

# RESPIRATORY PROTECTION



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## INTRODUCTION

Toxic materials can enter the body in three primary ways: By skin absorption, oral ingestion and through inhalation. Of these three paths, the human respiratory system represents the quickest and most direct route of entry due to its close association with the circulatory system and the constant flow of oxygenated blood to body tissues.

Current Company work practices at + ( Q W H U S U L V H place / / & ( + employees on job sites or in work areas containing airborne contaminants that may exceed listed permissible exposure limits and/ or oxygen deficient/ excess atmospheres. Work sites typically consist of work around new pipe lines, valves and equipment or other areas where the facility owner/ operator has reduced the contaminant levels down to acceptable, permissible exposure limits.

If potential hydrocarbon gas, mist, fume, vapor or particulate concentrations are ever present in amounts that exceed federal permissible exposure limits, and + contracts perform required work in this area, then we will institute the following respirator users program:

## PURPOSE

Federal OSHA regulation 29CFR1910.134 states that when engineering, administrative, or work practice controls are not feasible to control respiratory hazards like harmful vapors and oxygen deficient atmospheres, or while they are being instituted, or during emergency situations with high exposure potential, respiratory equipment shall be provided which is applicable and suitable for the purpose intended.

## RESPONSIBILITIES

It will be the responsibility of the HSE Director to administer all components of the + Respirator Protection Program. The Program Administrator was selected based upon qualifications received after attending appropriate training classes taught by certified personnel, as well as practical experience received from manufacturers/sales representatives from respiratory equipment suppliers. Anytime respiratory equipment is provided by any client facility operator for + employee use, appropriate training will be received before the issuance of that facility's equipment specifically required to complete the assigned job. The HSE Director may designate other trained employees to assist in the following operations to ensure the established guidelines are met:

- Respirator selection will be based on potential exposure hazards.
- A written program is developed and implemented.
- All identified + personnel are trained in the proper selection, use, maintenance and storage of respiratory protection equipment.

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- Work areas are monitored for respiratory hazards to determine the degree of exposure (performed by client facility operator, safety personnel or other responsible party).
- Fit testing is documented for each person wearing a negative pressure respirator.
- Procedures are developed for cleaning and sanitizing respirators.
- Provide convenient, clean, sanitary storage facilities for respirators.
- Annual audits and inspections regarding the maintenance of respiratory protection equipment are performed.
- All respirator users are medically evaluated to determine their fitness to wear a respirator.
- Authorize the exclusive use of NIOSH-approved respiratory equipment.
- Evaluate the Respiratory Protection Program on a regular basis to ensure its continued effectiveness. Employees will be asked about respirator fit, selection, use, maintenance, cleaning, inspection, storage and any problems incurred during routine work-site inspections or unannounced audits conducted by the HSE Director or other designated **H2** Safety Professionals.

It shall be the responsibility of each identified **H2** employee to use the provided respiratory protection equipment in accordance with all instructions and training that is provided, whether by **H2** Safety personnel or outside contract training sources. Each designated employee shall inspect the respirator before use, and if found to be defective, return it at once to the Project Safety Coordinator.

All training, equipment, medical exams and items required by this program is provided at no cost to **H2** employees.

#### **4. RESPIRATOR SELECTION GUIDELINES**

Various types of respirators have their own intended purpose and limitations. No single respirator is appropriate for all jobs. The proper selection of the identified respirator(s) will be made only after considering:

- The air contaminants to be encountered.
- The type of work activity.
- The workspace.
- The duration of exposure.
- The amount of oxygen present.
- Environmental or process conditions.

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- The ANSI 288.2-1969 & 1980 publications entitled: "Practices for Respiratory Protection".
- The NIOSH respirator decision logic guideline (attached).

