Respiratory Protection

Purpose

The purpose is to establish a set of guidelines for the selection of respiratory protection equipment, situations for its use, and training in the use of the respirator required when personnel are exposed to airborne contaminants encountered during normal working and emergency situations and when the oxygen level is less than 9.5%.

Scope

To provide guidelines for the selection and use of equipment for job duties that require respiratory protection. Such exposures may include the following:

- Hydrogen Sulfide (H₂S)
- Confined Space/Vessel Entry
- Painting/Blasting
- Asbestos
- Naturally Occurring Radioactive Material (NORM)
- Exposures exceeding OSHA Permissible Exposure Limits (PEL)

Whenever possible, effective engineering controls shall be used to control exposure of personnel. Effective engineering controls include enclosure or confinement of the operation, general and local ventilation, and substitution of less toxic materials. When engineering controls are not feasible, or in the period while controls are being instituted, appropriate respiratory protection shall be used as described in this SWP.

Responsibilities

The Person in Charge (PIC), Lead Operator, Consultant or Production Superintendent is responsible for:

- Identifying the need for respiratory protection through evaluating the job scope (JSA) and material being handled (i.e. H₂S, NORM, Asbestos). Contact Apache EH&S Department for guidance.
- Evaluating that contractors using respiratory protective equipment have the appropriate equipment, testing, skills and knowledge.
- Evaluating the need for the use of engineering controls where feasible. Such controls may include:
  - Change of the work process
  - Substitution of less hazardous substances for harmful materials
  - Isolation or enclosure of the work process or affected workers
  - Local exhaust or general dilution ventilation
Contractors

Contractor companies whose personnel perform work requiring respiratory protection are required to have a documented respiratory protection program in place. The contractor company must ensure that their personnel are properly trained, medically cleared, fit-tested, and that the program is properly implemented.

Requirements

Platforms or Operations with H2S Present

H2S Present Means: that drilling, logging, coring, testing, or producing operations have confirmed the presence of H2S in concentrations and volumes that could potentially result in atmospheric concentrations of 20 ppm or more of H2S.

In H2S present environment(s), a contingency plan shall be developed to effectively monitor, control and minimize employee exposure. The use of respiratory protection equipment may be part of the contingency plan. If so, all personnel shall adhere to the requirements set forth in the plan, which may include medical evaluation, fit testing and training. Refer to Apache’s Safe Work Practices Section D Chapter 9 H2S Safety and your site specific H2S contingency plan.

Exposure to Hazardous Materials

Atmospheres are considered hazardous if they contain toxic or disease-producing contaminants (gas vapors or particulates) which exceed Permissible Exposure Limits (PEL) given by the Safety Data Sheets or as required in separate OSHA, U.S. Coast Guard, local government regulatory regulations, or other industry standards. Respirators shall be worn while working in areas with atmospheres which exceed the permissible exposure/time criteria, or when concentrations are unknown but suspected to approach the PEL. Also, respirators shall be worn during emergency and rescue operations whenever the gas or particulate concentrations exceed the “Acceptable Ceiling Concentration” levels.

Oxygen Deficient Atmosphere

Normal Working Atmospheres require an oxygen concentration between 19.5% and 23.5% and must be free of harmful amounts of flammable gases, dusts, and toxic materials (less than 10% of the LEL and below the PEL or TLV). Anything other than this will be considered an abnormal, unsafe atmosphere and will require additional control measures to continue permitted entry. Personnel shall not be allowed to enter areas where the oxygen content is found to contain less than 19.5% oxygen.

Respirator Selection

Exposure Considerations

Respirators shall be selected on the basis of the hazards to which the worker is exposed. The following factors shall be considered in the selection of respirators:
Respiratory Protection

• Location – The location of the hazardous area with respect to a safe area having respirable air shall be considered as this will allow planning for escape of workers if an emergency occurs.

• Time – The time period that a respirator must be worn and environmental conditions shall be taken into account (e.g., tank capacity required, extreme weather conditions).

• Physical Characteristics – Physical Characteristics, functional capability and performance limitations of the various types of respirators shall be considered.

• Regulatory Guidelines – Respirators shall be selected from among those tested and approval by the National Institute of Occupational Safety and Health (NIOSH). The selection shall be made in accordance which ANSI Z88.2.

