Brunel Energy, Inc.

Respiratory Protection

Contents

1. Purpose

1.1. Brunel Energy, Inc., hereinafter referred to as, the "Company," has established a Respiratory Protection Program compliant with OSHA 1910.134.

1.2. It is the intention of the company to provide a Respiratory Protection Program that meets or exceeds all federal standards. The company will attempt to engineer potential harmful vapors and oxygen deficient atmosphere exposure hazards out of the work environment. If engineering control measures are not feasible or during emergency situations with high exposure, then respirators shall be provided which are applicable and suitable for purpose intended.

2. Applicability

2.1. This policy applies to employees, subcontractors and/or visitor(s) of the Company. For the purposes of this policy, an employee shall be considered on the job whenever he/she is:

2.1.1. On or in, any Company or client property, including parking areas; or

2.1.2. On Company time even if off Company premises (including paid lunch, rest periods and periods of being on call).

2.2. As a condition of employment, Company employees are required to abide by additional governmental or customer policies and requirements that may be imposed at a worksite in addition to the requirements of these policies and procedures. Nothing set forth in this policy constitutes, construes, or interprets in any way as a contract of employment.

3. Definitions

3.1. ***Permissible Exposure Limit (PEL)*** is a legal limit for exposure of an employee to a chemical substance or physical agent such as high-level noise.

3.2. ***Personal Protective Equipment (PPE)*** is equipment worn to minimize exposure to hazards that cause serious workplace injuries and illnesses.

3.3. ***Respiratory Protective Equipment (RPE)*** is worn to protect workers against insufficient oxygen environments, harmful dusts, fog, smoke, mist, gases, vapors, and sprays.

3.4. ***Self-Contained Breathing Apparatus (SCBA)*** is an atmosphere-supplying respirator for which the breathing air source is designed to be carried by the user.

3.5. ***Supplied Air Breathing Apparatus (SABA)*** is an atmosphere-supplying respirator for which the source of breathing air is not designed to be carried by the user.

3.6. ***Short-Term Exposure Limit (STEL)*** is the acceptable average exposure over a short period of time, usually 15 minutes as long as the time-weighted average is not exceeded. STEL is a term used in exposure assessment, occupational health, industrial hygiene and toxicology.

4. Responsibilities

4.1. Manager(s) shall:

4.1.1. Be responsible for implementing, supporting, and enforcing the requirements of this Policy in their locations.

4.2. HSE Supervisor(s) shall:

4.2.1. Shall assist management in the implementation of this Policy and assign a Program Administrator.

4.3. Employee(s) shall:

4.3.1. Be familiar with and comply with the contents of this Policy.

4.3.2. Are responsible for wearing respiratory protection when potential for airborne contaminants exposure.

4.4. Program Administrator(s) shall:

4.4.1. Be responsible for the Respiratory Protection Policy is assigned to the company Manager to ensure that specific requirements are followed.

4.4.2. The Administrator must be knowledgeable of the complexity of the program, able to conduct evaluations and have the proper training.

4.4.3. Conduct an annual written evaluation of the program.

4.4.3.1. The program evaluation should be completed no later than December 31, of each year.

4.4.4. Ensure an adequate supply of respirators, cartridges, and repair/replacement parts. The Program Administrator may delegate this duty but will retain overall responsibility. The person(s) to whom this duty has been delegated is the Project Manager and/or Field Supervisor.

4.4.5. Identify hazards and ensure only NIOSH certified respirators must be selected and provided based on those hazards and factors affecting performance.

4.4.6. Ensure that all respirator users have been trained in the use, selection, and limitations of the type of respirators they will be using prior to the first time the respirator must be used. While the duty of conducting the training may be delegated, the Program Administrator retains final responsibility for seeing that all employees are appropriately trained.

4.4.7. Ensure that all respirator users have been medically evaluated and found fit to use the type of respirators that will be required in their job. The medical evaluation must be completed prior to assigning any employee to a task that requires use of a respirator.

4.4.8. Ensure that all respirator users are fit-tested at least annually and more often if other federal requirements apply.

4.4.9. Ensure that respirators are individually issued, are cleaned, and sanitized on a regular basis, and respirators are stored in a clean and accessible location. This duty may also be delegated but the Program Administrator retains final responsibility for seeing that it is done.

4.4.10. Ensure that respirators are selected based on the hazard that will be encountered. This program describes the basic respirators that will be used at this site and the tasks for which they will be required. In special circumstances, the Program Administrator will contact the corporate health and safety staff for guidance in selecting the correct respirator.

4.4.11. Ensure that employee exposure is monitored to assure the correct respirator type is used. Exposure monitoring may be delegated to others; however, the Program Administrator has final responsibility of monitoring completion and to request assistance when necessary.

4.4.12. Ensure surveillance of employees who wear respirators shall leave the area to wash, change cartridges or if they detect break through or resistance.

4.4.13. Ensure that the elements of the Respiratory Protection Program for the selection, use, cleaning/maintenance, storage to protect them from damage, contamination, dust, sunlight extreme temperatures, excessive moisture and chemicals and they are packed stored to prevent deformation of the facepiece and exhalation valve, and fit testing of respirators are followed.

4.4.14. Ensure that respirator parts are not exchanged between brands of respirators.

4.4.15. Ensure that respirators are inspected before use.

5. Requirements

5.1. General Requirements – Respiratory Equipment

5.1.1. The company shall provide respiratory equipment and training to all employees at no cost to the employees.

5.1.2. The company shall provide a confidential medical evaluation during normal business hours to determine the employee's ability to use a respirator before the employee is fit tested or required to use the respirator in the workplace.