Consideration of these identified criteria will be utilized during a hazard assessment of each assigned job site, to determine any hazards to which any employee could be exposed. This will be performed by the **H2** Project Safety Coordinator or client facility operator, using calibrated, direct-reading gas monitoring equipment, colorimetric tubes or similar gas detection items. Should any atmospheric condition at the work site be unable to be correctly identified as to the exact type and level of contaminant, then that atmosphere will be (IDLH) immediately dangerous to life and health. Only NIOSH approved full-face respirators, either pressure-demand 30-minute Self-Contained Breathing Apparatus (SCBA) or Supplied Air Respirator (SAR) with emergency escape bottles, are acceptable for this situation.

A SAR is an atmosphere supplying respirator with a loose-fitting hood (full head covering with partial facial seal) or tight-fitting face-piece with a low-pressure breathing regulator (respiratory inlet covering that forms a complete seal with the face) for which the source of breathing air is not designed to be carried by the user. The user is attached to an air-line that receives its air supply from a compressor pump that delivers filtered outside air or is attached to an air-line hose fitted to a bottle of Grade "D" compressed breathing air.

A SCBA means an atmosphere-supplying respirator for which the breathing air source is designed to be carried by the user in the form of a composite cylinder rated for compressed air volumes relative to the size of the container (i.e. 30 minutes or 45 - 60 minutes of breathing air). A low-pressure breathing air regulator is attached to a tight-fitting face-piece which allows air to be delivered on demand by the user, or continuously if a bypass valve is opened by the user.

Emergency escape or egress bottles are small, composite, pressurized breathing air cylinders with smaller amounts of available air (5, 10, or 15-minute rated air-supply) that the user would revert to in the event of loss of primary supply of breathing air.

The following areas/ operations and work sites at **H2** may be identified as required areas for respiratory protection.

AREA	Refinery tank farms
OPERATION	Industrial tank cleaning

In these areas, the following chemicals or hazards may exist:

AREA	Refinery tank farms
CHEMICAL/HAZARD	hydrocarbons in liquid,

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The respirator(s) selected for employees working in those areas will be dependent upon the type and level of exposure.

NOTE: Only respirators that have been tested and certified or jointly approved by the Mine Safety and Health Administration (MSHA) of the Department of Labor, and the National Institute for Occupational Safety and Health (NIOSH) of the Department of Health and Human Services will be used.

The specific work areas previously mentioned are assessed daily by the client facility operator who permits this work to be conducted. Updates or changes will be made as different situations evolve or are discovered during routine client facility or H2 Management initiated audits or inspections.

## 5. TRAINING

Supervisors and workers must be taught the proper selection, use and maintenance of respirators. All employees required to use respiratory protective equipment will then be instructed in the proper use of the equipment and its limitations. Training will be conducted and documented by outside contract training resources or in-house certified and trained personnel. Training must be provided before an employee will be required to use a respirator. Retaining will be conducted annually and whenever an employee fails to follow any portion of this procedure when using respiratory protection.

Training will include the following:

- Nature of the respiratory hazard and what may happen if the respirator is not used properly.
- Engineering and administrative controls being used and the need for the respirator as added protection.
- Reason(s) for the selection of a respirator.
- Use and limitations of the selected respirator.
- Methods of handling, donning the respirator, checking its proper fit and face-seal, wearing it in normal air for a familiarity period, and wearing it in a test atmosphere.
- Respirator maintenance, cleaning and storage.
- Medical evaluations, physical limitations and user health.
- Proper method for handling emergency situations.
- Air monitoring and industrial hygiene practices.
- Review of all applicable Safety Data Sheets.

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- A general instruction of respirators, fit, use, limitations, emergency situations, wearing, fit checks, maintenance and storage, medical signs and symptoms of effective use, and general requirements of the OSHA standard.

NOTE: A list of all employees who have received the training stated above and the date(s) they received this training will be posted when this procedure is implemented at a work site.

## 6. GENERAL PROGRAM GUIDELINES

Each tight-fitting face-piece respirator user will be trained and receive initial quantitative fit testing prior to being issued a respirator selected for their specific work area or assigned job task. Certification of this training will be documented and maintained by the Director of HSE. Fit testing will be conducted by trained and certified personnel using certified and appropriate equipment. Fit tests will again be conducted for any identified respirator wearer who has a 10% body weight change, receives significant facial scarring, dental changes, reconstructive or cosmetic surgery or any other condition which may affect the respirator fit.

