RESPIRATORY PROTECTION PROGRAM

A. Introduction:

Due to the potential risks involved from exposure to hazardous substances and atmospheres, UNE has developed a Respiratory Protection Program to protect its faculty, staff and students from contracting occupational diseases or illness caused by breathing air contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, sprays, or vapors.

The Respiratory Protection Program at UNE has been developed in accordance with OSHA standard 29CFR1910.134. Section 1910.134(c) states that: OSHA "requires that the employer develops and implements a written respiratory protection program with required worksite-specific procedures and elements for required respirator use."

B. Responsibilities

1. UNE Environmental Health and Safety Department or EHS:

a. Develop and implement a written respiratory protection program within the OSHA 1910.134 guidelines.

b. Provide a questionnaire and medical examination to the employee before approving respirator use for that employee

c. Provide NIOSH approved respiratory protection for employees.

d. Assign a Program Administrator to regulate the respiratory protection program to insure it is being followed properly.

e. Revise the Respiratory Protection program annually or as needed.

f. Recordkeeping of all information contained under the Respiratory Protection Program except medical information, which is retained by the Human Resources Department.

g. Perform air quality testing if requested by an employee or if there is an area of concern that needs to be addressed.

2. Program Administrator:

a. Provide training to employees on the Respiratory Protection Program.

b. Review sanitation/storage procedures for effectiveness and compliancy;

c. Ensure respirators are properly stored, inspected and maintained on a regular basis;

d. Monitor compliance for this program and update annually and as needed;

e. Provide adequate fit testing of respiratory protection in accordance with the Respiratory Protection Plan and OSHA guidelines.

2. Employee

a. Report any areas to EHS for evaluation that may require respiratory protection.

b. Submit to a medical questionnaire and a medical examination to determine if the employee is eligible to participate in the Respiratory Protection Program.

c. Submit to a respirator fit testing for each type of respirator that may be used.

d. Adhere to all policies and procedure contained in the Respiratory Protection Program set forth by UNE.

e. The employee is responsible for cleaning, disinfecting, storing, inspecting, repairing, and discarding and generally maintaining their respirators and notifying their Supervisor or EHS if new equipment is needed.

4. Designated Occupational Health Care Provider

a. Perform all medical examinations pertaining to the Respiratory Protection Program

b. Review the Medical Questionnaire and address any concerns with the employee

c. Make recommendations to the employee and the EHS department based on the employee's medical evaluation and Medical Questionnaire and approve the employee to participate in the Respiratory Protection Program or address any concerns that would prevent the employee from being able to participate in the program.

d. Conduct follow up examinations as requested.

5. Human Resources

a. Work with Occupational Health Care Provider to have Respiratory Questionnaires evaluated by a physician and the results forwarded to Human Resources to be kept in the employee's confidential personnel file.

b. Notify EHS if any individual fails the Respiratory Questionnaires and is subsequently not able to participate in UNE's Respiratory Protection Program.

c. Notify EHS of any restrictions given by the physician for employees that are part of UNE's Respiratory Protection Program.

C. Scope:

1. Respiratory protective devices will be used:

a. For activities that cannot be safely or practically controlled by engineering methods or procedural alteration, such as for asbestos abatement activities, pesticide applications, spray painting, etc. Engineering controls are to be used if possible before resorting to respiratory protection.

b. When working in confined spaces.

c. When airborne radioactive chemicals, toxic materials, or hazardous chemicals could exceed OSHA Permissible Exposure Limits (PEL's) or Time Weighted Average's (TWA's) or whenever an employee will come in contact with harmful dusts, fogs, fumes, mists, gases, smokes, sprays or vapors.

d. When requested for additional protection.

e. In emergency situations where respiratory protection is required.

D. Respirator Selection:

a. Respirators will be selected based on the type of hazards to which the worker is exposed and workplace or user factors that affect respirator performance and reliability. All selections will be made by EHS based on the recommendations from the Chemical Hygiene Officers (CHO) in the lab areas. EHS will make recommendations for use of respiratory protection for other staff members such as the Facilities Department. Only MSHA/NIOSH-certified respirators that meet ANSI 288. 2 - 1980 will be used in compliance with the conditions of their certifications.

b. EHS and CHO's will identify and evaluate respiratory hazards in the workplace by looking at the following items:

i. Type of hazardous substance that employee is exposed to.

ii. Form of the hazardous substance ie) liquid, gas, smoke, vapor, etc.

iii. Amount of the hazardous substance the employee is exposed to.

iv. Duration of time the employee will be exposed to the substance.

v. Other engineering controls or ventilation systems in place.

vi. Conducting air monitoring of area for OSHA PEL's if needed.

