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Respiratory Protection Program

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Respiratory Protection Program

Section 1: SUMMARY

In the workplace, the primary route of exposure to harmful material is inhalation. Airborne contaminants can physically damage the lung tissue, irritate the respiratory tract, or be absorbed into the bloodstream for transport throughout the body. In the control of occupational diseases caused by breathing air contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, sprays, vapors, or bioaerosols the primary objective is to prevent atmospheric contamination. Engineering and work practice controls are the primary methods of protecting workers from hazardous materials or conditions. Engineering controls include general and local ventilation, enclosure or confinement of the operation, and substitution of less hazardous materials. Work practice modifications may include changing the way a worker performs a task so that contact with the hazardous material is minimized. It is only when these controls cannot effectively reduce the potential for over exposure or are not feasible, or when exposure conditions are temporary (such as during emergencies or while controls are being instituted) that respirators can be used.

Respirators provide protection from inhalation of airborne contaminants either by removing contaminants from the air before they are inhaled or by supplying an independent source of clean, breathable air. Nova Southeastern University (NSU) will provide appropriate respirators when it is necessary to protect the health of employees.

This document represents the NSU's plan for safe respirator use in compliance with the OSHA Respiratory Protection Standard. It outlines the methods and procedures to use in respirator selection, maintenance, and use. The Respiratory Protection Program Administrator, designated by Environmental Health and Safety (EHS), is responsible for the administration or oversight of the respiratory protection program and conducts the required evaluations of program effectiveness.

The NSU Respiratory Protection Program applies to all university employees who are required to wear respirators during normal work operations and some non-routine or emergency operations such as a spill of a hazardous substance. All employees using respirators in a required-use situation must be enrolled in the Respiratory Protection Program and are subject to all the requirements of this document. Personnel using respirators voluntarily, in a non-hazardous situation, are subject to the medical evaluation, cleaning, maintenance, and storage elements of the program and must be provided with the information contained in Appendix D to the OSHA Respiratory Protection standard, Information for Employees using Respirators When Not Required under the Standard. Employees using filtering facepiece respirators (i.e. dust masks) in a voluntary use situation only need to be provided with the information provided at end of this document.

The responsible supervisor, whose employees are required to use respirators, must customize and implement a written unit-specific respiratory protection plan. Individual plans must establish policies and procedures SPECIFICALLY addressing the hazard assessment, respirator selection and use, medical evaluation and qualification, fit testing, training and recordkeeping.

The Environmental Health and Safety (EHS) has developed the Respiratory Protection Plan as a template, which departments and responsible supervisors can use to design a Unit-Specific Respiratory Protection Plan.

Section 2: SCOPE

This document applies to NSU's personnel who are required to wear respirators and those who choose voluntarily to use respirators.

2.1 Required Use of Respirators

The Respiratory Protection Program Administrator, in conjunction with the responsible supervisor and the employee, will determine if a respirator is required based on the employee's potential exposure to respiratory hazards. Employees who are required to wear respirators during normal work operations and during certain non-routine or emergency situations must participate in all elements of the Nova Southeast University Respiratory Protection Program. The following elements are required:
Procedures for:

- Selection of appropriate respirators
- Fit testing.
- Proper respirator use in routine and foreseeable emergencies.
- Ensuring adequate air quality, quantity, and flow for air supplied respirators.
- Cleaning, disinfecting, storing, inspecting, repairing, removing from service.
- or discarding, and otherwise maintaining respirators, with schedules for
- implementation
- Regularly evaluating the effectiveness of the program.
- Provision of a medical evaluation
- Training for employees and responsible supervisors in their potential respiratory hazards and in the proper use, limitations, and maintenance of respirators

2.2 Voluntary Use of Respirators

Employees may choose to use respirators in situations where the potential exposure levels are below the exposure limit to provide an additional level of comfort and protection.

> ***What is meant by "voluntary" use of respirator equipment?***
> Voluntary use is when an employee chooses to wear a respirator, even though the use of a respirator is not required by any OSHA standard or Nova Southeastern University.

Voluntary use of respirators is permitted if the Respiratory Protection Program Administrator determines that such respirator use will not in itself create a hazard. If the employee's request is approved, the employee's responsible supervisor must implement the NSU Respiratory Protection Program.