We will fit-test our respirators using the qualitative fit test method.

An improperly selected or poor fitting respirator can present a false sense of security to the wearer. Each person should know how to select and put on the respirator, adjust correctly, and determine if it fits correctly.

Respirator components may be similar in size, shape or color, but cannot be interchanged between Manufacturers.

Filtering materials or filter cartridges shall be specific for the identified contaminants present in the employee's work area. They shall be clean, unused and sealed from any possible type of contamination.

The assigned workplace area shall be provided with an atmospheric oxygen concentration that is greater than 19.5% but less than 23.5%. (Negative pressure air-purifying respirators are not allowed unless this exists.) Any oxygen concentration above or below this range shall be considered IDLH and employees are to follow the guidelines established in the Company's Confined Space Entry Program. Briefly, this will involve the participation of an outside standby person to maintain communication with all entrants, whose trained to recognize dangers that could or may affect the entrants, and this person is to be equipped with SCBA or SAR with auxiliary air supply and retrieval equipment for non-entry rescue or notification means for emergency rescue.

Any employee required to wear a respirator shall be clean shaven (daily) between the sealing surface of the respirator and the face (no full beard, long mustache, goatee, extended side- burns, or long hair that extends into the sealing area of the respirator). A positive and negative pressure fit check shall be performed by any employee wearing a

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negative air purifying respirator each time prior to performing any assigned job-tasks in respirator required workplace areas.

Respirators shall be inspected for defects making sure all inhalation and exhalation valves and valve covers are in place and in good physical condition, head and neck straps are secured to the respirator body, and adjusted properly, if needed.

The respirator wearer shall know the limitations of the assigned equipment, as well as the signs and symptoms of potential workplace exposure contaminants that would indicate chemical breakthrough or filter saturation has occurred. (These may include, but are not limited to, abnormal breathing pattern, shortness of breath, difficulty breathing, detecting a chemical or particulate warning property by noticing a peculiar chemical taste, irritation, or smelling an unusual odor.)

Any employee who detects any part of or all the above symptoms are required to leave the contaminant area immediately to either decontaminate their body or change out filter cartridges. The Project Safety Coordinator or Director, HSE will ensure compliance with this issue through appropriate workplace surveillance.

## 7. MEDICAL SURVEILLANCE

The OSHA respiratory protection standard requires that no employee be assigned to a task requiring the use of a respirator unless it has been determined that the person can perform work under such conditions. In addition, once a determination is made as to the physical ability to wear a respirator and perform the work task, a review of the employee's health status must be made.

The physicians utilized have knowledge of pulmonary disease, respiratory protection practices, pertinent medical factors, and test methods required to determine if an employee may wear a respirator. Medical evaluation for all respirator users will be reviewed periodically. Upon written request, all **H2** respirator users will have full access to their medical evaluation results, which are maintained by the Director, HSE. Documentation and maintenance of these medical evaluation, any fit-testing results, and this written program are maintained and retained respectively by the licensed health care provider or the Director of HSE. These documents are made available, in accordance with 29CFR1910.1020, upon written request.

Supplemental information will be provided upon request by any **H2** employee to include a copy of this OSHA Standard, the Company's written respiratory program and information concerning possible stress factors experienced upon wearing a respirator.

## 8. CLEANING AND DISINFECTING

All respirators will be cleaned and sanitized by each user under the supervision of the Project Safety Coordinator (or by client facility respirator cleaning technician if borrowed



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equipment) after each use, unless the respirator is of the disposable type. Cleaning procedures will follow the guidelines listed in Attachment 7 of this program or per the Manufacturer's listed instructions. **H2** Management will be responsible for monitoring these procedures and documenting its completion. The actual cleaning method can be accomplished by following these suggested guidelines:

- Disassemble and inspect respirator components.
- Wash respirator in warm water with dissolved biocide detergent, using a soft bristle brush if required to displace contaminants.
- Do not use organic solvents as they may damage elastomeric compounds used in the respirator design.
- Remove all detergent and disinfectant residues by rinsing off in warm water, since skin irritation or contact dermatitis may develop.
- Allow respirator to air dry in a fixed position so as not to damage or distort the original face-piece design of the equipment.
- Do not use high heat as a drying influence as damage may occur.

