MARQUETTE UNIVERSITY

1.0 SCOPE / PURPOSE

This program establishes written procedures for all elements of an effective respiratory protection program. It provides for training, medical examination, and fit testing of required respirator users and establishes a surveillance program to monitor the effectiveness of the program.
Overall responsibility for the documentation and administration of the program belongs to the Director of Environmental Health & Safety.

2.0 REQUIREMENTS:

Respirators are required under the following circumstances: when it is not feasible to control an exposure to a level below an acceptable exposure limit by engineering, administrative controls, and/or work practices (or prior to implementation of same); there is the potential for an overexposure to a contaminant and the exposure is difficult to measure and control due to variability in the process; and where oxygen deficient atmosphere exists. The basic elements of this written respirator program are as follows:

2.1 GENERAL REQUIREMENTS:

1.0 Respirator Selection: The procedures for the proper selection of a respirator, based on the hazards to which the worker is exposed, are addressed in this section. An exposure assessment must be conducted in order to establish the need for respirator use. Only respirators, which are certified by NIOSH, may be used at this facility. There will be at least two different styles and manufactures to choose from.

2.0 Medical Evaluation: Respirators will not be issued to any employees, unless it has been determined that the employee is physically able to perform required work while wearing the respirator. Each respirator user's medical status will be reviewed at least annually.

3.0 Respirator Fit: Each person required to wear or voluntarily wearing a tight-fitting respirator, both air-purifying and atmosphere-supplying, must be given a fit-test before using a respirator. The program administrator will ensure that specific individuals, who are properly trained in all aspects of conducting fit tests, are assigned to perform fit tests at this facility.

4.0 Use of Respirators: Specific procedures exist to address the effective use of respirators. These procedures focus on the issues of: the assignment of respirators; the conditions that can affect the face-to-facepiece seal; the surveillance of respirator use; when to leave exposure areas; responsibilities of various individuals and departments; and, IDLH or possible IDLH atmospheres. Where practical, respirators will be assigned to individual workers for their exclusive use. Respirators should be cleaned, sanitized and inspected after each use.

5.0 Maintenance: Non-disposable respirators must be regularly cleaned and disinfected and must be stored in a convenient, clean, and sanitary location. Respirators must be inspected before each use and during cleaning. Respirators for emergency use must be thoroughly inspected at least once a month and after each use.

6.0 Training: All respirator users will be instructed and trained in the proper use of respirators and their limitations. The respirator hazards controlled by the use of the respirator will also be addressed.

7.0 Program Evaluation: The effectiveness of the respirator program will be evaluated at least annually.

8.0 Recordkeeping: Adequate records must be maintained to demonstrate program effectiveness.

2.1.2 Voluntary Respirator Program:

Voluntary use of respirators by employees is permitted upon request even though there is neither a potential for overexposure to a contaminant nor an oxygen deficient atmosphere. Approval for the voluntary use of a respirator shall be the responsibility of the Program Administrator on a case-by-case basis. Consideration will be given to individual sensitivity, characteristics of the contaminant, and other factors relevant to the situation.

1.0 Respirators may be issued for voluntary use provide the following conditions are met:
- 1.1 There is an exposure assessment and the exposure does not exceed applicable limits;
- 1.2 A medical evaluation has determined that the employee is physically capable of wearing the respirator; and,
- 1.3 The use of the respirator in and of itself will not create a hazard.

Where a respirator is worn voluntarily and not required, the following elements of the program apply:

1.1.1 Selection:
1.1.2 Instruction – elementary training in the use and limitations of respirators;
1.1.3 Program Evaluation;
1.1.4 Medical Evaluation;
1.1.5 Approved respirators;
1.1.6 Cleaning, maintenance, and storage, when other than disposable respirators are used: and,
1.1.7 User seal checks should be used as a training aid.

2.2.1 Respirator Selection:

1.0 General: Respirators shall be selected on the basis of the hazards to which the employee is exposed. Proper selection is based on the physical, chemical, and toxic properties of the contaminants; on the concentration likely to be encountered; and on the amount of oxygen expected to be present. The work activity, length of the activity, and the performance attributes of the respirator must also be considered. Additional information, such as the contaminants present and the concentrations of those contaminants, is needed to make a more definitive selection. An Industrial Hygienist should be contacted to assist in the selection of the appropriate respirator.

