a guard having openings no larger than 1/2 inch.

6. Machines designed for a fixed location shall be securely anchored to prevent walking or moving. For example; Drill Presses, Bench Grinders, etc.

General Requirements for Machine Guards

1. Guards must prevent hands, arms or any part of an Employees body from making contact with hazardous moving parts. A good safeguarding system

eliminates the possibility of the operator or other Employees from placing parts of their bodies near hazardous moving parts.

2. Employees should not be able to easily remove or tamper with guards. Guards and safety devices should be made of durable material that will withstand the conditions of normal use and must be firmly secured to the machine.

3. Guard should ensure that no objects can fall into moving parts. An example would be a small tool which is dropped into a cycling machine could easily become a projectile that could and injure others.

4. Guard edges should be rolled or bolted in such a way to eliminate sharp or jagged edges.

5. Guard should not create interference which would hamper Employees from performing their assigned tasks quickly and comfortably.

6. Lubrication points and feeds should be placed outside the guarded area to eliminate the need for guard removal.

Training

All Employees shall be provided training in the hazards of machines and the importance of proper machine guards. Machine safety and Machine guarding rules will be thoroughly explained as part of the new hire orientation program and annually as refresher safety training.

Motor Vehicle Operation

Policy:

Vehicles are to be operated in a safe manner consistent with local, state and federal laws. All accidents must be reported promptly according to procedures outlined below. The use of vehicles is limited to necessary Company business.

Personnel permitted to drive vehicles (e.g. Company automobiles, delivery vehicles, trucks, forklifts, tractors, loaders, back hoes, bobcats, mowers, etc.) must demonstrate the knowledge and ability to operate the equipment safely to the satisfaction of a qualified examiner.

Responsibilities:

a. Driver's Supervisor

1. Ensures that employees under his/her supervision who drive vehicles possess a valid state driver's license.

2. Ensures that vehicles are used only for official Company business and carries only Company employees who are authorized passengers.

3. Ensures all operators of powered industrial trucks are properly trained in the operation of the vehicles.

4. Ensures all vehicle drivers have the necessary medical examinations to ensure that the driver is physically qualified to operate the equipment.

5. Regularly inspects vehicles and vehicle systems.

b. Employee

1. Carries the required, valid state driver's license

2. Inspects daily the vehicle before it is used. Items to be checked should include the forks, batteries, wheels, cables, lights, horns, back-up alarm, mirrors, steering, brakes, tires and controls.

3. Reports any defects or malfunctions to the supervisor immediately. Does not use a malfunctioning vehicle if the defect impairs the safe operation or use of the vehicle.

4. Operates equipment safely and in accordance to operating instructions.

5. Wears appropriate protective equipment at all times.

c. Safety and Health Manager

1. Maintains with the Supervisor, records of employee qualification tests.

2. Assists, when necessary, in selection and designation of jobs which require powered industrial trucks.

3. Periodically and routinely inspects vehicles and vehicle operations.

4. Coordinates with the supervisor, training programs for use and operation of the vehicles.

General Requirement:

a. The examiner will administer a driving test to each prospective operator.

b. The operator is required to:

1. Point to and explain the following controls: lift, tilt, forward and reverse gears.

2. Perform all driving and loading/unloading maneuvers deemed necessary by the examining official.

c. Upon satisfactory completion of the test procedures, a permit card shall be signed by the examiner and motor vehicle licensing official. The permit shall be valid as long as health requirements and safe operating techniques are met.

Operating Rules and Practices:

a. Safeguard pedestrians at all times. Do not drive a truck up to anyone standing in front of a stationary or fixed object (e.g., a bench or parked vehicle).

b. Do not allow anyone to stand or pass under the elevated portion of any truck or lift.

c. Unauthorized personnel shall not be permitted to ride on or operate powered industrial trucks.

d. Never allow anyone to ride the forks, while the vehicle is in motion, or to lift them to a higher level except with a personnel platform.

Operating Rules and Practices: (continued)

e. Do not put arms or legs between the uprights of the mast or outside the running lines of the truck.

f. When leaving a powered industrial truck unattended, lift platform shall be fully lowered, controls shall be neutralized, power shut off, brakes set, key or connector plug removed. Block wheels if truck is parked on an incline.

g. When you park the machine, lower the forks so they are flat on the ground.

h. Maintain a safe distance from edge or ramps or platforms.

i. Be sure of sufficient head room under overhead installations, lights, pipes, sprinkler systems, etc.

j. Use an overhead guard as protection against falling objects.

k. Use a load backrest extension whenever necessary to minimize the possibility of the load or part of it falling rearward.

l. Report to supervisor all accidents involving personnel, building structures, and equipment.

m. Obey all safety signs and markers.

n. Never exceed trucks' rated capacity.

o. Never travel with load above five feet.

p. Avoid sudden stops and starts when loaded.

q. Do not use fork extensions.

Use of Powered Mowers, Tractors, etc.

a. Operation is limited to qualified operators approved for use of specific equipment. Equipment may also be used by supervised individuals who are training for certification.

a. Equipment operators must wear approved safety shoes, and, as appropriate, eye and hearing protection.

Motor Vehicle Accident:

a. In cases of accident:

1. Stop immediately.

2. Take steps to prevent another accident at the scene.

3. Call a doctor or ambulance, if necessary.

4. Notify police.

5. DO NOT sign any paper or make any statement as to who was at fault (except to your supervisor or to a Federal Government investigator).

6. Obtain the name and address of each witness.

7. Provide your name, address, place of employment, name of your supervisor, and upon request, show your operator's permit.

8. Make notes of the following:

a. Registration information for other vehicle(s) (owner's name, tag number and state, serial number, and vehicle description).

b. Information on other driver (name, address, operator's permit number, and expiration date).

c. Name and address of each person involved and extent of injury, if any.

d. Name and address of company insuring other vehicle(s).

e. General information such as location, time, measurements, weather, damage, etc.

9. As soon as possible, notify your supervisor and, if driving an interagency motor pool vehicle, the manager of the pool which issued the vehicle.

10. If the vehicle is unsafe to operate, have it towed to the nearest garage or service station.

11. If you are injured, notify the Safety and Health Manager.

12. Submit all reports and data to your supervisor within one working day.

13. If you are injured have the police notify your supervisor who will assume your responsibilities for reporting the accident.

100 Hour Maintenance Inspection:

The following items must be checked on a 100 hour maintenance inspection schedule by a qualified mechanic.

A. Steering and horn – check free play – ease of handling horn operation.
B. Brakes – check brake power.
C. Tires – remove all foreign matter from tires.
D. Hoist cylinder – check for leaks and wear – clean off.
E. Tilt cylinder – check for leaks and wear – clean off.
F. Hydraulic oil – check dipstick – add oil, if necessary.
G. Forks – check for cracked or bent forks.

H. Battery – check water level.
I. Acceleration control – check speed – time delay- general operation.
J. Wires and terminals – check and tighten.
K. Lubricate – as specified on lubrication chart.
L. Hoist motor – check brush wear.
M. Drive motor – check brush wear.
N. Controller – check contact tips – switches.

Office Safety

Policy:

All work performed in Company offices and administrative areas will be conducted using safe work practices. Office and administrative areas will be maintained free of recognized hazard

Purpose:

The office is like any other work environment in that it may present potential health and safety hazards. Most of these, however, may be minimized or eliminated by designing jobs and workplaces properly, and by taking into account differences among tasks and individuals.

Inadequate environmental conditions, such as noise, temperature, and humidity, may cause temporary discomforts. Environmental pollutants such as chemical vapors released from new carpeting and furniture may also induce discomforts.

Responsibility:

a. Office Supervisor

1.The ultimate responsibility for office safety rests with the office supervisor. All work hazards must be anticipated and appropriate safeguards utilized.

2. Ensures all employees are properly trained and instructed in safe office practices and aware of all hazards associated with their work.

b. Employees

1. Follows the Company's health and safety policies and instructions of the responsible Office Supervisor and the Safety and Health Manager.

2. Brings to the attention of the Office Supervisor and/or Safety and Health Manager potential hazardous situations.

c. Safety and Health Manager

1. Assists Office Supervisors in correcting hazardous situations and designating safe working practices.

1. Periodically inspects all office facilities to ensure compliance with existing Company policy.

Procedure:

The Company will ensure all employees work in an environment that is comfortable to work in. With this in mind, the following topics will be addressed and policies relating to each will be conducted:

Noise
Electrical Safety
Housekeeping
Waste Disposal
Video Monitors and Computer Typing
Lighting
Indoor Air Quality

Noise:

A. Effects of Noise

Noise can be defined very simply as unwanted sound. Whether a sound is classified as noise or not depends mostly on personal preferences. For noise levels in offices, the most common effects are interference with speech communication, annoyance, and distraction from mental activities. Noise in the office can interfere with communications. For example, it may be difficult to talk on the telephone when other people are talking nearby. Speech is likely to interfere with communications especially if the speakers have similar voices.

The annoying effect of noise can decrease performance or increase errors in some task situations. If the task requires a great deal of mental concentration, noise can be detrimental to performance. Also, there is some indication that unexpected or unpredictable noise can have more of an effect than continuous or periodic noise. The annoyance caused by noise also depends on the individual.

Noise can also be distracting. A sudden noise can interrupt activity temporarily, such as when someone drops a heavy object.

B. Reducing Noise

Many unexpected noises cannot be controlled, as when someone accidentally drops something. For many of the annoying sounds in the office environment, the following measures are useful for reducing the level of noise or its effects:

- Select the quietest equipment if possible. When there is a choice between two or more products, sound levels should be included as a consideration for purchase and use.

B. Reducing Noise (continued)

- Provide proper maintenance of equipment, such as lubrication and tightening of loose parts that can cause noise.
- Locate loud equipment in areas where its effects are less detrimental. For example, place impact printers away from areas where people must use the phone.
- Use barrier walls or dividers to isolate noise sources. Use of buffers or acoustically-treated materials can absorb noise that might otherwise travel further. Rubber pads to insulate vibrating equipment can also help to reduce noise.
- Enclose equipment, such as printers, with acoustical covers or housings.
- Schedule noisy tasks at times when it will have less of an effect on the other tasks in the office.

Electrical Safety:

Electric cords should be examined on a routine basis for fraying and exposed wiring. Attention should be paid to connections behind furniture, since files and bookcases may be pushed tightly against electric outlets, severely bending the cord at the plug.

A. Use of Extension Cords

- •Extension cords shall only be used in situations where fixed wiring is not feasible.
- •Extension cords shall be kept in good repair, free from defects in their insulation. They will not be kinked, knotted, abraded, or cut.
- •Extension cords shall be placed so they do not present a tripping or slipping hazard.
- •Extension cords shall not be placed through doorways having doors that can be closed, and thereby damage the cord.
- •All extension cords shall be of the grounding type (three conductor).

Housekeeping:

Good housekeeping is an important element of accident prevention in offices.

Poor housekeeping may lead to fires, injuries to personnel, or unhealthful working conditions. Mishaps caused by dropping heavy cartons and other related office equipment and supplies could also be a source of serious injuries to personnel.

Passageways in offices should be free and clear of obstructions. Proper layout, spacing, and arrangement of equipment, furniture, and machinery are essential.

Housekeeping: (continued)

All aisles within the office should be clearly defined and kept free of obstructions.

Chairs, files, bookcases and desks must be replaced or repaired if they become damaged. Damaged chairs can be especially hazardous. Filing cabinet drawers should always be kept closed when not in use. Heavy files should be placed in the bottom file drawers.

Materials stored within supply rooms must be neatly stacked and readily reached by adequate aisles. Care should be taken to stack materials so they will not topple over. Under no circumstances will materials be stacked within 18 inches of ceiling fire sprinkler heads.

Materials will not be stored so that they project into aisles or passageways in a manner that could cause persons to trip or could hinder emergency evacuation.

Waste Disposal:

Office personnel should carefully handle and properly dispose of hazardous materials, such as broken glass. A waste receptacle containing broken glass or other hazardous material should be labeled to warn maintenance personnel of the potential hazard.

Video Monitors and Computer Typing:

Complaints concerning musculo-skeletal problems are frequently heard from computer operators. Most common are complaints relating to the neck, shoulders, and back. Others concern the arms and hands and occasionally the legs.

Certain common characteristics of computer typing jobs have been identified and associated with increased risk of musculo-skeletal problems. These include:

- Design of the workstation.
- Nature of the task.
- Repetitiveness of the job.
- Degree of postural constraint.
- Work pace.
- Work/rest schedules.
- Personal attributes of individual workers.

The key to comfort is in maintaining the body in a relaxed, natural position. The ideal work position is to have the arms hanging relaxed from the shoulders. If a keyboard is used, arms should be bent at right angles at the elbow, with the hands held in a straight line with forearms and elbows close to the body. The head should be in line with the body and slightly forward.

A. Display Screen

When work is conducted at a computer, the top of the display screen should be at, or just slightly below, eye level. This allows the eyes to view the screen at a comfortable level, without having to tilt the head or move the back muscles.

Control glare at the source whenever possible; place VDTs so that they are parallel to direct sources of light such as windows and overhead lights, and use window treatments if necessary. When glare sources cannot be removed, seek appropriate screen treatments such as glare filters. Keep the screen clean.

B. Chairs

The chair is usually the most important piece of furniture that affects user comfort in the office. The chair should be adjusted for comfort, making sure the back is supported and that the seat pan is at a height so that the thighs are horizontal and feet are flat on the floor. An ergonomically sound chair requires four degrees of freedom - seat pan tilt, backrest angle, seat height, and backrest height. Operators can then vary the chair adjustments according to the task. In general, chairs with the most easily adjustable dimension permit the most flexibility to support people's preferred sitting postures.

Armrests on chairs are recommended for most office work except where they interfere with the task. Resting arms on armrests is a very effective way to reduce arm discomforts. Armrests should be sufficiently short and low to allow workers to get close enough to their work surfaces, especially for tasks that require fixed arm postures above the work surface.

C. Working height

The work surface height should fit the task. The principle is to place the surface height where the work may be performed in such a manner as to keep arms low and close to the body in relation to the task. If the working height is too high, the shoulders or the upper arms have to be lifted to compensate, which may lead to painful symptoms and cramps at the level of the neck and shoulders. If, on the other hand, the working height is too low, the back must be excessively bowed, which may cause backache. Generally, work should be done at about elbow height, whether sitting or standing. Adjustable work stations should be provided so that individuals may change the stations to meet their needs. A workstation without an adjustable keyboard height and without an adjustable height and distance of the screen is not suitable for continuous work.

D. Work/Rest Schedules

One solution for stress and fatigue is to design the computer operator's work so that tasks requiring concentrated work at the terminal are alternated with non-computer based tasks throughout the workday. Also, a short break (5-10 minutes) should be taken at least once each hour when involved in continuous work at the computer.

E. Other

Additional measures that will aid in reducing discomfort while working with computer typing include:

- Change position often, standing up or stretching whenever the employee begins to feel tired.
- Using a soft touch on the keyboard and keeping the shoulders, hands, and fingers relaxed.
- Using a document holder, positioned at about the same plane and distance as the display screen.
- Resting the eyes by occasionally looking off into the distance.

Lighting:

Different tasks require different levels of lighting. Areas in which intricate work is performed, for example, require greater illumination than warehouses. Lighting needs vary form time to time and person to person as well. One approach is to use adjustable task lighting that can provide needed illumination without increasing general lighting.

Task lamps are very effective to supplement the general office light levels for those who require or prefer additional light. Some task lamps permit several light levels. Since the individual controls task lamps, they can accommodate personal preferences.

Indoor Air Quality:

Indoor air quality (IAQ) is an increasingly important issue in the work environment. The study of indoor air quality and pollutant levels within office environments is a complex problem. The complexity of studying and measuring the quality of office environments arises from various factors including:

- Office building floor plans are frequently changing to accommodate increasingly more employees and reorganization.
- Office buildings frequently undergo building renovations such as installation of new carpet, modular office partitions and free-standing offices, and painting.
- Many of the health symptoms appearing are vague and common both to the office and home environment.
- In general, very little data on pollutant levels within office environments is available.
- Guidelines or standards for permissible personal exposure limits to pollutants within office buildings are very limited.

Many times, odors are associated with chemical contaminants from inside or outside the office space, or from the building fabric. This is particularly noticeable following building renovation or installation of new carpeting.
Out-gassing from such things as paints, adhesives, sealants, office furniture, carpeting, and vinyl wall coverings is the source of a variety of irritant compounds. In most cases, these chemical contaminants can be measured at levels above ambient (normal background) but far below any existing occupational evaluation criteria.

In order to determine if relationships between the adverse human health symptoms and the indoor air quality exist, the Company will conduct an indoor air quality survey. In many situations, the cause of the inadequate indoor air quality can be recognized and certain mitigation measures can be implemented.

To request an indoor air quality investigation, contact the Safety and Health Manager.

Miscellaneous Safe Work Practices:

a. Guard the sharp edges of furniture to prevent personal injury. Keep desk "pull-out" writing surfaces closed when not in use.

b. Practice good housekeeping. Keep floors free of items that might cause tripping. Keep waste cans out of the way; do not overfill them.

c. Prevent slipping accident by cleaning up spills immediately.

d. Report all defects such as loose tiles, broken steps, railings and doors immediately to the Office Supervisor.

e. Do not participate in horseplay.

f. Keep razor blades, tacks, and other sharp objects in closed containers.

g. Use the proper tool for the job at hand (e.g. a staple remover to remove staples).

h. Do not overload electrical outlets. Do not plug a multiple outlet strip-- an extension cord with multiple electrical receptacles--into a second multiple outlet strip.

i. Report immediately, any damaged electrical cords, broken switches, loose connections, or bare wires to the Office Supervisor.

j. Unplug any office machine that smokes, sparks, or delivers an electrical shock. Have it inspected by the appropriate repair personnel.

k. Our Company is a smoke free environment and smoking is prohibited inside all Company buildings.

Miscellaneous Safe Work Practices:

l. Avoid overloading the top drawers of filing cabinets to avoid the possible tipping of the cabinet when the drawers are opened. Open one drawer of the file cabinet at a time to prevent tipping. File cabinets should be placed where their use will not interfere with office traffic patterns.

m. Keep file and desk drawers closed when not in use to help prevent tripping accidents.

n. Be sure to use proper lifting techniques. Make arrangements with personnel skilled in moving to shift furniture and other heavy objects.

o. Do not lean too far back in chairs. This may result in over-balancing and a fall.

p. Use only safety step stools or ladders for climbing. Don't stand on swivel chairs or use them as step stools.

q. Be careful with flammable liquids. Only the quantity needed for use should be in the work place. They should be kept and used in a ventilated area, away from excessive heat or ignition sources.

r. Book cases or file cabinets taller than 64 inches must be secured or anchored. Keep book case doors closed when not in use.

s. Power switches must be off, or the cord unplugged, when electrical equipment, such as a typewriter, is being cleaned or serviced.

t. Office doors shall be free of obstructions at all times to permit egress in case of an emergency.

u. Jewelry, long hair, and clothing must be kept clear of the moving parts of all office machines.

v. If it is necessary to run a cable or electrical cord across the floor, a cable cover must be used to protect the wiring and prevent tripping.

w. Do not cover air vents or obstruct air flow from registers. Do not place furniture, equipment, or materials in locations that will interfere with air movement around thermostats.

x. Report any observed pest control problems to the Office Supervisor. Never attempt to apply any pest control chemical yourself.

Painting Operations

Policy:

Painting and paint removal present hazards requiring effective controls. Hazards include exposure to toxic materials and flammable or explosive mists, particulates, and vapors.

Inhalation of mists and vapors from nearly all paints, solvents, thinners, cleaning chemicals, strippers, and epoxies can be injurious depending upon the agent's toxic characteristics and the amount and method of exposure. Further, many can physically injure the skin and eyes, or be absorbed through the skin.

Potential physical and health hazards can be effectively controlled by appropriate work procedures, controls, facility design, protective clothing, and equipment.

Procedures:

Pressure Equipment-

> Pressure equipment used in painting operations is hazardous because of the compressed air component; therefore, the Supervisor shall assure that spray painting equipment is in serviceable condition.

On all air-type spraying equipment a pressure regulator valve shall be installed in the air line between the compressor and painting equipment. A pressure relief valve and a pressure gauge shall be installed between the pressure regulator and pressurized paint containers and/or spray guns. Pressure relief valves shall be set to open at pressures not more than 10 pounds above the required working pressure.

Other Equipment-

Painter's ladders, scaffolds, and other equipment shall be inspected prior to use to be certain they are in safe condition.

Paint Mixing-

Paint mixing shall be done in designated, adequately ventilated rooms constructed of fire-resistant materials. All sources of ignition shall be prohibited in mixing areas. All electrical fixtures or equipment in or within 20 feet of designated paint preparation areas shall meet the requirements of the National Electrical Code (NFPA #70) for Class I Division 2 locations.