## 9. STORAGE

Improper storage of respirators can cause damage to the respirator and reduce the protection supplied. OSHA requires that respirators be stored to protect against dust, sunlight, heat, extreme cold, excessive moisture and damaging chemicals. Respirators should also be protected against mechanical damage. Leaving a respirator unprotected, as on a work-bench or in a tool cabinet/box among heavy tools, is not proper storage.

It is strongly recommended that cleaned respirators be placed in a reusable plastic bag until used again. They should be stored in a clean, dry, sanitary location and in a single layer with the face-piece and exhalation valve able to prevent distortion. Do not hang or suspend respirators from their retention straps.

All emergency respirators will be clearly marked and stored where they are easily accessible always.

## 10. MAINTENANCE AND INSPECTION

Manufacturer's instructions for cleaning, inspection and maintenance for routinely worn respirators will be followed to ensure that the respirator continues to function properly.

Emergency respirators will be inspected monthly and before and after each emergency use.

Wearing poorly maintained or malfunctioning respirators may be more dangerous than not wearing a respirator at all, since the worker may falsely assume that protection is being

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provided. Rubber or elastomer parts must remain pliable and show no signs of deterioration.

Replacement or repairs will be performed only by experienced personnel, with specific parts designed for that identified respirator.

The following persons will be responsible for routine respirator inspections: Safety Coordinators, Superintendents, Assistant Superintendents and Foremen.

Records will be maintained of regular inspection dates and findings documented by the Director, HSE to determine the continued effectiveness of this program. Work area surveillance by H2 Management, or the client facility operator will also be conducted frequently to ensure that contaminant exposure will not rise above the maximum protective capability of the respirators being used, and respirator-wearer stress is controlled.

## **11. BREATHING AIR QUALITY AND USE**

H2 will provide its employees using atmosphere-supplying respirators (SAR's & SCBA's) with breathing gases of high purity (Type 1 - Grade "D" or better), and certification of this material as it is made available from client facility operators or breathing DOT49CFR Part 173 & 171 gas suppliers.

Any compressor used to supply breathing air to respirators must be situated in a "clean" atmosphere, to prevent entry of contaminated air into the air-supply system and have an inline purification system that utilizes filters or sorbent beds to further ensure breathing air quality. A filter change-out tag is required to indicate the most recent date of replacement, as well as a carbon monoxide monitor set to alarm at 10 ppm to ensure that allowable levels are not exceeded. An "air-watch/bottle-watch person" can be assigned to frequently monitor this equipment and acceptable levels of gas contaminants. All fittings are to be incompatible with outlets for non-respirable work-site air or other gas systems. Any cylinders of Grade "D" or medical-quality breathing air will be stored and maintained in accordance with DOT Shipping Container Specification Regulations, secured on bottle carts or dollies with the valve end protected from damage.

## **12. VOLUNTARY RESPIRATOR USE**

Should any H2 employee who has not been identified as a respirator user wish to volunteer to become a respirator user due to health concerns about potential exposures to airborne contaminants, that person will be included in all the respirator user program guidelines established by this written program. H2 does not allow any employee to



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voluntarily use their own respirator, but will provide the proper equipment at no charge to the employee.

**H2** will ensure that any employee using a respirator voluntarily is medically able to use that respirator and that the respirator is cleaned, stored and maintained so that its use does not present a health hazard to the user. One exception to this rule is that employees whose only use of respirators involves the voluntary use of filtering face pieces (dust masks) will not be included in the guidelines of the written respiratory protection program. These employees will have the contents of the 1910.134 Appendix D made available and explained to them by the Project Safety Coordinator or other trained supervisory personnel.

Non-compliance by any **H2** employee of any part of this described program will result in disciplinary action as outlined in the Company's Corrective Actions and Disciplinary Program found in this manual.