5.1.3. The company may discontinue an employee's medical evaluations when the employee is no longer required to use a respirator.

5.1.4. Medical evaluation procedures shall include identification of a physician or other licensed health care professional (PLHCP) to perform medical evaluations using a medical questionnaire or an initial medical examination that obtains the same information as the medical questionnaire.

5.1.5. The medical evaluation prior to fit-testing will be confidential, conducted during normal working hours, be at a convenient time and location, be understandable and the employee will be given a chance to discuss the results with the PLHCP.

5.1.6. Fit testing shall be conducted.

5.2. Supplemental Information PLHCP

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

5.2.1.1. The type and weight of the respirator to be used by the employee.

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

5.2.1.3. The expected physical work effort.

5.2.1.4. Additional protective clothing and equipment to be worn; and

5.2.1.5. Temperature and humidity extremes that may be encountered.

5.2.2. The company shall provide the PLHCP with the required information, either by providing the documents directly to the PLHCP or having the documents transferred from the former PLHCP to the new PLHCP. However, OSHA does not expect employers to have employees medically re-evaluated solely because a new PLHCP has been selected.

5.3. Medical Determination

5.3.1. In determining the employee's ability to use a respirator, the company shall obtain a written recommendation regarding the employee's ability to use the respirator from the PLHCP. The recommendation shall provide only the following information.

5.3.1.1. Any limitations on respirator use related to the medical condition of the employee or relating to the workplace conditions in which the respirator will be used, including whether the employee is medically able to use the respirator.

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

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

5.4. Additional Medical Evaluations

5.4.1. At a minimum, the company shall provide additional medical evaluations that comply with the requirements of this program if:

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

5.4.1.2. A PLHCP, supervisor, or the respirator Program Administrator informs the company that an employee needs to be re-evaluated.

5.4.1.3. Information from the respiratory protection program, including observations made during fit testing and program evaluation indicates a need for employee re-evaluation or a change occurs in workplace conditions (e.g., physical work effort, protective clothing, and temperature) that may result in a substantial increase in the physiological burden placed on an employee.

6. Procedure

6.1. Each work site where respirators are required to protect the health of the worker shall have work site procedures that follow the guidelines of this program. Employees will be provided training on company Respiratory Protection Program. Specific procedures may also be required by our client which will be followed. The following areas shall be included:

6.1.1. Identification of specific hazard requiring respiratory protection.

6.1.2. The selection of the appropriate respiratory protective equipment based on the specific respiratory hazard and concentration levels, characteristics, etc. Specific brands and models of respiratory equipment to be used shall be identified in the procedures.

6.1.3. Verification that each user of respiratory protection is qualified (medical approval, current fit test, annual training and demonstrates competency.

6.1.4. If company employees are exposed to atmospheres that been determined to be dangerous to life and health (IDLH). The company shall ensure that one employee, or when needed more than one employee, is located outside the IDLH atmosphere. Visual, voice or signal line communication must be maintained between the employee in the IDLH atmosphere, and the employee located outside the IDLH atmosphere. The employee located outside the IDLH atmosphere must be trained and equipped to provide emergency rescue. The company or designee authorized to do so by the Company, once notified, will provide necessary assistance appropriate to the situation. Employee located outside the IDLH atmospheres must be equipped with pressure demand or other positive pressures SCBAs, or a pressure demand or other positive pressure supplied-air respirator with auxiliary SCBA and either appropriate retrieval equipment for removing the employee who enters these hazardous atmospheres where retrieval equipment would contribute to the rescue of the employee and would not increase the overall risk resulting from entry or an equivalent means for rescue where retrieval equipment is not required.

6.2. A hazard assessment shall be conducted.

6.2.1. Due to the many varied work locations, the company identification of respiratory hazards will be contained in the various work site specific safety plans. However, common respiratory hazards will require respiratory protection due to exposure to airborne contaminants that include:

6.2.1.1. Dust

6.2.1.2. Fumes

6.2.1.3. Gases

6.2.1.4. Chemical Particles

6.2.1.5. Oxygen Deficiency

6.3. Characteristics of Hazardous Operation or Process

6.3.1. Hot operations: welding, chemical reactions, soldering, melting, melding, and burning.

6.3.2. Liquid operations: painting, degreasing, dipping, spraying, brushing, coating, etching, cleaning, pickling, plating, mixing, galvanizing and chemical reactions.

6.3.3. Solid operations: pouring, mixing, separations, extraction, crushing, conveying, loading, bagging, and demolition.

6.3.4. Pressurized spraying: cleaning parts, applying pesticides, degreasing, sand blasting and painting.

6.3.5. Shaping operations: cutting, grinding, filing, milling, melding, sawing, and drilling.

6.4. Contaminants – Gaseous

6.4.1. Inert gases (helium, argon, etc.), which do not metabolize in the body but displace air to produce an oxygen deficiency.

6.4.2. Acid gases (SO2, H2S, HCl, etc.) which are acids or produce acids by reaction with water.

6.4.3. Alkaline gases (NH3, etc.), which are alkalized or produce alkalize by reaction with water.

6.4.4. Organic gases (butane, acetone, etc.), which exist as true gases or vapors from organic liquids. Organometallic gases (tetraethyl lead, organo-phosphates, etc.), which have metals attached to organic groups.

6.5. Particulate contaminants

6.5.1. Dusts are mechanically generated solid particulates (0.5 to 10µm)

6.5.2. Fumes are solid condensation particles of small diameter (0.1 to 1.0 µm)

6.5.3. Mists are liquid particulate matter (5 to 100 µm)

6.5.4. Smoke is chemically generated particulates (solid and liquid) of organic origins (0.01 to 0.3 µm)

6.6. Selection of Respirator

6.6.1. The concentration and type of contaminant will determine the model and type of respirator and cartridges/filters or filters to be used. The concentration is based on a sampling of the atmosphere.

