UAH RESPIRATORY PROTECTION PROGRAM

This document establishes standard operating procedures and provides information required for the safe and effective use of respiratory protective equipment by employees of UAH.

Review Date: September 29, 2014

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REVIEW DATES FOR THE UAH RESPIRATORY PROTECTION PROGRAM

UAH OEHS quality control guidelines for safety programs require that this Program be reviewed and evaluated at least once every five years from the date of the original. The Director of Environmental Health and Safety must ensure the review is conducted. The review dates are documented below.

Review Date	**Revision No.**	**Reviewing Party Printed/Typed Name/Title**	**Reviewing Party Signature**
1999	Original Plan	Randy Wright/Director -OEHS	
December 2000	Review	Marcia Green/Director - OEHS	
August 2014	Review	Marcia Pendleton/Director - OEHS	

1.0 PURPOSE

The purpose of this document is to establish a standard operating procedure and to provide the necessary information required for the safe and effective use of respiratory protective equipment by employees of The University of Alabama in Huntsville.

It is the responsibility of the Office of Environmental Health and Safety to establish an effective respiratory protection program which sets guidelines for the control of occupational illnesses which may be caused by breathing air contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, sprays, or vapors. It is the responsibility of the employees and their supervisors for overall compliance with the program.

2.0 FEDERAL REGULATIONS

2.1 OSHA / EPA GUIDELINES

The Occupational Safety and Health Administration (OSHA) is the primary governing body for the establishment of occupational related regulations. Regulations concerning respiratory protection, including the use of Self- Contained-Breathing-Apparatus (SCBA). These regulations are found in chapter 29 of the Code of Federal Regulations (CFR) section 1910 paragraph 134. The regulatory document can be accessed at https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=12716. These regulations require workplaces where respirators are necessary to protect the health of the employee to establish guidelines in a written program. The EPA has established the Worker Protection Rule that directly links EPA and OSHA regulations concerning occupational respiratory exposures. The UAH Respiratory Protection Program outlines the specifics necessary to comply with OSHA and EPA requirements, thus ensuring the health and safety of UAH employees through adequate respiratory protection.

2.2 Primary Requirements

EPA/OSHA guidelines state that prevention of atmospheric contamination is the primary means of controlling occupational diseases related to breathing contaminated air. Engineering control measures shall be the primary means of controlling respiratory hazards. Examples include enclosure or confinement of the operation, general and local ventilation, and substitution for less toxic materials.

When these control measures are not feasible or while they are being instituted, appropriate respiratory protection will be used based on the following requirements:

(1) The employer shall provide respirators suitable for the purpose intended when such equipment is necessary to protect the health of the employee.

(2) The employer shall be responsible for the establishment and maintenance of a respiratory protection program based on OSHA and EPA standards and American National Standards Institute (ANSI) guidelines.

(3) The employee shall use the provided respiratory protection in accordance with instructions and training received.

3. UAH POLICY

The policies of The University of Alabama in Huntsville regarding the Respiratory Protection Program are intended to safeguard the health and safety of employees of UAH who must at any time, due to the nature of their occupational exposure, be required to wear respiratory protection. However, the ultimate responsibility for safety and the proper use of respiratory equipment lies with the individual employee.

Where and when an employee will be required to use respiratory protection may be the most important decisions made with regard to safety while on the job. Generally, any employee who enters into an atmosphere which may contain dusts, organic vapors, fumes, mists, and or sprays of a hazardous nature above the Action Limit (AL) or Permissible Exposure Limit (PEL) as specified by regulatory guidance for a given substance is required to wear respiratory protection.

Specific instances which occur on the UAH campus requiring the use of respirators are:

a) Maintenance procedures requiring the removal or possible disturbance of asbestos containing materials which might constitute a fiber release.

b) Entrance into an atmosphere containing when the use of chemicals creates an atmosphere where the permissible exposure limit (PEL) is exceeded.

c) Hazardous chemical spills/releases.

d) Painting/spray painting that may create hazardous vapors and/or the release of particulates or mists into the air that may be inhaled by the employee.

e) Routine boiler maintenance that produces large quantities of oil mists and or dust.

f) Entrance into an area with an oxygen level below 19.5%.