***EXCEPTION*:** Voluntary use of filtering face piece respirators or dust masks by employees does not require a medical evaluation, but does require provision of the Information for Employees for Voluntary Use of Respirators

Section 3: RESPONSIBILITIES

3.1 Environmental Health and Safety (EHS)

- Provide support sufficient to develop and evaluate the Respiratory Protection Plan.
- Designate the Respiratory Protection Program Administrator.
- Conduct workplace assessments for potential employee exposure to respiratory hazards including a reasonable estimate of employee exposure.
- Provide any necessary resources for training and fit- testing.

Program Administrator
The Program Administrator is responsible for administering the respiratory protection program. Duties of the administrator include:

- Develop and evaluate the written Respiratory Protection Program.
- Provide guidance to responsible supervisors for selection and purchase of approved respirators
- Develop and provide NSU Respiratory Protection training
- Provide qualitative or quantitative fit testing
- Coordinate with health care provider, supervisors, and employees to facilitate medical evaluations for respirators as needed.

3.2 Departmental Responsibilities

Departments whose employees may be exposed to respiratory hazards are responsible for providing the necessary and appropriate resources, including personnel, equipment, and financial support to ensure a proper respiratory protection plan is developed and implemented.

- Assign the Responsible Supervisor to develop and implement the site specific Respiratory Protection Plan.
- Provide all necessary resources to implement an effective Respiratory Protection Plan.
- Provide resources for implementation of a Medical Surveillance Program as required for employees who wear respirators.
- Provide resources for respirators, cartridges and other necessary equipment.

3.3 Responsible Supervisors

The Responsible Supervisor (referred to as supervisor) is the person immediately responsible for an employee (i.e. a departmental representative, manager, supervisor) The Responsible Supervisor is responsible for ensuring that the respiratory protection program is implemented in their

particular work areas. They also must ensure that the program is understood and followed by the employees under their charge. These duties may be delegated by the responsible supervisor as needed or practical. Duties include the following:

- Identify and report to the Respiratory Protection Administrator:
  - ✓ Hazardous chemicals used or generated in their work area and operations.
  - ✓ The employees who may be exposed to respiratory hazards.
  - ✓ The tasks or jobs conducted requiring respiratory protection.
- Contact the Program Administrator for assessment of the work area for potential respiratory hazards.
- Develop and write the customized Respiratory Protection Plan for their area and employees.
- Schedule appointments for employees with designated health care providers for initial and periodic medical surveillance
- Furnish the designated health care provider with specific information to be used in determining the employee's ability to use a respirator including a copy of the customized Respiratory Protection Plan
- Schedule initial and annual respiratory protection training and fit testing.
- Obtain appropriate respirators and accessories for each employee who has been medically qualified and fit tested
- Ensure respirators continue to fit well and do not cause discomfort.
- Ensure employees properly clean, store and maintain their respirators.
- Notify the Respiratory Protection Program Administrator if any employee experiences difficulty wearing their respirator.
- Develop appropriate respirator cartridge change out schedule approved by the Program Administrator.
- Assure respirators and cartridges are being used in accordance with their certifications.
- Conduct ongoing work-site assessments and evaluations as necessary to ensure that the written plan is being effectively implemented.

3.4 Respirator Users

Respirator users include those employees who are required to wear respirators or who voluntarily wear respirators related to their work at NSU. Duties of all respirator users include:

- Use respirators according to instruction and training provided by EHS and their responsible supervisor.
- Clean, store and maintain their respirator properly.
- Inspect respirator for any defect before each use.
- Report to responsible supervisor any defect or malfunction of the respirator.
- Report to responsible supervisor any signs, symptoms or difficulty related to respirator use.
- Conduct respirator Fit-Checks each time the respirator is donned.
- Do not wear voluntary use-respirators in required use areas without approval from the Program Administrator or supervisor.

3.5 Physician or other Licensed Health Care Professional (LHCP)

The physician or LHCP is an individual who is legally permitted (i.e. by license, registration or certification) to provide some or all of the health care services required by the OSHA Respiratory Protection Standard.