2.0 Exposure Evaluation: More specifically, an exposure assessment must be conducted to identify the hazardous chemicals/processes that could potentially create a hazardous atmosphere. The recommendation for the type of respirator to be used will be based on this exposure assessment. The initial assessments will be conducted by the program administrator or other personnel as deemed appropriate. These assessments may include a review of: air sampling plan baseline and update data; historical sampling data; detector tube results, chemical usage; exposure modeling; duration of work; and, an assessment of the degree of hazard.

3.0 Approved Respirators: Only NIOSH certified respirators shall be allowed to be used at this facility. All filters, cartridges, and canisters must be labeled and color coded with the NIOSH approval label and must remain so throughout their use. The program administrator shall develop and maintain a list of respirators approved for use at this facility in required-use situations.

2.2.2 Medical Evaluation:

The area supervisor/coordinator and program administrator will provide the chosen Medical Provider with work related information to assist in determining the physical and medical suitability of the employee to perform the assigned task while wearing a specified respirator. This information will include the type of respirator to be

used, a description of the job, other PPE used, how often the respirator will be worn, and any special conditions.
The following medical evaluation guidelines are to be followed prior to issuing and employee medical approval for the use of any type of respirator:

- Respirator medical evaluations are to be performed on a yearly basis or more frequently if deemed necessary on an individual basis;
- Performance of elements of the medical respirator evaluation may be waived if they have been performed with the previous calendar year; and,
- Elements of the respirator medical evaluation may be performed by properly trained medical staff members but the results of the examination must be reviewed by the assigned Physician who must also give the final medical approval for employees to use respirators.

The respirator medical evacuation shall consist of the elements contained in the following list.

1.0 Completion of a medical history and physical assessment with special emphasis placed on the respiratory and cardiovascular systems. Any history of previous cardiovascular disease will be carefully documented.
2.0 A baseline PA chest x-ray when necessary to identify any underlying pulmonary disease and to rule out the presence of any pulmonary blebs. PA chest x-rays on subsequent exams are to be obtained only as medically warranted
3.0 A pulmonary function test.
4.0 A baseline EKG to screen for any cardiac problems or rhythm irregularities. EKG's on subsequent exams are to be obtained only as medically warranted.

The following pulmonary function parameters will be considered in the decision to give medical approval for employees to use respirator.

FEV 1%: 70% or greater
FEV1: 2.5 liters or greater
FVC: 80% or greater

2.2.3 Fit Testing:

The purpose of a respirator fir test is to determine the ability of a respirator wearer to obtain a satisfactory fit given a respirator with a tight-fitting facepiece. Each person assigned a required tight-fitting respirator shall be given a fit test before using the respirator to help ensure protection against any airborne contaminant.

Although quantitative fit testing (QNFT) may be preferred, qualitative fit testing (QLFT) may be more feasible. However, QLFT may only be used to fit test negative pressure air-purifying respirators that must achieve a fit factor of 100 or less and positive-pressure (pressure-demand) SCBA's and supplied air respirators. Fit testing will be conducted prior to utilizing the respirator on the job for the first time and annually thereafter.

Fit testing will be conducted by an authorized contractor chosen by the EH&S Dept. Who has been properly trained in the methodology of QLFT and/or QNFT. Upon satisfactory completion of fit testing the "Respirator Fitting-Test Record" will be maintained by the EH&S Dept.

1.0 Size and Comfort Requirement: The employee will select a respirator, which provides the most comfortable fit from a selection of a least three different sizes of two different manufacturer's models. Prior to donning the respirator, the employee shall be shown how to put on the respirator, set the tension straps, and obtain a comfortable fit (following the manufacturer's recommendations). To assess comfort, the respirator selected will be worn for at least five minutes prior to the fit test. The assessment will encompass a review of the following:

- Fit across the bridge of nose
- Chin properly places;
- Tendency of respirator to slip;
- Adequate strap tension, avoiding excessively tight straps;
- Room for eye protections, welding hoods, etc.;
- Seal around chin, cheek, and nose; and,
- Room to speak.

A positive and negative pressure respirator seal check can be performed to help ensure that the proper facepiece size has been selected. These checks apply to respirators equipped with exhalation and /or inhalation valves. Before conducting these tests, the respirator wearer should move his/her head from side to side and up and down slowly while taking a few deep breaths to help seat the respirator. A brief description of the user seal check process follows.

Positive Pressure Seal Check – Close off the exhalation valve and exhale gently into the facepiece. A slight positive pressure will be evident if the sealing surface does not leak.