This list is not all-inclusive, and if there are any questions as to the safety of a particular assignment, contact the OEHS at 824-6053. Specific responsibilities of The UAH supervisory staff and employees are discussed below.

3.1 UNIVERSITY RESPONSIBILITES

The University of Alabama in Huntsville through the Office of Environmental Health and Safety (OEHS) shall:

3.1.1 Establish and maintain a written respiratory protection program that includes the requirements outlined in 29 CFR 1910.134.

3.1.2 Ensure employees will not be assigned to tasks requiring use of respirators unless it has been determined that they are physically able to perform the work and use the equipment. A physician or other licensed health care provider (PLHCP) shall review the user's medical evaluation status on an annual basis. Each employee will be fit tested by trained professionals prior to being issued a respirator.

3.1.3 Be responsible for providing the necessary medical screening and training for personnel in the respiratory protection program.

3.1.4 Be responsible for keeping records of all respiratory training and medical evaluations of employees within the program.

3.1.5 Provide respirators and appropriate filters/cartridges that are applicable and suitable for the purpose intended.

3.1.6 Costs associated with respiratory protection equipment, fit testing and annual medical surveillance shall be provided at no cost to the employee.

3.2. SUPERVISOR RESPONSIBILITIES

The supervisors of employees who perform tasks that have the potential for respiratory exposure must notify the OEHS prior to the performance of these tasks. Furthermore, the Department and immediate supervisor must ensure the proper usage of all respiratory equipment through appropriate surveillance of employee work habits and implementation of the guidelines in this document.

3.2.1 Supervisors must notify employees of hazards requiring the use of respirators. Employees shall not be assigned to tasks requiring the use of respirators unless they have completed the appropriate training, medical clearance, and fit testing as per sections 3.1.2 and 3.1.3 of this document.

3.2.2 A copy of The UAH Respiratory Protection Program must be made available to all employees who participate in the respiratory protection program.

3.2.3 The supervisor will ensure affected employees receive training. Training shall encompass (but is not limited to) the proper use of respirators, donning and doffing respiratory protective equipment, limitations of respirator use, and maintenance.

3.2.4 Supervisors will periodically inspect respirators to ensure serviceability and cleanliness. A record of inspection and routine maintenance dates as well as any findings for respirators maintained for emergency use shall be maintained under supervisor direction.

3.2.5 An inspection schedule for respiratory protection equipment must be

implemented by supervisory staff. Inspection documentation must be verified and maintained. A schedule for changing cartridges according to manufacturers' guidelines shall be implemented. Respirators for emergency use shall be thoroughly inspected at least once a month and after each use. Labels identifying performance of monthly inspections of SCBA units must be attached to the unit. Inspection records must be maintained and kept with a copy of the written Respiratory Protection Program in the shop.

3.3 PROGRAM PARTICIPANT RESPONSIBITIES

3.3.1 It is the responsibility of the employee to use the provided respiratory equipment in accordance with the instructions and training received.

3.3.2 Respirators shall not be worn when conditions prevent a good face seal. Conditions which may prevent a good seal and therefore decrease the effectiveness of a respirator include the growth of a beard, excessive sideburns, hair over the forehead, dentures, and eyeglasses.

3.3.3 Respirators shall be stored in a convenient, clean, and sanitary location. The use of personal lockers for respirator storage is appropriate. Respirators shall be washed, dried, and placed in sealed plastic bags prior to storage in this manner.

3.3.4 The user must conduct inspections of the respirators during routine cleaning. Alternatively, cartridges with end of service life indicators (ESLI) may be used. The date of change must be recorded on the respirator maintenance log (see Appendix A). Worn or deteriorated parts shall be replaced.

3.4 MEDICAL SURVEILLANCE

A medical evaluation is required prior to training for the Respiratory Protection Program. The medical evaluation and testing related to this program will be conducted at no cost to the employee. Upon review of the medical questionnaire by a physician or other licensed health care provider (PLHCP), a pulmonary function test and chest X-ray may be required. The PLHCP will provide the employee with either an approval or disapproval to participate in the Respiratory Protection Program.