- Conduct medical evaluation in accordance with the OSHA Standard
- Provide written recommendation on employees' ability to use a respirator
- Provide follow-up medical examination if indicated
- Maintain all medical records as required by the standard

Section 4: HAZARD ASSESSMENT

When an overexposure to an airborne contaminant is suspected, either during routine operations or during a foreseeable emergency, it is important that a thorough hazard evaluation be conducted. EHS staff or other qualified personnel will perform hazard assessments in the workplace. It is the responsibility of the responsible supervisor to notify the Program Administrator of workplace conditions where airborne contaminants may be present and potential worker exposure exists. The following elements will be considered when conducting a hazard assessment:

- Identification of hazardous substances in the workplace
  - ✓ Review of work processes to determine where potential exposures to hazardous substances may occur. This review may include a survey of the workplace, review of process records, and talking with employees and supervisors.
  - ✓ Exposure monitoring will be conducted, when possible, where it is determined that the potential for overexposure to hazardous levels of airborne contaminants exists and when sampling and analysis methods exist.

Hazard assessments will be reevaluated periodically. The responsible supervisor must notify the Program Administrator of any change in workplace conditions or operations that may affect employee exposure. Items that may trigger a reassessment include changes in materials or equipment used, changes in volume of work, or change in process or location. EHS staff or other qualified personnel will evaluate worker exposure in light of the changes, update the hazard assessment and written program as needed. The responsible supervisor will be notified of the findings and recommendations. It is the supervisor's responsibility to implement the recommendations.

Employees who believe that respiratory protection is needed during a particular activity should contact their responsible supervisor, who in turn must relay the information to the Program Administrator for assessment. Detailed information on hazard assessment is contained in Section 4of this document.

Section 5: MEDICAL EVALUATION AND CERTIFICATION

Employees slated for respirator use, either in required-use or voluntary-use situations, must receive medical certification before respirator use is permitted.

> ***EXCEPTION:*** Medical Evaluations are not required for voluntary use of filtering face piece respirators (Dust Masks).

Medical evaluations must be provided by the employee's responsible supervisor, department, or lab at no cost to the employee and during normal business hours. The evaluation includes the OSHA Respiratory Protection Questionnaire or a medical examination that obtains the same information. A follow-up examination must also be provided for an employee who gives a positive response to any question among questions.

1 through 8 in Section 2 of the questionnaire or whose initial medical examination demonstrates the need for follow-up medical examination.

Personal health and medical information obtained in the medical evaluation will be kept confidential by the LHCP. The only information returned to the Program Administrator and the employee's responsible supervisor is a written recommendation regarding the employee's ability to use the respirator.

5.1 Prior to Respirator Use

Medical evaluations must be provided when:

- Elastomeric (e.g. latex or silicone) face piece respirators are required or worn voluntarily
- Filtering facepiece respirators (dust masks) are required.

Respirator use is absolutely prohibited until a physician or other licensed health care professional (LHCP) has submitted a medical certification that the employee is medically able to do so. The medical evaluation must be provided before the employee is fit tested and uses the respirator at NSU for the first time. Any employee refusing a medical evaluation will not be allowed to work in an area requiring respirator use.

The requirement for medical evaluation is necessary because using a respirator may place a burden on a worker's health. This burden varies according to a number of factors, such as the weight and breathing resistance of the respirator and the workplace conditions under which the respirator is worn. Specific medical conditions that may place an employee at increased risk of illness, injury or death include:

- Cardiovascular and respiratory disease, such as high blood pressure, angina, asthma, chronic bronchitis, or emphysema
- Cardiovascular damage caused by heart attack or stroke

- Reduced lung function caused by factors such as smoking or prior exposure to respiratory hazards
- Neurological disorders, such as epilepsy
- Musculoskeletal disorders, such as lower back pain
- Psychological conditions, such as claustrophobia and severe anxiety

5.2 Facilities Providing Services

The Program Administrator will select and determine the LHCP to perform the Medical Evaluations. The Program Administrator will provided the LHCP with a copy of the NSU Respiratory Protection Program and the OSHA Respiratory Protection Standard and assure that the LHCP is familiar with the requirements of both documents.