6.6.2. Location of hazardous area.

6.6.3. Worker activity (extreme heat, cold, welding hood requirement, etc.)

6.7. Types of Respirators

6.7.1. Air-purifying respirators can be either full-face or half masks with mechanical or chemical cartridges to filter dust, mist, fumes, vapors, or gases.

6.7.2. Powered air-purifying respirators use a blower to pass the contaminated air through a filter. The purified air is then delivered into a mask or hood. They filter dust, mist, fumes, vapors, and gases, just like ordinary air-purifying respirators.

6.7.3. Air-purifying respirators cannot be used in oxygen-deficient atmospheres, which can result when another gas displaces the oxygen or consumption of oxygen by a chemical reaction occurs. Oxygen levels below 19.5% require either a source of supplied air or supplied-air respirator protection. Levels below 16% are unsafe and could cause death. To determine the proper cartridge for air-purifying respirators contact the company Safety Manager or a qualified on-site safety representative of the client. You should also consult the Safety Data Sheet of the substance that needs to be filtered.

6.7.4. All cartridges are assigned a color designating the type of contaminant they will filter:

6.7.4.1. White – Acidic gas

6.7.4.2. Black – Organic vapors

6.7.4.3. Green – Ammonia gas

6.7.4.4. Yellow – Acidic gas and organic vapors

6.7.4.5. Purple – Radioactive materials

6.7.4.6. Orange Dust, fumes, and mists

6.7.4.7. Olive – Other gases and vapors

6.7.5. Once the wearer of the respirator can detect an odor, irritation, or taste of the contaminant, the cartridge should be replaced. All cartridges and/or filters shall be changed at the beginning of each shift.

6.7.6. Supplied-air respirators provide the highest level of protection against highly toxic and unknown materials. Supplied air refers to self-contained breathing apparatuses (SCBAs) and air-line respirators. SCBAs have a limited air supply that is carried by the user, allowing for good mobility and fewer restrictions than air-line respirators.

6.7.7. Air-line respirators have an air hose that is connected to a fresh air supply from a central source. The source can be from a compressed air cylinder or air compressor that provides at least Grade D breathing air.

6.7.8. Emergency Escape Breathing Apparatuses (EEBAs) provide oxygen for 5, 10 or 15 minutes depending on the unit. These are for emergency situations in which an employee must escape from environments immediately dangerous to life or health (IDLH).

6.7.9. SCBA (Self Contained Breathing Apparatus) The company does NOT allow employees to work in an Immediately Dangerous to Life and Health (IDLH) environment.

6.7.10. To maintain the NIOSH/OSHA approval of any respirator, mixing parts from other respirator manufacturers is prohibited. This includes airline hoses, valves, gaskets, cartridges, etc. North cartridges or valve gaskets shall not be used with an MSA product.

6.8. Respirator Brand and Models

6.8.1. The Company has selected 3M and/or Scott as its NIOSH-certified respirator. Only this brand of respirator shall be used in compliance with the conditions of the certification of its Respiratory Protection Program (fit testing model, no mixing of different manufacturer parts, cartridges, filters, etc.).

6.8.2. The specific model will be based on the hazard, concentration of contaminant, oxygen level, work environment and type of work being performed. To aid in the selection process the following will be used to identify the proper 3M and/or Scott respiratory equipment for the work being performed and hazard that is present.

6.8.3. NIOSH Pocket Guide to Chemicals

6.8.4. 3M Cartridge Selection Guide

6.8.5. 3M Respirator Selection Guide

6.9. Estimate of Exposures and Contaminant Information

6.9.1. No employee shall enter an IDLH environment.

6.9.2. Normal oxygen levels shall be maintained.

6.9.3. No employee shall be exposed to an atmosphere containing concentrations that would exceed the STEL or PEL for the identified atmospheric hazard.

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

6.9.5. All respirator users are fit-tested at least annually and more often if other federal requirements apply.

6.9.6. Supplied Air Respirators are required to be fit tested as well.

6.9.7. The company shall ensure that employees using a tight-fitting face piece respirator pass an appropriate qualitative fit test (QLFT) or quantitative fit test (QNFT) as before initial use if different respirator is used and annually.

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

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

6.9.10. If after passing a QLFT or QNFT, the employee subsequently notifies the company Program Administrator, supervisor, or PLHCP that the fit of the respirator is unacceptable, the employee shall be given a reasonable opportunity to select a different respirator face piece and to be retested.

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

6.9.12. QLFT may only be used to fit test negative pressure air-purifying respirators that must achieve a fit factor of 100 or less. Half face air filtering respirators may be fit tested with irritant smoke while full face air filtering respirators require Porta count fit testing.

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

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

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

6.9.16. Quantitative fit testing of these respirators shall be accomplished by modifying the face piece to allow sampling inside the face piece in the breathing zone of the user, midway between the nose and mouth. This requirement shall be accomplished by installing a permanent sampling probe onto a surrogate face piece, or by using a sampling adapter designed to temporarily provide a means of sampling air from inside the face piece.

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

6.9.18. The company shall conduct evaluations of the workplace to ensure implementation. The employer shall regularly consult employees about fit, selection, use, maintenance, etc. and overall program effectiveness.

6.10. Respirator Fit Testing

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

6.10.2. All respirator users are fit-tested at least annually and more often if other federal requirements apply.

6.10.3. Supplied Air Respirators are required to be fit tested as well.

6.10.4. The company shall ensure that employees using a tight-fitting face piece respirator pass an appropriate qualitative fit test (QLFT) or quantitative fit test (QNFT) as stated in this program.