Respirators for Atmospheres with Gas and Vapor Contaminants

Respirators for use in gas and vapor atmospheres that contain adequate oxygen and are not immediately dangerous to life or health may be either of the pressure demand or positive pressure air breathing type mentioned above, or the chemical cartridge or canister type, full or half mask. The cartridge type shall possess the appropriate absorbent chemical designed for the specific exposure conditions. These chemical absorbent masks are mainly intended for very low concentrations of toxic gases. Cartridge and canister equipment produce negative pressure in the respiratory inlet during inhalation. If the specific exposure concentrations are suspected to equal or exceed the amounts considered “immediately” dangerous to life or health, only positive pressure air breathing equipment shall be used.

Respirators for Atmospheres with Particulate Contaminants (Dusts, Fogs, Smoke, Spray)

Particulate-filters with quarter mask, half mask, or full face piece shall be used provided the unit meets the respiratory protection factor criteria of NIOSH for the specific conditions encountered. For example, OSHA regulations for asbestos require use of a continuous flow or pressure demand, supplied-air respirator whenever the concentration of asbestos fibers in the work atmosphere exceeds 100 times the permitted eight hour exposure limit. Mechanical filter respirators (dust mask) provide protection against particulate matter such as non-volatile dusts, mists, or metal fumes. Selection of the appropriate respirator is based on the type, toxicity, and particle size of the particulate matter.

Jobs that May Require the Use of Respirators

• Paint spraying and blasting operations
• Welding and cutting operations
• Confined space entry
• Grinding, buffing, chipping and sanding
• Handling hazardous chemicals, products or materials where exposure exceeds permissible exposure limits (PEL) as per SDS
Emergency Situations

Many chemicals, under normal operating conditions, will not cause overexposure to personnel, but in emergencies such as during a fire or spill, exposure can exceed permissible exposure limits. Follow the facility emergency response/evacuation plan and contact the EH&S department.

Fit Testing Procedures

Employees or contractor employees using a tight-fitting facepiece respirator must first pass a qualitative fit test (QLFT) or a quantitative fit test (QNFT). The employee or contractor employee must be fit tested with the same make, model, style, and size of respirator that will be used by that individual.

Respirator Maintenance

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

Cleaning, Storage and Inspection

- Employees and contractors shall keep respirators clean, sanitary, and in good working order.
- Respirators issued to more than one individual shall be cleaned and disinfected following use by the person who used the respirator.
- Test the respirator to ensure that all components work properly after the respirator is cleaned and reassembled.
- Respirators shall be protected from damage, contamination, dust, sunlight, extreme temperatures, excessive moisture, and damaging chemicals, and they shall be packed in a container to prevent deformation of the facepiece and exhalation valve.
- Respirators shall be inspected before each use and during cleaning.
- Respirators that fail inspection or are otherwise defective shall be removed from service or discarded.

Breathing Air Systems

Supplied Air Cylinders

When supplied air respirator requirements are met by supplying air from compressed air cylinders, the cylinders shall be tested and maintained as prescribed in the Shipping Container Specification Regulations of the US Department of Transportation (49 CFR part 173 and part 174); the air shall have a certificate of analysis from the supplier that the breathing air meets the requirements for Grade D breathing air and the moisture content in the cylinder does not exceed a dew point of (-)50 degrees Fahrenheit at 1 atmosphere pressure.

Supplied Air Compressors

Breathing air compressors shall be constructed and situated so as to:
• Prevent entry of contaminated air into the air-supply system.

• Minimize moisture content so that the dew point at 1 atmosphere pressure is 10 degrees Fahrenheit below the ambient temperature.

• Have suitable in-line air-purifying sorbent beds and filters to further ensure breathing air quality. Sorbent beds and filters shall be maintained and replaced or refurbished periodically following the manufacturer's instructions. Maintain at the compressor a tag containing the most recent change date and the signature of the supervisor or foreman who performed the change.

• For non-oil lubricated compressors, ensure the carbon monoxide level in the breathing air does not exceed 10 ppm.

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

• Ensure breathing air couplings are incompatible with outlets for non-respirable worksite air or other gas systems. No asphyxiating substance shall be introduced into breathing air lines.

• Ensure breathing gas containers are marked in accordance with the NIOSH respirator certification standard.

Filters and Cartridges

Filters and cartridges used in the workplace shall be labeled and color-coded with the NIOSH approved label. Ensure the label is not removed and that it remains legible. If for any reason the label becomes illegible, the filters and/or cartridges shall be discarded and not used.