NOTE: Any area where the employer cannot identify or reasonably estimate the hazard will be considered IDLH (Immediately Dangerous to Life or Health) and the equipment will be selected accordingly.

c. EHS will provide a respirator that coincides with OSHA regulations and that is adequate to protect the employee from the hazard they are exposed to.

d. EHS will use Assigned Protection Factors (APF's) listed in Table 1 under 1910.134 (d) (3) (i) (a) of the OSHA Respiratory Protection Standard to make sure the respirators meet or exceed level of protection needed. Also see Appendix F for respirator types and APF's.

Table 1. -- Assigned Protection Factors[5]

Type of respirator[1], [2]	Quarter mask	Half mask	Full facepiece	Helmet/ hood	Loose-fitting facepiece
1. Air-Purifying Respirator	5	[3]10	50	.....	.....
2. Powered Air-Purifying Respirator (PAPR)	.....	50	1,000	[4]25/1,000	25

3. Supplied-Air Respirator (SAR) or Airline Respirator					
• Demand mode	.....	10	50	.....	.....
• Continuous flow mode	.....	50	1,000	[4]25/1,000	25
• Pressure-demand or other positive-pressure mode	.....	50	1,000	.....	.....
4. Self-Contained Breathing Apparatus (SCBA)					
• Demand mode	.....	10	50	50	.....
• Pressure-demand or other positive-pressure mode (e.g., open/closed circuit)	.....	.....	10,000	10,000	.....

Notes:

[1]Employers may select respirators assigned for use in higher workplace concentrations of a hazardous substance for use at lower concentrations of that substance, or when required respirator use is independent of concentration.

[2]The assigned protection factors in Table 1 are only effective when the employer implements a continuing, effective respirator program as required by this section (29 CFR 1910.134), including training, fit testing, maintenance, and use requirements.

[3]This APF category includes filtering facepieces, and half masks with elastomeric facepieces.

[4]The employer must have evidence provided by the respirator manufacturer that testing of these respirators demonstrates performance at a level of protection of 1,000 or greater to receive an APF of 1,000. This level of performance can best be demonstrated by performing a WPF or SWPF study or equivalent testing. Absent such testing, all other PAPRs and SARs with helmets/hoods are to be treated as loose-fitting facepiece respirators, and receive an APF of 25.

[5]These APFs do not apply to respirators used solely for escape. For escape respirators used in association with specific substances covered by 29 CFR 1910 subpart Z, employers must refer to the appropriate substance-specific standards in that subpart. Escape respirators for other IDLH atmospheres are specified by 29 CFR 1910.134 (d)(2)(ii).

Example for calculating APF: $\frac{\text{Concentration}}{\text{PEL(TWA}_8\text{)}} = \frac{300\ \text{mg/M}^3}{50\ \text{mg/M}^3}$ = A hazard ratio of **6** for 8 hr TWA

e. EHS will select respirators of varying models and sizes so the respirator is comfortable and fits the user correctly.

f. EHS will provide a full face piece pressure demand SCBA certified by NIOSH for a minimum of 30 minutes of service life or a full face pressure demand air respirator with self-contained air supply for any IDLH situation. Oxygen deficient atmospheres are also considered IDLH.

g. For protection against gases or vapors the following will be provided:

i. An atmosphere-supplying respirator or

ii. An air purifying respirator

NOTE: Each device should be equipped with an ESLI or end of life service indicator, if one is not equipped with an ESLI, the EHS will have a change schedule in place for changing canisters or cartridges.

h. For protection against particulates, the following will be provided:

i. An atmosphere supplying respirator or

ii. An air purifying respirator with a filter certified by NIOSH as a high efficiency particulate air (HEPA) filter or equipped with a filter certified for particulates by NIOSH under 42CFR part 84.

E. Medical Surveillance:

1. Persons 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. All employees required to wear respirators will be enrolled in the medical surveillance program and be required to go to the off-site designated medical facility chose by the University to receive medical clearance prior to respirator use. Medical certification for respirator use will be re-evaluated annually. When the employee is no longer using respiratory protection, medical surveillance will no longer be required. All medical evaluations will be provided at no cost to the employee.