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

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

6.10.7. If after passing a QLFT or QNFT, the employee subsequently notifies the company Program Administrator, supervisor, or PLHCP that the fit of the respirator is unacceptable, the employee shall be given a reasonable opportunity to select a different respirator face piece and to be retested.

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

6.10.9. QLFT may only be used to fit test negative pressure air-purifying respirators that must achieve a fit factor of 100 or less. Half face air filtering respirators may be fit tested with irritant smoke while full face air filtering respirators require Porta count fit testing.

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

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

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

6.10.13. Quantitative fit testing of these respirators shall be accomplished by modifying the face piece to allow sampling inside the face piece in the breathing zone of the user, midway between the nose and mouth. This requirement shall be accomplished by installing a permanent sampling probe onto a surrogate face piece, or by using a sampling adapter designed to temporarily provide a means of sampling air from inside the face piece.

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

6.10.15. The company shall conduct evaluations of the workplace to ensure implementation. The employer shall regularly consult employees about fit, selection, use, maintenance, etc. and overall program effectiveness.

6.11. Fit Test Procedures:

6.11.1. The requirements in this section apply to all OSHA-accepted fit test methods, both QLFT and QNFT.

6.11.2. The test subject shall be allowed to pick the most acceptable respirator from enough respirator sizes so that the respirator is acceptable to, and correctly fits, the user.

6.11.3. Prior to the selection process, the test subject shall be shown how to put on a respirator, how it should be positioned on the face, how to set strap tension and how to determine an acceptable fit. A mirror shall be available to assist the subject in evaluating the fit and positioning of the respirator. This instruction may not constitute the subject's formal training on respirator use, because it is only a review.

6.11.4. The test subject shall be informed that he/she is being asked to select the respirator that provides the most acceptable fit. Each respirator represents a different size and shape, and if fitted and used properly, will provide adequate protection.

6.11.5. The test subject shall be instructed to hold each chosen face piece up to the face and eliminate those that obviously do not give an acceptable fit.

6.11.6. The more acceptable face pieces are noted in case the one selected proves unacceptable; the most comfortable mask is donned and worn at least five minutes to assess comfort. Assistance in assessing comfort can be given by discussing the following points.

6.11.6.1. If the test subject shall be directed to don the mask several times to adjust the straps each time to become adept at setting proper tension on the straps.

6.11.6.2. Position of the mask on the nose

6.11.6.3. Room for eye protection

6.11.6.4. Room to talk

6.11.6.5. Position of mask on face and cheeks

6.11.7. The following criteria shall be used to help determine the adequacy of the respirator fit:

6.11.7.1. Chin properly placed.

6.11.7.2. Adequate strap tension not overly tightened.

6.11.7.3. Fit across nose bridge

6.11.7.4. Respirator of proper size to spa distance from nose to chin

6.11.7.5. Tendency of respirator to slip.

6.11.7.6. Self-observation in mirror to evaluate fit and respirator position.

6.11.7.7. Use fit test form.

6.12. User Seal Check

6.12.1. Before conducting the negative and positive pressure checks, the subject shall be told to seat the mask on the face by moving the head from side-to-side and up and down slowly while taking a few slow deep breaths. The test subject shall conduct a user seal check, either the negative or positive pressure seal checks described below.

6.12.2. Positive Pressure Check- Close off the exhalation valve and exhale gently into the face piece. The face fit is considered satisfactory if a slight positive pressure can be built up inside the face piece without any evidence of outward leakage of air at the seal. For most respirators, this method of leak testing requires the wearer to first remove the exhalation valve cover before closing off the exhalation valve and then carefully replacing it after the test.

6.12.3. Negative Pressure Check- Close off the inlet opening of the canister or cartridge(s) by covering with the palm of the hand(s) or by replacing the filter seal(s), inhale gently so that the face piece collapses slightly, and hold the breath for ten seconds. The design of the inlet opening of some cartridges cannot be effectively covered with the palm of the hand. The test can be performed by covering the inlet opening of the cartridge with a thin latex or nitrile glove. If the face piece remains in its slightly collapsed condition and no inward leakage of air is detected, the tightness of the respirator is considered satisfactory.

6.12.4. The test shall not be conducted if there is any hair growth between the skin and the face piece sealing surface, such as stubble beard growth, beard, moustache, or sideburns which cross the respirator sealing surface. Any type of apparel which interferes with a satisfactory fit, seal, or valve function, shall be altered, or removed, including glasses.

6.12.5. If a test subject exhibits difficulty in breathing during the tests, she or he shall be referred to a physician or other licensed health care professional, as appropriate, to determine whether the test subject can wear a respirator while performing her or his duties. If the employee finds the fit of the respirator unacceptable, the test subject shall be given the opportunity to select a different respirator and to be retested.

6.12.6. Prior to the commencement of the fit test, the test subject shall be given a description of the fit test and the test subject's responsibilities during the test procedure. The description of the process shall include a description of the test exercises that the subject will be performing. The respirator to be tested shall be worn for at least 5 minutes before the start of the fit test.

6.12.7. The fit test shall be performed while the test subject is wearing any applicable safety equipment that may be worn during actual respirator use which could interfere with respirator fit.

6.13. Test Exercises

6.13.1. Each test exercise shall be performed for one minute except for the grimace exercise which shall be performed for 15 seconds. The test subject shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become unacceptable, another model of respirator shall be tried. If due to medical or health conditions the employee cannot perform the test exercises the fit test shall not be performed and the employee not allowed to use a respirator until all elements of the fit test can be achieved.