3.5 TRAINING

Training will be provided prior to initial use of respiratory protective equipment and annually thereafter. Additional training is deemed necessary when respiratory protection regulations have changed or a new respiratory hazard is introduced. Respiratory protection training will encompass but not be limited to the following:

a) The respiratory hazard and the effect if the respirator is not used appropriately.

b) Why the respirator is needed to provide protection and the engineering controls already being used to control the hazard.

c) Choosing appropriate respirators and cartridges. Selection of appropriate respirators shall be in accordance with Standards for Respiratory Protection, as published in ANSI Z88.2.

d) Limitations of the selected respirator.

e) Donning and doffing respiratory protective equipment. Ensuring appropriate fit and function.

f) Respirator maintenance, inspection, and storage.

g) Recognizing and handling emergency situations.

h) Governmental regulations on specific substances.

3.6 FIT TESTING

Maintaining the facepiece-to-face seal is imperative for proper respiratory protection. Therefore, all individuals in the program must successfully pass the fit-test as described in Section 7.0. A copy of the fit test record is maintained in the OEHS.

4.0 RESPIRATORY PROTECTION DEVICES

The basic function of a respirator is to reduce the risk of respiratory injury due to breathing airborne contaminants. A respirator provides protection by either removing the contaminants from surrounding air (air-purifying respirators) or by supplying the wearer with an alternate source of clean breathing air (air-supplying respirators).

4.1 AIR PURIFYING RESPIRATORS

When using air-purifying respirators (APRs), air is passed through air-purifying elements, which removes aerosols, vapors, gases, or a combination of these contaminants. Negative-pressure type respirators draw breathing air through the air-purifying element creating a negative pressure inside the facemask. This type of respirator is also known as tight-fitting. Powered air-purifying respirators (PAPR) contain a blower that pulls surrounding air across the air-purifying element and blows the purified air into the facepiece. The powered type is equipped with either a tight-fitting facepiece or a loose-fitting facepiece, helmet, hood, or suit. Of the wide variety of APRs available, they must fall into one of the following groups:

4.1.1 MECHANICAL PARTICULATE RESPIRATORS

Particulate APR's which employ a mechanical filter element such as the High Efficiency Particulate (HEPA) filter; screens out particulates based solely on size and are used for contaminants in the form of dusts, mists, fibers, and radionucleotides.

4.1.2 VAPOR OR GAS REMOVING RESPIRATORS

Gas and vapor APRs that utilize chemical adsorbents remove, a) a single type of vapor or gas (for example, chorine gas), b) a single class of gases or vapors (for example, organic vapors), or c) a combination of two or more classes of vapors or gases (for example, organic vapors and acid gases) from surrounding air.

4.1.3 COMBINATION PARTICULATE, VAPOR AND GAS REMOVING RESPIRATORS

These respirators consist of a combination of particulate removal filters and gas-vapor adsorbent cartridges.

4.2 ATMOSPHERE SUPPLYING RESPIRATORS

Atmosphere (air)-supplying respirators (ASR) provide a substitute source of clean breathing air. This air is supplied to the worker from either a stationary source through a supply hose or from a portable container independent of the surrounding air. ASR must be used in oxygen deficient atmospheres and those atmospheres containing hazardous chemicals that cannot be purified by cartridges and cassettes for APR.

4.2.1 OXYGEN DEFICIENCY

The body requires oxygen in order to sustain the physiological activities necessary for life. If the oxygen concentration decreases, the body reacts in various ways (Table 4-1). Death occurs rapidly when the concentration of oxygen decreases to 6.0% and below.

The physiological effects of oxygen deficiency may not be apparent until the concentration falls below 16%. The various regulations and standards dealing with respirator use recommend that concentrations ranging between 16.0-19.5% be considered indicative of an oxygen deficiency. In hazardous materials response operations, 19.5% oxygen is considered the lowest"safe" working concentration. In instances where the oxygen content falls below 19.5%, a supplied-air respirator must be used.