2. The employee will be required to fill out a detailed medical questionnaire (see Appendix C for example of the Medical Questionnaire set forth by OSHA) and complete a medical evaluation at no cost to the employee. The medical questionnaire will be confidential and will have the right to go over the questionnaire and results of the physical exam with the physician.

3. The following information will be given to the physician before they approve respirator use for the employee:

a. Type and weight of respirator to be used

b. Duration and frequency of respirator use

c. Expected physical work effort

d. Additional PPE and clothing to be worn

e. Any extreme temperatures or humidity extremes that may be encountered

f. A copy of the Respiratory Protection Program

3. Medical Determination. In determining whether the employee is eligible to participate in the Respiratory Protection Program, EHS will:

a. Obtain a written recommendation from the health care professional with the following information:

i. Any limitations related to respirator use or whether the employee is able to use respiratory protection.
ii. If there is a need for any follow-up medical evaluations.
iii. A written recommendation from the health care professional with their written consent or denial of the employee to participate in the program or any stipulations that may be in place to due to medical restrictions.

4. Additional Medical Evaluations. Additional medical evaluations and follow-up appointments may be required under the following circumstances:

a. The employee reports concerning signs or symptoms related to respirator use.

b. The health care provider, the employee's supervisor, or the program administrator feels that the employee needs to be re-evaluated.

c. Information obtained during the fit testing process indicates the employee needs to be re-evaluated.

d. Changes occurring in the workplace may result in more of a physiological burden on the employee or duration of use of respirators is dramatically increased.

F. Fit-testing:

1. All campus personnel required to use respiratory protection equipment (except for disposable dust/mist single use masks) must undergo and pass a qualitative fit test prior to use of the equipment. The employee must be fit tested using the exact size and exact model that they will be using in the field on a regular basis. Employees are required to do a seal check every time they put on the respirator. If the employee shows any signs of breathing difficulty during fit testing, discontinue fit testing and bring to a health professional. See Appendix B for example of fit testing form.

2. Procedures for Fit Testing: For specific fit testing requirements, please reference OSHA 29CFR 1910.134 App A.

a. Assessment of comfort shall include a review of the following points with the test subject and allowing the test subject adequate time to determine the comfort of the respirator:

i. Position of the mask on the nose

ii. Room for eye protection

iii. Room to talk

iv. Position of mask on face and cheeks

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

i. Chin properly placed

ii. Adequate strap tension, not overly tightened.

iii. Fit across nose bridge

iv. Respirator of proper size to span distance from nose to chin

v. Tendency of respirator to slip

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

c. Qualitative Fit Testing. Qualitative fit testing will be performed in the following manner:

i. Positive-pressure check- with the exhaust post(s) blocked, the positive pressure of slight exhalation should remain constant for several seconds.

ii. Negative-pressure check- with intake port(s) blocked, the negative pressure of slight inhalation should remain constant for several seconds.

d. Stannous Chloride irritant smoke, Isoamyl Acetate, Bitrex, or Saccharin test.

The employee will be instructed to close his/her eyes and breathe normally during the test.

i. The chosen test solution ampule is puffed/dispersed around the entire face/cartridge seal to determine the integrity of the mask/face seal.

ii. In normal standing position, without talking, the subject will breathe normally for at least one minute.

iii. In the normal standing position, the subject performs deep breathing for at least one minute, pausing so as not to hyperventilate.

iv. Standing in place, the subject will slowly turn his/her head from side to side between the extreme positions to each side. The head will be held at each extreme position for at least 5 seconds.

v. Standing in place, the subject will slowly move his/her head up and down between the extreme position straight up and the extreme position straight down. The head should be held at each extreme position straight down. The head should be held at each extreme position for at least 5 seconds.

iv. Reading of the rainbow passage.

3. Restrictions:

a. Facial hair between the skin and face mask sealing surface can interfere with the fit or operation of a half mask if it extends under the face piece sealing the area. If this condition exists, no attempt will be made to fit test such employee under any circumstances. The hair obstruction must be removed before the employee will be approved for fit testing and respirator use.

b. If for any reason an individual is unable to obtain a satisfactory face piece seal when presented with a variety of sizes and models of respirators, that individual will not be assigned or allowed to engage in any task requiring suitable respiratory protection.

c. If the employee wears corrective lenses glasses or goggles, or other PPE, it must be confirmed that they do not interfere with the seal of the face piece.

4. Additional Fit Testing. Additional fit testing will be required if the employee, employer, or health care professional notices any of the following differences in the employee including but not limited to: facial scarring, dental changes, cosmetic surgery, or an obvious change in body weight.