The medical evaluation for Respirator Qualification is conducted using a Respirator Medical Evaluation Questionnaire. The employee's supervisor provides each employee who slated to use a respirator (except voluntary use of a dust mask) with a copy of Medical Questionnaire and is responsible for assuring the questionnaire is administered confidentially during the employee's normal working hours or at time and place convenient to the employee.

Depending on the LHCP selected by the Program Administrator, the questionnaire may be completed on-line or on paper form. The questionnaire must be administered in a way that the employee understands the content and that the confidentiality of the record is maintained. If the employee cannot read or understand the content of the questionnaire, a physician or other licensed health care professional (LHCP) will administer the questionnaire.

The employee's department is responsible for providing any medical follow-up as determined by the Physician or LHCP evaluating the Medical Respirator Evaluation Questionnaire. This includes any additional follow-up, medical tests, or diagnostic procedures necessary to make a final decision on the employee's ability to use respiratory protection.

5.3 Worksite Information Supplied to LHCP

The responsible supervisor must provide the clinic or physician with specific information about the employee's workplace conditions using the form Worksite Information Regarding Respirator Use.

This information must be provided to the evaluating physician or clinic before a recommendation is made concerning the employee's ability to use a respirator. The following information is required:

- The type and weight of the respirator being used by the employee
- Description of the task
- The duration and frequency of respirator use, including use for rescue and escape
- The expected physical work effort
- Additional protective clothing and equipment to be worn

- Temperature and humidity extremes that may be encountered

5.4 Information LHCP Provides NSU

The responsible supervisor is to obtain the physician's written evaluation for respirator use for each employee, and provide a copy to the Program Administrator. The employee may simply bring the certification, if approved. The Program Administrator must be provided with a copy of the employee's certification for respirator use before fit testing.

To assure confidentiality of medical records, the LHCP will provide NSU with only the following information:

- Any limitations on respirator use related to the medical condition of the employee, or relating to the workplace conditions in which the respirator will be used, including whether or not the employee is medically able to use the respirator.
- The need, if any, for follow-up medical evaluations
- A statement that the physician has provided the employee with a copy of the written recommendation

If the medical evaluation excludes the use of negative pressure respirators, the employee will be provided with a positive pressure air-purifying respirator (PAPR) as long as the medical evaluation permits such use. Alternatively, appropriate modifications may be made so that the employee's job does not require the use of respiratory protection.

5.5 Additional Medical Evaluations

After an employee has received medical certification and begun to wear their respirator, additional medical evaluations will be provided under the following circumstances:

- The employee reports signs or symptoms that are related to their ability to use a respirator, such as shortness of breath, dizziness, chest pains, or wheezing.
- The physician, clinic, employee's responsible supervisor, or the Program
- Administrator recommends re-evaluation.
- The information from the NSU Respiratory Protection Program, including observations made during fit testing, program evaluation, or hazard re-assessment indicates a need for employee re-evaluation
- A change occurs in the workplace conditions (e.g., physical work effort, protective clothing, and temperature) that may result in an increased physiological burden placed on the employee.

The employee's responsible supervisor must notify the Program Administrator if any of these conditions arise. The Program Administrator will contact the LHCP for consultation and recommendation.

The Program Administrator and the employee's responsible supervisor will maintain copies of the Respirator Qualification Certificate. The physician or clinic must maintain all medical records for at least the duration of the employee's employment plus 30 years.

Section 6: EDUCATION AND TRAINING

Selecting the proper respirator for a given hazard is important, but equally important is using the selected device correctly. Proper use can be ensured by carefully training both supervisors and workers.

6.1 Employee Training

Respiratory Protection Training is mandatory for all employees who wear a respirator for protection against hazardous air contaminants, and their responsible supervisors. General NSU Respiratory Protection Training is administered/conducted by EHS.

Employees voluntarily using only filtering facepiece respirators (dust masks) are exempt from this formal training. They must, however, be given a copy of Information for Employees Using Respirators When Not Required under the Standard. Supervisors must maintain a signed copy, ensuring the employee reads and understands the information contained in the document.

NSU General Training

Training will include the contents of the NSU Respiratory Protection Program and the personnel requirements under it. Along with classroom instruction, hands-on training is provided on the proper use and limitations of each specific respirator assigned. The user will be fitted with an appropriate size and type of respirator he or she will use in their workplace.