Air-supplying respirators fall into two major categories and several subcategories as described below:

4.2.2 SELF CONTAINED BREATHING APPARATUS (SCBA)

With this type of apparatus, the wearer carries the breathing atmosphere. Either compressed air or oxygen provides the atmosphere. A full facepiece is most commonly used, although half-masks, mouthpieces, and hoods are available on some units. Classes of SCBA units include:

a) Closed-circuit SCBA - In a closed-circuit breathing apparatus, all or a percentage of the exhaled air is cleaned and rebreathed. All closed-circuit

units have the advantage of lower weight for the same use interval as open-circuit units. Available units contain supplied air for a 30 minute to a four hour duration. Disadvantages include increased complexity and cost. With the exception of the liquefied gas systems, closed-circuit SCBAs tend to produce more heat in the system than the open-circuit systems.

b) Open-circuit SCBA- In this type of SCBA, exhaled air is released to the surrounding environment rather than being recirculated. The equipment is simpler and less expensive than the closed-circuit systems. Units typically supply air for 30 minutes to one hour.

c) ESCAPE SCBA - SCBAs designed for escape are similar to the types described above, except the use duration tends to be shorter, typically five, seven or ten minutes. SCBAs certified for escape only shall not be used to enter a hazardous atmosphere. Protection factors have not been established for this category of SCBA. Positive pressure units are recommended for all activities requiring SCBA use.

4.2.3 AIRLINE RESPIRATORS

This type of ASR supplies the user with breathing air through a hose from a compressor or compressed air cylinder(s). The hose is attached to the wearer by a belt or other suitable means and can be detached rapidly in an emergency. A flow-control valve is used to govern the rate of airflow to the wearer.

ASRs can be used regardless of the type of airborne contaminant or oxygen concentration. However, the contaminant concentration limits vary for the different types of ASRs and the wearer must be aware of the limitations of the respirator.

4.3 TYPES OF FACEPIECES

The protection provided to the wearer of respiratory equipment is based on how well the facepiece or respirator fits. Regardless of the efficiency of the purifying element or how clean the supplied air, if the facepiece-to-face seal is insufficient then little protection is afforded the user.

There are three basic configurations for facepieces, each of which relates to their protective capabilities.

a) Quarter Mask: fits over the bridge of the nose across the cheeks and over the chin. Limited protection is expected with this type of mask because it can be easily dislodged, therefore breaking the seal. Quarter-masks are not approved for use by University employees.

b) Half-Mask: fits over the bridge of the nose across the cheek and under the chin. Protection is better than with the quarter-mask due to the seal being less likely to be broken.

c) Full-Face Mask: fits across the forehead, down over the temples and cheeks, and

under the chin. Head harness usually has a five or six-point suspension. These facepieces give the greatest protection, because they are held in place more securely with the seal along the forehead. An added benefit is the eye protection afforded by the clear lens in the full-facepiece.

5.0 RESPIRATOR SELECTION CRITERIA

Requests for the use of respiratory equipment shall be made by contacting the OEHS at 824-6053. Upon medical approval, the OEHS will be responsible for the selection of the appropriate respiratory equipment and for assuring the user has been instructed and trained in the proper use of respirators and their limitations. Selection will be in accordance with the guidance of the most recently published American National Standard Practices for Respiratory Protection Z88.2 and OSHA 29 CFR 1910.134.

5.1 HAZARD DETERMINATION STEPS

The UAH OEHS shall determine the nature of all hazards. The proper respiratory protection equipment will be selected based upon this information. The steps involved in hazard determination are described below:

a) Determine if an oxygen deficient atmosphere exists.

b) Determine what contaminants may be present in the work area.

c) Measure or calculate the concentration of the contaminant(s).

d) Determine whether there is a published Action Limit (AL), Permissible Exposure Limit (PEL), Threshold Limit Value (TLV), or any other available exposure limit or estimate of toxicity for the contaminants. Determine if an Immediately Dangerous to Life and Health (IDLH) concentration for the contaminant is available

e) Determine if there is regulatory guidance in effect for the contaminant(s) (e.g. lead, asbestos). If so, there may be specific respirators required which will influence the selection process.

f) Determine the physical state of the contaminant. If an aerosol, determine or estimate the particulate size. Determine if the vapor pressure of the aerosol is significant at the maximum expected temperature of the work environment.

g) Determine whether the contaminant(s) present can be absorbed through the skin, produce skin sensitization, or be irritating or corrosive to the eyes or skin.

h) For gas or vapor contaminant(s), determine if a known odor, taste, or irritation concentration exists.