Negative Pressure Seal Check – Close off the inlet opening and inhale gently so that the facepiece collapses lightly, and hold breath for ten seconds. If no inward leakage of air is detected, the effectiveness of the respirator seal is deemed satisfactory.

2.2.4 Use of Respiratory:

Assignment – Where practical, non-disposable respirators will be assigned to individual workers for their exclusive use. A respirator shall not be issued to an employee without fulfilling the requirements of "Respiratory Protection Program": obtaining supervisor/coordinator approval, successfully completing a medical examination, completion of training, and successfully passing a respirator fit test.

Respirator Sealing Problems:

1.0 A person who has hair which passes between the face and the sealing surface of the face piece of the respirator or which interferes with the function of a respirator valve(s) shall not be permitted to wear such a respirator.
2.0 A spectacle, which has temple, bars or straps which pass between the sealing surface of a respirator full facepiece and the wear's face shall not be used.
3.0 A head covering which passes between the sealing surface of a respirator facepiece and the wear's face shall not be used.
4.0 The wearing of a spectacle, goggle, a face shield, a welding helmet, or other eye and face protective device, which interferes with the seal of a respirator to the wearer, shall not be allowed. Special consideration must be given to the use of contact lenses while wearing a respirator.
5.0 Facial features, such as excessively high cheek bones or missing teeth or dentures, which prevent a seal of a respirator facepiece to a wearer's face will disqualify the person from wearing a respirator.

Conditions During Use:

Employees are required to leave the area where respirators are required for the following reasons:

1.0 To wash their faces and facepieces as necessary to prevent skin irritation.
2.0 If they detect gas or vapor breakthrough, increased breathing resistance, or leakage; and,
3.0 To replace filters, cartridges, or canisters.

Surveillance:

The work area and conditions surrounding the use of respirators will be evaluated regularly by the supervisor/coordinator and program administrator. Operational changes will be investigated to identify conditions, which could present a change in exposure requiring the use of different respiratory protection

Individual and Departmental Responsibilities:

Responsibility for critical elements of the respirator protection program has been assigned at an individual and departmental level. The following is a listing of those responsibilities.

Program Administrator:

1.0 Develop, implement, and revise, as necessary the facility respirator program.
2.0 Coordinate the development, implementation, and revision of training programs including the acquisition of educational material and or trainers to conduct employee training.
3.0 Coordinate respirator purchasing, maintenance, cleaning, distribution, and fit testing.
4.0 Coordinate Industrial Hygiene surveys as needed to determine appropriate selection and use of respiratory protection based upon measured exposure levels.
5.0 Develop and issue canister and cartridge change schedules base on manufacturer's recommendations, AIHA "rule of thumb" estimations, or "mathematical model" estimations.
6.0 Evaluate program effectiveness and make revisions to program as necessary.
7.0 Monitor program documentation including maintenance of training and fit test records.
8.0 Monitor transfer records to help ensure that respirators are being used where required as well as by employees who have been properly approved to use them.
9.0 Review confined space monitoring records. Entry into Oxygen-deficient (,19.5% oxygen) and IDLH environments shall not be allowed. Strict adherence to Confined Space Entry Procedure requirements shall be ensured.

Area Supervisor/Coordinator:

1.0 Be familiar with the use, care, capabilities and limitations of respirators.
2.0 Initiate the respirator request.
3.0 Ensure that employees under his/her supervision receive annual training, fit testing, and medical evaluation.
4.0 Instruct employees who are under his/her supervision on the hazards associated with the chemical(s) in use for which respirator protection is required.
5.0 Supervise respirator use to ensure that the proper respirator (with correct cartridges) is worn in accordance with the training instructions and that the cartridge change schedule is followed.
6.0 Provide a proper location for employee respirator storage.
7.0 Support proper respirator maintenance.
8.0 Contact the program administrator whenever a new or modified process or activity may require chemical exposure evaluation.

Medical Provider:

1.0 Respirator medical evaluations to employees required to wear a respirator and to employees who voluntarily choose to wear a respirator.
2.0 Document and maintain records of the medical evaluations performed, track annual renewal needs.