6.13.2. The respirator shall not be adjusted once the fit test exercises begin. Any adjustment voids the test, and the fit test must be repeated.

6.13.3. The following test exercises are to be performed for all fit testing methods prescribed in this procedure:

6.13.3.1. Normal breathing. In a normal standing position, without talking, the subject shall breathe normally. Deep breathing. In a normal standing position, the subject shall breathe slowly and deeply, taking caution so as not to hyperventilate.

6.13.3.2. Turning head side to side. Standing in place, the subject shall slowly turn his/her head from side to side between the extreme positions on each side. The head shall be held at each extreme momentarily, so the subject can inhale at each side.

6.13.3.3. Moving head up and down. Standing in place, the subject shall slowly move his/her head up and down.

6.13.3.4. The subject shall be instructed to inhale in the up position (i.e., when looking toward the ceiling).

6.13.3.5. Talking. The subject shall talk aloud slowly and loud enough to be heard clearly by the test conductor. The subject shall read from the Rainbow Passage.

"When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow." Continue to read for one minute.

6.13.3.6. Grimace. The test subject shall grimace by smiling or frowning. (This applies only to QNFT testing; it is not performed for QLFT)

6.13.3.7. Jogging in place. The test subject shall jog in place being careful to be aware of their surroundings.

6.13.3.8. Normal breathing. Same as exercise (1).

6.14. Qualitative Fit Test (QLFT) Protocols

6.14.1. The company shall ensure that persons administering QLFT are able to prepare test solutions, calibrate equipment and perform tests properly, recognize invalid tests, and ensure that test equipment is in proper working order. The company shall ensure that QLFT equipment is kept clean and well maintained to operate within the parameters for which it was designed.

6.14.2. Irritant Smoke (Stannic Chloride) Protocol. This qualitative fit test uses a person's response to the irritating chemicals released in the ``smoke'' produced by a stannic chloride ventilation smoke tube to detect leakage into the respirator.

6.14.3. General Requirements and Precautions. The respirator to be tested shall be equipped with high efficiency particulate air (HEPA) or P100 series filter(s).

6.14.4. Only stannic chloride smoke tubes shall be used for this protocol. No form of test enclosure or hood for the test subject shall be used.

6.14.5. The smoke can be irritating to the eyes, lungs, and nasal passages. The test conductor shall take precautions to minimize the test subject's exposure to irritant smoke. Sensitivity varies, and certain individuals may respond to a greater degree to irritant smoke. Care shall be taken when performing the sensitivity screening checks that determine whether the test subject can detect irritant smoke to use only the minimum amount of smoke necessary to elicit a response from the test subject.

6.14.6. The fit test shall be performed in an area with adequate ventilation to prevent exposure of the person conducting the fit test or the build-up of irritant smoke in the general atmosphere.

6.14.7. The person to be tested must demonstrate his or her ability to detect a weak concentration of the irritant smoke.

6.14.8. The test operator shall break both ends of a ventilation smoke tube containing stannic chloride and attach one end of the smoke tube to a low flow air pump set to deliver 200 milliliters per minute or use an aspirator squeeze bulb. The test operator shall cover the other end of the smoke tube with a short piece of tubing to prevent potential injury from the jagged end of the smoke tube.

6.14.9. The test operator shall advise the test subject that the smoke can be irritating to the eyes, lungs, and nasal passages and instruct the subject to keep his/her eyes closed while the test is performed.

6.14.10. The test subject shall be allowed to smell a weak concentration of the irritant smoke before the respirator is donned to become familiar with its irritating properties and to determine if he/she can detect the irritating properties of the smoke. The test operator shall carefully direct a small amount of the irritant smoke in the test subject's direction to determine that he/she can detect it.

6.15. Irritant Smoke Fit Test Procedure

6.15.1. The person being fit tested shall don the respirator without assistance and perform the required user seal check(s).

6.15.2. The test subject shall be instructed to keep his/her eyes closed if wearing a half face respirator.

6.15.3. The test operator shall direct the stream of irritant smoke from the smoke tube toward the face seal area of the test subject, using the low flow pump or the squeeze bulb. The test operator shall begin at least 12 inches from the face piece and move the smoke stream around the whole perimeter of the mask. The operator shall gradually make two more passes around the perimeter of the mask, moving to within six inches of the respirator.

6.15.4. If the person being tested has not had an involuntary response and/or detected the irritant smoke, proceed with the test exercises.

6.15.5. The exercises identified in the Test Exercises of this procedure shall be performed.

6.15.6. by the test subject while the respirator seal is being continually challenged by the smoke, directed around the perimeter of the respirator at six inches.

6.15.7. If the person being fit tested reports detecting the irritant smoke at any time, the test is failed. The person being retested must repeat the entire sensitivity check and fit test procedure.

6.15.8. Each test subject passing the irritant smoke test without evidence of a response (involuntary cough, irritation) shall be given a second sensitivity screening check, with the smoke from the same smoke tube used during the fit test, once the respirator has been removed, to determine whether he/she still reacts to the smoke. Failure to evoke a response shall void the fit test.

6.15.9. If a response is produced during this second sensitivity check, then the fit test is passed. The glass tube shall be disposed of properly.

6.15.10. Quantitative Fit Test (QNFT) Protocols Using controlled negative pressure and appropriate instrumentation to measure the volumetric leak rate of a face piece to quantify the respirator have been demonstrated to be acceptable to OSHA.

6.15.11. The company shall ensure that persons administering QNFT are able to calibrate equipment and perform tests properly, recognize invalid tests, calculate fit factors properly and ensure that test equipment is in proper working order.