5.2 SELECTION STEPS

The proper respirator shall be selected by the UAH OEHS as follows:

a) If unable to determine what potentially hazardous contaminant may be present, the atmosphere shall be considered Immediately Dangerous to Life and Health (IDLH) and require the use of an air-supplying respirator.

b) If no exposure limit or guideline is available and estimates of the toxicity cannot be made, the atmosphere shall be considered IDLH and require the use of an air-supplying respirator.

c) If a specific regulation or standard exists for the contaminant, follow those guidelines/requirements.

d) Only air-supplying respirators may be used in oxygen-deficient atmospheres.

e) If the measured or estimated concentration of the contaminant(s) is considered IDLH, air-supplying respirators must be used.

f) Obtain the hazard ratio by dividing the measured or estimated concentration of each contaminant by the exposure limit or guideline. When two or more substances are present, consideration needs to be given if there is a synergistic or combined effect of exposure rather than considering each substance individually. Select a respirator with an assigned protection factor greater than the value of the hazard ratio. If an air purifying respirator is selected continue with (g).

g) If the contaminant(s) is a gas or vapor only, select a device with an assigned protection factor that is greater than the hazard ratio. The concentration shall also be less than the maximum use concentration of the cartridge/canister; go to (m). If an aerosol contaminant is present, go to (h) below.

h) If the contaminant is a paint, lacquer, or enamel, select a respirator approved specifically for paint mists or an air-supplying respirator. (Approval label or regulatory provision may preclude its use for some paints.)

i) If the contaminant is a pesticide, select a respirator and filtration system specifically approved for pesticides or an air-supplying respirator. (Approval label may preclude its use for some pesticides).

j) If the contaminant is an aerosol, with an unknown particle size or less than two micrometers, a high efficiency particulate air (HEPA) filter shall be used. If the aerosol has a particle size greater than 2 micrometers, any filter (dust, fumes, mists, or HEPA) may be used.

k) If the contaminant is a fume, use a filter approved for dusts, mists, fumes, or a HEPA filter.

5.3 ATMOSPHERES IMMEDIATELY DANGEROUS TO LIFE AND HEALTH (IDLH)

5.4 SPECIAL CONSIDERATIONS FOR CONFINED SPACES

6.0 FIT TESTING

A fit test shall be used to determine the ability of each individual respirator wearer to obtain a satisfactory fit with any NIOSH-certified air-purifying or supplied-air respirator. Quantitative fit tests will be performed, if possible. Qualitative fit tests will be performed if testing equipment deficiencies preclude use of quantitative testing methods. Fit-testing methods shall conform with the minimum requirements as detailed in the OSHA Respiratory Protection Standard (29 CFR 1910.134).

Quantitative Fit Test: A particle counting instrument is used to accurately measure respirator fit by comparing the dust concentration in the surrounding air with the dust concentration inside the respirator. The ratio of these concentrations is called the fit factor. A modified filter cartridge (or a modified respirator facepiece) equipped with a sampling port is used to collect air from inside the respirator. With the sampler attached, the wearer is asked to perform several exercises to challenge the respirator fit. During these movements, any leakage is measured by the particle counting device. The fit test data is stored by a computer and a final fit test report is generated. For half-face or filtering facepiece respirators, an acceptable fit test is a measured fit factor of at least 100. Full-face respirators must demonstrate an acceptable fit factor of at least 500.
Quantitative: an analytical determination of the concentration of a test agent inside the mask compared to that outside the mask. This concentration ratio is called the Protection Factor (PF) and is a measure of the relative protection offered by a respirator.

Concentration outside mask PF =Concentration inside mask

Qualitative: the qualitative fit-test is not an analytical measurement. It is a subjective test where an irritant or aroma is used to determine if there is a good facepiece-to-face seal. If the test subject does not respond (by smelling, tasting, coughing, etc.) to the test agent, the worker can wear the tested respirator with an assigned PF for that type of respirator.