5. After being fit tested successfully and the employer, employee, or program administrator find that the fit is unacceptable in the field, the employee has the right to re-select a different size and/or model of respirator and be fit tested and fitted with that equipment.

G. Types of Respirators and Operating Procedures (See Appendix F for diagrams and APF):

1. Dust Masks:

a. Dust Masks of various kinds, including disposable types, have been approved against low concentrations of certain dusts (nuisance dust, pollen, animal dust, etc only). Contact the EHS prior to using a dust mask.

b. Discard a disposable dust mask after use or when breathing becomes difficult. If the dust mask has a replaceable dust filter, replace the filter with a new one when normal breathing becomes difficult.

2. Air-Purifying Half –Mask Respirators:

a. Half-mask respirators are the most widely used types of respirators. Each half-mask face piece is normally equipped with High Efficiency Particulate Air (HEPA) filter elements, or vapor and gas removing cartridges. These cartridges purify the air as the wearer breathes. HEPA filters protect against low concentrations of radioactive and toxic particulates. Vapor or gas removing cartridges protect against low concentrations of organic vapors and/or acid gas vapors.

b. Since this type respirator does not supply air, it cannot be used in oxygen-deficient atmospheres, in Immediately Dangerous to Life or Health (IDLH) atmospheres, or in confined spaces. It can only be used for protection against the contaminants listed on the cartridge. It cannot be used against natural gas or vapors with poor olfactory warning properties. The wearer should leave an area immediately if he or she detects an odor inside the mask or if the breathing resistance increases.

c. The Half-mask sealing area; Procedure to put on and adjust a half-mask:

i. Use the mask approved for use.

ii. Hold the mask so narrow nose-cup points upward.

iii. Grasp both lower mask straps and hook them behind the neck.

iv. Grasp both top straps and hook them behind the head and above the ears for a proper fit.

v. Adjust the straps so the fit is snug but comfortable.

vi. Check for leaks when possible by covering the filter elements with the palms of the hands and inhaling gently. If the mask pulls in toward the face, the fit is good. This is known as a negative fit check.

3. Full Face-Mask Respirators:

a. Full face-mask respirators provide more protection than half-masks because their shape allows a better mask-to-face seal. They also protect the eyes from irritating chemicals or particulate atmospheres. Full face-masks come equipped with selective types of air-purifying canisters/cartridges, dependent upon the protection required. Additionally, full face-masks are available with air-supplied systems such as air lines or SCBA units.

b. Air-purifying full face-masks have the same limitations for use as half-mask respirators. Additionally, standard eyeglasses interfere with the mask-to-face seal; therefore, respirator wearers should obtain an additional pair of glasses for installation into the mask.

c. Procedure to put on a full face-mask:

i. Loosen all straps, pull the harness over the head, and place the chin in the chin cup.

ii. Pull the head harness well down on the back of the head.

iii. Tighten the harness gently, starting with the eye straps, and then the bottom and middle straps.

d. Check the fit by closing off the air hose or canister opening with the palm of the hand and inhaling gently. The user should then hold his/her breath for a few seconds. A good fit is indicated if the mask remains collapsed toward the face during this time.

4. Powered air-purifying respirator (PAPR)

a. Powered Air-Purifying Respirators look like Full-Face Respirators, except that they have an air pump attached. It has HEPA filters or cartridges. The air pump and the filters are usually on a belt or in the face piece. The pump pulls the air through the filters. It blows the air through a hose into the mask.

b. This respirator only filters the dirty air that's already in the room. It is an air-purifying respirator. The air coming through the hose pushes air away from the sides of the mask. This is a positive pressure respirator. The air pump makes a positive pressure inside the mask. One good thing about a positive-pressure respirator is that if it leaks, it leaks out.

c. With a powered air-purifying respirator, the lungs do not have to work so hard to pull the air through the filters. The air pump does some of the work.

d. If the batteries are low, this PAPR is not better than a full-face respirator without an air pump.

H. Respirator Maintenance:

1. Respirators will be regularly cleaned and disinfected. Those issued for the exclusive use of one worker will be cleaned after each day's use, or more often, if necessary. Those used by more than one worker will be thoroughly cleaned and disinfected after each use. Respirators

used in fit testing will be cleaned and disinfected in between use. EHS will establish respirator cleaning and maintenance instructions (See Appendix D).