6.15.12. The company shall ensure that QNFT equipment is kept clean and is maintained and calibrated according to the manufacturer's instructions to operate at the parameters for which it was designed.

6.16. Paramount Fit Test Requirements

6.16.1. Check the respirator to make sure the respirator is fitted with a high-efficiency filter and that the sampling probe and line are properly attached to the face piece.

6.16.2. Instruct the person to be tested to don the respirator for five minutes before the fit test starts. This purges the ambient particles trapped inside the respirator and permits the wearer to make certain the respirator is comfortable. This individual should already have been trained in how to wear the respirator properly.

6.16.3. Check the following conditions for the adequacy of the respirator fit: Chin properly placed; Adequate strap tension, not overly tightened; Fit across nose-bridge; Respirator of proper size to span distance from nose to chin; Tendency of the respirator to slip; Self-observation in a mirror to evaluate fit and respirator position.

6.16.4. Have the person wearing the respirator do a user facial seal check. If leakage is detected, determine the cause. If the leakage is from a poorly fitting face piece, try another size of the same model respirator, or another model of respirator.

6.16.5. Follow the manufacturer's instructions for operating the Porta count and proceed with the test.

6.16.6. The test subject shall be instructed to perform the exercises in the Test Exercises section of this procedure.

6.16.7. After the test exercises, the test subject shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become unacceptable, another model of respirator shall be tried.

6.17. Porta count Test Instrument

6.17.1. The Porta count will automatically stop and calculate the overall fit factor for the entire set of exercises. The overall fit factor is what counts. The Pass or Fail message will indicate whether the test was successful. If the test was a Pass, the fit test is over. Since the pass or fail criterion of the Porta count is user programmable, the test operator shall ensure that the pass or fail criterion meets the requirements for minimum respirator performance.

6.17.2. A record of the test needs to be sent to the Safety Manager and kept on file, assuming the fit test was successful. The record must contain the test subject's name; overall fit factor; make, model, style, and size of respirator used; and date tested.

6.18. Use, Maintenance and Care of Respirators

6.18.1. This section requires the company to provide for the use, cleaning and disinfecting, storage, inspection, and repair of respirators used by employees.

6.18.2. Appendix B - Respirator Cleaning Procedures (Mandatory) shall be followed.

6.18.3. Use of Items that can affect the face to mask seal are prohibited. This includes facial hair, glasses, clothing, etc.

6.18.4. Each time a respirator is put on a positive and negative pressure check shall be performed.

6.18.5. Cleaning and Disinfecting Requirements The company shall provide each respirator user with a respirator that is clean, sanitary, and in good working order. The company shall ensure that respirators are cleaned and disinfected using the procedures in this Respiratory Protection Program, or procedures recommended by the respirator manufacturer, provided that such procedures are of equivalent effectiveness. The respirators shall be cleaned and disinfected at regular intervals. Respirators issued for the exclusive use of an employee shall be cleaned and disinfected by the employee as often as necessary to be maintained in a sanitary condition,

6.18.6. Respirators used in fit testing and training shall be cleaned and disinfected after each use by the Safety Manager or designated person.

6.18.7. Everyone who is assigned a cartridge respirator is responsible for seeing that the respirator is cleaned, inspected, and properly stored.

6.19. Cleaning Procedures

6.19.1. Remove filters, cartridges, or canisters. Disassemble face pieces by removing speaking diaphragms, demand and pressure-demand valve assemblies, hoses, or any components recommended by the manufacturer. Discard or repair any defective parts.

6.19.2. Wash components in warm water with a mild detergent or with a cleaner recommended by the manufacturer. A stiff bristle (not wire) brush may be used to facilitate the removal of dirt.

6.19.3. Rinse components thoroughly in clean, warm, preferably running water. Drain.

6.19.4. When the cleaner used does not contain a disinfecting agent, respirator components should be immersed for two minutes in commercially available cleansers of equivalent disinfectant quality. Another alternative is to use wipes containing alcohol that are intended for use with respirators.

6.19.5. Rinse components thoroughly in clean, warm, preferably running water. Drain. The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on face pieces may result in dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts if not completely removed. Components should be hand-dried with a clean lint-free cloth or air dried. Reassemble face piece, replacing filters, cartridges, and canisters where necessary. Test the respirator to ensure that all components work properly.

6.20. Storage and Inspection

6.20.1. Respiratory equipment shall be stored in a manner that protects the respirator from damage, contamination, dust, sunlight, extreme temperatures, excessive moisture, damaging chemicals, and must be packed or stored to prevent deformation of the facepiece and exhalation valve.

6.20.2. Respiratory equipment shall be inspected before each use.

6.20.3. Respirators maintained for emergency situations shall be inspected at least monthly and shall be checked for proper function before and after each use.

6.20.4. Inspections shall include respirator function, tightness of connections and the condition of the various parts.

6.20.5. Respiratory equipment intended for emergency use shall be stored in an area that is readily accessible and clearly marked.

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

7. Training

7.1. Training shall be provided upon initial hire and refresher training annually thereafter. Training is also required when any other situation arises in which retraining appears necessary to ensure safe respirator use.

7.2. Training, will be provided by employer to ensure that each employee can demonstrate knowledge of why the respirator is necessary, and how improper fit, usage, or maintenance can compromise the protective effect of the respirator, what the limitations and capabilities of the respirator are, how to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions, how to inspect, put on and remove, use and check the seals of the respirator, how to recognize medical signs and symptoms that may limit or prevent the effective use of respirators.