A Protection Factor is then used to determine the Maximum Use Limit (MUL) of a successfully fit-tested respirator. The MUL is the highest concentration, not exceeding the (IDLH) concentration, of a specific contaminant in which a given respirator will be worn:

MUL = PF x TLV x 0.10

It shall be the policy of the University of Alabama in Huntsville and the Office of Environmental Health and Safety that all fit tests are conducted qualitatively. Fit test results will be used in conjunction with other criteria to select specific types, makes, and models of respirators for use by individual respirator wearers.

Table lists several types of respirators and their assigned PFs.

Respirator Type	**Protection Factor**
Filtering Facepiece Respirators	10
Air-Purifying Half-Mask Respirators	10
Loose-Fitting Air-Purifying Respirator	25

Air-Purifying Full-Face Respirator	50
Tight-Fitting Powered Air-Purifying Respirators (full face)	1000
Air Line Respirators	1000
Self-Contained Breathing Apparatus (SCBA)	10,000

* The Assigned Protection Factors (APFs) shall comply with any changes to 29 CFR 1910.134(d)(3)(i)(A) Table 1 was reproduced from ANSI Z88.2-1980 (American National Standard Practices for Respiratory Protection).

Supervisors are responsible for insuring employees are fit-tested at least once per year. If any conditions or circumstances are observed by the supervisor that is suspected to impact the fit of an employee's respirator, the supervisor shall insure respirators are not worn unless fit testing is repeated. The safe and effective use of respiratory protection equipment, especially negative pressure respirators, requires that the respirator be properly fitted to the employee. Poorly-fitting respirators fail to provide the expected degree of protection. Additionally, no single model or size of respirator is capable of fitting all people. Several models may be needed to determine which provides an acceptable fit. Prior to being issued a re-useable, tight-fitting respirator, the employee must successfully pass a fit-test for that specific brand, model and size of respirator. Copies of fit-test reports should be kept by the supervisors.

Employees who use powered air purifying respirators (PAPR) with loose-fitting hood or helmet cannot be fit tested. However, supervisors shall assure that employees utilizing this type of respiratory protection shall undergo a proficiency evaluation, to evaluate the employee's proficiency in:

1. Inspecting the respirator,
2. Turning on the battery-powered flower,
3. Checking the airflow rate of the blower,
4. Donning and doffing the loose-fitting hood or helmet,
5. Turning off the blower,
6. Disassembling the respirator.

An employee cannot be fit-tested nor wear a face-sealing respirator if there is any facial hair present between the skin and face mask sealing surface. More than slight beard stubble at the sealing surface is considered excessive facial hair. Any other condition that interferes with the sealing surface of the facepiece or interferes with the valve function shall be identified during fit-testing and corrected.

Prerequisites for fit testing

The following conditions shall be completed by each proposed respirator user prior to fit testing.

1. Successful completion of a respirator medical evaluation from a qualified Licensed Healthcare Practitioner or physician dated within the past 12 months.
2. Successful completion of UAH respiratory protection training within the past 12 months
3. Shall not have smoked within 15 minutes prior to the fit test
4. Shall be clean shaven (defined as within the last 24 hours and preferably that morning) in the seal area of the respirator.
5. Any protective equipment that may be worn during a project which could interfere with the respirator fit shall be worn during the fit test (e.g., hard hat, safety glasses, etc.).
6. The respirator used for the fit test shall be cleaned and sanitized. (For the half masks used in the qualitative fit test, a thorough wipe with an appropriate disinfectant shall suffice).

Fit-testing shall be repeated at least annually or more frequently if any change occurs which may alter respirator fit. Such changes may include:

1. Weight change of 20 pounds or more,
2. Significant facial scarring in areas of the face seal,
3. Significant dental changes (e.g., multiple extractions or new dentures),
4. Reconstructive or cosmetic surgery in the head/face, or
5. Any condition suspected to affect the face-respirator seal.

All records of fit testing shall receive a documented review by the supervisor and the supervisor shall retain all respirator fit test records in subject's respirator file indefinitely.

7.0 PROCEDURES FOR CLEANING, INSPECTION AND MAINTENANCE

Cleaning, Inspection and Maintenance of Respirators

The following information is intended as a guide for appropriate cleaning, storage, and inspection and maintenance practices.