Housekeeping-

Good housekeeping is essential to safe operations in paint shops. Paint rooms, booths, etc., shall be kept clean with equipment stored in a proper and orderly manner. All solvent or paint soiled rags shall be placed in approved self-closing metal containers plainly marked to indicate the contents. At the end of each day, these containers shall be emptied or removed to an approved location for pickup and disposal.

Health-

Personnel Exposures-

There is a wide application of organic solvents in painting. All organic solvents have some effect on the central nervous system and the skin. The principal modes of personnel exposure are inhalation of vapors and skin contact and absorption. Personnel engaged in painting operations should review Material Safety Data Sheets (MSDS) in order to acquaint themselves with the properties and hazards of the solvents that are used. Skin contact with solvents may cause dermatitis, ranging in severity from a simple irritation to actual damage to the skin.

Protective Equipment-

Personnel engaged in painting and paint removal shall wear protective clothing, respiratory devices if required, and appropriate face, eye, and hand

protection. Eye or face protection is required during scraping or paint preparation (abrasive techniques). Clothing shall be changed, as needed, to minimize body contamination.

Respiratory Protection-

The Safety and Health Manager should be consulted for specific advice on respiratory protection required for specific painting activities.

. Personal Hygiene-

The hands and face shall be kept clean, clothes shall be changed when contaminated and hands and soiled objects shall be kept out of the mouth.

No food or drink shall be brought into, or consumed, in paint shops.

Personnel shall wash their hands prior to smoking or consuming food.

Air and Water Pollution-

Pollution Prevention-

Painting and paint removal operations can cause air and water pollution problems which can impact the local community. Liquid, solid, and gaseous waste products from painting and paint removal operations shall be disposed of in accordance with federal and state air, water, and solid waste pollution control laws and as specified by the Safety and Health Manager.

. Spills-

All spills of flammable or combustible liquids shall be cleaned up promptly. With major spills, remove ignition sources, evacuate, and ventilate the area, and provide appropriate protective equipment to cleanup personnel. These liquids shall not be allowed to enter a confined space, such as a sewer, because of the possibility of an explosion.

Fire Prevention and Protection-

Fire Prevention-

Painting operations of particular concern are those having a fire potential; i.e., paint removal, solvent wipe and paint application by means of spray apparatus. Certain paints, lacquers, varnishes, shellacs, solvents, and thinners are very flammable. These, for the purpose of control, are classified as being flammable. Solvent materials selected to do the residual clean up, after the initial removal, shall have a flash point of 140 degrees F or above.

Spray Painting

Spray painting presents varying degrees of fire hazards, depending on the materials used. Material having a flash point below 140 degrees will be handled very carefully, and precautions are in order even for those having a flash point higher than this.

Sprinklers

Fire suppression sprinklers installed in spray finishing areas shall conform to NFPA 13, provisions for extra hazardous occupancy. Dry chemical, carbon dioxide, or halogenated extinguisher systems may be installed where automatic sprinkler protection is not available.

Extinguishers

Portable fire extinguishers shall be installed near all paint spraying areas. The Safety and Health Manager shall determine the type of extinguisher that is appropriate.

Ventilation Systems-

Ventilation-

Ventilation and exhaust systems shall be in accordance with the standard for Blower and Exhaust Systems for Vapor Removal, NFPA 91. Mechanical ventilation shall be in operation while spraying operations are being conducted and for a sufficient time thereafter to assure vapors are completely exhausted. Adequate conditioned make-up air must be provided.

Fan Unit

The fan-rotating element and its casing shall be non-sparking. Ample clearances shall be provided to prevent friction-caused fire hazards. Fan blades shall be mounted on a shaft rigid enough to maintain alignment when the fan is operating under full load.

Exhaust Ducts

Exhaust ducts shall be protected against mechanical damage, properly supported, and will normally have a separation of at least 18 inches from combustible materials. Ducts shall be periodically inspected for accumulation of paint deposits and shall be cleaned as needed.

Exhaust

Air exhaust from spray operations shall be directed so that it will not contaminate make-up air being introduced into the spraying area or other ventilation intakes. Unless the spray booth exhaust duct terminal is from a

water-wash spray booth, the terminal discharge point shall be at least 6 feet from any combustible exterior wall or roof.

Motors

Electric motors driving exhaust fans shall not be placed inside booths or ducts. Drive belts shall not enter the duct or booth unless the belt and pulley within the duct or booth are enclosed or guarded.

Storage and Handling

Storage

The quantity of paints, lacquers, thinners, solvents and other flammable and combustible liquids kept near spraying operations shall be the minimum required for operations but shall not exceed 1 day's supply.

Bulk storage of these liquids shall be in a separate building detached from other buildings or in rooms specifically designed and constructed to meet flammable storage room requirements.

No storage of open containers of solvents is permitted. Open containers may only be used for cleaning of painting materials after which the solvent shall be transferred back to a closed container for retention or disposal.

Supplies of flammable and combustible liquids shall be stored in approved fire-resistant safety containers equipped with flash screens and self-closing lids.

Operations involving water base latex paints are exempt from the above requirements.

Containers

Original closed containers, approved portable tanks, and approved safety cans shall be used for bringing flammable or combustible liquids into spray finishing rooms. Open or glass containers shall not be used.

Liquid Transfer

The withdrawal of liquids from containers and the filling of containers, including portable mixing tanks, shall be done only in a mixing room or in a spraying area when the ventilating system is in operation. Precautions shall be taken to protect against liquid spillage.

Grounding

Whenever flammable or combustible liquids are transferred from one container to another, both containers shall be effectively bonded and grounded. This practice prevents electrical discharge from the accumulation of static charge because of the transfer process.

Electrical

Electrical Wiring

Electrical wiring and equipment shall conform to the provisions of the National Electrical Code (NFPA 70). Electrical wiring located in spray areas must be rigid metal conduit, Type MI cable, or in metal boxes or fitting containing no taps, splices or terminal connections. There are alternative electrical wiring in options when the location is adjacent to (rather than inside) a spray area (NFPA 33).

Electrical Equipment

Electrical equipment outside of, but within 20 feet horizontally and 10 feet vertically, of any spraying area and not separated from it by partitions extending at least to the boundary of the Division 2 location shall be of non-spark producing design. This equipment shall also conform to the provisions of NFPA 70, for Class I or Class I, Division 2 locations as applicable. If spraying operations are confined to an enclosed spray booth or room, the space adjacent to the booth or room shall be considered non-hazardous except for the space within three feet in all directions from any opening in the booth or room.

Grounding

All metal parts of spray booths and exhaust ducts conveying flammable or combustible liquids or aerated combustible solids shall be electrically grounded.

Location of Paint Shops and Spray Finishing Operations:

Paint Shops

Paint shops may be located in specially constructed rooms if they are separated from other operations by fire resistant walls. Paint shops shall be provided with automatic sprinkler protection. Avoid locating these shops near ignition sources.

Spray Booths

When possible, paint spray booths shall be located in the paint shop. All spray booths shall be installed to conform to NFPA 33.

Location of Paint Shops and Spray Finishing Operations: (continued)

Prohibited Locations

Spray finishing operations shall not be conducted in a building classified as administrative or public assembly unless a room is specifically designed for that purpose, is protected with an automatic sprinkler system, and is separated vertically and horizontally from such occupancies by not less than two hour fire resistance construction.

Airless Paint Spraying

Never point an airless spray gun at any part of the body. Paint can be hypodermically injected into the body by the high operating pressures.

Do not disconnect the gun from the fluid hose or the hose from the pump until the pressure has been released from the hose. This is accomplished by first closing off the main line air pressure to the pump and then bleeding off the pressure in the fluid hose by triggering the gun before disconnecting it.

When handling the gun but not actually spraying (such as while changing parts or work position), hold the gun by the grip and remove the fingers from the trigger. This will prevent the gun from being activated if the operator should inadvertently tighten his hold due to sipping or stumbling. Guns should be equipped with trigger guards and a safety lock. The lock should be in the non-operating position except when the gun is actually in use.

Check all hose connections and fittings to make sure they are tight and not leaking. The fluid hose must be designed to withstand the high pressure to which it is subjected. The hose, gun, and pressure vessel should be equipped with special fittings that are not interchangeable with low pressure fittings.

Check the fluid hose to be sure that there are no weak or worn spots. Make certain the hose does not contact moving parts of machinery, lie over or around sharp edges and corners, or come near objects that would damage it. Check for deterioration caused by exposure to chemicals or ordinary wear and tear. High-pressure leaks from the hose or connections can also cause hypodermic injection.

Never pass the finger over the gun orifice to clean it, as this will result in hypodermic injection of paint into the finger. Consult the manufacturer's operating manual for cleaning procedures.

The object being sprayed as well as the spray gun, should be grounded to prevent static electricity from being created. Periodic continuity checks should be performed to ensure the hose ground wire is intact.

Airless Paint Spraying (continued)

The operator shall wear eye protection and gloves to guard against accidental contact with the spray. Respiratory protective equipment shall be worn if exhaust ventilation is not available. The Office of Health and Safety shall be contacted to determine appropriate protective equipment needed for the operation.

Paint Spray Booths

Extinguishers

Provide portable fire extinguishers adequate to handle the most flammable of the coating materials being used. The Safety and Health Manager shall be consulted for appropriate extinguishers needed.

Floor Covering

It is desirable that the floor of paint spray booths be covered with a non-combustible mat, removable for cleaning or disposal.

Hoses and Couplings

Pressure hoses and couplings shall be regularly inspected for condition and shall be replaced as needed. When positive displacement pumps are used, a relief valve shall be installed in the discharge line to prevent overpressure.

Portable Paint Spray Equipment

Description

Such equipment consists of an air compressor, paint spray gun and hose. The paint reservoir on most portable spray guns holds one quart of fluid or less. When a considerable amount of paint is to be applied, a 2 ½ or 5 gallon pressure tank is usually employed.

Compressor

The air compressor shall be equipped with an ASME rated air tank, a visible pressure gauge on the tank, a pressure reducer with its own gauge, a guard fully enclosing the drive belt and pulleys, and a pressure limiting switch to shut down the compressor when the system's working pressure has been reached. The equipment should be securely mounted on a wheeled carriage for portability. For interior painting only electric motor-driven equipment shall be used.

Portable Paint Spray Equipment (continued)

Overpressure Protection

When separate paint pressure tanks are used, they shall be equipped with a gauge and a relief valve to prevent overpressure. Hoses shall be rated for the maximum working pressure of the system.

Maintenance

A preventive maintenance program shall be implemented to cover periodic inspection and testing of all components.

Storage of compressors, hoses, paint pressure tanks and spray guns shall be in areas designated and approved by the supervisor in conjunction with the Office of Health and Safety.

Aerosol Spray Paint Cans

The same general safety and health precautions apply to spray painting from pressurized cans as to spray painting by other means. The following specific items are noted:

Storage

Pressurized cans of spray paint are to be considered flammable materials and stored in appropriate locations.

Office desks are not to be used for the storage of pressurized cans of spray paint.

Office store rooms are not to be used for the storage of pressurized cans of spray paint unless the storage area has been designated safe for the storage of flammable materials by the Office of Health and Safety.

Disposal

Disposal of malfunctioning paint spray cans still containing paint under pressure shall be in accordance with the Office of Health and Safety hazardous waste disposal procedures.

Office waste cans shall not be used for the disposal of cans of spray paint nor for the disposal of wiping rags and other waste material.

Disposal of wiping rags and other waste materials shall be in self-closing metal containers labeled to indicate the contents.

Protective Equipment

The same general rules governing the use of personal protective equipment apply to painting with pressurized cans.

Procedures For the Identification, Safe Removal, and Disposal of Lead-Based Paints:

Due to the potential exposure of personnel to lead released during abatement of lead-based paint, proposed EPA regulatory authority over lead abatement activities in federal buildings, and existing regulatory mandates governing the disposal of hazardous wastes, the following procedures shall be adopted in order to reduce the possibility of human exposure and contamination of the environment.

1) Identification of Lead-Based Paints

Lead-based paints may have been used in the past in Company buildings. The presence of lead on existing painted surfaces shall be determined by sequential use of the following methods:

First, knowledge by painters, maintenance personnel, or contractors of a specific paint that has been applied where the manufacturer's Material Safety Data Sheet documents there is greater than 1% lead in the paint.

Second, all "red or rust-colored", and gray primer coats are assumed to contain lead.

Third, presence of lead as determined by "lead swabs" or any other direct reading procedure or instrument.

Fourth, analysis by a contracted analytical laboratory by the AIHA Environmental Lead Laboratory Accrediation Program.

2) Training of Personnel

The Federal EPA is proposing the establishment of specific disciplines and training for lead-based paint activities. The disciplines to be established are: Inspector Technicians,

Inspector/Risk Assessors, Workers, and Supervisors. Additionally, numerous OSHA requirements govern the activities associated with lead exposure.

To that end, prior to involvement in lead removal activities, successful completion of the following training must be documented:

OSHA hazard communication training specific to lead and any hazardous materials used during the paint removal process.

Respiratory protection training and fit testing.

Maintenance supervisors responsible for causing the removal of lead-based paints should attend an accredited lead abatement course for supervisors.

Hazardous waste training pursuant to 40 CFR 265.16 and 262.34.

Work Practices-

Interior building surfaces-

All work areas where paint removal or scraping is to be conducted must be sealed off from other work areas. This step includes placing barrier tape across all access areas to the work site and taping 6-mil plastic over all vents, doorways, windows, and other openings into the work site.

Personnel shall be instructed not to grind or sand painted areas known to contain lead. Hand scraping is permitted.

The work area shall be cleaned periodically during the day by using a combination of a HEPA-filtered vacuum and wiping down the area using damp cloths.

Exterior building surfaces

When removing lead-containing paint from the exterior of Company buildings, the following occupational health/ environmental guidelines shall be followed:

Special precautions shall be taken when working near air intakes, doors, and windows. Air intakes shall be protected by construction of a wood frame and plastic sheeting barrier and shall be of such a size to ensure that air is pulled from uncontaminated areas. Door and windows shall remain closed and shall be sealed with duct tape and/or plastic sheeting.

Physical barriers shall be set up around the work area to prevent pedestrian traffic through the work site.

When removing lead-containing paint from the exterior of Company buildings, the following occupational health/ environmental guidelines shall be followed:

Loose and flaking paint should be removed by manually scraping the surfaces of the building. Sanding or grinding will not be permitted.

A drop cloth shall be placed directly and completely under the work area. Paint chips shall be collected periodically throughout the day and at the end of the work day and shall be placed in a container with a tight fitting lid or sealed in a plastic bag (6-mil).

Abrasive blasting units-

Removal of paints containing lead or other heavy metals must be conducted in a sealed abrasive blasitng unit equipped with a high efficiency particulate air (HEPA) filter.

The abrasive blasting media should be used to its fullest extent prior to disposal.

Institute the protective measures listed below when cleaning out an abrasive blasting unit.

General Practices-

Personnel shall remove contaminated clothing prior to leaving the work site for breaks, lunch, and at the end of the work day.

All surfaces shall be maintained as free as practicable of accumulation of lead-based paint debris.

All waste materials, including used disposable clothing, respirator cartridges, plastic, etc. shall be placed in a plastic bag or other container as appropriate and sealed.

All tools and equipment used on the project shall be wet-wiped prior to removal from the work site.

After the waste containers are sealed, the outside of the container shall be wiped off for any residual dust that may be present prior to being taken off-site for disposal.

Protective Measures

All personnel shall wear respiratory protection (half-mask, dual cartridge with HEPA filters, as a minimum) and full-body disposable clothing. Personnel shall have a current (<6 months) medical clearance to wear a respirator and have been fit-tested with their respirator.

Personnel shall also be provided and instructed to wear face shield or vented goggles, gloves, head coverings, and disposable shoe coverlets.

Personnel are not permitted to eat, drink, or smoke in or near the work area.

Personnel shall be instructed to wash their face and hands before eating, drinking or smoking and before leaving the work area for breaks or lunch.

All personnel involved in lead-based paint removal shall shower at the end of the shift before going home to prevent contamination of their vehicle and exposure of family members and others to lead-containing dust.

The Safety and Health Manager requires that paint removal personnel participate in the personal air monitoring program in order to determine their potential exposures to lead dust. The results of this monitoring will also be used to determine if personnel need to be enrolled in a medical surveillance program for lead. Contact must be made with Safety and Health Manager prior to the start of the project to coordinate the sampling effort.

Host Contractors are responsible for meeting OSHA personnel air monitoring, personal protective equipment, and medical surveillance requirements for lead exposures (29 CFR 1910.1025, or 29 CFR 1926.62, as appropriate).

Hazardous Waste Disposal

The Safety and Health Manager shall be contacted prior to the initiation of a lead-based paint removal project. The Safety and Health Manager will dispose of hazardous wastes generated by in-house maintenance personnel only. Contractors are responsible for disposing of all waste materials that they generate in the course of their work/contract obligations. Specific wastes generated during lead-based paint removal can include, but is not limited to:

•Paint chips/dusts •Solvents used to remove paints •Media using in abrasive blasting units

Other Wastes

Materials known to have been painted with a lead-based paint such as scrap metal (old filing cabinets, HVAC ducts, etc.) should be turned in for recycling. Contact the Safety and Health Manager if there are any questions on disposal of other materials.

Personal Protective Equipment Program

Policy:

Protective clothing will be provided whenever it is necessary by reason of hazards, processes or environmental conditions. The Company requires that protective clothing be used when chemical hazards, radiological hazards, or mechanical irritants are encountered in a manner capable of causing injury or impairment through absorption, inhalation, or physical contact.

References

20 CFR 1910.134 Subpart I - Personal Protective Equipment

Responsibilities:

The Safety and Health Manager will be responsible for assessing the hazards and exposures that may require the use of PPE, determining the type of equipment to be provided, and purchasing the equipment. Input from managers, supervisors, and employees will be obtained and considered in selecting appropriate equipment.

Managers/supervisors will be responsible for training employees in the use and proper care of PPE, ensuring that all employees are assigned appropriate PPE, and ensuring that PPE is worn by employees when and where it is required.

Employees are responsible for following all provisions of this program and related procedures. They are expected to wear PPE when and where it is required

Purpose:

The purpose of this program is to protect our employees by ensuring that Personal Protective Equipment (PPE) is provided, used, and maintained in a sanitary and reliable condition whenever it is necessary due to hazards from processes or in the work environment. To the extent that it is possible and feasible, the company will remove or eliminate hazards or exposures through engineering means to eliminate the need for PPE.

This program covers eye and face protection, head protection, foot protection, hand protection, and electrical protection. Respiratory hazards and hearing hazards are covered by other programs, but they will also be included in the Hazard Assessment described below. This program covers the responsibilities of managers, supervisors and workers, assessment of hazards, selection and use of personal protective equipment (PPE), and training.

Procedures:

a. Personal protective clothing is to include approved lab coats, surgical caps, masks, gloves, special shirts, trousers, overalls, jumpsuits, safety shoes, hard hats, coats and

smocks. As a minimum, Company furnished lab coats should always be worn during laboratory work.

b. Requests for all personal protective clothing not available as Company stock items are generated by the supervisor and are approved by the Safety and Health Manager. The protective clothing must be worn by the employees and visitors as dictated by Company policy. The clothing will be available only in compromise sizes (i.e. small, medium, and large).

c. Personal protective clothing may not be worn in the cafeteria or other food consumption areas, conference rooms, picnic areas or off campus.

d. Sandals, and open-toed shoes, are prohibited in laboratory, shop, warehouse, and animal housing areas.

e. Safety shoes should be worn by all shop, warehouse and maintenance personnel as dictated by the nature of the work. Safety shoe areas are recommended by the supervisor and approved by the Safety and health Manager. The user will be responsible for the proper cleaning, maintenance and use of the safety shoes.

g. Hard hats should be worn in all posted areas (e.g., locations in warehouses, shops, and building construction or renovation areas) and when performing work in which the supervisor Safety and Health Manager decides such hazards exist.

Hazard Assessment:

The Company will perform an assessment of the workplace to determine if hazards are present, or likely to be present, which necessitate the use of personal protective equipment (PPE). This assessment will consist of a survey of the workplace to identify sources of hazards to workers. Consideration will be given to hazards such as impact, penetration, laceration, compression (dropping heavy objects on foot, roll-over, etc.), chemical exposures, harmful dust, heat, light (optical) radiation, electrical hazards, noise, etc. Where such hazards are present, or likely to be present, the Company will:

Select, and have each affected employee use, the types of PPE that will protect the employee from the hazards identified in the hazard assessment.

Communicate equipment selection decisions to each affected employee

Where such hazards are present, or likely to be present, the Company will (continued):

Select PPE that properly fits each affected employee

Train employees in the use and care of PPE as described elsewhere in this program

The Company will verify that the workplace hazard assessment has been performed by conducting a written certification. This certification will be dated and signed by the Safety and Health manager or person conducting the assessment. Whenever there is a change in process or in the workplace that might introduce or change an exposure or hazard, the company will perform an assessment to determine if there needs to be additional PPE or a change in the PPE provided. These supplemental hazard assessments will also be documented, signed and dated by the person performing the assessment. The Company will review and update the workplace hazard assessment on an annual basis.