The training course is presented in a comprehensive and understandable format with hands-on use of the specific make, model and brand of the respirator each employee will be assigned. The training covers the following topics:

- Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator.
- The limitations and capabilities of the respirator
- How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions
- How to inspect, put on, and remove, how to use, and how to check the seals of the respirator
- The procedures for maintenance and storage of the respirator
- How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators
- The general requirements of the OSHA Respiratory Protection Standard

EHS will periodically review the training program to ensure the material is current and appropriate for the existing conditions.

Unit-Specific Training

The supervisor or the designee will conduct the unit- specific training focusing on the specific aspects of the plan that may be unique to the unit; where the respirators are stored, who is responsible for ordering filters or cartridges. This training will be provided before the employee is assigned to wear a respirator. Additional training shall be provided for employees whenever a new procedure relating to respirators is introduced into the work area. The supervisor is responsible for ensuring Unit specific training content is clearly understood prior to respirator use.

Unit-Specific training will include:

- A review of the written unit-specific Respiratory Protection Plan
- Location and procedures for cleaning, storage and maintenance of respirators
- Procedures for obtaining Medical Evaluation, including how to obtain follow-up as necessary
- Procedures for obtaining fit tests including follow-up fit testing, as necessary
- Explanation of routine and non-routine tasks involving respirator use
- Emergency procedures involving respirators

Employees will be trained annually and more frequently if retraining appears necessary to ensure the safe use of respirators, for example:

- Changes in the workplace or in the type of respirator render previous training obsolete.
- Inadequacies in the employee's knowledge or use of the respirator indicate that the employee has not retained the requisite understanding or skill in using a respirator.
- Any other situation arises in which retraining appears necessary to ensure safe respirator use

The respiratory program administrator must be contacted by the responsible supervisor in such a case to ensure appropriate re-training is conduct.

Voluntary Use

For employees who choose to wear a respirator but are not required to do so, the responsible supervisor must provide the advisory information; Information for Employees Using Respirators When Not Required under the Standard. The document must be signed and dated by the employee, indicating the employee has received and understands the information. The supervisor must obtain and maintain a copy of this document.

When filtering facepiece respirators are freely available to employees to use on a voluntary basis, the supervisor must ensure all affected employees receive training, which at a minimum will include the Information for Employees for Voluntary Use of Respirators. The employees' supervisor must ensure that each employee reads and understands this basic information by having the employee sign and date the form.

6.2 Supervisor Training

All supervisors who oversee the work activities of respirator users must have a fundamental knowledge of respirators and NSU's respiratory protection practices. Their training will include at least the following:

- The fundamentals of respiratory protection
- The respiratory protection practices of NSU as described in this Respiratory Protection Program.
- Nature and extent of the hazards to which employees under their charge may be exposed
- The selection and use of respirators used by employees under their charge
- Each employee's responsibilities and duties that facilitate functioning of NSU Respiratory Protection Program

6.3 Scheduling NSU University General Training

The responsible supervisor must assure each employee required to wear a respirator receives the NSU training prior to initial use of a respirator and annually thereafter. Workers must be trained before being fit tested and before using a respirator in the workplace. A workplace hazard assessment must be conducted and each employee must have a Respirator Qualification Certificate issued by an approved LHCP (see Sections V & VI) prior to the training and fit testing.

Section7: FIT TESTING

Fit testing is a procedure used to determine how well a respirator "fits", that is, whether the respirator forms a good seal to the wearer's face. If a good face-to-facepiece seal is not achieved, this may allow the respirator to leak. Since only tight-fitting respirators rely on this seal, they are the only type of respirator for which fit testing is valid.

General Requirements

Fit testing is coordinated by the Program Administrator and may be provided by EHS, a contractor or trained staff. Supervisors must contact the Program Administrator in advance to schedule fit testing and training for their employees.

Fit testing will not be conducted until the Program Administrator or EHS has a copy of the employee's signed Medical Qualification for Respirator Use.

Fit testing is mandatory when employees are required to wear a tight-fitting respirator on their job. Employees must be fitted for the specific brand, model, and size for each respirator they are required to wear.

Before fit testing, employees will be provided with enough respirator models and sizes to select

from so that the employee may select a respirator that correctly fits and is acceptable to the wearer.