3.0 Notify program administrator of medical approval/disapproval for respirator use.

Employee Approved to Use a Respirator:

1.0 Perform positive and negative pressure user seal checks each time the respirator is put on. Required tight-fitting facepiece respirators must not be worn when a good face seal cannot be achieved.
2.0 Assure that annual training, fit testing and medical evaluation is performed.
3.0 Inspect the respirator before each use and during cleaning as prescribed in training.
4.0 Use the respirator as instructed in training, never modifying the equipment.
5.0 Leave the area of use as instructed for any reason that necessitates the removal of the respirator.
6.0 Properly maintain the respirator, which includes: following the cartridge change schedule; regular cleaning and disinfecting; and, careful and proper storage.
7.0 Report to the area supervisor or medical if any signs or symptom of exposure or physical discomfort occur during respirator use.
8.0 Report respirator malfunctions/defects to the area supervisor/coordinator.

Environmental Health & Safety Department:

1.0 Maintain a stock of respirator merchandise as specified by the Program Administrator.
2.0 Issue respirator equipment only to employees who have been given prior medical evaluation, training and fit testing.
3.0 Maintain a file of the completed respirator fit testing.
4.0 Identify employees requiring annual fit testing and training.
5.0 Generate and maintain a list of employees approved to use a respirator.
6.0 Coordinate the surveillance of respirator use throughout the facility.

2.2.6 Maintenance of Routine Use Respirators:

Cleaning:

Non-disposable respirators must be regularly cleaned and disinfected. Those issued for the exclusive use of one worker should be cleaned after each day's use more often, if necessary. Those used by more than one worker should be thoroughly cleaned and disinfected after each use, and then placed in a sealed sanitary container. Cleaner /disinfectant solutions that effectively clean respirators and contain a bactericidal agent when available commercially from the respirator manufacturer may be used. The manufacturer's recommendations for type of solution and appropriate cleaning procedures may be followed. In the absence of a specific manufacture's recommendations or if they are deemed inadequate, the following procedures are recommended for cleaning and disinfecting respirators:

1.0 Remove and discard any filters, cartridges, or canisters.
2.0 Wash face piece (and breathing tube if applicable) in detergent and warm water (120 degrees F) or in an acceptable cleaner/disinfectant solution. Use a soft brush to facilitate removal of dirt.
3.0 Rinse completely in clean warm water.
4.0 Air-dry in clean area.
5.0 Clean out other parts as recommended by the manufacturer.
6.0 Inspect valves, head straps, and other parts and if defective return the respirator to the EH&S department.
7.0 Place in plastic bag or container for storage (do not place a wet respirator in a plastic bag).
8.0 Insert new & appropriate filters, cartridges, or canisters prior to use: make sure the seal is tight.

Storage:

Respirators must be stored in a cool, dry and sanitary location with care taken to prevent deforming the facepiece. They must be protected from damage, dust, sunlight, temperature extremes, excessive moisture, and damaging chemicals.

Inspection:

Respirator inspections are important tasks that must be done routinely. Any defective respirators must be replaced. An inspection should be done before each use and during cleaning. The following pages contain a listing of the items to be checked.

Respirator Inspection Checklist

Negative Pressure Air-Purifying Respirator

a. Check rubber/silicone for:
   - excessive dirt
   - cracks, tears, or holes
   - distortion of shape from improper storage
   - cracked, scratched, or loose-fitting lens (full-face)
   - broken or missing mounting clips (full-face)

b. Check head straps for:
   - breaks, or tears
   - loss of elasticity
   - broken or malfunctioning buckles or attachments
   - excessively worn serrations of the head harness which might allow for slippage of the facepiece (full-face)

c. Check inhalation and exhalation valves for;
   - detergent residue, dust particles, or dirt on valve or valve seat
   - cracks, tears, or distortions, in the valve material or valve seat
   - missing or defective valve cover

d. Check filter cartridge for:
   - proper filter for hazard
   - approval designation (TC or ID #)
   - missing or worn gaskets
   - worn threads or improper threading

Powered Air-Purifying Respirator

a. Check rubber/silicone facepiece for:
   - excessive dirt
   - cracks, tears, or holes
   - distortion of shape from improper storage
   - cracked, scratched, or loose-fitting lens (full-face)
   - broken or missing mounting clips (full-face)

b. Check head straps for:
- breaks or tears
- loss of elasticity
- broken or malfunctioning buckles or attachments
- excessively worn serration of the head harness which might allow for slippage of the facepiece (full-face)

c. Check inhalation and exhalation valves for:
- detergent residue, dust particles, or dirt on valve or valve seat
- cracks, tears, or distortions in the valve material or valve seat
- missing or defective valve cover

d. Check the breathing tube for:
- cracks
- missing or loose hose clamps
- broken or missing connectors

e. Check hood or helmet (if applicable for:
- headgear suspension (adjust properly to the wearer)
- cracks or breaks in the face shield

f. Check the power pack for proper operation by measuring flow to the mask according to the manufacturer's instructions.