2. Respirator Storage: Each department will store respirators properly in a clean and sanitary location. UNE employees who have been assigned a respirator for their exclusive use will be responsible for storing their own respirator in a clean and sanitary location. This location must protect the respirator from damage, contamination, dust, sunlight, extreme temperatures, excessive moisture, and damaging chemicals. They should be packed and stored in a manner that prevents deformation of the face-piece and exhalation valve.

3. Respirator Inspection: Respirators used routinely will be inspected before use and during cleaning. Worn or deteriorated parts will be replaced. Any respirator that fails inspection will be removed from service and discarded immediately and the EHS will provide new equipment. The following items will be part of the inspection:

a. Respirator function

b. Tightness of connections

c. Condition of various parts including but not limited to: face piece, head straps, valves, connecting tubes, cartridges, canisters or filters.

d. Check elastomeric parts for pliability and deterioration.

e. Make sure cartridges are not clogged, if they are, seek replacement cartridges.

NOTE: For SCBA's, monthly inspections should take place and all air and oxygen cylinders should be maintained in a fully charged state and be recharged when pressure falls to 90% of manufacturer's recommended pressure level. Also, ensure regulator and warning devices function properly.

4. Cartridges and filters shall be changed based on the most limiting factor below:

a. Prior to expiration date;

b. Manufacturers recommendations for the specific use and environment;

c. After each use;

d. When requested by employee;

e. When contaminant odor is detected; and

f. When restriction to air flow has occurred as evidenced by increase effort by user to breathe normally.

Cartridges shall remain in their original sealed packages until needed for immediate use

5. Surveillance of Work Site: Many variables may affect the need for respiratory protection. Upgrading of required respiratory protection will be based on appropriate surveillance of the work area conditions, degree of employee exposure, heat or cold stress and physical exertion.

6. Evaluation: Regular inspection and evaluation will be carried out to determine the continued effectiveness of the program. EHS will make frequent inspections of all areas where respirators are used to ensure compliance with the UNE Respiratory Protection Program.

I. Emergency Response Respirators

1. All respiratory protection used in emergency situations will be rated for IDLH situations since the nature of the emergency may not be known.

2. All emergency respiratory protection will follow the standards set forth in the UNE Respiratory Protection Program.

3. Emergency respiratory protection will be clearly marked as such and put in the appropriate locations.

4. ONLY employees that have been approved and trained for respirator use should be using the emergency response respiratory protection.

5. Respirators used for emergency response may not be used on a regular basis, so they are to be inspected after use and monthly. Monthly inspections should be documented, signed, and dated by the employee.

J. Training:

1. All personnel will be instructed and trained in the proper use of respirators and their limitations. The training will include all elements of the Respiratory Protection Program and will be designed by the program administrator.

2. Training will occur in the following cases:

    a. When beginning to wear respiratory protection, after medical monitoring clearance, but before the employee uses respiratory protection.

    b. Training will be repeated annually, within 12 months of previous training session.

    c. If there are changes in the workplace that dictate re-training.

    d. If there are changes in the Respiratory Protection Program that would require re-training of employees.

    e. If the employee shows inadequacies in the knowledge of the program or has had trouble understanding the training.

3. Training will provide the employee:

    a. An opportunity to handle the respirator,

    b. Have it fitted properly,

    c. Test its face piece-to-face seal,

    d. Wear it in normal air for a long familiarity period,

e. To wear it in a test atmosphere

K. Record Keeping:

1. All fit testing forms will be maintained in EHS for minimum of three years.

2. Medical surveillance records will be maintained the Human Resources Department due to confidentiality regulations.

3. Training records of topics covered by this chapter will be maintained by the EHS Department for a minimum of three years, unless otherwise specified.

4. A copy of the Respiratory Protection program is contained within the UNE Safety Manual and may be requested from EHS at any time.

UNE AREAS THAT REQUIRE RESPIRATORY PROTECTION

WORK AREA	**EXPOSURE HAZARD**	**DEPT/MANAGER**	**TYPE OF RESPIRATORY PROTECTION REQD**
SELECT RESEARCH LABS	ANIMAL DANDER	VARIOUS	N95 MASK
SELECT LABS	CHEMICAL/BIOLOGICAL EXPOSURE	VARIOUS	N95 MASK
COLLEGE OF MEDICINE ROTATIONS	BODILY FLUID/GERM EXPOSURE	COLLEGE OF MEDICINE	N95 MASK
FACILITIES SHOP	SAW DUST, FUMES, VEHICLE REPAIR	FACILITIES	N95 MASK