Cleaning and Disinfecting:

Respirators should be regularly cleaned and disinfected. Respirators issued for the exclusive use of one worker may be cleaned as often as necessary. Cleaning frequencies, facilities and materials used for cleaning/disinfecting must be determined by the supervisor and provided as an attachment to this program.

Shared respirators or emergency use respirators must be cleaned and disinfected after each use. The person(s) responsible for cleaning and disinfecting of shared or emergency use respirators must be identified in the supervisors attachments to this document.

Manufacturer recommendations should be followed when cleaning respirators.

Inspection Procedures and Schedules:

Each respirator shall be inspected routinely before and after use. A respirator shall be inspected by the user immediately prior to each use to ensure that it is in proper working condition. After cleaning, each respirator shall be inspected to determine if it is properly functioning or if it needs repairs or replacement of parts.

Respirators stored for emergency or rescue use shall be inspected monthly and before and after each use. . Monthly inspections must be documented and include the date of inspection, name or signature of inspector, inspection findings, required remedial action and a serial number identifying the respirator. Provide this information on a tag or label that is attached to the storage compartment of the respirator, is kept with the respirator or is included in inspection reports stored as paper or electronics files.
SCBA cylinders for emergency use shall be maintained in a fully charged state and recharged when pressure falls to 90% of the manufacturer's recommended pressure level, unless the SCBA is demonstrated as a training exercise. Cylinders must be tested and maintained as prescribed in Department of Transportation regulations 49CFR173 and 49CFR178. These regulations detail requirements for scheduled hydrostatic testing, maintenance, etc. Supervisors with compressed air respirator equipment must be thoroughly familiar with the requirements pertaining to their equipment, and shall ensure appropriate maintenance and service. Inspections must include determinations that the regulator and warning devices function properly.

The supervisor must detail inspection responsibilities, criteria and attach the requirements to this

departmental copy of this program. Manufacturers' recommendations shall be followed for equipment inspection, but should include at a minimum:

Inspection Checklist for Filtering Facepiece Respirators:

1. Holes in filter
2. Elasticity of straps
3. Deterioration of straps and metal nose clip

Inspection Checklist for Air-Purifying Respirators:

Facepiece:

1. Dirt
2. Cracks, tears, or holes
3. Distortion of facepiece
4. Cracked, scratched, or loose fitting lenses

Headstraps:

1. Breaks or tears
2. Loss of elasticity
3. Broken buckles or attachments

Inhalation and Exhalation Valves:

1. Dust particles, dirt, or detergent residue on valve and valve seat
2. Cracks, tears, or distortion in valve material
3. Missing or defective valve covers

Filter Elements:

1. Proper filter for the hazard Approval designation Missing or worn gaskets
2. Worn threads on filter and facepiece Cracks or dents in filter housing Deterioration of canister harness
3. Service life indicator, or end of service date

Breathing tube:

1. Cracks or holes
2. Missing or loose hose clamps
3. Broken or missing end connectors

Inspection Checklist for Atmosphere-Supplying Respirators:

Facepiece:

1. Dirt
2. Cracks, tears, or holes
3. Distortion of facepiece
4. Cracked, scratched, or loose fitting lenses

Headstraps:

1. Breaks or tears
2. Loss of elasticity
3. Broken buckles or attachments

Hood, Helmet, Blouse, or Full Suit:

1. Rips or torn seams
2. Headgear suspension
3. Cracks or breaks in faceshield
4. Protective screens that are intact and fit correctly over faceshields, hoods, or blouses

Air Supply Systems:

1. Breathing air quality
2. Breaks or kinks in air supply hoses and fittings

3. Tightness of connections
4. Settings of regulators and valves Adequate pressure and/or airflow
5. Correct operations of air-purifying elements and alarm for carbon monoxide or high temperatures

Maintenance

The maintenance of respirators 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 shall be reissued for use. No attempt shall be 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.

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 from the individual departments.

Cleaning and disinfection of respirators must be conducted 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.