SELECTION OF PERSONAL PROTECTIVE EQUIPMENT (PPE):

Personal protective equipment (PPE) will be selected on the basis of the hazards to which the workers' are exposed or potentially exposed. All selections will be made by with input from managers, supervisors and workers.

Personal protective equipment will meet the following standards:

Eye & Face Protection devices - ANSI Z87.1-1989 "American National Standard Practice for Occupational and Educational Eye and Face Protection"

Head Protection devices - ANSI Z89.1-1986 "American National Standard for Personal Protection - Protective Headwear for Industrial Workers"

Foot Protection devices - ANSI Z41-1991 "American National Standard for Personal Protection - Protective Footwear"

Hand Protection - No national standard available - Selection will be based on task performed, conditions present, duration of use, and the hazards and potential hazards identified.

Electrical Protective equipment - No national standard - Equipment will be tested electrically before first use and every 6 months thereafter or upon indication that insulating value is suspect.

Training:

Each employee who is required to use PPE will be trained in the following:

- Why PPE is necessary

- When PPE is necessary
- What PPE is necessary and any alternative choices of equipment
- How to properly don, doff, adjust, and wear PPE
- The proper care, maintenance, storage, useful life, and disposal of PPE

The training will include an opportunity for employees to handle the PPE and demonstrate that they understand the training and have the ability to use the PPE properly. Training will be provided by the manager or supervisor of the affected employees. Training will be documented in writing with the documentation including the names of each employee trained, the date(s) of the training, and the subject matter covered.

If an employee, who has been trained, demonstrates a lack of knowledge or behavior which leads the supervisor to believe the employee does not have a proper understanding of the PPE involved, that employee will be retrained. If there are changes in the workplace or processes that change the exposures or type of PPE to be used, all affected employees will be retrained.

Care Of Personal Protective Equipment:

Whenever practical, PPE will be assigned to individual workers for their exclusive use. Employees will be responsible for the PPE equipment assigned to them or used by them.

PPE will be regularly cleaned, inspected and stored according to instructions given during the training sessions or as directed by supervisors or managers. Defective or damaged PPE shall not be used. Employees are to report any defective or damaged equipment to their supervisor for repair or replacement.

Personal Protective Equipment:

Engineering controls shall be the primary methods used to eliminate or minimize hazard exposure in the workplace. When such controls are not practical or applicable, personal protective equipment shall be employed to reduce or eliminate personnel exposure to hazards.

Personal protective equipment (PPE) will be provided, used, and maintained when it has been determined that its use is required and that such use will lessen the likelihood of occupational injuries and/or illnesses. The Safety and Health Manager will recommend and/or provide necessary protective equipment where there is a reasonable probability that the use of the equipment will prevent or reduce the severity of injuries or illness.

Equipment Specifications and Requirements-

All personal protective clothing and equipment will be of safe design and construction for the work to be performed. Only those items of protective clothing and equipment that meet National Institute of Occupational Safety and Health (NIOSH) or American National Standards Institute (ANSI) standards will be procured or accepted for use.

Eye and Face Protection-

The majority of occupational eye injuries can be prevented by the use of suitable/approved safety spectacles, goggles, or shields. Approved eye and face protection shall be worn when there is a reasonable possibility of personal injury. Supervisors, with assistance from the Safety and Health Manager, determine jobs and work areas that require eye protection and the type of eye and face protection that will be used.

Typical hazards that can cause eye and face injury are:

- Splashes of toxic or corrosive chemicals, hot liquids, and molten metals;
- Flying objects, such as chips of wood, metal, and stone dust;
- Fumes, gases, and mists of toxic or corrosive chemicals; and
- Aerosols of biological substances.

Prevention of eye accidents requires that all persons who may be in eye hazard areas wear protective eyewear. This includes employees, visitors, researchers, contractors, or others passing through an identified eye hazardous area. To provide protection for these personnel, activities shall procure a sufficient quantity of heavy duty goggles and/or plastic eye protectors which afford the maximum amount of protection possible.

If these personnel wear personal glasses, they shall be provided with a suitable eye protector to wear over them.

Eye and Face Protection- (continued)

Specifications-

Eye and face protectors procured, issued to, and used by Company personnel must conform to the following design and standards:

a) Provide adequate protection against the particular hazards for which they are designed

b) Fit properly and offer the least possible resistance to movement and cause minimal discomfort while in use.

c) Be durable.

d) Be easily cleaned or disinfected for or by the wearer.

e) Be clearly marked to identify the manufacturer.

f) Persons who require corrective lenses for normal vision, and who are required to wear eye protection, must wear goggles or spectacles of one of the following types:

1) Spectacles with protective lenses which provide optical correction.

2) Goggles that can be worn over spectacles without disturbing the adjustment of the spectacles.

3) Goggles that incorporate corrective lenses mounted behind the protective lenses.

Description and Use of Eye/Face Protectors

a) Safety Spectacles. Protective eye glasses are made with safety frames, tempered glass or plastic lenses, temples and side shields which provide eye protection from moderate impact and particles encountered in job tasks such as carpentry, woodworking, grinding, scaling, etc.

b) Single Lens Goggles. Vinyl framed goggles of soft pliable body design provide adequate eye protection from many hazards. These goggles are available with clear or tinted lenses, perforated, port vented, or non-vented frames.

Single lens goggles provide similar protection to spectacles and may be worn in combination with spectacles or corrective lenses to insure protection along with proper vision.

Description and Use of Eye/Face Protectors (continued)

c) Welders/Chippers Goggles. These goggles are available in rigid and soft frames to accommodate single or two eye piece lenses.

Welders goggles provide protection from sparking, scaling or splashing metals and harmful light rays. Lenses are impact resistant and are available in graduated shades of filtration.

Chippers/grinders goggles provide eye protection from flying particles. The dual protective eye cups house impact resistant clear lenses with individual cover plates.

d) Face Shields. These normally consist of an adjustable headgear and face shield of tinted/transparent acetate or polycarbonate materials, or wire screen. Face shields are available in various sizes, tensile strength, impact/heat resistance and light ray filtering capacity. Face shields will be used in operations when the entire face needs protection and should be worn to protect eyes and face against flying particles, metal sparks, and chemical/ biological splash.

e) Welding Shields. These shield assemblies consist of vulcanized fiber or glass fiber body, a ratchet/button type adjustable headgear or cap attachment and a filter and cover plate holder. These shields will be provided to protect workers' eyes and face from infrared or radiant light burns, flying sparks, metal spatter and slag chips encountered during welding, brazing, soldering, resistance welding, bare or shielded electric arc welding and oxyacetylene welding and cutting operations.

The Safety and Health Manager maintains a supply of various eye and face protective devices. Personnel requiring prescription safety glasses must contact the Safety and Health Manager.

Emergency Eyewash Facilities-

Emergency eyewash facilities meeting the requirements of ANSI Z358.1-1981 shall be provided in all areas where the eyes of any employee may be exposed to corrosive materials. All such emergency facilities shall be located where they are easily accessible to those in need.

Hearing Protection-

Hearing protection devices are the first line of defense against noise in environments where engineering controls have not reduced employee exposure to safe levels. Hearing protective devices can prevent significant hearing loss, but only if they are used properly.

The most popular hearing protection devices are earplugs which are inserted into the ear canal to provide a seal against the canal walls. Earmuffs enclose the entire external ears inside rigid cups. The inside of the muff cup is lined with acoustic foam and the perimeter of the cup is fitted with a cushion that seals against the head around the ear by the force of the headband.

Preformed earplugs and earmuffs should be washed periodically and stored in a clean area, and foam inserts should be discarded after each use. It is important for you to wash hands before handling pre-formed earplugs and foam inserts to prevent contaminants from being placed in the ear which may increase your risk of developing infections.

Also, check hearing protective devices for signs of wear or deterioration.

Replace devices periodically.

The Safety and Health Manager maintains a supply of a variety of disposable foam ear inserts and earmuffs.

Respiratory Protection-

Respiratory hazards may occur through exposure to harmful dusts, fogs, fumes, mists, gases, smoke, sprays, and vapors. The best means of protecting personnel is through the use of engineering controls, e.g., local exhaust ventilation. Only when engineering controls are not practical or applicable shall respiratory protective equipment be employed to reduce personnel exposure.

The Safety and Health Manager is responsible for the Respiratory Protection Program at the Company. Workers requiring the use of respirators must first obtain medical approval from the Company physician to wear a respirator before a respirator can be issued. The Safety and Health Manager conducts respirator training and fit tests and is responsible for determining the proper type of respiratory protection required for the particular hazard.

Respiratory Protection- (continued)

Adherence to the following guidelines will help ensure the proper and safe use of respiratory equipment:

- Wear only the respirator you have been instructed to use. For example, do not wear a self-containing breathing apparatus if you have been assigned and fitted for a half-mask respirator.
- Wear the correct respirator for the particular hazard. For example, some situations, such as chemical spills or other emergencies, may require a higher level of protection than your respirator can handle. Also, the proper cartridge must be matched to the hazard (a cartridge designed for dusts and mists will not provide protection from vapors)
- Check the respirator for a good fit before each use. Positive and negative fit checks should be conducted.
- Check the respirator for deterioration before and after use. Do not use a defective respirator.

• Recognize indications that cartridges and canisters are at their end of service. If in doubt, change cartridges/ canisters before using respirator.
• Practice moving and working while wearing the respirator so that you can get used to it.
• Clean the respirator after each use, thoroughly dry it and place the cleaned respirator in a sealable plastic bag.
• Store respirators carefully in a protected location away from excessive heat, light, and chemicals.

Head Protection-

Hats and caps have been designed and manufactured to provide workers protection from impact, heat, electrical and fire hazards. These protectors consist of the shell and the suspension combined as a protective system. Safety hats and caps will be of nonconductive, fire and water resistant materials. Bump caps or skull guards are constructed of lightweight materials and are designed to provide minimal protection against hazards when working in congested areas.

Head protection will be furnished to, and used by, all employees and contractors engaged in construction and other miscellaneous work in head-hazard areas. Head protection will also be required to be worn by engineers, inspectors, and visitors at construction sites. Bump caps/skull guards will be issued to and worn for protection against scalp lacerations from contact with sharp objects. They will not be worn as substitutes for safety caps/hats because they do not afford protection from high impact forces or penetration by falling objects.

Hand Protection-

Skin contact is a potential source of exposure to toxic materials; it is important that the proper steps be taken to prevent such contact. Gloves should be selected on the basis of the material being handled, the particular hazard involved, and their suitability for the operation being conducted. One type of glove will not work in all situations.

Most accidents involving hands and arms can be classified under four main hazard categories: chemicals, abrasions, cutting, and heat. There are gloves available that can protect workers from any of these individual hazards or any combination thereof.

The first consideration in the selection of gloves for use against chemicals is to determine, if possible, the exact nature of the substances to be encountered. Read instructions and warnings on chemical container labels and MSDSs before working with any chemical. Recommended glove types are often listed in the section for personal protective equipment.

All glove materials are eventually permeated by chemicals. However, they can be used safely for limited time periods if specific use and glove characteristics (i.e., thickness and permeation rate and time) are known. The Safety and Health Manager can assist is determining the specific type of glove material that should be worn for a particular chemical.

Gloves should be replaced periodically, depending on frequency of use and permeability to the substance(s) handled. Gloves overtly contaminated should be rinsed and then carefully removed after use.

Gloves should also be worn whenever it is necessary to handle rough or sharp-edged objects, and very hot or very cold materials. The type of glove materials to be used (in these situations) include leather, welder's gloves, aluminum-backed gloves, and other types of insulated glove materials.

Careful attention must be given to protecting your hands when working with tools and machinery. Power tools and machinery must have guards installed or incorporated into their design that prevent the hands from contacting the point of operation, power train, or other moving parts. To protect the hands from injury due to contact with moving parts, it is important to:

- Ensure that guards are always in place and used.
- Always lock out machines or tools and disconnect the power before making repairs.
- Treat a machine without a guard as inoperative; and
- Do not wear gloves around moving machinery, such as drill presses, mills, lathes, and grinders.

Hand Protection- (continued)

The Safety and Health Manager can help the supervisor identify appropriate glove selections for their operations. The Safety and Health Manager also maintains a selection of gloves for various tasks.

Safety Shoes-

Safety shoes shall be worn in the shops, warehouses, maintenance, cagewash, glassware, and other areas as determined by the Health and Safety Branch. Recommendations for safety footwear shall be approved by the Health and Safety Branch. All safety footwear shall comply with American National Standards Institute (ANSI) Standard ANSI Z41-1991, "American National Standard for Personal Protection - Protective Footwear. Protective footwear purchased before July 5, 1994, shall comply with ANSI Standard Z41.1-1967.

Permanent full time employees will be initially issued two pairs of safety shoes of approved type. Shoes will be replaced or repaired as necessary based on supervisory approval. Other than permanent employees will be issued one

pair of safety shoes with replacement as necessary based on supervisory approval.

Responsibilities-

a. Supervisor - Reviews employees work situation and recommends safety footwear as appropriate in accordance with established Institute policy. Requests safety shoes from the Safety and Health manager for new employees or as indicated for replacement. Ensures that all employees under his supervision use and maintain safety footwear. Makes determination on the need for replacement or repair of safety shoes.

b. Employee - Wears Institute provided or approved safety shoes in all areas requiring safety footwear as determined by the supervisor and the Health and Safety Manager.

c. Health and Safety Manager - Consults with supervisors concerning safety shoe requirements and approves issuance of all safety shoes. Arranges for local purchase of all safety shoes. Makes arrangements for necessary repairs.

Safety Shoes-

Procedures-

a. Supervisors must review employee's work situation in consultation with the Health and Safety Manager to decide the need for safety footwear and appropriate types. The "Request for Safety Shoes" must be completed, reviewed and signed by the supervisor and approved by the Health and Safety Manager.

b. Any employee desiring to replace his/her safety footwear must complete the "Request for Safety Shoes" and have it signed by their supervisor.

c. If an employee is unable to find appropriate safety footwear at the designated vendors, he or she should check with the Health and Safety Manager for alternate procedures. Alternate procedures involve employees purchasing safety footwear with their own funds and being reimbursed.

f. Employee who want to have their footwear repaired, should be encouraged

to do so. Some footwear is designed to be repaired, and some is not. Repairs would include such items as new soles and heels. The Company will reimburse employees for repairs.

Hearing Personal Protective Equipment

Hearing protective devices (ear plugs, muffs, etc.) shall be the permanent solution only when engineering or administrative controls are considered to be infeasible or cost prohibitive. Hearing protective devices are defined as any device that can be worn to reduce the level of sound entering the ear. Hearing protective devices shall be worn by all personnel when they must enter or work in an area where the operations generate noise levels of:

- Greater than 80 dBA sound levels, or
- 120 dB peak sound pressure level or greater

Types of Hearing Protective Devices Hearing protective devices include the following:

a. Insert Type Earplugs

A device designed to provide an air-tight seal with the ear canal. There are three types of insert earplugs – premolded, formable, and custom earplugs.

1. Premolded Earplugs

Premolded earplugs are pliable devices of fixed proportions. Two standard styles, single flange and triple flange, come in various sizes, and will fit most people. Personnel responsible for fitting and dispensing earplugs will train users on proper insertion, wear, and care. While premolded earplugs are reusable, they may deteriorate and should be replaced periodically.

2. Formable

Formable earplugs come in just one size. Some are made of material which, after being compressed and inserted, expands to form a seal in the ear canal. When properly inserted, they provide noise attenuation values that are similar to those from correctly fitted premolded earplugs. Individual units may procure

approved formable earplugs. Supervisors must instruct users in the proper use of these earplugs as part of the annual education program. Each earplug must be held in place while it expands enough to remain firmly seated. A set of earplugs with a cord attached is available. These earplugs may be washed and therefore are reusable, but will have to be replaced after two or three weeks or when they no longer form an airtight seal when properly inserted.

3. Custom Molded Earplugs

A small percentage of the population cannot be fitted with standard premolded or formable earplugs. Custom earplugs can be made to fit the exact size and shape of the individual's ear canal. Individuals needing custom earplugs will be referred to an audiologist.

b. Earmuffs

Earmuffs are devices worn around the ear to reduce the level of noise that reaches the ear. Their effectiveness depends on an air tight seal between the cushion and the head.

Selection of Hearing Protective Devices

Employees will be given the opportunity to select hearing protective devices from a variety of suitable ones provided by the Office of Health and Safety. In all cases the chosen hearing protectors shall have a Noise Reduction Ratio (NRR) high enough to reduce the noise at the ear drum to 80 dBA or lower.

Issuance of Hearing Protective Devices

The issuance of hearing protective devices is handled through the Safety and Health Manager. The Safety and Health Manager will issue and fit the initial hearing protective devices (foam inserts, disposables). Instruction on the proper use and care of earplugs and earmuffs will be provided whenever HPDs (hearing protective devices) are dispensed. Personnel requiring earmuffs in addition to earplugs will be informed of this requirement and educated on the importance of using proper hearing protection. The Safety and Health Manager will dispense ear muffs when necessary and will maintain a supply of disposable earplugs.

Use of Hearing Protective Devices

Always use and maintain HPDs as originally intended and in accordance with instructions provided.

Earmuff performance may be degraded by anything that compromises the cushion-to-circumaural flesh seal. This includes other pieces of personal protective equipment such as eyewear, masks, faceshields, and helmets.

Maintenance of Hearing Protective Devices

Reusable earplugs, such as the triple flange or formable devices should be washed in lukewarm water using hand soap, rinsed in clean water, and dried thoroughly before use. Wet or damp earplugs should not be placed in their containers. Cleaning should be done as needed.

Earmuff cushions should be kept clean. The plastic or foam cushions may be cleaned in the same way as earplugs, but the inside of the muff should not get wet. When not n use, ear muffs should be placed in open air to allow moisture that may have been absorbed into the cups to evaporate.

Hearing Protection Performance Information

The maximum of sound attenuation one gets when wearing hearing protection devices is limited by human body and bone conduction mechanisms. Even though a particular device may provide outstanding values of noise attenuation the actual noise reductions may be less because of the noise surrounding the head and body bypasses the hearing protector and is transmitted through tissue and bone pathways to the inner ear.

The term “double hearing protection” is misleading. The attenuation provided from any combination earplug and earmuff is not equal to the sum of their individual attenuation values.

PERSONAL PROTECTIVE EQUIPMENT

HAZARD ASSESSMENT FORM

Date of Hazard Assessment: _____

Person Performing Hazard Assessment: _____

Location Job	Task/Position	Hazards	PPE Required
(EXAMPLE)			
(Molding Dept).	*(Press Operator)*	*(Flying particles)*	*(Safety Glasses)*

PERSONAL PROTECTIVE EQUIPMENT

CERTIFICATION OF HAZARD ASSESSMENT

I certify that a hazard assessment of the workplace was performed at our facility located at _____. This assessment consisted of a review of prior injury and illness records and a walk-through inspection of all work areas. The purpose of this assessment was to identify sources of hazards to employees that are present, or are likely to be present, in the workplace which necessitate the use of personal protective equipment (PPE).

Workplace Evaluated:
(Insert address of the facility and a listing of all departments or areas of the facility that were inspected.)

Person Certifying Hazard Assessment:

Name: _____ Title: _____

Date(s) of Hazard Assessment: _____

Attachments: Hazard Assessment Forms

Plumbing Operations and Safety

Policy:

Plumbing operations normally includes the installation, preventive maintenance, and repair of water supply systems, sewage and water disposal systems, natural liquified petroleum gas (LPG) or other gas supply systems (to include gas appliances), and oxygen supply systems. These systems and the maintenance of them contribute to the total well-being Company facilities.

Hazards encountered during plumbing operations include, but are not limited to, entry into an oxygen deficient atmosphere (confined space), fire or explosion (by introducing an ignition or flame source into a hazardous environment), and falls. Cave-in of an excavated area, burns from heat producing equipment, strains and sprains of the back (or other muscle group), and cuts and/or bruises, are also potential dangers.

Working in confined spaces, handling heavy and awkward materials, being subjected to numerous obstructions in limited working space, and health related hazards are conducive to producing accidents. Plumbing maintenance workers need to be knowledgeable of these potential hazards and conditions and take reasonable actions to prevent incidents before they occur.

Personal Protective Equipment:

Personal protective equipment worn during plumbing maintenance operations normally consists of eye and/or face protection, work or chemical resistant gloves, and safety-toe shoes. A bump cap or hard hat may be required under conditions that could result in head injuries (e.g., work in manholes and in close spaces with low overhead pipe or other obstructions).

Eye or face protection is required while working plumbing connections, with chemicals, or where an eye hazard could exist while using tools or machines, and while working on pressure systems.