7.3. Training will include procedures for working in conditions immediately dangerous to life or health IDLH conditions and ensuring one employee is located outside the IDLH atmosphere, maintains communication, and is properly trained to provide emergency rescue, has notification procedures, and provides necessary assistance appropriate to the situation.

7.4. Re-training will be administered when the following situations occur:

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

7.4.2. Inadequacies in the employee's knowledge or use of the respirator indicate that the employee has not retrained the requisite understanding or skill.

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

8. Recordkeeping

8.1. Employee fit tests records and training records shall be maintained.

9. Appendix

9.1. International Breathing Air Standards of Compressed Air.

9.2. Respiratory Protective Equipment – FIT Test Record

9.3. Respirator – General Instructions.

9.4. Respirator – Instructions for Use

10. Reference

10.1. OSHA Respiratory Protection Standard 29 CFR 1910.134

INTERNATIONAL BREATHING AIR STANDARDS FOR COMPRESSED AIR

	Standard	Nominal Pressure psi (Bar)	Water Content mg/m^3	Oil Mist ppm (v) ml/m^3	CO ppm (v) ml/m^3	CO_2	Compressed Dew Point
Europe	EN 12021	600 – 3000 400 – 200 (compressed air tank) 3000 >200 (compressed air tank) 4500 <300 (compressor direct)	<50 <35 <25	<0.5 <0.5 >0.5	<15 <15 <15	<500 <500 <500	5^0C below Est. Operating Temp
Great Britain	BS 4001	X	As dry as possible	1	10	1000	X
USA	CGA Grade D CGA Grade E NFPA 1500 Navy STD	X X X X	63 ppm 63 ppm 24 ppm Free of Gross Moisture	5 5 5 5	10 10 10 20	1000 500 1000 500	-50^0F -50^0F X X
Canada	CSA Z1800.1-M85	X	PD Pat 5^0C below systems	1	5	560	-53^0C -63^0F

RESPIRATORY PROTECTIVE EQUIPMENT – FIT TEST RECORD

Location:				Employee:			
Date:				Time:			
Respirator & breathing apparatus face masks fittings shall be conducted by the Managers / Field Superintendent (or designated the company representative) and records kept for at least the duration of the employee's employment.							
FIT Testing Conducted	Positive Pressure	o	Negative Pressure	o	Banana Oil	o	
Half Mask Respirator (size)	Small	o	Medium	o	Large	o	
Manufacturer/Model							
Test Results	o	Unsatisfactory	o	Satisfactory			
Full Mask Respirator	Small	o	Medium	o	Large	o	
Manufacturer/Model							
Test Results	o	Unsatisfactory	o	Satisfactory			
Breathing Apparatus SCBA	Small	o	Medium	o	Large	o	
Manufacturer/Model							
Test Results	o	Unsatisfactory	o	Satisfactory			
Breathing Apparatus SABA	Small	o	Medium	o	Large	o	
Manufacturer/Model							
Test Results	o	Unsatisfactory	o	Satisfactory			

Review Test Results:	
o	Discuss difficulties; interferences by clothing & other PPE that may needs to be worn in conjunction with the RPE.
o	Review personal fitting problems, e.g., eyeglasses, contact lenses, dentures, unusual facial features, or facial hair. Review personal hygiene.
o o o o	Follow-up FIT tests will be required: • When a new respirator is issued, or brand / model changes. • When a new model SCBA is issued or brought to location. • When straps and/or upper cradle components are replaced. • After twelve months has elapsed from the initial FIT test.
o	Employee reviewed and understands the company RPE.
Comments:	

Employee:					
Name:		Position:		Signature:	
Manager:					
Name:		Position:		Signature:	

RESPIRATOR – GENERAL INSTRUCTIONS

The **Respirator** must be a reusable, half-mask, air-purifying respirator with air purifying elements. It is approved by NIOSH to protect against and reduce exposure to the type of air contaminants specified in the NIOSH/MSHA Approval Label on the cartridge (concurrence with country regulations). When assembled to a felt pre-filter, this respirator is also approved by NIOSH to protect against, and reduce exposure to, the additional air contaminants specified in the Approval Label on the pre-filter package.

This respirator does not supply oxygen. It must not be used in oxygen deficient atmospheres (less than 19.5% oxygen by volume); in poorly ventilated areas or enclosed spaces such as tanks or small rooms; for abrasive blasting or firefighting; or for protection against contaminants excluded or not covered by the applicable Approval Label.

> ***CAUTION****:*
>
> *This respirator does not protect the eyes or skin against vapors, gases, or particulate matter that may irritate or burn the eyes or skin or that may be absorbed by the body through penetration of the skin. When these types of hazards are present, the* ***Full-Face Respirator****, and appropriate hand or other protective equipment must be worn for protection. [E.g.: using a diesel pressure washer]*

The service life of this respirator will vary depending on the work environment. When you are using gas or vapor cartridges, you will know the service life is ending when you smell, taste, or sense irritation from the contaminants while wearing the respirator. Felt pre-filters should be used where possible with respirator cartridges and should be replaced when breathing becomes difficult. When using the High Efficiency Particle Filters (HEPA) you will know the cartridge life is ending when breathing becomes difficult. (No pre-filter required)

WARNING: Immediately leave the work area and replace the cartridges if:

- Breathing becomes difficult
- Dizziness or other distress occurs
- You sense irritation, smell or taste contaminants present in the work area
- If the respirator becomes damaged or leakage of the facepiece occurs
- If there is a vapor/gas breakthrough