Cleaning and inspection of respirators are the responsibility of the supervisors and individual employees to whom a respirator has been assigned. In all cases, the manufacturer recommendations for cleaning and sanitizing of respirators must be followed. Procedures in addition to the manufacturer's instructions are provided as follows:

1. Remove filters, cartridges, canisters.
2. Disassemble the facepiece and discard or replace any defective parts. The following must be removed for appropriate cleaning:

    a. speaking diaphragms
    b. valve assemblies
    c. any components recommended by the respirator manufacturer
3. Wash components in warm water containing a mild detergent. A stiff bristle (not wire) brush may be used to facilitate removal of dirt or other foreign material.
4. Rinse components in clean, warm water. Drain thoroughly.
5. When cleaners do not contain a disinfecting agent, immerse the respirator for 2 minutes in one of the following solutions:

    i. hypochlorite solution (50 parts per million) prepared by diluting one milliliter of laundry bleach to 1 liter of water
    ii. an aqueous iodine solution (50 parts per million of iodine) prepared by adding 0.8 milliliters of tincture of iodine (6-8 grams ammonium and/or potassium iodide/100 milliliters of 45% alcohol) to 1 liter of water. Other equivalent commercially available disinfectant cleansers may be used as directed, when approved by the respirator manufacturer

6. Dry components with a clean lint free drying cloth or alternatively, air dry.
7. Reassemble parts on respiratory inlet covering assemblies.
8. Attach filters, cartridges, and canisters to respiratory inlet coverings.
9. Visually inspect and, where possible, test parts and respirator assemblies for proper function.
10. Place assembled respirators in appropriate containers for storage.
11. If applicable, complete appropriate maintenance log.

Cleaners/sanitizers which effectively clean the respirator and contain bactericides are commercially available. Strong cleaning and sanitizing agents and many solvents can damage rubber or elastomeric respirator parts. These materials should not be used for cleaning purposes. Immersion times should not be extended beyond the recommended time periods. Respirators should be thoroughly rinsed to remove any traces of cleaning compounds.

Repair of Respirators

Respirators that fail inspection or are otherwise found to be defective will be removed from service to be discarded, repaired or adjusted in accordance with the following procedures:

1. Repairs or adjustments to respirators are to be made only by persons appropriately trained to perform such operations and shall use only the respirator manufacturer's NIOSH-approved parts designed for the respirator.
2. Repairs shall be made according to the manufacturer's recommendation and specifications for the type and extent of repairs to be performed

Replacement Parts/Filters

1. Consult the manufacturer or distributor for replacement parts and filters. Manufacturers may assign their filters/cartridges specific end-of-service-life or change schedule.
2. Do not attempt to remove paint, varnish, or lacquer from cartridges or filters. When these air purifying elements contain accumulation of paint, enamel, or lacquer, they must be discarded.
3. When air-purifying respirators are used for protection against gases and vapor, cartridges must be changed when the wearer has worn the cartridges for a total of eight (8) hours, when the wearer smells the gas or vapor or when cartridges have reached the manufacturer's end-of-service-life.

APPENDIX A – FIT TEST RECORD

RESPIRATOR FIT TEST RECORD

A. EMPLOYEE NAME:_____ DATE:_____

JOB TITLE:_____

B. SUPERVISOR:_____

DEPARTMENT/DIVISION:_____

C. TYPE RESPIRATOR:_____

MANUFACTURER/MODEL/SIZE/NIOSH NUMBER:_____

D. CONDITIONS AFFECTING RESPIRATOR FIT:

CLEAN SHAVEN_____ FACIAL SCARS_____

FACIAL HAIR_____ DENTURES_____

MUSTACHE_____ GLASSES_____

NONE_____

E. FIT CHECKS:

NEGATIVE PPRESSURE: _____PASS _____ FAIL _____ NOT DONE

POSITIVE PRESSURE: _____PASS _____ FAIL _____ NOT DONE

F. QUALITATIVE FIT TESTING:

_____PASS _____ FAIL

G. EMPLOYEE ACKNOWLEDGEMENT OF TEST RESULTS:

EMPLOYEE SIGNATURE:_____ DATE:_____

H. TEST ADMINISTRATOR SIGNATURE:_____ DATE:_____