Procedures:

Hot Operations- ("Open Flame" permits may be required for these operations. Seek guidance from the Safety and Health Manager or Supervisor prior to "Hot Operations")

1) Torches and Furnaces

    a) Only essential fire prevention items pertaining to the operation of blowtorches and plumber's furnaces are included. Work and storage areas for this equipment shall be well ventilated.

1) Torches and Furnaces (continued)

    b) No one shall be permitted to use a torch or furnace until the user is trained on its use and is familiar with the operating instructions.

    c) Where flammable or explosive vapors or dust may be present, torches and furnaces shall not be used until the atmosphere has been vented and the sources of such vapors or dust removed.

    d) Gasoline blowtorches and furnaces shall not be used in small, unventilated spaces since they could cause explosions. Acetylene gas shall never be brought in contact with metal powders such as copper or silver as the combination may produce flashes which can ignite explosive atmospheres.

    e) Combustible materials in locations where torches or furnaces are to be used shall be protected or kept far enough away to prevent their being subjected to sparks or dangerous temperatures. Appropriate fire extinguishers shall be available.

2) Soldering and Brazing

    a) Soldering and brazing is the joining of metal parts by melting a fusible alloy. When solders used have a melting point above 800 degrees F, the procedure is called brazing.

Improper equipment and/or unsafe practices may cause lead poisoning, irritation from fluxes, burns, electric shock, or fires. The concentration of toxic fumes and irritants at the breathing level of the operation shall be checked. Where required because of toxic fumes, a respirator or adequate ventilation shall be provided. Lead-tin, zinc, silver, cadmium, and antimony-tin solders can pose moderate to serious health hazards.

Soldering, particularly with lead-tin, in a confined space where ventilation is not adequate to remove toxic fumes may require the use of a self-contained breathing device. The Safety and Health Manager shall be consulted for evaluation of potential health hazards and recommendations on respiratory protection during welding, soldering, and brazing operations.

b) Electric soldering irons shall be grounded unless of double insulation construction. All soldering irons shall be placed in suitable non-combustible receptacles when not in use.

c) Appropriate safety eyewear shall be worn during all soldering and brazing operations.

Open Storm Drains Procedures:

Plumbing personnel are not likely to come in contact with the hazards associated with sewer systems while working on open storm drains. However, there are certain hazards associated with that type of drainage system. Some of these hazards and their associated incidents are:

a. Manhole covers

Manhole covers are heavy and closely fitted to the manhole opening. Never attempt to lift a cover without using proper pry bar tools, special lifting tools, and additional help where needed. Ensure fingers and toes do not remain under manhole covers when putting them down.

b. Hazards

Insects, animals, and snakes have been known to nest or den in storm drains. Hazards encountered are:

Stings from wasps, spiders, and ants that could lead to toxic shock.

Bites from animals that could lead to rabies.

Bites from poisonous snakes that could be fatal or cause gangrene.

Requirements:

Prior to working in storm drains, inspect and clear the drains of dangerous insects, animals, or snakes. Seek assistance from an exterminator or County Animal Control Department when necessary.

Wear proper protective clothing, hard hats, boots, and gloves while working in storm drains.

Gas Systems:

Maintenance of gas systems include natural gas, LPG, and oxygen. Shop personnel shall be familiar with the properties of the gases in the systems they maintain. Until proved otherwise, all escaping gases shall be considered flammable. Prior to entering an area where a gas leak is suspected, the area shall be properly vented and purged of existing gas. Personnel entering the area shall be suited with proper protective clothing and self-contained breathing devices.

Gas Systems: (continued)

For oxygen deficient atmospheres, air supply systems with a special emergency escape air supply are required and shall be used. Tools used to repair leaks in or perform maintenance on gas lines shall be spark-free and protective clothing shall be static-free. When working on oxygen dispensing lines, workers shall not use tools and equipment that are coated with lubricating substances or grease.

Tunnels, Pits, and Sumps:

Where shop personnel are required to work in utility tunnels, pits, and sumps, the atmospheric conditions shall be checked for explosive atmosphere or oxygen deficiency before allowing them to enter. Personnel shall be suited with proper protective clothing and respiratory protective devices, when required, while performing maintenance to underground utilities.

All tunnels, pits, or sumps known to be contaminated shall be tagged or identified for the information of work crews. Workers shall be assigned in pairs for work performed on underground utilities and all known contaminated tunnels, pits, and sumps shall be ventilated while work is in progress.

When a manhole or vault is open, at least one member of the crew shall be stationed at the surface. This person shall not, under normal circumstances, leave for any purpose.

NOTE: UNDER NO CIRCUMSTANCES SHALL A PERSON ENTER A SUBSURFACE STRUCTURE FOR ANY REASON WITHOUT A SECOND PERSON TO ACT AS A GUARD AND TO OBTAIN ASSISTANCE IN THE EVENT OF AN EMERGENCY.

In areas where removal of a victim would be difficult, an approved lifeline, equipped with a wrist harness, shall be worn by the person entering the area to facilitate rapid removal in case of an emergency.

Compressed Air:

Plumbing workers should be trained and authorized to inspect, maintain, or install compressed air systems. Before opening a compressed air line, workers shall ensure the line has been completely drained of existing air to prevent a sudden release of air which will cause the line to whip. The reverse is also true; when personnel have installed a new compressed air system, all parts of the system shall be secured together before air is put into the system. Workers shall wear eye and face protective equipment while working on compressed air systems.

Refrigeration and Air Conditioning Maintenance

Policy:

Refrigeration and air conditioning maintenance personnel, as with many other mechanical contractor activities, perform duties in many different locations and environments. Not only must these workers be aware of the hazards of the tasks they are performing, but also tasks being performed around them. Potential hazards include hazardous noise, electrical hazards, exposure to refrigerants, lifting hazards, and compressed gases and cylinders.

Potential physical and health hazards can be effectively controlled by proper work procedures and controls, and by using the required personal protective equipment.

Procedures:

Equipment rooms where air conditioning equipment is installed shall be kept free and clear of all trash and clutter which could present tripping or fire hazards. Refrigerant piping shall be properly insulted, both to improve operating efficiency and to prevent injury to workers who may accidentally come in contact with it. Equipment rooms are not normally designed for, nor intended for, storage of materials.

All belts, pulleys, and rotating shafts shall be guarded to prevent accidental contact. Large valve handle stems which can present a bump or trip hazard shall be marked (color coded) for easy recognition.

Electrical parts of the equipment and controls shall have all covers and plates in place.

Wiring shall be properly secured to the equipment or structure.

Storage and Handling:

Storage and handling of cylinders of compressed gas refrigerants can be a source of injury to workers.

Workers shall ensure that containers are legibly marked with the type of gas contained and stored with minimum intermingling of types of refrigerant.

Cylinders shall be stored separately from flammable gases and oxygen.

Where caps have been provided for valve protection, they shall be kept in place at all times until the cylinder is actually in use. Valves shall be kept closed at all times except when the cylinder is in use.

Storage and handling of cylinders of compressed gas refrigerants can be a source of injury to workers. (continued)

Cylinders shall not be used as rollers or supports. Their only use is to contain the gas.

Non-refillable containers, such as Department of Transportation (DOT) –2P, DOT 2Q, and DOT 39 containers, shall not be refilled with any material after use of the original contents. They shall be disposed of in accordance with the container manufacturer's or filler's instructions.

Cylinders shall not be dragged, slid, dropped, or allowed to strike each other or solid objects violently. Whenever possible, a suitable hand truck or roll platform shall be used.

Containers shall never be lifted by the valve. Cylinders shall not be suspended by chains, ropes, or slings unless the manufacturer has provided appropriate attachment points.

Storage areas shall be legibly marked with the names of the gases being stored. Full cylinders and empty cylinders shall be segregated and the full ones arranged so the oldest stock can be removed first with a minimum of handling. The storage area shall be kept as dry as possible and away from exposure to salt or other corrosive chemicals or materials. Cylinders shall be secured by a metal securing device or rack specifically designed to prevent damage.

The rules above apply to all refrigeration and air conditioning maintenance work centers that use and store compressed gases.

Fluorocarbons:

The fluorocarbons are relatively inert, in general are non-flammable, and are low in toxicity. Shipped as liquefied compressed gases under their own vapor pressures, they are colorless as liquids and gases under their own vapor pressures, they are colorless as liquids and freeze to white solids. The fluorocarbons are odorless in concentrations of less than 20 percent by volume in air but some have a faint and ethereal odor in higher concentrations.

The fluorocarbons are unusually stable for organic compounds. Resistance toward thermal decomposition, in general, is high but varies with each product. When decomposition does occur, toxic products are very irritating and usually give adequate warning of their presence in very low concentrations in air. Hot work should never be performed on charged systems.

Large Liquid Leaks:

Large liquid leaks in fluorocarbon systems may be detected visually. As the material escapes, moisture in the air surrounding the leak condenses and then freezes around the leak due to the refrigerating effect of the vaporizing fluorocarbons. The frost thus formed is readily apparent. Smaller leaks may be located with the use of:

A solution of liquid detergent in water applied directly to the area being tested. The formation of bubbles indicates a leak.

Electronic leak detectors, capable of sensitivities far greater than the other methods – often in terms of fractions of an ounce of fluorocarbon per year. When the probe of the instrument is placed near a leak, positive identification of the leak is indicated by a flashing light, meter deflection, or by audible means.

NOTE: The vapors of these fluorocarbons are all much heavier than air and in the absence of good ventilation will tend to collect in low areas, thus possibly displacing available air. The vapors will undergo decomposition when drawn through a flame or if in contact with very hot surfaces. The products of decomposition include hydrogen fluoride and hydrogen chloride and, perhaps, small quantities of carbonyl
compounds such as phosgene. The halogen acids are both toxic and intensely irritating to the nose and throat. The irritating action of these decomposition products is readily noticeable before hazardous levels are reached. If such a situation develops, the affected areas should be vacated, the heat source and leak eliminated, and the area well ventilated before resuming work.

Respiratory Protection Program

Policy:

All employees will be protected from exposure to airborne radioactive, chemical, or biological contamination by installing, implementing, or instituting feasible engineering or administrative controls. If these controls do not prove feasible, or while they are being installed/instituted, appropriate respiratory protection will be provided. For some experiments, respiratory protection may be provided as an additional safeguard against exposure.

It is the Company's policy to provide employees with a safe and healthful working environment. This is accomplished by utilizing facilities and equipment that have all feasible safeguards incorporated into their design. When effective engineering controls are not feasible, or when they are being initiated, protection shall be used to ensure personnel protection.

This program does not apply to contractors as they are responsible for providing their own respiratory protection programs and respiratory protective equipment.

Definitions:

a. Respirator – A device provided to protect the wearer from inhalation of harmful or nuisance atmospheres. Respirators may function by air purifying and/or air supplying techniques.

b. Air Purifying Respirator – A respirator that filters and/or absorbs contaminants from the ambient air being inhaled by the wearer.

c. Supplied Air Respirator – A respirator in which clean air is supplied to the facepiece from an auxiliary source away from the wearer.

d. Self-Contained Breathing Apparatus – A respirator in which the air supply is carried by the wearer.

e. Atmospheric Contamination – The term applies equally to gases such as nitrogen, carbon monoxide, and carbon dioxide; the vapors of volatile substances such as benzene and carbon tetrachloride; toxic dusts and fumes; radioactive materials; and so forth.

f. Respirator Fit Test – A test used to determine a proper match or fit between the facepiece of the respirator and face of the wearer.

Responsibilities:

a. Supervisor

Supervisors will ensure each employee under his or her supervision using a respirator has received appropriate training in its use and an annual medical evaluation. Supervisors will ensure the availability of appropriate respirators and accessories, provide adequate storage facilities, and encourage proper respirator equipment maintenance. Supervisors must be aware of tasks requiring the use of respiratory protection, and ensure all employees engaged in such work use the appropriate respirators at all times. The Supervisors are responsible for the following:

1. Ensures that all employees who wear respiratory protective devices are thoroughly trained in their use.

2. Provides employees with the respiratory protection appropriate for the operation, and ensures the use of such devices.

3. Identifies potentially hazardous conditions and immediately notifies the Safety and Health Manager for corrective action.

Supervisors shall contact the Safety and Health Manager prior to non-routine work which may expose workers to hazardous substances or oxygen deficient atmospheres. Examples of work which may require the use of respirators includes, but are not limited to:

- Asbestos abatement activities
- Abrasive blasting
- Cutting or melting lead or stripping lead-based paints from surfaces
- Welding or burning
- Painting, especially with epoxy or organic solvent coatings
- Using solvents, thinners, or degreasers
- Any work which generates large amounts of dust
- Working in a confined space
- Using formaldehyde to decontaminate a space
- Bioaerosols

b. Employee

1. Uses respiratory protective equipment as instructed and required under hazardous agent protocols.

2. Stores respirator properly to prevent damage and inspects prior to each use.

3. Reports any malfunction of respiratory protective equipment to the immediate supervisor.

Responsibilities: (continued)

c. Others

Personnel, such as employees, inspectors, and visitors, who must enter an area where the use of respiratory protective equipment is required, even when their stay time in the area may be 15 minutes or less, shall be provided with and use appropriate equipment, including instructions regarding use and limitations. Personnel shall be fit tested and medically qualified to wear the respirator being issued prior to entry to the site.

Contractors are required to develop and implement a respiratory protection program for their employees who must enter into or work in areas where exposure to hazardous materials can not be controlled or avoided. This program must meet OSHA regulations and include issuance of respirators, medical evaluations, fit testing and training.

d. Safety and Health Manager

1. Develops and implements all aspects of the respiratory protection program.

2. Develops training programs and standard operating procedures to fulfill the requirements of existing OSHA regulations and amendments. 3.Purchases, selects, inspects, maintains, cleans, stores, and fit tests respiratory protective equipment.

4. Periodically inspects and replaces all respiratory protective devices stored for emergency use.

Procedures:

a. Selection – Respirators shall be selected on the basis of the potential hazards to which the worker is exposed. The following factors shall be ascertained by the Health and Safety Branch to ensure that the device selected for the employee will provide satisfactory protection when used properly:

1. Chemical, physical, and toxicological properties of the contaminant(s).

2. Review of actual and potential hazards to assess extent of injurious effects produced under all conditions of potential exposure.

3. Evaluation of the duties to be performed by the wearer as they relate to restriction of movement and duration of potential exposure.

4. An understanding of the principles, design, scope of use, limitations, advantages, and disadvantages of the available respirators. Respiratory equipment selected will be approved by the Company or will otherwise be in accordance with existing OSHA regulations.

Procedures: (continued)

b. Medical Evaluations – It is the responsibility of the Health and Safety Branch to review the health status of all employees who may be required to wear respiratory equipment. In the event of prolonged respirator use, the wearer should have a medical examination to determine if he/she is medically able to wear respiratory protective equipment without aggravating a pre-existing medical condition

Medical considerations include, but are not limited to the following:

- History of asthma or emphysema
- Difficulty in breathing
- Previously documented lung problems
- High blood pressure
- Artery diseases
- Documented heart problems
- Missing or arthritic fingers
- Facial scars
- Claustrophobia
- Poor eyesight

c. Fitting – Each individual required to use a respirator of any type will be fitted by the Safety and Health Manager prior to using any such device. The fit test will include a demonstration of proper donning, wearing, and field fit testing techniques, an extensive leak test using a solution of isoamyl acetate as the test vapor and a quantitative fit test using a respirator fit tester. Any individual with a beard or other facial hair that may prevent a proper facepiece-to-face seal will not be fit tested until the hair has been removed. A separate Respirator Fitting and Training Record shall be maintained for each participating individual.

Respirator Fit testing

A fit test shall be used to determine the ability of each individual respirator wearer to obtain a satisfactory fit with any air-purifying respirator. Both quantitative and qualitative fit tests will be performed. Personnel must successfully pass the fit test before being issued an air-purifying respirator.

No Company employee is permitted to wear a negative-pressure respirator in a work situation until he or she has demonstrated that an acceptable fit can be obtained. Respirator fitting is conducted initially upon assignment to a task requiring use of a respirator. Refitting is conducted annually thereafter upon successful completion of the respirator training.

Respirator Fit testing (continued)

Fit testing will be conducted by the Safety and Health Manager and the test results will be the determining factor in selecting the type, model, and size of negative-pressure respirator for use by each individual respirator wearer.

Fit Checking-

Each time a respirator is donned, the user will perform positive and negative pressure fit checks. These checks are not a substitute for fit testing. Respirator users must be properly trained in the performance of these checks and understand their limitations.

A. Negative Pressure Check

Applicability/Limitations:This test cannot be carried out on all respirators; however, it can be used on facepieces of air purifying respirators equipped with tight-fitting respirator inlet covers and on atmosphere supplying respirators equipped with breathing tubes which can be squeezed or blocked at the inlet to prevent the passage of air.

Procedure: Close off the inlet opening of the respirator's canister(s), cartridge(s), or filter(s) with the palm of the hand, or squeeze the breathing air tube or block its inlet so that it will not allow the passage of air. Inhale gently and hold for at least 10 seconds. If the facepiece collapses slightly and no inward leakage of air into the facepiece is detected, it can be reasonably assumed that the respirator has been properly positioned and the exhalation valve and facepiece are not leaking.

B. Positive Pressure Check

Applicability/Limitations:This test cannot be carried out on all respirators; however, respirators equipped with exhalation valves can be tested.

Procedure: Close off the exhalation valve or the breathing tube with the palm of the hand. Exhale gently. If the respirator has been properly positioned, a slight positive pressure will build up inside the facepiece without detection of any outward air leak between the sealing surface of the facepiece and the face.

Qualitative Fit Testing

Federal regulations (29 CFR 1910.1001) require qualitative fit tests of respirators and describe step-by-step procedures. This test checks the subject's response to a chemical introduced outside the respirator facepiece. This response is either voluntary or involuntary depending on the chemical used. Several methods may be used. The two most common are the irritant smoke test, and the odorous vapor test.

b. Irritant Smoke

The irritant smoke test is an involuntary response test. Air purifying respirators must be equipped with a high efficiency particulate air (HEPA) filter for this test. An irritant smoke, usually either stannic chloride or titanium tetrachloride, is directed from a smoke tube toward the respirator. If the test subject does not respond to the irritant smoke, a satisfactory fit is assumed to be achieved. Any response to the smoke indicates an unsatisfactory fit.

The irritant smoke is an irritant to the eyes, skin, and mucous membranes. It should not be introduced directly onto the skin. The test subject must keep his or her eyes closed during the testing if a full facepiece mask is not used.

b. Odorous Vapor

The odorous vapor test is a voluntary response test. It relies on the subject's ability to detect an odorous chemical while wearing the respirator. Air purifying respirators must be equipped with an organic cartridge or canister for this test. Isoamyl acetate (banana oil) is the usual test. An isoamyl acetate-saturated gauze pad is placed near the facepiece-to-face seal of the respirator of the test subject's skin. If the test subject is unable to smell the chemical, than a satisfactory fit is assumed to be achieved. If the subject smells the chemical, the fit is unsatisfactory.

If the subject cannot smell the chemical, the respirator will be momentarily pulled away from the subject's face. If the subject is then able to smell the chemical, a satisfactory fit is assumed. If the subject cannot smell the chemical with the respirator pulled away from the face, this test is inappropriate for this subject, and a different test will be used.

This test is limited by the wide variation of odor thresholds among individuals and the possibility of olfactory fatigue. Since it is a voluntary response test it depends upon an honest response.

Quantitative Fit Testing

Quantitative fit testing, using the Portacount Plus fit test system, is generally performed on both full-face and half-face negative pressure respirators. Fit factors are determined by comparing the particle concentration outside the respirator with the concentration inside the respirator facepiece. An acceptable fit is achieved when the respirator wearer successfully completes a series of six programmed exercises (normal breathing, deep breathing, moving head up and down, moving head side to side, reading, and normal breathing) with a fit factor of 100 or more.

Special Problems

A. Facial Hair

No attempt is made to fit a respirator on an employee who has facial hair which comes between the sealing periphery of the facepiece and the face, or if facial hair interferes with normal functioning of the exhalation valve of the respirator.

B. Glasses and Eye/Face Protective Devices

Proper fitting of a respiratory protective device facepiece for individuals wearing corrective eyeglasses or goggles, may not be established if temple bars or straps extend through the sealing edge of the facepiece. If eyeglasses, goggles, face shield or welding helmet must be worn with a respirator, they must be worn so as not to adversely affect the seal of the facepiece. If a full-facepiece respirator is used, special prescription glasses inserts are available if needed.

d. Training – Appropriate training and instructions in the proper use of each type of respirator shall be provided by the Safety and Health Manager. Respirator users and their supervisors will receive training on the contents of this Respiratory Protection Program and their responsibilities under it. They will be trained on the proper selection and use, as well as the limitations of the respirator. Training also covers how to ensure a proper fit before use and how to determine when a respirator is no longer providing the protection intended.

The Safety and Health Manager provides training of respirator wearers in the use, maintenance, capabilities, and limitations of respirators is initially upon assignment of personnel to tasks requiring the use of respirators. Retraining is given annually thereafter and only upon successful completion of the medical evaluation.