When possible, fit testing will be provided by EHS or trained NSU staff, but when an outside provider is used, they must provide documentation showing their procedures comply with all requirements of the OSHA Respiratory Protection Standard. A copy of the fit test record and compliance documentation must be forwarded to the Program Administrator or EHS prior to employee respirator use.

NIOSH certified filtering facepiece respirators (dust masks) may need to be provided for fit testing by the employee's responsible supervisor. These respirators are readily available from safety supply and lab supply catalogs, and local distributors.

7.1 Re-Fit Testing

If the employee finds the fit of the respirator unacceptable or a good fit is not achieved, they will be given a reasonable opportunity to select a different respirator and be re- tested. If an acceptable fit still is not achieved with one of the above respirators,
additional brands and sizes may be tried. If no suitable respirator can be found the worker will not be permitted to work in an area where respirators are required.

The responsible supervisor must contact the Program Administrator to schedule fit testing for their employees. Fit testing must be conducted:

- Before a respirator is provided or used in the workplace.
- At least annually
- Whenever an employee switches to a different tight-fitting respirator (e.g. different size, make, model or type)
- When there are changes in the employee's physical condition that could affect the respirator fit (e.g. an obvious change in body weight, facial scarring, extensive dental work, or cosmetic surgery) either reported by the employee, observed by the employee's supervisor, LHCP or the Program Administrator.
- When an employee reports that their respirator does not fit properly (e.g. smelling a contaminant while wearing the respirator with new cartridges, hearing or feeling air leaking around the facepiece).

Employees are fit tested with the same make, model and size respirator that they will actually wear on the job. The Program Administrator or other qualified personnel conduct the fit testing following the OSHA quantitative or qualitative fit test procedures.

7.2 Required Use of Filtering Facepiece Respirators (Dust Masks)

Fit testing is also mandatory when employees are *required* to use disposable filtering facepiece respirators. Fit testing is not required for their voluntary use. The respirators must be NIOSH certified (or approved by the FDA under a current Emergency Use Authorization) and approved by the Program Administrator prior to fit testing. The university currently offers fit testing for filtering face piece respirators upon request from the employee's responsible supervisor using Bitrex® qualitative fit test procedures.

7.3 Quantitative Fit Testing

Quantitative fit testing is a method of measuring the amount of leakage into a respirator. It is a numeric assessment of how well a respirator fits a particular individual. Quantitative fit tests (QNFT) are administered using OSHA-accepted QNFT protocols and procedures, which are included in Appendix A of the OSHA Standard.

A quantitative fit test measures the concentration of the challenge agent within the respirator facepiece and does not depend on the subject's response to the challenge agent. The PortaCount® system uses ambient particles as the test aerosol with measurements made of particle concentration outside and inside the facepiece. Currently, a fit test adapter specific to the brand of respirator being fit tested is used to measure within the respirator facepiece. An assessment of the quantitative fit is made based on the ratio of
the particle concentration in the ambient air to the concentration inside the facepiece. This ratio or Fit Factor achieved by the fit test must be at least 100 (preferred 1000) for half face respirators and at least 500 (preferred 5000) for full facepiece respirators.

Quantitative fit testing for groups of employees is available through EHS, if requested.

7.4 Qualitative Fit Testing

Qualitative fit testing and/or the training of fit testers is available from EHS. Qualitative fit testing is a non-numeric pass/fail test that relies on the respirator wearer's response to a substance, (i.e. test agent) used in the test to determine respirator fit. While wearing the respirator and after successfully completing respirator fit checks, the employee is exposed to an atmosphere containing an odorant, irritant, or taste agent such as Bitrex® or irritant smoke. If the individual can detect the test agent, this indicates that the agent has leaked into the facepiece and the respirator has failed the test because a good facepiece-to-face seal has not been achieved. If the employee cannot successfully complete the qualitative fit test with a particular respirator, then another make, size, or brand of respirator will be tried. Qualitative fit testing may only be used when the employee's exposure to air contaminants will not exceed ten times the OSHA PEL for that contaminant.

EHS routinely does qualitative fit testing on an as needed basis. Quantitative Fit-testing is available if prior arrangements have been made.