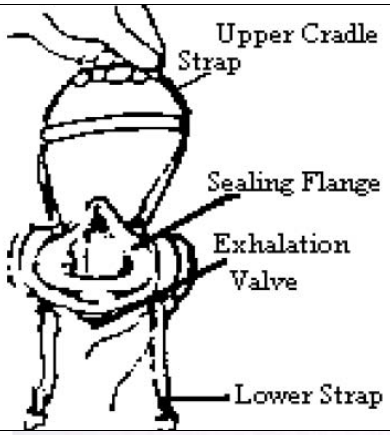
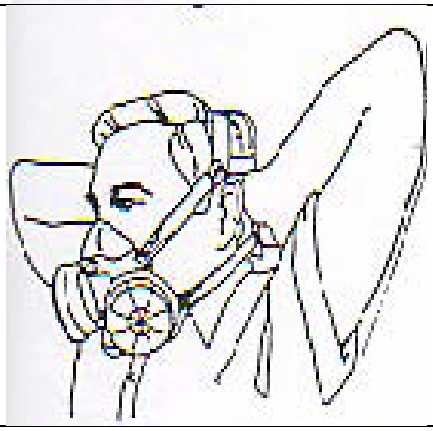
STORAGE REQUIREMENTS:

When not in use, respirators must be stored in a clean, dry, non-contaminated area. The minimum standard for storing respirators is to keep them in a self-sealing, zip-lock freezer bag.

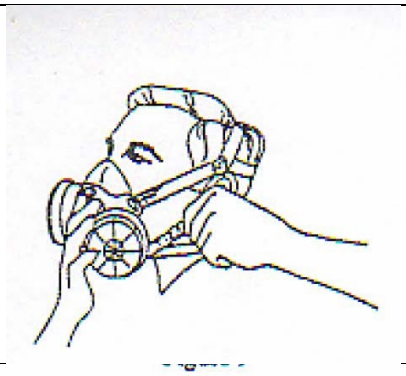
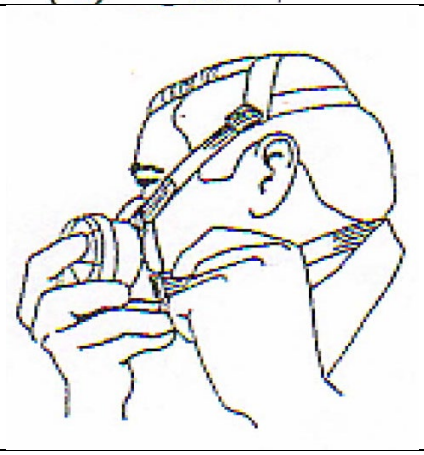
FACIAL HAIR WARNING:

This respirator cannot be used by individuals with beards, or other facial hair which passes between the sealing flange or the respirator face piece and the wearer's face. Facial hair will cause leakage or interfere with the proper operation of the respirator exhalation valve, which exposes the wearer to the hazardous contaminants.

RESPIRATOR – INSTRUCTION FOR USE – Page 1 of 3

1. After assembling the respirator and air purifying elements, inspect the respirator to make certain the respirator has not been damaged, the exhalation valve flap is in place, and the sealing flange is not distorted. As per HSE requirements, respirators must be inspected by the wearer before and after each use to ensure that it is in suitable working condition.	
2. To put the respirator on, grasp the front of the respirator with one hand and the upper strap with the other hand. Then place the portion of the face piece containing the exhalation valve under the chin.	
3. Position the narrow portion of the respirator on the nose bridge and place the cradle suspension system on the head so that the top strip rests across the top of the head and the bottom rests above the ears, on the back of the head. Then hood the bottom headband strap behind the neck, below the ears, and adjusting the position of the face piece on the face for best fit and comfort.	

RESPIRATOR – INSTRUCTION FOR USE – Page 2 of 3

4. The lengths of the headband straps are adjustable; tighten or loosen by holding the respirator body or headband and yoke with one hand and pulling on the elastic material in the appropriate direction with the other hand. For proper fit, ensure the headband straps are equally adjusted on both sides of the respirator.	
5. Position the face piece so that the nose section rests as low on the ridge of the nose as is comfortable and tighten the upper headband strap on both sides just tight enough so that the respirator doesn't slide down the nose. Do not over tighten. (If the respirator pinches the nose, loosen the upper left strap slightly).	
6. Then tighten the lower headband strap on both sides just tight enough to secure the respirator under the chin (Note: For proper positioning and comfort, the upper headband strap must be adjusted first, and then the lower straps must be adjusted). If you have previously removed protected eye wear, put it back on at this time.	

RESPIRATOR – INSTRUCTION FOR USE – Page 3 of 3

NEGATIVE PRESSURE FIT CHECK METHOD A. Prior to entering a contaminated environment, fit check the respirator as follows: Place the palms of the hands over the openings of the inhalation connectors, (Note: Unscrew the air purifying elements from the respirator first). Inhale and hold your breath for about 5 seconds. If the face piece collapses slightly and no air leaks between the face piece and the face are detected, a good fit has been obtained. If air leaks are detected, reposition the face piece on the face and/or readjust the tension of the elastic straps and repeat the negative pressure check until a tight seal has been obtained.	
POSITIVE PRESSURE FIT CHECK METHOD B. This check is carried out by covering the opening in the exhalation valve guard with the palm of your hand, and simultaneously exhaling. If the face piece bulges slightly and no air leaks between the face piece and the face are detected, a tight fit has been obtained. If air is detected to be leaking out between the face piece and the face, reposition the face piece on the face and/or readjust the tension of the elastic straps to eliminate the leakage. This check must be repeated until a tight seal of the face piece to the face is obtained. **IF YOU CANNOT OBTAIN A GOOD SEAL WITH YOUR RESPIRATOR, TRY ANOTHER SIZE RESPIRATOR**.