The training program will include the following:

Respirator training will be properly documented (Appendix A) and will include the type and model of respirator for which the individual has been trained and fit-tested.

This training will include, but not be limited to:

1.Nature and degree of respiratory hazard

2.Respirator selection, based on the hazard and respirator capabilities and limitations

3.Donning procedures and fit tests including hand's-on practice to ensure an effective face piece to face seal

4. Actual handling of the respirator and wearing it for a period in a test atmosphere.

5. A discussion of respirators construction, operating principles and limitations.

6.Care of the respirator, e.g., need for cleaning, maintenance, storage, and/or replacement

7. Instruction on the nature of the hazard, including information on its physical properties, possible concentrations, modes of physiological action and means of detection.

8. Use and limitations of respirator

9. Discussions of maintenance and inspection procedures.

e. Inspection – For sanitary and health reasons, clean respirators shall be used by one individual only and shall be returned to the Safety and health Manager for cleaning, maintenance, and repairs. Cleaning and disinfecting of reusable components of a respirator unit will be performed by utilizing recognized procedures corresponding to the exposure atmosphere. Disposable respirators will be discarded properly after use by the individual. Inspection frequency for all unused devices shall be monthly. Units receiving routine use shall be inspected by the employee before and after each use. The inspection shall include the following checks when applicable.

1.Tightness of connections
2. Condition of facepiece, headbands, exhalation and inhalation valves, connecting tube, and canister
3. Pressure in cylinders (do not use if less than 1500 psi)
4. Deterioration of all rubber parts

The inspection shall include the following checks when applicable. (continued)

5. Regulator mechanism
6. Lens of facepieces
7. Warning alarm (self-contained units)
8. Seal on cartridge package

f. Location and Storage of Respirators – Location and storage of all respiratory devices shall be controlled by the Safety and Health Manager. When the need for respiratory equipment is anticipated, approval by the Safety and Health Manager should be obtained in advance.

After inspection, cleaning, and any necessary minor repairs, store respirators to protect against sunlight, heat, extreme cold, excessive moisture, damaging chemicals or other contaminants. Respirators placed at stations and work areas for emergency use shall be stored in compartments built for that purpose, shall be quickly accessible at all times and will be clearly marked. Routinely used respirators, such as half-mask or full-face air-purifying respirators, shall be placed in sealable plastic bags. Respirators may be stored in such places as lockers or tool boxes only if they are first placed in carrying cases or cartons. Respirators shall be packed or stored so that the facepiece and exhalation valves will rest in a normal position and not be crushed. Emergency use respirators shall be stored in a sturdy compartment that is quickly accessible and clearly marked.

g. Self-Contained Breathing Apparatus – Emergency respirators in carrying cases shall be located in areas designated by the Safety and Health Manager. These respirators are provided for emergency situations only, and for use by authorized personnel. Any conditions requiring the use of these devices shall be reported to Safety and Health Manager.

h. Special Requirements for Confined Spaces – In areas immediately hazardous to life or health, self-contained breathing apparatus, air line respirators or hose masks with blowers shall be used. For emergency rescue, a standby person with suitable self-contained breathing apparatus shall be at the nearest fresh air base. Communications (visual, voice or signal line) shall be maintained between all individuals present.

Persons using air line respirators and hose masks with blowers shall be equipped with safety harnesses and safety lines for lifting or removing them from hazardous atmospheres, or other equivalent provisions for rescue from hazardous atmospheres shall be used. More details concerning respiratory protection for confined space entry can be found in the Company’s Confined Space Program.

Types of Respirators-

A. Air-Purifying Respirator

These respirators remove air contaminants by filtering, absorbing, adsorbing, or chemical reaction with the contaminants as they pass through the respirator canister or cartridge. This respirator is to be used only where adequate oxygen (19.5 to 23.5 percent by volume) is available. Air-purifying respirators can be classified as follows:

1. Particulate removing respirators, which filter out dusts, fibers, fumes and mists. These respirators may be single-use disposable respirators or respirators with replaceable filters.

NOTE: Surgical masks do not provide protection against air contaminants. They are never to be used in place of an air-purifying respirator. They are for medical use only.

2. Gas- and vapor-removing respirators, which remove specific individual contaminants or a combination of contaminants by absorption, adsorption or by chemical reaction. Gas masks and chemical-cartridge respirators are examples of gas- and vapor-removing respirators.

3. Combination particulate/gas- and vapor-removing respirators, which combine the respirator characteristics of both kinds of air-purifyingrespirators.

B. Supplied-Air Respirators

These respirators provide breathing air independent of the environment. Such respirators are to be used when the contaminant has insufficient odor, taste or irritating warning properties, or when the contaminant is of such high concentration or toxicity that an air-purifying respirator is inadequate. Supplied- air respirators, also called air-line respirators, are classified as follows:

1. Demand

This respirator supplies air to the user on demand (inhalation) which creates a negative pressure within the facepiece. Leakage into the facepiece may occur if there is a poor seal between the respirator and the user’s face.

2. Pressure-Demand

This respirator maintains a continuous positive pressure within the facepiece, thus preventing leakage into the facepiece.

3. Continuous Flow

This respirator maintains a continuous flow of air through the facepiece and prevents leakage into the facepiece.

C. Self-Contained Breathing Apparatus (SCBA)

This type of respirator allows the user complete independence from a fixed source of air and offers the greatest degree of protection but is also the most complex. Training and practice in its use and maintenance is essential. This type of device will be used in emergency situations only.

Identification of Respirator Cartridges and Gas Mask Canisters

Respirator cartridges and canisters are designed to protect against individual or a combination of potentially hazardous atmospheric contaminants, and are specifically labeled and color coded to indicate the type and nature of protection they provide.

An approved label on the respirator will also specify the maximum concentration of contaminant(s) for which the cartridge or canister is approved. For example, a label may read:

"DO NOT WEAR IN ATMOSPHERES IMMEDIATELY DANGEROUS TO LIFE. MUST BE USED IN AREAS CONTAINING AT LEAST 20 PERCENT OXYGEN. DO NOT WEAR IN ATMOSPHERES CONTAINING MORE THAN ONE-TENTH PERCENT ORGANIC VAPORS BY VOLUME. REFER TO COMPLETE LABEL ON RESPIRATOR OR CARTRIDGE CONTAINER FOR ASSEMBLY, MAINTENANCE, AND USE."

Warning Signs of Respirator Failure

A. Particulate Air-Purifying

When breathing difficulty is encountered with a filter respirator (due to partial clogging with increased resistance), the filter(s) must be replaced. Disposable filter respirators must be discarded.

B. Gas or Vapor Air-Purifying

If, when using a gas or vapor respirator (chemical cartridge or canister), any of the warning properties (e.g., odor, taste, eye irritation, or respiratory irritation) occur, promptly leave the area and check the following:

- Proper face seal
- Damaged or missing respirator parts
- Saturated or inappropriate cartridge or canister

If no discrepancies are observed, replace the cartridge or canister. If any of the warning properties appear again, the concentration of the contaminants may have exceeded the cartridge or canister design specification. When this occurs an airline respirator or SCBA is required.

C. Service Life of Air-Purifying Respirator Canisters and Cartridges

The canisters or cartridges of air-purifying respirators are intended to be used until filter resistance precludes further use, or the chemical sorbent is expended as signified by a specific warning property, e.g., odor, taste, etc. New canisters, cartridges or filters shall always be provided when a respirator is reissued. When in doubt about the previous use of the respirator, obtain a replacement canister or cartridge.

D. Supplied Air Respirator

When using an airlines respirator, leave the area immediately when the compressor failure alarm is activated or if an air pressure drop is sensed. When using an SCBA leave the are as soon as the air pressure alarm is activated.

Maintenance and Issuance of Respirators:

Maintenance

The maintenance of respiratory protective devices involves a thorough visual inspection for cleanliness and defects (i.e., cracking rubber, deterioration of straps, defective exhalation and inhalation valves, broken or cracked lenses, etc.). Worn or deteriorated parts will be replaced prior to reissue. No respirator with a known defect is reissued for use. No attempt is made to replace components, make adjustments or make repairs on any respirator beyond those recommended by the manufacturer. Under no circumstances will parts be substituted as such substitutions will invalidate the approval of the respirator. Any repair to reducing or admission valves, regulators, or alarms will be conducted by either the manufacturer or a qualified trained technician.

Cleaning of Respirators

All respirators in routine use shall be cleaned and sanitized on a periodic basis. Respirators used non-routinely shall be cleaned and sanitized after each use and filters and cartridges replaced. Routinely used respirators are maintained individually by the respirator wearer. Replacement cartridges and filters are obtained by contacting the Safety and Health Manager.

Cleaning and disinfection of respirators must be done frequently to ensure that skin-penetrating and dermatitis-causing contaminants are removed from the respirator surface. Respirators maintained for emergency use or those used by more than one person must be cleaned after each use by the user.

The following procedure is recommended for cleaning and disinfecting respirators:

1. Remove and discard all used filters, cartridges, or canisters.
2. Wash facepiece and breathing tube in a cleaner-disinfectant solution. A hand brush may be used to remove dirt. Solvents which can affect rubber and other parts shall not be used.
3. Rinse completely in clean, warm water.
4. Air dry in a clean area in such a way as to prevent distortion.
5. Clean other respirator parts as recommended by the manufacturer.
6. Inspect valves, headstraps, and other parts to ensure proper working condition.
7. Reassemble respirator and replace any defective parts.
8. Place in a clean, dry plastic bag or other suitable container for storage after each cleaning and disinfection.

Issuance of Respirators

Respiratory protective equipment shall not be ordered, purchased, or issued to personnel unless the respirator wearer has received respirator training and a fit test. New employees who require respiratory protective equipment, must be placed into the respirator program before being issued equipment.

APPENDIX A

RESPIRATOR TRAINING CERTIFICATION

I hereby certify that I have been trained in the proper use and limitations of the respirator issued to me. The training included the following:

1. Instruction on putting on, fitting, testing and wearing the respirator.

2. Instruction on inspection, cleaning, and maintaining the respirator.

3. Explanation of dangers related to misuse.

4.Instructions on emergency situations.

I further certify that I understand the use, care, and inspection of the respirator and have tested and worn the unit.

Date: _____

Signed:_____ SSN: _____

Respirator Type Issued: _____

Training Coordinator: _____

APPENDIX B – FIT TEST WORKSHEETS

QUALITATIVE RESPIRATOR FITTEST

Name: _____ SSN: _____

Clean Shaven? __Yes __No

Spectacle Kit? ___Yes ___No

Manufacturer/Model _____ Size: ___S ___M ___L

Irritant Smoke ___Pass ___Fail

Isoamyl Acetate ___Pass ___Fail

Manufacturer/Model_____ Size: ___S___M___L

Irritant Smoke ___Pass ___Fail

Isoamyl Acetate ___Pass ___Fail

Examiner _____

Date_____

Employee _____

Date _____

APPENDIX B – FIT TEST WORKSHEETS

QUANTITATIVE RESPIRATORFIT TEST REPORT

LAST NAME _____

FIRST NAME_____

ID NUMBER_____

NEXT TEST DUE_____

OPERATOR NAME_____

RESPIRATOR MODEL_____

•SIZE_____ •MANUFACTURER_____

•APPROVAL NUMBER_____

NOTES_____

TEST DATE_____

TEST TIME_____

TEST DATA

Fit Factor Pass Level: 100

Ex. Ambient
(Part/cc) Mask
(Part/cc) Fit FactorPass/FailNB
DB
SS
UD
R
NB
OVERALL FIT FACTOR = _____

Operator _____ Date _____

Subject_____ Date _____

Roof Labor Safety

Roof construction, repair, and other maintenance operations often require manual labor at dangerous heights and on steeply pitched working surfaces. The possibility of lost footing, decreased stability, and objects falling from such heights is great; appropriate employee safeguards shall be present. When employees of the Company are involved in such operations, the following minimum safety guidelines shall be followed to promote a safe and healthful workplace and guard against injury to others below the work area.

Training:

Each department head whose employees are required to perform duties on roofs shall insure that they receive safety training and comply with the minimum standards as specified in this document.

Catch Platforms:

A substantial catch platform shall be installed below the working area of roofs more than 20 feet from ground to eaves without a parapet, or 16 feet from ground to eaves with a slope greater than 4 inches in 12 without a parapet. The platform shall extend 2 feet in

width beyond the projection of the eaves and shall be provided with a safety rail, mid-rail, and toeboard. This provision shall not apply where employees engaged in work upon such roofs are protected by a safety belt attached to a lifeline.

Safety Belts, Lifelines, and Lanyards:

Where catch platforms are not in place, employees performing duties on a roof more than 20 feet from ground to eaves without a parapet, or 16 feet from ground to eaves with a slope greater than 4 inches in 12 inches without a parapet, shall be secured by an approved safety belt attached to a lifeline.

The safety belt lanyard shall be a minimum of 1/2- inch nylon, or equivalent, with a maximum length to provide for a fall of no greater than 6 feet. The rope shall have a nominal breaking strength of 5,400 pounds.

Lifelines shall be secured above the point of operation to an anchorage or structural member capable of supporting a minimum dead weight of 5,400 pounds. One employee acting as anchor for another does not fulfill this requirement.

Lifelines used in areas where they may be subjected to cutting or abrasion, shall be a minimum of 7/8-inch wire core manila rope. For all other lifeline applications, a minimum of 3/4- inch manila or equivalent, with a minimum breaking strength of 5,400 pounds, shall be used.
Lifelines, safety belts, and lanyards shall be used only for employee safeguarding. Ropes used for hoisting lines and other purposes shall not be used as lifelines. Any lifeline, safety belt, or lanyard actually subjected to in-service loading, as distinguished from static testing, shall be immediately removed from employee safeguarding.

Safety Nets:

Where the use of ladders, scaffolds, catch platforms, temporary floors, safety lines, or safety belts is impractical, safety nets shall be provided when workplaces are more than 20 feet above the ground, water, or other surface.

Roofing Brackets:

Roofing brackets shall be constructed to fit the pitch of the roof.
In addition to the pointed metal projections, brackets shall be secured by nailing in place. The nails shall be driven full length into the roof. When rope supports are used, they shall consist of first-grade manila of at least 3/4-inch diameter, or equivalent.

Crawling Boards or Chicken Ladders:

Crawling boards shall not be less than 10 inches wide and one inch thick, having cleats 1 x 1-1/2 inches. The cleats shall be equal in length to the width of the board and spaced at

equal intervals not to exceed 24 inches. Nails shall be driven through and clinched on the underside. The crawling board shall extend from the ridge pole to the eaves when used in connection with roof construction, repair, or maintenance.

A firmly fastened lifeline of at least 3/4-inch rope shall be strung beside each crawling board for a handhold.

Crawling boards shall be secured to the roof by means of adequate ridge hoods or equivalent effective means.

Use of Hoisting Lines:

When hoisting lines are used to raise tools or materials to a roof greater than 16 feet from ground to eaves without a parapet (or with a parapet less than 30 inches in height), the employee on the roof shall be secured by an approved safety belt attached to a lifeline.

The safety belt lanyard shall be a minimum of 1/2- inch nylon, or equivalent, with a maximum length to provide for a fall of no greater than 6 feet. The rope shall have a nominal breaking strength of 5,400 pounds.

Work Site Isolation:

Prior to the start of roof construction, repair, or maintenance, the crew chief, foreman, or person in charge of the project shall insure that the area below the work site is isolated against entry by the use of barrier tape or other means.
If means of egress are to be blocked by ladders, scaffolds, or other equipment, or to isolate below a work site, prior approval must be obtained from an Environmental Health Services Department representative.

Personal Protective Equipment:

Employees involved in roof construction, repair, or maintenance operations shall use appropriate personal protective equipment including, but not limited to, hard hats, eye protection, and leather gloves.

If Conventional Fall Protection Systems are not used, OSHA Requires the Following:

All workers who are allowed on the roof must be proficient in the alternate methods of fall protection. Affected employees must also be trained in the specific hazards associated with work on roofs which have rake edges.
Roof surfaces must be inspected for slipping hazards--either eliminating them or taking measures to ensure that employees avoid them.
Workers must wear appropriate foot wear to reduce slipping potential.

Operations must be suspended when weather conditions such as high wind, rain, snow or sleet create a hazardous condition, and must remain suspended until the condition has passed.
Damaged portions of the roof deck must be repaired as soon as practicable. Any holes (including skylight openings) must be protected either by covers or by installing guardrails.
Employees must be protected with a safety monitoring system or by roofing slide guards.
Workers must not ascend or descend the roof slope within 6 feet of the rake edge, except where such a limit on movement would prevent the performance of work.
Supplies and materials must not be stored within 6 feet of the rake edge, or three feet where tile and metal roof systems are being installed.
The area below eaves and rakes must be kept clear of materials and other objects which could pose impalement hazards, or they must be guarded properly.

The Company shall, when using roofing slide guards as fall protection, take additional precautions:

On slopes of 6-in-12 or less, three rows of roofing material must be placed prior to installing slide guards. Guards must be capable of holding a worker's weight should that person slip.
On roofs with slopes greater than 6-in-12, up to and including 8-in-12, eaves slide guards must be installed for the entire length of the eaves. Additional guards must be installed below the work area at intervals not to exceed 8 feet. While standing on the plank below, the employee must secure roof jacks with nails and add planks, then climb up to the plank and continue to install the roof. Once the roof is installed, the employee will climb down to a lower plank and remove above planking and roof jacks until all jacks and planking have been removed.
When a conventional method of fall protection must be provided:
On roofs of 8-in-12 or greater, and on roofs with slopes greater than 4-in-12 where the fall potential measured from eaves is greater than 25 feet.
Conventional methods include safety nets, guardrails or a personal fall arrest system.

REFERENCES

29 CFR 1910.28 (T)	Crawling boards or chicken ladders
29 CFR 1926.451 (U)	Roofing brackets
29 CFR 1926.104	Safety belts, lifelines, and lanyards
29 CFR 1926.105	Safety nets

29 CFR 1910.28 (S)	Roofing brackets
29 CFR 1926.451 (U) (3)	Catch platforms

Safety and Health Signs and Tags

Policy and Purpose:

All devices, structures and areas where hazardous materials are used, or where hazards or possible hazards may exist will be identified with appropriate hazard warnings.

Signs and tags are not intended as substitutes for preferred abatement methods such as engineering controls, substitution, isolation, or safe work practices. Rather, they are additional safety guidance and increase the employee's awareness of potentially hazardous situations.

Tags are temporary means of warning all concerned of a hazardous conditions, defective equipment, etc. **Tags are not to be considered as a complete warning method** but should only be used until a positive means can be employed to eliminate the hazard; for example, a "Do Not Start" tag is affixed to a machine and is used only until the machine can be locked out, de-energized, or inactivated.

The Safety and Health Manager maintains a supply of a variety of safety signs and tags for use by Company personnel.

Responsibilities:

Supervisor-

> Posts appropriate warning signs for materials of a hazardous nature (poisonous, toxic, flammable, carcinogenic, biological hazard, radioactive, etc.) or hazardous conditions (high voltage, slippery when wet, welding arcs, etc.).

Employee-

1. Conducts themselves in the manner (safe procedures, protective equipment, clothing, etc.) as called for by the hazard warning signs and training.

2. Assists the supervisor in recognition of any potentially hazardous condition that may need identification by hazard warning signs.

Safety and Health Manager-

1. Periodically surveys all operations to ensure proper identification of hazardous areas or conditions by use of warning signs and immediately notifies supervisor of any lack of, or improper markings.

2. Assists the supervisor in defining proper identification, and acceptable location of signs in compliance with existing OSHA, Nuclear Regulatory Commission (NRC), Environmental Protection Agency (EPA), or other regulations.

3. Provides fabricated hazard warning signs.

4. Maintains a supply of all frequently used hazard warning signs.

Sign Policy:

a. Common sense is required in the use of Hazard Warning Signs so their effectiveness is not lost by over use. Hazard Warning Signs are not to be abused for personal reasons such as to keep people out of an area or to discourage use of laboratory materials, equipment, etc.

b. Any temporary posting of a hazard should be replaced as soon as possible by an acceptable permanent sign or removed when the hazard no longer exists.

c. Safety colors and specifications for accident prevention signs and tags shall be in accordance with applicable federal and state regulations.

d. The following key colors will be used in the signs, paint, tape, etc. for warning personnel of hazardous conditions and identifying emergency equipment.

1. Red – basic color for fire protection equipment and apparatus, danger, and emergency stop devices.

2. Orange – designates dangerous parts of machines or energized equipment which may cut, crush, shock, or otherwise injure.

3. Yellow – designates caution and is used for marking physical hazards. Solid yellow, yellow and black stripes, or checkers should be used interchangeably to attract the most attention in the area in question.

4. Green – used as a safety designation and for marking the location of first aid equipment.

5. Blue – also designates caution, but limited to warning against the starting, use of, or movement of equipment under repair or being worked on. 6.Black, Purple or magenta on yellow – designates radiation hazards.