<u>Supplied-Air Respirators & SCBA's</u>

a. Check rubber/silicone facepiece for:
- excessive dirt
- cracks, tears, or holes
- distortion of shape from improper storage
- cracked, scratched, or loose-fitting lens (full-face)

b. Check head straps for:
- breaks or tears
- loss of elasticity
- broken or malfunctioning buckles or attachments
- excessively worn serration of the head harness which might allow for slippage of the facepiece (full-face)

c. Check inhalation and exhalation valves for:
- detergent residue, dust particles, or dirt on valve or valve seat
- cracks, tears, or distortions in the valve material or valve seat
- missing or defective valve cover

d. Check the breathing tube for:
- cracks
- missing or loose hose clamps
- broken or missing connectors

e. Check hood, helmet, or suit for:
   - headgear suspension
   - cracks, or breaks in the face shield
   - rips or tears in the suit or seams

f. Check air supply for:
   - breaks or kinks in the air supply hoses and end fitting attachments
   - tightness of connections
   - proper setting of regulators and valves (consult manufacturer's recommendations)
   - correct operation of air purifying elements and carbon monoxide and/or high temperature alarms

2.2.7 Training:

To ensure the proper and safe use or respirators, all respirator wearers will receive some level of training. The training for a voluntary user of a respirator shall include an may be limited to the communication of the information contained in Appendix D of the OSHA respiratory protection standard, 1910.134. Employees required to use a respirator shall undergo the respirator training (or equivalent) to understand: why a respirator is required; the type of respirator required; its limitations; and, proper donning, use, maintenance, and inspection techniques.

Air-Purifying Respirator:

Air-purifying respirators are used to remove contaminants from the air. Chemical are used to remove specific gases and vapors and mechanical filters are used to remove particulate contaminants. This type of device is limited to environments where the air contaminant level is within the concentration limitation of the device. This device offers No Protection in oxygen deficient atmospheres. Oxygen deficient atmospheres contain less than 19.5 percent oxygen by volume.

The various types of air-purifying devices include: particulate-filter cartridge; chemical-cartridges; combination particulate-filter/chemical-cartridge; gas masks; and, powered air-purifying respirators (PAPR). Particulate-filter respirators offer respiratory protection against airborne particulate matter, including dusts, mist, metal fumes and smoke but do not provide any protection against gases or vapors. Chemical cartridge respirators differ from particulate filter respirators in that they use cartridges containing chemicals to remove gases and vapors from the air They afford protection against various concentrations of specific gases and vapors. Combination particulate-filter/chemical cartridge respirators use dust mist, or fume filters with a chemical cartridge for dual or multiple exposure. Gas masks afford respiratory protection against certain gases, vapors, and particulate matter. They are designed solely to remove specific contaminants from the air. Finally, a PAPR uses a small battery-powered blower to either draw or force the surrounding air through an air purifying element and deliver it to a facepiece, hood, or helmet.

Canisters and chemical cartridges do not have the same capabilities. Gas and vapor removing respirators provide no protection against particulate contaminants unless specified on the canister or chemical cartridge label. Likewise, particulate removing respirators protect against non-volatile particulate only and provide no protection against gases or vapors.

Canisters and cartridges have a limited useful service life which requires that they shall be replaced based on the established change schedule for the specific use, or more often if the user detects odor, taste, or irritation. Change schedules may be based on an end-of-service-life indicator, the manufacturer's recommendation, or

various estimation methods. Particulate removing respirators may be used until breathing resistance increases to an uncomfortable level. Remember, air-purifying respirators shall not be used in atmospheres containing less than 19.5% oxygen.

2.2.8 Program Evaluation:

The effectiveness of the program will be regularly by the program administrator or the appropriate designee. These evaluations will focus on the adequacy of the respiratory protection afforded to the employees. They will examine the active practices demonstrated in the identification of hazardous atmosphere, the selection of respiratory protection, and the training of personnel in the proper use, maintenance and storage of respirators. In addition, the accompanying procedures and documentation will be reviewed. Employee consultations will be an integral part of these evaluations.

It is the responsibility of the program administrator to review the program evaluation report, consider the recommendation, and implement corrective measures when necessary.