7. Black on white – designates traffic and housekeeping markings.

Danger Signs- "Danger" signs shall be used where an immediate hazard exists and specific precautions are required to protect personnel or property. The sign shall be of red, black, and white colors.

"**Danger**" tag shall be placed on a damaged ladder or other damaged equipment, and immediate arrangements made for the ladder/equipment to be taken out of service and sent to be repaired.

Caution Signs- "Caution" signs shall be used to warn of a potential hazard or to caution against unsafe practices, and to prescribe the precaution that will be taken to protect personnel and property from mishap probability. The sign shall be of yellow and black colors.

Radiation Signs- "Radiation" signs shall be used to warn of radiation hazards and of special precautions that will be taken. "Radiation" signs shall use the conventional radiation warning colors of magenta on a yellow background. Radiation warning signs are strictly regulated.

Exit Signs- "Exit" signs shall be utilized to clearly identify the means of egress from a building or facility. Where the exit is not apparent, signs shall have an arrow indicating the direction of the exit.

Biological Hazard Warning Signs- "Biological Hazard" warning signs shall be used to signify the actual or potential presence of a biological hazard and to identify equipment, containers, rooms, experimental animals, etc., which contain or are contaminated with viable hazardous agents. The symbol on these signs shall be the standard fluorescent orange or orange-red color.

Safety Instruction– Shall be used where there is a need for general instructions and suggestions relative to safety measures.

No smoking, eating or drinking signs – Will be placed in all designated areas where there are flammable, toxic, carcinogenic, mutagenic, teratogenic, or radioactive materials stored or used.

Special signs or tags – Will be used as needed (e.g. labels for chemical carcinogens).

No Smoking Signs – Our Company is a smoke free environment and smoking is prohibited inside all Company owned buildings. No Smoking Signs are required in all areas (i.e., loading docks) designated by fire regulations or as areas where smoking is not allowed.

Posting of Signs and Tags-

Any Company employee who becomes aware of an unsafe condition will immediately advise the work area Supervisor of that condition. The Supervisor will determine whether a tag or sign is needed and, if so, that the appropriate sign or tag is posted or attached as required. They will coordinate the placement of tags, with the Safety and Health manager. If the responsible Supervisor is not available, the employee will contact the Safety and Health Manager and request assistance.

The Supervisor will evaluate the situation and initiate appropriate corrective action. The Supervisor, in coordination with the Safety and Health Manager, is responsible for removing the sign or tag only after the unsafe condition has been corrected.

Method of Posting

a. Signs that are to be used permanently will be installed only by the Company Authorized Personnel.

b. Signs that are to be used in laboratory areas on a temporary basis (less than one month) will be posted with masking tape on a glass surface door or, if more appropriate, on refrigerators, freezers, etc.

c. Signs will not be posted with tacks, pins, and various adhesive materials that will damage the doors, walls, or building when the signs are removed. In areas where suitable surfaces for attaching the signs are not available, stands will be provided by Management.

Unauthorized signs

In hallways and conference rooms are subject to immediate removal.

Laboratory Entrance Warning Placards

Laboratory entrance warning placards to alert personnel of specific hazards within laboratories will be affixed to the doors of laboratories. These placards will identify the presence of carcinogenic agents, biohazards, radioactive materials, reproductive toxins, flammable solvents, corrosive materials, reactive chemicals, toxic chemicals, toxic gases, and emergency contacts.

Scaffold Safety Program

Policy:

It is the policy of the Company to take all practical measures possible to prevent employees from being injured by falls from scaffolds. The Company will take all necessary steps to eliminate, prevent, and control fall hazards. The Company will comply fully with the OSHA Fall Protection standard (CFR 1926, Subpart M, Fall Protection).

Workers may die or be injured if scaffold equipment and fall protection systems are defective or misused.

A "Scaffold" means one or more working platforms suspended by ropes or other means from an overhead structure. Recent investigations by OSHA suggest that fatal falls occur as a result of defective scaffold equipment, improper installation or operation, improper training of workers, or a failure to use appropriate personal fall protection equipment.

Safety regulations of the Occupational Safety and Health Administration (OSHA) establish specific requirements for suspension scaffolds and their operation, including the use of fall protection systems. Our Company will ensure that all supervisors, and worker(s) involved in work from suspension scaffolds will comply with these regulations.

Background:

Falls are a leading cause of traumatic occupational death. The U.S. Department of Labor indicates that falls accounted for 8% of all occupational fatalities from trauma. Personal fall protection equipment was used in several of these incidents, but it was used improperly in each case. In several incidents, workers fell out of their improperly fastened safety belt or in the other incidents, excessively long lanyards broke or separated after victims fell 30 feet.

Responsibilities:

Supervisors of all employees that are required to work from scaffolds will ensure the following procedures are taken:

1. Comply with the current and proposed OSHA regulations for working with scaffolds.

2. Assure that design and construction of scaffolds conform with OSHA requirements.

3. Shield scaffold suspension ropes and body belt or harness system (lifelines) from hot or corrosive processes, and protect them from sharp edges or abrasion.

4. Inspect all scaffolds, scaffold components, and personal fall protection equipment before each use.

<u>Responsibilities</u>: (continued)

5. Provide personal fall protection equipment and make sure that it is used by all workers on suspension scaffolds.

6. Use structurally sound portions of buildings or other structures to anchor droplines for body belt or harness systems and tiebacks for suspension scaffold support devices. Droplines and tiebacks should be secured to separate anchor points on structural members.

7. Provide proper training for all workers who use any type of suspension scaffold or fall protection equipment.

8. Follow scaffold manufacturers' guidance regarding the assembly, rigging, and use of scaffolds.

Employees shall;

1. Inspect all scaffolds, scaffold components, and personal fall protection equipment before each use. Defective components must be removed from service and replaced.
2. Shield scaffold suspension ropes and body belt or harness system lifelines from hot
8 or corrosive processes, and protect them from sharp edges or abrasion.
3. Wear a body harness which may include a deceleration device, lifeline, or suitable combinations. The body harness shall be rigged so that an employee can neither free fall more than 4feet nor contact any lower level and bring an employee to a complete stop and limit the maximum deceleration distance an employee travels to 3.5 feet

The use of body belts for fall arrest is prohibited

.

<u>General Scaffold Requirements:</u>

Supervisors and employees will insure that the following operating procedures are observed:

Scaffolds must be substantially constructed to carry the loads imposed upon them

and to provide a safe work platform. All scaffolds more than 4 ‘ high must have approved guardrails on all ends exposed ends and sides.

Guardrails, mid-rails, and toe boards must be installed on all open sides of scaffolds 4’ high or more in height.

Only approved scaffolds will be used. Barrels, boxes, rebar. Or other make-shift substitutes for scaffolds will not be used.
Scaffold planks must be cleated together, and must extend over the end supports at least 6 inches, but not more than 12 inches.

All scaffold planks must be visually inspected before each use. Damaged scaffold planks must be destroyed immediately.

All scaffold planks must be at least two planks wide: No employee may work from a single plank.

Adequate mud sills or other rigid footing, capable of withstanding the maximum intended load, must be provided.

Scaffolds must be tied to the building or structure at intervals which do not exceed 30 feet horizontally and 26 feet vertically.

Do not overload scaffolds. Materials should be brought up as needed. Scaffolds must not be loaded in excess of one-fourth of their rated capability.

Where persons are required to work or pass under scaffolds, a screen of 18 guage, ½ inch wire mesh is required between the toe and guard rail.

Overhead protection is required if employees working on scaffolds are exposed to overhead hazards. Such protection must be a 2” thick plank or equivalent.

Diagonal bracing must be used on all support components.

Midrails 1” X 6” or equivalent must be present on all sides.

Ladders will be used as a means of entry onto and exit off of the scaffold.

Rolling Scaffolds- General Requirements:

The height of the rolling scaffold must not exceed four times the minimum base dimension.

The work platform must be planked tight for the full width of the scaffold. Cleat the underside of the planks to prevent their movement.

Caster breaks must be locked when the scaffold is not in motion.

Get help when moving rolling scaffolds. Make certain that the route is clear. Watch for holes and overhead obstructions.

No one shall be permitted to ride on rolling scaffolds.

Two Point Suspended Scaffolds (Swinging Stages) General Requirements:

Each employee working from a two point suspended scaffold must be tied off to an independent safety line.

Suspended scaffolds must be not less than 20 inches nor more than 36 inches wide.

Wire ropes used to suspend such scaffolds must be able to withstand a load that is six times the load it is intended to support.

Non–conductive insulating material must be placed over suspension cables of each scaffold for protection when the chance of contact with an electric arc exists.

Design and Construction of Scaffolds:

The design and construction of scaffolds must conform with OSHA requirements concerning type of equipment, rated capacities, construction methods, and use. Each scaffold and scaffold component must be capable of supporting its own weight plus at least four times the maximum intended load without failure. Each suspension rope must be capable of supporting at least six times the maximum intended load.

Shielding of Ropes

Suspension ropes and droplines for body belt or harness systems should be shielded from:

- heat-producing processes such as welding,
- acids or other corrosive substances, and
- sharp edges or abrasions.

Such ropes should be made from material that is not adversely affected by heat or by acids or other corrosives.

Inspection

Supervisors and Employees will inspect all scaffolds and scaffold components for visible defects before use on each work shift. Scaffolds will be erected, moved, dismantled, or altered only under the supervision of a competent person.

All components of personal fall protection equipment (including body belts or harnesses, lanyards, droplines, trolley lines, and points of anchorage) should be

inspected by Supervisors and Employees before use. Any visibly damaged or worn equipment should be removed from service immediately.

Use of Fall Protection Equipment

The Company will provide appropriate fall protection systems and ensure their use by all workers on suspension scaffolds. Generally, these workers will be protected by a Type I guardrail system [see note 2 below] or a combination of body belt or harness system with a Type II guardrail system [see note 3 below].

However, when single-point and two-point adjustable suspension scaffolds are used, workers must be protected by both a body belt or harness system and a Type I or Type II guardrail system. Also, when boatswain chairs, catenary scaffolds, and float scaffolds are used, workers must be protected only by a harness system.

Use of Structural Members as Anchor Points:

Structurally sound portions of buildings or other structures must be used to anchor droplines for body belt or harness systems and tiebacks for suspension scaffold support devices. Droplines and tiebacks should be secured to separate anchor points of structural members. Owners, architects, and engineers planning renovation or designing new facilities should incorporate strategically located anchor points on structural members of buildings for future exterior maintenance and repair work.

Proper Training of Workers

The Company will provide workers with proper training, including the manufacturers' recommendations for installing and operating suspended scaffold systems and for using personal fall protection equipment. Untrained personnel should never be permitted to work from any type of suspension scaffold.

NOTES

1. Fall protection systems consist of harness systems (personal fall arrest systems) used independently or in combination with guardrail systems.

2. Type I guardrail systems are those capable of providing adequate fall protection without the use of body belts.

3. Type II guardrail systems are those that delineate the scaffold edge, restrain movement, provide handholds, and prevent mis-stepping. Type II systems must be supplemented by body belt or harness systems to provide adequate fall protection

Temporary Contract Worker Safety

Policy:

All firms contracted by the Company, because they are employers, are required by the Williams-Steiger Occupational Safety and Health Act of 1970 to provide safe and healthy employment to their employees.

The Company as an employer is also responsible for providing a safe and healthful work environment for its employees. Contract work, especially in occupied buildings, may present situations or conditions that may adversely impact on the safety and health of our Company employees.

Responsibilities:

All Company personnel responsible for managing contracts will ensure that:

1. Each contractor is provided with warnings of hazards and information about our Company programs for abating these hazards;

2. Each contractor is informed of our Company's safety, health, and environmental requirements; and

3. The work is conducted in a safe and responsible manner in compliance with applicable regulations and our Company's requirements.

Our Company's Contracting Officer will ensure that the contract language requires the contractor to:

1. Meet all applicable federal, state, and local environmental, health, and safety regulations and our Company's requirements;

2. Provide their employees with the necessary training, medical exams, and safety equipment;

3. Submit written comprehensive safety and health plan for the specific contract undertaken;

4. Comply with all applicable federal, state, and local regulations and our Company's requirements, with violation being grounds for default of the contract.

Our Project Contracting Officer will:

1. Communicate the contractual, statutory, and other environmental, health and safety requirements to the contractor prior to the start of the contract;

2. Ensure that the contractor's safety and health plan is submitted with their bid package;

3. Ensure that such requirements are addressed in the Request for Solicitation and/or contract paperwork; and

4. Ensure that such requirements are observed.

5. Upon receipt of a report of a noncompliance or any condition which poses a serious or imminent danger to health or safety, issue a request for immediate corrective action from the contractor.

Our Project Compliance Officer will, prior to the start of the contract, inform the contractor of the requirement to observe all environmental, health, and safety provisions specified in the contract, provided by statutes/regulations or otherwise required.

Our Project Compliance Officer and his/her representative will:

1. Ensure our Safety and Health Manager is provided with a copy of the contractor's written health and safety plan for review prior to the pre-construction meeting with the contractor.

2. Ensure our Safety and Health Manager is represented at all pre-construction meetings held with contractors.

3. Provide our Safety and Health Manager and our Security Officer with a tentative construction schedule for contractors on-site and immediate written notification of changes.

4. Notify our Company's Management of the contractor work schedule, location, and special precautions or concerns prior to the start of the project.

5. Monitor the contractor's work performance and determine if contractor is complying with the contract health and safety plan and pertinent environmental, health, and safety regulations. Any questions regarding compliance with specific regulations should be referred to our Safety and Health Manager.

Our Project Compliance Officer and his/her representative will: (continued)

6. Ensure that all required permits are completed by the contractor and provided for review and signature of an authorized person and by our Safety and Health Manager

7. Notify our Safety and Health Manager immediately of construction accidents and provide our Safety and Health Manager with a copy of the contractor's accident reports.

8. Notify our Safety and Health Manager immediately of an OSHA complaint and/or inspection of contractor's job site.

Our Safety and Health Manager will conduct a pre-solicitation project review of the contract to ensure that all appropriate health and safety regulations and requirements and pertinent work site hazard information have been incorporated, where necessary. Our Safety and Health Manager will document review of the plan and will note any areas of special concerns.

The Safety and Health Manager will review and monitor the contractor's adherence to its written health and safety plan and all applicable environmental, health, and safety requirements.

The contractor is responsible for meeting all contractual agreements and for providing a safe and healthy workplace for its employees.

The contractor will:

1. Provide for frequent and regular safety inspections of the work sites, materials, and equipment by competent employees.

2. Notify our Project Compliance Officer of construction accidents in a timely manner.

3. Notify our Project Compliance Officer of any non-formal OSHA complaint notifications and/or OSHA inspection(s) of the job site.

The contractor Health and Safety Plan:

When required by the contract, the contractor must develop and implement a comprehensive health and safety plan for his or her employees which covers all aspects of onsite construction operations and activities associated with the contract. This plan must comply with all applicable health and safety regulations and any project-specific requirements that our Company has specified. The contractor must provide our Contracting Officer with a copy of this plan with their bid package.

Acceptance of the contractor's health and safety plan only signifies that the plan generally conforms to the requirements of the contract. It does not relieve the contractor of the

responsibility for providing employees with a safe and healthful work environment. This concept must be communicated to the contractor by our Contracting Officer and also incorporated into the contract document.

Pre-Construction Meeting:

Representatives of the contractor shall meet with our Contracting Officer, Project Compliance Officer, and Safety and Health Manager. The purpose of the meeting will be to discuss our safety requirements and for the implementation of all health and safety provisions pertinent to the work under contract.

Our Safety and Health Manager will review the contractor's site specific safety and health plan with the contractor as well as review all required material safety data sheets (MSDS) submitted for proposed products to be used by the contractor.

Our Company is required by OSHA standards (most notably 29 CFR 1910.1200, Hazard Communication Standard) to provide information to contractors on the hazards present at the work site. This information will be made available to the contractor in the project specifications (pre-bid) as well as at the pre-construction meeting.

Our Safety and Health Manager will, during the pre-construction meeting, provide the contractor with copies of our Company's written procedures such as lockout/tagout, confined space entry and permit process, and other safety and health requirements that apply.

Fire Prevention and Protection:

The contractor shall prepare and carry out an effective fire protection and prevention plan, including provisions for the fire protection and suppression equipment set forth in this section. This plan shall be made part of the comprehensive safety and health plan submitted by the contractor with their bid package.

Housekeeping:

Good housekeeping, with provision for the prompt removal and disposal of accumulations of combustible scrap and debris, shall be maintained in all areas of the job site. Self-closing metal containers shall be used for disposal of waste saturated with flammable liquids.

Codes and Regulations:

The contractor shall comply with the requirements published in the current revisions of the National Electrical Code, National Electrical Safety Code, the National Fire Protection Association standards, and all other applicable Municipal Codes and Regulations.

Smoking:

Smoking or other sources of ignition shall not be permitted in areas where flammable or explosive materials are stored or are present. All such areas shall be conspicuously posted:

NO SMOKING OR OPEN FLAMES. There is a no smoking policy in effect within all Company facilities.

Fires:

Fires and open flame devices shall not be left unattended unless protected with automatic temperature control and cutoff devices.

Cleaning and Degreasing:

Gasoline and liquids with a flash point below 100 degrees fahrenheit shall not be used for cleaning and degreasing.

Building Exits:

All buildings, shops, and plant facilities in which employees are required to work shall have at least two well-marked and lighted exits. The two exits shall be arranged to minimize the possibility of both exits being rendered inaccessible by one fire or emergency condition.

Fire Extinguishers:

Distinctly marked fire extinguishers rated 2A40B:C or greater shall be suitably placed as follows:

1. One for each 3,000 square feet of building area or major fraction thereof. Travel distance from any point of protected area to nearest extinguisher shall not exceed 100 feet.
2. One or more on each floor of buildings with at least one located adjacent to each stairway.
3. At least one located outside but not more than 10 feet from the door opening into any room used for storage of more than 60 gallons of flammable or combustible liquids.
4. At least one located not less than 25 feet, nor more than 75 feet from any outside flammable or combustible liquid storage area.
5. At least one within 50 feet of wherever more than 5 gallons of flammable or combustible liquids or 5 pounds of flammable gas is being used.

Noncompliance with Safety and Health Requirements:

If during the course of the contract, our Safety and Health Manager notes any situations of non-compliance with the contractor's safety and health plan or with our Company’s safety and health requirements, our Safety and Health Manager will bring them to the attention of our Project Compliance Officer and our Contracting Officer verbally (and will

immediately follow-up in writing). Failure to correct the violation or continued violations shall be grounds for termination of the contract.

If after notifying the Project Compliance Officer and Contracting Officer in writing of deficiencies in any health, safety, or environmental requirements, and if our Safety and Health Manager finds continued violations of those requirements, or find actions that pose an imminent danger, an immediate order to stop work will be issued. Should this occur, our Safety and Health Manager will bring the matter to the immediate attention of the Project Compliance Officer and Contracting Officer. Such violations may result in the default of the contract.

Our Safety and Health Manager will document all violations brought to the attention of the contractor, Project Compliance Officer and Contracting Officer

Safety Training:

The contractor must ensure that their employees have completed appropriate health and safety training when required by statute/regulation and our Company's requirements and provide documentation of such training when required by the contract.

Medical Clearance:

The contractor must ensure that their employees have appropriate medical clearance when required either by governmental regulations or by our Company's requirements. Copies of medical clearance for contractor personnel are required to be presented as specified by the contract.

The Project Compliance Officer and our Safety and Health Manager shall, in conjunction with our Company's requirements, determine if additional medical requirements (i.e., Blood serum samples, immunizations) are required for contractor personnel prior to the start of work.

Incident Reporting:

Our Safety and Health Manager will participate with contractors in the investigations of incidents resulting in injury/illness and/or damage or loss of government property and also near misses.

Safety and Personal Protective Equipment:

Unless otherwise specified, the contractor is responsible for providing all necessary safety and personal protective equipment needed by their employees. This equipment must meet appropriate OSHA and ANSI approval requirements and be in good working order.

The contractor shall ensure that their employees have received appropriate training on the use and maintenance of safety and personal protective equipment prior to its use. Failure to correctly use appropriate safety equipment is a violation of the contract and may result in default of the contract.

Documentation:

The contractor must provide our Company with documentation of all required training, medical exams, permits, material safety data sheets (MSDS), etc., for his or her employees or operations at the pre-construction meeting.

Welding and Metal Fabrication

Policy:

Welding, cutting and brazing operations present a series of hazardous situations with potential exposure to burns, eye damage, electrical shock, crushed toes and fingers, and the inhalation of vapors and fumes. Many welding, cutting and brazing accidents result from:

- Inadequately trained personnel.
- Poor housekeeping practices.
- Poor shop layout.
- Inadequate lighting and ventilation.
- Improper storage and movement of compressed gas cylinders.
- Exposure of oxygen cylinders and fittings to oil or grease creating a fire or explosive hazard.
- Pointing welding or cutting torches at a concrete surface causing spattering and flying fragments of concrete.
- Electric shock when motors, generators and other electric welding equipment are not grounded.
- Inhalation of toxic fumes or vapors from welding metals or alloys.

Fires, explosions, and injuries can occur resulting from:

- The proximity of combustible solids, liquids, or dusts.
- The presence or development of possible explosive mixtures of flammable gases and air.
- The presence or nature of an oxygen-enriched atmosphere in locations where hot work is performed.

Cutters and welders, and other exposed personnel, are also susceptible to eye injury from infrared light and ultraviolet radiation.

Procedures:

The following provides minimum guidance on procedures and operating precautions:

Provide ventilation in shops or rooms where work is to be performed but avoid strong drafts directed at the welding work.

Do not place work to be welded or heated on a concrete floor. Concrete, when heated, may splatter and fly, exposing the welder to possible burns (and also throwing hot particles a considerable distance creating a potential fire hazard).

The following provides procedures and operating precautions: (continued)

Provide appropriate protection for welders and helpers when working on elevated surfaces. Welding areas shall be kept neat, clean, and free from tripping hazards.

Provide approved personal protective equipment for welders who must enter confined spaces, manholes or other space restricted areas. Also, provide a means to ensure their quick removal in case of an emergency.

Do not perform cutting and welding operations in sprinklered buildings when the sprinkler system is inoperable; in explosive atmospheres or where explosive atmospheres may develop; or, within 50 feet of storage of large quantities of exposed, readily ignitable materials.

Before lighting the torch for the first time each day, allow enough of each gas to flow through its respective hose to purge any flammable gas mixture.

Purge hoses in open spaces and away from ignition sources. Light the torch with a friction lighter or stationary pilot flame keeping a safe distance between he torch and the welder's hands. Point the torch away from persons or combustible materials when lighting. Do not attempt to light a torch from hot metal.

When working in a confined space, the fuel gas and oxygen supply shall be located outside the confined space. The torch and hose should be removed from confined spaces when not in use.

Fuel gas and oxygen torch valves shall be closed and the fuel gas and oxygen supply to the torch shall be shut off during lunch or break periods, when not in use for extended periods, and when unattended.

Welding torch hoses must be protected from damage by contact with hot metal, open flames, corrosive agents or sharp edges. Pressure on hoses will be released at the end of each workday. Hoses must be visually inspected for damage at the beginning of each shift. Hose showing leaks, cuts, burns, worn spots or other evidence of deterioration must be repaired or replaced prior to use. Replacement hoses or fittings must be approved for use with acetylene equipment.

Shielding shall be provided to protect personnel from heat, sparks, slag, light, and radiation.

A fire watch will be maintained for at least 30 minutes after completion of cutting or welding operations to detect and extinguish possible smoldering fires.

Personal Protective Equipment:

Key portions of OSHA Standard 1910.252 covering protective equipment are included here. Personnel engaged in or exposed to welding, cutting, or brazing activities will be provided and use personal protective equipment to include eye and face protection, head protection when in a hard hat area, foot protection, and body, arm, and hand protection.

a. Eye Protection

b. Helmets shall be used during all arc welding or arc cutting operations. Goggles should also be worn during arc welding or cutting operations to provide protection from injurious rays from adjacent work, and from flying objects. The goggles may have either clear or colored glass, depending upon the amount of exposure to adjacent welding operations. Helpers or attendants shall be provided with proper eye protection. Helmets shall be arranged to protect the face, neck, and ears from direct radiant energy from the arc.

d. Goggles or other suitable eye protection shall be used during all gas welding or oxygen cutting operations. Spectacles with side shields and suitable filter lenses are permitted for use during gas welding operations on light work, for torch brazing or for inspection. Goggles shall be ventilated to prevent fogging of the lenses as much as practicable.

e. All operators and attendants of resistance welding or resistance brazing equipment shall use transparent face shields or goggles, depending on the particular job, to protect their faces or eyes, as required.

e.Eye protection in the form of suitable goggles shall be provided where needed for brazing operations.

Protective Clothing:

a. All welders should wear flame-resistant gauntlet gloves and shirts with sleeves of sufficient length and construction to protect the arms from heat, UV radiation, and sparks.

b. All welders should wear fire-resistant aprons, coveralls, and leggings.

c. Clothing should be kept reasonably free of oil or grease. Front pockets and upturned sleeves or cuffs should be prohibited, and sleeves and collars should be kept buttoned to prevent hot metal slag or sparks from contacting the skin.

Respiratory Protection:

The Safety and Health Manager shall be consulted to determine appropriate levels of respiratory protection to be worn by personnel performing welding operations.

Fire Prevention and Protection:

1. The welding operation environment shall be free of flammable liquids and vapors. Combustible materials within a radius of 35 feet of the operation will be protected from activity residue (flame, heat, sparks, slag, etc.).

2. Fire watcher procedures shall be implemented whenever welding activities are conducted within 35 feet of combustible materials, regardless of protection provided. A qualified individual proficient in the operation of available fire extinguishing equipment and knowledgeable of fire reporting procedures shall observe welding or cutting activities. His or her duty is to detect and prevent the spread of fire produced by welding or cutting activities.

3. Whenever there are cracks or other floor openings within 35 feet of the welding or cutting that cannot be closed or covered, precautions shall be taken to remove or otherwise protect combustible materials on the floor below that may be exposed to sparks. The same precautions shall be observed with regard to cracks or openings in walls, open doorways, and open or broken windows.

4. Fire extinguishing equipment shall be maintained, ready for use, while welding or cutting operations are being performed. Equipment may consist of pails of water, buckets of sand, hose, or portable extinguishers depending upon the nature and quantity of the combustible material exposed.

5. Where sprinkler protection exists, it shall be in full service while welding or cutting work is being performed. If welding or cutting is to be done within three feet of automatic sprinkler heads, noncombustible sheet material or damp cloth guards will be used to temporarily shield the individual heads.

Welding and Cutting Tanks, Cylinders, or Containers:

The procedures described below apply only to tanks too small to be entered. Compressed gas cylinders are excluded as are pipelines. Cutting and welding on containers that have held flammable liquids or gases shall be under the direct supervision of knowledgeable personnel.

Inspection-

BEFORE any tank, cylinder, or other container is cut, welded, or other hot work is performed, the item shall be purged or made inert. New containers shall also be made inert as they may contain a flammable preservative which could form explosive vapors when heated. Welders shall also ensure that there are no substances such as grease, tars, or acids which, when subjected to heat, might produce explosive or toxic vapors. Any pipe lines or connections to the drums, cylinders, tanks, or other containers shall be disconnected or blanked.

Purging and Inerting-

Purging with Water

Where the liquid or gas previously contained is known to be readily displaced or easily soluble in water, it can be removed by completely filling the container with water and then draining. When hot work is performed on containers filled with water, extreme care shall be used to eliminate any vapor accumulation by proper venting or positioning of the container during the filling operation.

Purging with Air

Hazardous vapors may be displaced from inside containers by purging with air. A safe atmosphere shall be maintained by continuous ventilation.

Inerting with Gas

Inert gas may be used to displace flammable gas from the container. Adequate ventilation shall be maintained during the operation to ensure gas concentrations remain below hazardous levels.

Examples of inert gases are carbon dioxide and nitrogen.

Venting-

All hollow spaces, cavities, or containers shall be vented to permit the escape of air or gases before and during preheating, cutting, or welding.

Arc Welding:

Arc welding equipment shall conform to the design and installation criteria of OSHA 29 CFR 1910.252, "Welding, Cutting, and Brazing." The frame or case of the welding machine (except engine-driven machines) shall be grounded under the conditions and according to the methods prescribed in OSHA Standard 1910, Subpart S, "Electrical", and 1910.252.

Before starting operations, all connections to the arc welding machine shall be checked. The work lead shall be firmly attached to the work; contact surfaces of the magnetic work clamps shall be free of metal splatter particles. Coiled welding cable shall be spread out before use to avoid serious overheating and damage to insulation. Work and electrode lead cables shall be inspected for damage and wear before use. Cables with damaged insulation or exposed conductors shall be replaced. Electrode cables shall be joined and insulated in accordance with approved methods.

Grounding of the welding machine from shall be checked. Special attention shall be given to the ground connections of portable machines.

Electrode holders, when not in use, shall be placed where they cannot make electrical contact with persons, conducting objects, fuel, or compressed gas cylinders.

When it is necessary to splice cables to extend their length, only certified electricians shall make the splices. Cables with splices within 10 feet of the electrode holder shall not be used. The welder shall not coil or loop welding electrode cables around parts of their body.

Welders shall not place welding cable and other equipment where it will obstruct passageways, ladders, and stairways.

Machines which have become wet shall be thoroughly dried and tested before being used.

When welders are working close to one another on one structure where they may touch the exposed parts of more than one electrode holder simultaneously, the machines shall be connected to minimize shock hazard as follows:

All direct current (DC) machines shall be connected with the same polarity.

All alternating current (AC) machines shall be connected to the same phase of the supply circuit and with the same instantaneous polarity.

Resistance Welding:

Thermal Protection

> Every pair of ignition tubes used in resistance welding equipment shall be equipped with a thermal protection switch. When used in a series-connected water line, a single switch shall be adequate if related to the downstream tube.

Control Safeguards

> Controls, such as push buttons, foot switches, retraction, and dual-schedule switches on portable guns, etc., shall be arranged or guarded to prevent inadvertent activation.

Guarding Welding Machines

> Multi-gun welding machines shall be effectively guarded at the point of operation. Devices such as an electronic eye, latches, blocks, barriers, or two-hand controls

shall be installed. All chains, gears, operating bus linkage, and belts shall be protected by adequate guards.

Electrical Hazards:

All external weld-initiating control circuits shall operate on low voltage, not over 120 bolts for stationary equipment and not over 36 volts for portable equipment. All electrical equipment shall be suitably interlocked and insulated to prevent access by unauthorized persons to live portions of the equipment. Only non-ferrous welding clamps should be used to prevent magnetic induction during actuation of the equipment.

Welding in Confined Spaces Procedures-

Confined space means a relatively small or restricted space such as a tank, boiler, pressure vessel, mixing vat, sump, or pit. Ventilation is a prerequisite to work in confined spaces. All welding and cutting operations carried on in confined spaces shall be adequately ventilated to prevent the accumulation of toxic materials, possible oxygen deficiency, or explosive atmosphere.

This applies not only to the welder but also to helpers and other personnel in the immediate vicinity. All air replacing *that* which is withdrawn shall be clear and breathable. Oxygen shall never be used as makeup air.

In such circumstances where it is impossible to provide such ventilation, respirators or hose masks approved for this purpose by NIOSH/MSHA shall be used. In areas immediately hazardous to life, hose masks with blowers or self-contained breathing apparatus shall be used.

Welding in Confined Spaces Procedures- (continued)

Where welding operations are carried on in a confined space and where welders and helpers are provided with hose masks, hose masks with blowers, or self-contained breathing apparatus, a worker shall be stationed on the outside of the confined space to ensure the safety of those working within.

When welding or cutting is being performed in any confined space, the gas cylinders and welding machines shall be left on the outside. Before operations are started, heavy portable equipment mounted on wheels shall be securely blocked to prevent accidental movement.

Where a welder must enter a confined space through a manhole or other small opening, a means shall be provided for quick removal of the worker in case of emergency. When safety belts and lifelines are used for this purpose, they shall be attached to the welder's body in a way that ensures his or her body cannot be jammed in a small exit opening. A wrist harness assembly shall be used. An attendant with a preplanned rescue procedure shall be stationed outside to observe the welder at all times and shall be capable of putting rescue operations into effect.

When arc welding is to be stopped for any substantial period of time, such as during lunch or overnight, all electrodes shall be removed from the holders and the holders carefully located so accidental contact cannot occur. The machine shall be disconnected from the power source.

When gas welding or cutting, the torch valves shall be closed and the fuel-gas and oxygen supply to the torch positively shut off at some point outside the confined area whenever the torch is not to be used for a substantial period of time, such as during lunch or overnight. Where practicable, the torch and hose shall also be removed from the confined space.

All confined spaces shall be monitored for oxygen content, combustible vapors, and toxic material prior to entry and periodically throughout the operation. Periodic testing shall depend on the type of space being entered. The Safety and Health Manager shall be consulted for guidance.

Portable Gas Units Procedures-

Portable gas welding, cutting, and brazing equipment must be of a type approved for the use intended.

Cylinders of compressed gas must have pressure reducing regulators installed.

Portable Gas Units Procedures- (continued)

Cylinders in use or in a transport must be stored in an upright position and secured to prevent them from falling.

Pressure hoses shall be secured to prevent whipping.

Oxygen cylinders and fittings shall be kept free of grease and oil at all times.

Cylinders shall be kept away from external sources of heat at all times.

Cylinders shall not be dropped of handled roughly. Cylinders or welding sets in excess of 40 pounds total weight shall be transported to and from work sites by push cart or motorized vehicle.

Portable Electric Unit Procedures-

Circuits shall be de-energized before testing, checking or transporting.

Motor-generator sets and other electrical welding equipment shall be grounded prior to use.

Rotary and polarity switches shall not be operated while the equipment is under an electrical load.

Arc welding equipment shall be inspected periodically and inspected prior to use following relocation. Power cables and electrode holders shall be inspected prior to every use.

Sheet Metal:

1.Machines shall be guarded in accordance with manufacturer's requirements.

2.Supervisors shall ensure sharp metal is stored in an area that will not pose a hazard to machine operators or personnel walking through designated aisles.

3. Work gloves shall always be worn when working with metal and metal scraps.

4. Hearing protection shall be worn when working in designated hazardous noise areas with noise sources operating or when using hand tools labeled hazardous noise producers

Prevention and Control of Workplace Hazards

Policy:

Section 19(a) of the Occupational Safety and Health Act (OSHA) requires that employees be provided with a safe and healthful place of employment. Identification of hazardous conditions may be accomplished at the planning and design stage, as a result of workplace inspections, or by employee reports.

All recognized safety and health hazards shall be eliminated or controlled as quickly as possible, subject to priorities based upon the degree of risk posed by the hazards. The preferred method of hazard abatement shall be through application of engineering controls or substitution of less hazardous processes or materials.

Total reliance on personal protective equipment is acceptable only when all other methods are proven to be technically and/or economically infeasible.

Principles:

Safety and Health Hazards shall be eliminated or controlled by one of the following methods:

Substitution-

The risk of injury or illness may be reduced by replacement of an existing process, material, or equipment with a similar item having more limited hazard potential Some examples include: brush painting instead of spray painting to reduce inhalation hazards, welding instead of riveting to reduce noise levels, use of safety cans instead of bottles to store flammable liquids, etc. Care must be exercised in any substitution to ensure that the substitute materials are technically acceptable and to avoid introducing a new or unforeseen hazards.

Isolation-

Hazards are controlled by isolation whenever an appropriate barrier or limitor is placed between the hazard and an individual who may be affected by the hazard. This isolation can be in the form of physical barriers, time separation, or distance. Examples include machine guards, electrical insulation, glove boxes, acoustical containment, and remote controlled equipment.

Ventilation-

The control of a potentially hazardous airborne substance by ventilation can be accomplished by one or two methods: diluting the concentration of the substance by mixing with uncontaminated air or capturing and removing the substance at its source or point of generation. Local exhaust ventilation is generally the preferred and more economical method of hazard control.

Ventilation- (continued)

However, dilution ventilation can be very effective for the removal of large volumes of heated air or for the removal of low concentrations of non-toxic or low toxicity contaminants from minor and decentralized sources.

Administrative Control-

This method of hazard mitigation depends on effective operating practices that reduce the exposure of individuals to chemical or physical hazards. These practices may take the form of limited access to high hazard areas, preventive maintenance programs to reduce the potential for leakage of hazardous substances, or adjusted work schedules which involve a regimen of work in high hazard and low hazard areas. Adjusted work schedules are appropriate only when the hazard is recognized as having a limit below which nearly all workers may be repeatedly exposed without adverse effect.

Personal Protective Equipment-

This method of hazard control is least preferred because personal protective devices may reduce a worker's productivity, while affording less effective protection against the recognized hazard than other methods of control. Nevertheless, there are instances where adequate levels of risk reduction cannot be achieved through other methods, and personal protective devices must be used, either alone or in conjunction with other protective measures.

Application of Hazard Control Principles:

Hazardous conditions in the workplace may be prevented through appropriate actions when facilities are designed, when operating procedures are developed, and when equipment is purchased. Notwithstanding these preventive measures, hazards will arise as a result of the dynamics of the workplace environment. Once hazards are identified, whether through inspection or complaint, immediate action shall be taken to avoid unreasonable danger.

1. Design Reviews.

Safety and occupational health issues shall be considered, designed, and engineered into all facilities which are acquired or constructed for use by Company employees. To ensure that appropriate hazard control techniques are applied, the Safety and Health Manager shall participate in the review of plans and specifications for construction and renovation projects. Recommendations shall be submitted in writing. Projects that involve potential health hazards such as toxic material, radiation, noise, or other health hazard shall be designed in accordance with established principles of good safety and industrial hygiene engineering.

2. Operating Procedures.

Standard operating procedures or similar directives developed by the supervisor that are issued to direct the manner in which work is performed shall include appropriate health and safety requirements. Supervisors are encouraged to submit standard operating procedures to the Safety and Health Manager for review. Recommendations for changes/additions to the procedures for safety and health purposes shall be submitted in writing to the originating supervisor.

3. Purchasing Procedures.

Many hazards can be avoided by incorporating appropriate specifications for purchased equipment/material and contracted efforts that involve work at Company facilities. Company organizations responsible for developing specifications for such purchases should coordinate with cognizant Safety and Health Manager to insure that health and safety requirements are considered in these specifications. Similarly, contracts that require work to be performed by host contract personnel at Company facilities should be coordinated with the Safety and Health Manager.

4. Interim Hazard Abatement Measures.

During the time needed to design and implement permanent hazard control measures, immediate, temporary measures are needed. Where engineering controls are not immediately applicable, administrative controls and/or personal protective equipment are appropriate for use as interim hazard abatement measures.

5. Permanent Hazard Abatement.

Engineering control methods are the preferred method of hazard control, followed by administrative control and personal protective equipment. Feasible engineering controls shall be used to reduce hazardous exposure, even when only partial reduction of exposure is possible through engineering methods.

Two criteria may be applied to determine whether engineering controls are feasible. First, a control is technologically feasible if it is available "off the shelf" or if technology exists which can be adapted to the hazard in question. Second, a control is economically feasible if it can be shown that the cost of the control is justified by the benefit it produces. On the other hand, if the expected reduction of the hazard through implementation of engineering control is insignificant in terms of increased protection, and the cost of implementing the control is great, then the control is economically infeasible.

Development of Hazard Control Recommendations:

The following possible actions will be considered when recommendations are developed for prevention or reduction of hazards:

1. Avoiding, eliminating, or reducing deficiencies by engineering design, material selection or substitution;

2. Isolating hazardous substances, components, and operations from other activities, areas, personnel, and incompatible materials;

3. Incorporating "fail-safe" principles where failures would disable the system or cause a catastrophe through injury to personnel, damage to the equipment, or inadvertent operation of critical equipment;

4. Relocating equipment/components so that personnel access during operation, maintenance, repair or adjustment shall not result in exposure to hazards such as chemical burns, electrical shock, electromagnetic radiation, cutting edges, sharp points, or toxic atmospheres;

5. Providing suitable warning and notes of caution concerning required personnel protection in operation, assembly, maintenance, and repair instructions;

6. Providing distinctive markings on hazardous components, equipment, or facilities;

7. Requiring use of personal protective equipment when other controls do not reduce the hazard to an acceptable level;

8. Monitoring exposure to insure that engineering controls effectively reduce the hazard; and

9. Training employees to recognize hazards and take appropriate precautionary measures.

Hazard Reporting:

Identification and reporting of potentially unsafe or unhealthful working conditions is the responsibility of all Company employees. All Company employees are encouraged to report unsafe or unhealthful working conditions to their immediate supervisor who will promptly investigate the situation and take appropriate corrective actions. Supervisors will contact the Safety and Health Manager for assistance as necessary. Supervisors will keep the reporting employee informed of all actions taken.

Any employee (or employee representative) may submit a written report of an unsafe or unhealthful working condition directly to the Safety and Health Manager.
The Safety and Health Manager will investigate all reports of hazards brought to its attention. The Safety and Health Manager will provide an interim or complete response in writing to the originator of the report of hazard. If the investigation validates the reported hazard, the complete response shall include a summary of the action taken for abatement. If no hazard is found to exist, the reply shall include the basis for that determination.

If the originator of the report of a hazardous condition is dissatisfied with the assessment of the alleged hazard made by the Safety and Health Manager or with actions taken to abate a confirmed hazard, he/she shall be encouraged to confer with the Safety and Health Manager to discuss the matter further.

Personal Protective Equipment:

Engineering controls shall be the primary methods used to eliminate or minimize hazard exposure in the workplace. When such controls are not practical or applicable, personal protective equipment shall be employed to reduce or eliminate personnel exposure to hazards.

Personal protective equipment (PPE) will be provided, used, and maintained when it has been determined that its use is required and that such use will lessen the likelihood of occupational injuries and/or illnesses. The Safety and Health Manager will recommend and/or provide necessary protective equipment where there is a reasonable probability that the use of the equipment will prevent or reduce the severity of injuries or illness.

Equipment Specifications and Requirements-

All personal protective clothing and equipment will be of safe design and construction for the work to be performed. Only those items of protective clothing and equipment that meet National Institute of Occupational Safety and Health

(NIOSH) or American National Standards Institute (ANSI) standards will be procured or accepted for use.

Eye and Face Protection-

The majority of occupational eye injuries can be prevented by the use of suitable/approved safety spectacles, goggles, or shields. Approved eye and face protection shall be worn when there is a reasonable possibility of personal injury. Supervisors, with assistance from the Safety and Health Manager, determine jobs and work areas that require eye protection and the type of eye and face protection that will be used.

Typical hazards that can cause eye and face injury are:

- Splashes of toxic or corrosive chemicals, hot liquids, and molten metals;
- Flying objects, such as chips of wood, metal, and stone dust;
- Fumes, gases, and mists of toxic or corrosive chemicals; and
- Aerosols of biological substances.

Eye and Face Protection- (continued)

Prevention of eye accidents requires that all persons who may be in eye hazard areas wear protective eyewear. This includes employees, visitors, researchers, contractors, or others passing through an identified eye hazardous area. To provide protection for these personnel, activities shall procure a sufficient quantity of heavy duty goggles and/or plastic eye protectors which afford the maximum amount of protection possible.

If these personnel wear personal glasses, they shall be provided with a suitable eye protector to wear over them.

Specifications-

Eye and face protectors procured, issued to, and used by Company personnel must conform to the following design and standards:

a) Provide adequate protection against the particular hazards for which they are designed

b) Fit properly and offer the least possible resistance to movement and cause minimal discomfort while in use.

c) Be durable.

d) Be easily cleaned or disinfected for or by the wearer.

e) Be clearly marked to identify the manufacturer.

f) Persons who require corrective lenses for normal vision, and who are required to wear eye protection, must wear goggles or spectacles of one of the following types:

1) Spectacles with protective lenses which provide optical correction.

2) Goggles that can be worn over spectacles without disturbing the adjustment of the spectacles.

3) Goggles that incorporate corrective lenses mounted behind the protective lenses.

Description and Use of Eye/Face Protectors

a) Safety Spectacles. Protective eye glasses are made with safety frames, tempered glass or plastic lenses, temples and side shields which provide eye protection from moderate impact and particles encountered in job tasks such as carpentry, woodworking, grinding, scaling, etc.

Description and Use of Eye/Face Protectors (continued)

b) Single Lens Goggles. Vinyl framed goggles of soft pliable body design provide adequate eye protection from many hazards. These goggles are available with clear or tinted lenses, perforated, port vented, or non-vented frames.

Single lens goggles provide similar protection to spectacles and may be worn in combination with spectacles or corrective lenses to insure protection along with proper vision.

c) Welders/Chippers Goggles. These goggles are available in rigid and soft frames to accommodate single or two eye piece lenses.

Welders goggles provide protection from sparking, scaling or splashing metals and harmful light rays. Lenses are impact resistant and are available in graduated shades of filtration.

Chippers/grinders goggles provide eye protection from flying particles. The dual protective eye cups house impact resistant clear lenses with individual cover plates.

d) Face Shields. These normally consist of an adjustable headgear and face shield of tinted/transparent acetate or polycarbonate materials, or wire screen. Face shields are available in various sizes, tensile strength, impact/heat resistance and light ray filtering capacity. Face shields will be used in operations when the entire face needs protection and should be worn to protect eyes and face against flying particles, metal sparks, and chemical/ biological splash.

e) Welding Shields. These shield assemblies consist of vulcanized fiber or glass fiber body, a ratchet/button type adjustable headgear or cap attachment and a filter and cover plate holder. These shields will be provided to protect workers' eyes and face from infrared or radiant light burns, flying sparks, metal spatter and slag chips encountered during welding, brazing, soldering, resistance welding, bare or shielded electric arc welding and oxyacetylene welding and cutting operations.

The Safety and Health Manager maintains a supply of various eye and face protective devices. Personnel requiring prescription safety glasses must contact the Safety and Health Manager.

Eye and Face Protection- (continued)

Emergency Eyewash Facilities-

Emergency eyewash facilities meeting the requirements of ANSI Z358.1-1981 shall be provided in all areas where the eyes of any employee may be exposed to corrosive materials. All such emergency facilities shall be located where they are easily accessible to those in need.

Hearing Protection-

Hearing protection devices are the first line of defense against noise in environments where engineering controls have not reduced employee exposure to safe levels. Hearing protective devices can prevent significant hearing loss, but only if they are used properly.

The most popular hearing protection devices are earplugs which are inserted into the ear canal to provide a seal against the canal walls. Earmuffs enclose the entire external ears inside rigid cups. The inside of the muff cup is lined with acoustic foam and the perimeter of the cup is fitted with a cushion that seals against the head around the ear by the force of the headband.

Preformed earplugs and earmuffs should be washed periodically and stored in a clean area, and foam inserts should be discarded after each use. It is important for you to wash hands before handling pre-formed earplugs and foam inserts to prevent contaminants from being placed in the ear which may increase your risk of developing infections.

Also, check hearing protective devices for signs of wear or deterioration.

Replace devices periodically.

The Safety and Health Manager maintains a supply of a variety of disposable foam ear inserts and earmuffs.

Respiratory Protection-

Respiratory hazards may occur through exposure to harmful dusts, fogs, fumes, mists, gases, smoke, sprays, and vapors. The best means of protecting personnel is through the use of engineering controls, e.g., local exhaust ventilation. Only when engineering controls are not practical or applicable shall respiratory protective equipment be employed to reduce personnel exposure.

Respiratory Protection- (continued)

The Safety and Health Manager is responsible for the Respiratory Protection Program at the Company. Workers requiring the use of respirators must first obtain medical approval from the Company physician to wear a respirator before a respirator can be issued. The Safety and Health Manager conducts respirator training and fit tests and is responsible for determining the proper type of respiratory protection required for the particular hazard.

Adherence to the following guidelines will help ensure the proper and safe use of respiratory equipment:

- Wear only the respirator you have been instructed to use. For example, do not wear a self-containing breathing apparatus if you have been assigned and fitted for a half-mask respirator.
- Wear the correct respirator for the particular hazard. For example, some situations, such as chemical spills or other emergencies, may require a higher level of protection than your respirator can handle. Also, the proper cartridge must be matched to the hazard (a cartridge designed for dusts and mists will not provide protection for chemical vapors)
- Check the respirator for a good fit before each use. Positive and negative fit checks should be conducted.
- Check the respirator for deterioration before and after use. Do not use a defective respirator.
- Recognize indications that cartridges and canisters are at their end of service. If in doubt, change the cartridges or canisters before using the respirator.
- Practice moving and working while wearing the respirator so that you can get used to it.
- Clean the respirator after each use, thoroughly dry it and place the cleaned respirator in a sealable plastic bag.
- Store respirators carefully in a protected location away from excessive heat, light, and chemicals.

Head Protection-

Hats and caps have been designed and manufactured to provide workers protection from impact, heat, electrical and fire hazards. These protectors consist of the shell and the suspension combined as a protective system. Safety hats and caps will be of nonconductive, fire and water resistant materials. Bump caps or skull guards are constructed of lightweight materials and are designed to provide minimal protection against hazards when working in congested areas.

Head Protection- (continued)

Head protection will be furnished to, and used by, all employees and contractors engaged in construction and other miscellaneous work in head-hazard areas. Head protection will also be required to be worn by engineers, inspectors, and visitors at construction sites. Bump caps/skull guards will be issued to and worn for protection against scalp lacerations from contact with sharp objects. They will not be worn as substitutes for safety caps/hats because they do not afford protection from high impact forces or penetration by falling objects.

Hand Protection-

Skin contact is a potential source of exposure to toxic materials; it is important that the proper steps be taken to prevent such contact. Gloves should be selected on the basis of the material being handled, the particular hazard involved, and their suitability for the operation being conducted. One type of glove will not work in all situations.

Most accidents involving hands and arms can be classified under four main hazard categories: chemicals, abrasions, cutting, and heat. There are gloves available that can protect workers from any of these individual hazards or any combination thereof.

The first consideration in the selection of gloves for use against chemicals is to determine, if possible, the exact nature of the substances to be encountered. Read instructions and warnings on chemical container labels and MSDSs before working with any chemical. Recommended glove types are often listed in the section for personal protective equipment.

All glove materials are eventually permeated by chemicals. However, they can be used safely for limited time periods if specific use and glove characteristics (i.e., thickness and permeation rate and time) are known. The Safety and Health Manager can assist is determining the specific type of glove material that should be worn for a particular chemical.

Gloves should be replaced periodically, depending on frequency of use and permeability to the substance(s) handled. Gloves overtly contaminated should be rinsed and then carefully removed after use.

Gloves should also be worn whenever it is necessary to handle rough or sharp-edged objects, and very hot or very cold materials. The type of glove materials to be used (in these situations) include leather, welder's gloves, aluminum-backed gloves, and other types of insulated glove materials.

Hand Protection- (continued)

Careful attention must be given to protecting your hands when working with tools and machinery. Power tools and machinery must have guards installed or incorporated into their design that prevent the hands from contacting the point of operation, power train, or other moving parts. To protect the hands from injury due to contact with moving parts, it is important to:

- Ensure that guards are always in place and used.
- Always lock out machines or tools and disconnect the power before making repairs.
- Treat a machine without a guard as inoperative; and
- Do not wear gloves around moving machinery, such as drill presses, mills, lathes, and grinders.

The Safety and Health Manager can help the supervisor identify appropriate glove selections for their operations. The Safety and Health Manager also maintains a selection of gloves for various tasks.

Safety Shoes-

Safety shoes shall be worn in the shops, warehouses, maintenance, cagewash, glassware, and other areas as determined by the Health and Safety Branch. Recommendations for safety footwear shall be approved by the Health and Safety Branch. All safety footwear shall comply with American National Standards Institute (ANSI) Standard ANSI Z41-1991, "American National Standard for Personal Protection - Protective Footwear. Protective footwear purchased before July 5, 1994, shall comply with ANSI Standard Z41.1-1967.

Permanent full time employees will be initially issued two pairs of safety shoes of approved type. Shoes will be replaced or repaired as necessary based on supervisory approval. Other than permanent employees will be issued one pair of safety shoes with replacement as necessary based on supervisory approval.

Responsibilities-

d. Supervisor - Reviews employees work situation and recommends safety footwear as appropriate in accordance with established Institute policy. Requests safety shoes from the Safety and Health manager for new employees or as indicated for replacement. Ensures that all employees under his supervision use and maintain safety footwear. Makes determination on the need for replacement or repair of safety shoes.

Responsibilities- (continued)

e. Employee - Wears Institute provided or approved safety shoes in all areas requiring safety footwear as determined by the supervisor and the Health and Safety Manager.

f. Health and Safety Manager - Consults with supervisors concerning safety shoe requirements and approves issuance of all safety shoes. Arranges for local purchase of all safety shoes. Makes arrangements for necessary repairs.

Procedures-

d. Supervisors must review employee's work situation in consultation with the Health and Safety Manager to decide the need for safety footwear and appropriate types. The "Request for Safety Shoes" must be completed, reviewed and signed by the supervisor and approved by the Health and Safety Manager.

e. Any employee desiring to replace his/her safety footwear must complete the "Request for Safety Shoes" and have it signed by their supervisor.

f. If an employee is unable to find appropriate safety footwear at the designated vendors, he or she should check with the Health and Safety Manager for alternate procedures. Alternate procedures involve employees purchasing safety footwear with their own funds and being reimbursed.

g. Employee who want to have their footwear repaired, should be encouraged to do so. Some footwear is designed to be repaired, and some is not. Repairs would include such items as new soles and heels. The Company will reimburse employees for repairs.

Workplace Violence Policy

PREVENTING ACTS OF AGGRESSION, THREATENING BEHAVIOR, AND VIOLENCE IN THE WORKPLACE

Background:

An average of 20 workers are murdered each week in the United States. The majority of these murders are robbery-related crimes. In addition, an estimated 1 million workers are assaulted annually in U.S. workplaces. Most of these assaults occur in service settings such as hospitals, nursing homes, and social service agencies. Factors that place workers at risk for violence in the workplace include interacting with the public, exchanging money, delivering services or goods, working late at night or during early morning hours, working alone, guarding valuables or property, and dealing with violent people or volatile situations.

The Company recognizes workplace violence as a serious occupational problem. In a June 1996 report, the National Institute for Occupational Safety and Health (NIOSH) published data that revealed homicide has become the second leading overall cause of occupational injury and death, exceeded only by motor-vehicle-related deaths. This report also identified homicide as the leading cause of occupational injury and death for female workers. The Northwestern National Life notes the seriousness of workplace violence in their 1993 report, which states that of every four full-time workers, one is harassed, threatened, or attacked on the job each year. Many incidents can be avoided by employees who are able to recognize early warning signs of potential violence, know when and how to report concerns, and know how to implement the steps to defuse situations before they become violent.

Purpose and Scope:

The purpose of this policy is to provide a safe workplace free from aggressive, threatening, or violent acts through the development and implementation of an effective program that provides a safe workplace. The provisions of this Policy apply to all work sites owned or controlled by the Company and at which work is performed for the Company.

Policy:

It is the policy of the Company to provide a safe workplace for its employees. To this end, all elements of the Company are expected to implement a program to prevent and respond to violence in the workplace.

For purposes of this policy, violence is defined as the deliberate and wrongful violation, damage, or abuse of other persons, self, or property and includes threats of violence. Acts of violence and threats thereof include, but may not be limited to:

verbal (such as threats, harassment, abuse, and intimidation),
non-verbal (such as gestures and intimidation),
physical (such as hitting, pushing, shoving, kicking, touching, and assault), and
other (such as arson, sabotage, vandalism, and stalking).

It is important that all threats be taken seriously. The threat should not be ignored in the hope that it will resolve itself or out of fear of triggering an outburst from the person who has lodged the threat. If someone poses a danger to himself or others, appropriate authorities should be notified and action should be taken.

It is Company Policy to notify the police if any employee is threatened by anyone.

In developing this program, all sites shall consider the following:

1) A site-specific workplace violence policy and plan that includes written objectives and requirements for all organizational elements and incorporates the overall company policy in identifying and addressing threatening workplace behavior.

2) A review and approval of each plan by the cognizant manager. Specific protocols to be considered in the approval of such plans include:

a) Establishment of crisis assessment and response teams to include all interested stakeholders;

b) Maintenance of information on incidents of violence for review and analysis;

c) Establishment of a procedure for employees to confidentially report threatening situations and other relevant information to management

3) An awareness program for workplace violence prevention which should include:

a) Initial awareness and response orientation and instruction for management and supervisors;

b) Initial awareness orientation and information for workers, including new employee orientation as necessary;

c) Refresher awareness training on an as needed basis for all employees.

4) Written communication from each site to the responsible office of all incidents of violence and subsequent outcomes as the incidents occur.

5) Written communication from each organizational element to human resources of all incidents of violence involving employees and subsequent outcomes.

6) A written quarterly report from each site of all workplace violence incidents and outcomes submitted to the responsible office with a copy of this report forwarded to the occupational health department.

The cognizant manager should include information on workplace violence incidents and outcomes involving the workforce in this submittal.

Responsibilities:

The Safety and Health Manager will provide specific guidance for implementation of this program.

Supervisors will develop implementation plans incorporating the program requirements for prevention of, and response to, workplace violence of this program for employees

Implementation:

All departmental elements will modify their responsibilities, organizations, management processes, and missions as needed to ensure implementation of this policy.

POSSIBLE RISK FACTORS AND PREVENTIVE MEASURES

Risk Factors

Researchers have suggested a number of factors that may increase the risk of violence, injury and homicide in the workplace. The following are examples of these factors:

- Exchange of money with the public
- Working alone or in small numbers
- Working late night or early morning hours
- Working in high-crime areas
- Guarding valuable property or possessions
- Working in community settings (e.g., taxicab drivers and police)

Preventive Measures

Immediate preventive measures are needed to reduce the large number of occupational violence and homicides each year. The preventive measures presented

here may provide some protection to workers until research studies can be conducted to evaluate their effectiveness.

A number of environmental and behavioral measures have been proposed for reducing occupational violence and homicides in high-risk establishments and occupations. These measures include the following:

- Make high-risk areas visible to more people.
- Install good external lighting.
- Use drop safes to minimize cash on hand.
- Carry small amounts of cash.
- Post signs stating that limited cash is on hand.
- Install silent alarms.
- Install surveillance cameras.
- Increase the number of staff on duty.
- Provide training in conflict resolution and nonviolent response.
- Avoid resistance during a robbery.
- Provide bullet-proof barriers or enclosures.
- Have police check on workers routinely.
- Close establishments during high-risk hours (late at night and early in the morning).

Conclusions:

Occupational violence and homicide is a serious public health problem, but many employers and workers may be unaware of the risk. No current OSHA regulations apply specifically to occupational violence or homicide, but a great need exists for worker protection from intentional injury in the workplace.

High-risk workplaces include taxicab establishments, liquor stores, gas stations, detective/protective services, justice/public order establishments, grocery stores, jewelry stores, hotels/motels, and eating/drinking places. High-risk occupations are taxicab drivers/chauffeurs, law enforcement officers (police officers/sheriffs), hotel clerks, gas station workers, security guards, stock handlers/baggers, store owners/managers, and bartenders. Employers in these high-risk establishments and occupations need to be aware of the risk for homicide and take steps to ensure a safe workplace.

RECOMMENDATIONS

NIOSH recommends that the following steps be taken to prevent occupational injuries and homicides. The Company will take these steps:

- Evaluate the factors or situations in the workplace that may place workers at risk, and
- Carefully consider intervention efforts that might minimize/remove risk.

Tool Box Talks/Work Group Safety Meetings

Purpose:

The purpose of Tool Box Talks/Work Group Safety Meetings is to provide a method for the dissemination of information to all employees regarding safety and health issues.

Regular Tool Box Talks/Work Group Safety Meetings demonstrate the Company's concern for the lives and well being of its employees. Tool Box Talks/Work Group Safety Meetings help build a cooperative climate by providing employees with the opportunity to contribute ideas, and to make suggestions that may improve quality, productivity, morale, and safety.

Safety education is required of all employees *at all levels* within the organization. The Company will have a formalized safety training program to prevent accidents and to train employees to do their job safely. Scheduled, Tool Box Talks/Work Group Safety Meetings, will be conducted every Monday morning at 8:00 am. and at times deemed necessary by the Safety and Health Manager or supervisory personnel

Responsibilities:

The Company President will provide the direction and motivation to ensure that all managers conduct regular Tool Box Talks/Work Group Safety Meetings.

Managers and Supervisory Personnel that conduct safety discussions will maintain a log of what was discussed and who attended the meeting. This information shall be turned over to the Safety and Health Manager on a weekly basis.

The Safety and Health Manager shall be a resource for safety and health discussion topics, and shall keep all documentation of all training at a central location.

Employees are required to attend all Tool Box Talks/Work Group Safety Meetings. In the event an employee misses a Tool Box Talk/Work Group Safety Meeting, the employee shall be given individual instruction by their supervisor concerning what was discussed/covered. The supervisor shall document this "training session" and will provide the Safety and Health Manager with this documentation.

Procedure:

The Tool Box Talk/Work Group Safety Meeting is a method used by this Company to develop the employees' safety awareness.

Conducting Tool Box Talks/Work Group Safety Meetings

For greatest effectiveness, cover subjects that most interest the employees. These topics might include accidents, inspection results, the safety program, or a work procedure.

These weekly meetings should last no longer than 15-30 minutes. Ideally, the meeting would include time for active participation by employees; at the least, there should be a question and answer session.

Schedule meetings at the beginning of new operations to ensure that all of the employees are familiar with safe job procedures and the requirements of the upcoming work. These meetings save a lot of time in the long run.

Tool Box Talks/Work Group Safety Meetings may be either motivational or instructional. The motivational meeting creates awareness and aims at worker self protection. The instructional meeting covers a particular job task or procedure.

The supervisor is the key management communicator for work groups, because he or she is most familiar with the individual workers and their work requirements.

Bibliography

The National Institute of Environmental Health Sciences (NIEHS)

The Center for Disease Control, US Government

National Institute of Occupational Safety and Health (NIOSH)

Occupational Safety and Health Administration (OSHA)

Oregon Occupational Safety and Health

US Department of Agriculture

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