Section 8: RESPIRATOR SELECTION

Effective respiratory protection programs are dependent on proper selection and use of respirators. Since there are many types of respirators, with very different characteristics, capabilities, and limitations, it is essential that sufficient information be gathered to determine which respirators are appropriate for the hazards that exist in the workplace.

8.1 General Requirements

Employees exposed to respiratory hazards will be provided, at no cost to them, with respirators based on the hazards to which they are exposed, taking into consideration how workplace and user factors may affect respirator performance and reliability. Several different brands, models and sizes of respirators are available through the university to assure respirators fit and are acceptable to the users.

8.2 Hazard Identification

One of the most critical components of the Respiratory Protection Plan is respirator selection, which relies on accurate respiratory hazard identification. The hazard identification may be completed in several ways. EHS, working with employees and responsible supervisors, may use actual exposure monitoring, historical documentation, or an industrial hygiene calculation with sound industrial hygiene practice to conduct hazard assessments.

It is the responsibility of the department or supervisor to notify the Program Administrator if there is a risk of employee exposure to hazardous air contaminants. If the hazard evaluation indicates that respiratory protection is required, the responsible supervisor will select an appropriate type(s) of respirator and cartridge, with guidance as needed from EHS.

The respirator must be approved by EHS or the Respiratory Protection Administrator prior to use.

Each respirator issued must be NIOSH certified (or under a current FDA Emergency Use Authorization), equipped with the filters or cartridges selected for the specific hazard, and used in compliance with the conditions of its certification. Changes in workplace conditions that affect the employees' potential exposure to air contaminants will require re-assessment to determine if the respirator is still effective.

The responsible supervisor must complete the Respiratory Selection and Use Worksheet, providing a copy to the Respiratory Protection Program Administrator prior to employee training, and fit testing.

Specific Respirators and cartridges are selected for employees based on specific environments and conditions. If conditions change, the Program Administrator must approve any changes in respirator use. ***Do NOT share or exchange respirators or cartridges without approval***

Some of the factors considered in respirator selection include:

- Characteristics of the operation or process
- Hot operations: chemical reactions, welding, soldering, burning
- Liquid operations: Painting, degreasing, spraying, etching, cleaning, plating, chemical reactions

- Solid operations: measuring, weighing, loading, crushing, demolition, sanding, scraping
- Nature of the hazard
- Identification of air contaminants including physical (e.g. gas, vapor, particulate) and chemical properties
- Potential health effects, including the potential for eye irritation and skin absorption
- Oxygen deficiency or the likelihood of one developing
- A reasonable estimate of the concentration of the contaminant using either:
- Exposure monitoring where feasible and analysis techniques available to assess time-weighted average (TWA) or short-term exposures
- Historical data and sound industrial hygiene practice
- If several contaminants are present, assessment of the potential additive effects
- Comparison to Occupational Exposure Limits when they exist
- OSHA Permissible Exposure Limits (PEL): OSHA established upper exposure limits for 8-hour day
- ACGIH Threshold Limit Values (TLV): recommended upper exposure limits
- Short-term Exposure Limits (STEL): maximum concentration to which workers can be exposed for a period of time, generally 15 minutes
- Ceiling (C): concentrations that should not be exceeded for any part of the workday
- Substance–Specific Standards
- Consideration of the Respirator Design to specific scenarios
- Tight-fitting or loose-fitting respirators
- Disposable or Reusable
- Need for face or eye protection and use with eyeglasses
- Respirator Protection factor relative to maximum contaminant concentration
- Worker activity
- Duration of the job, physical exertion, temperature and humidity of the work area
- Requirements for ease of communication

8.3 Site Audit

Frequent observation of work areas by the responsible supervisor is vital in ensuring the continued effectiveness of the respiratory protection program and the protection of workers.

By observing workers under actual workplace conditions, it is possible to determine:

- Other protective equipment is interfering with respirator use
- The respirator interferes with hearing, vision, communication, or job performance or restricts movement
- Workers are experiencing discomfort, such as skin irritation or breakthrough of contaminants
- A change in work conditions might result in exposure to new contaminants
- A change or addition of new machinery might cause employees to work or breath harder
- The respirator causes undue discomfort
- Employees have confidence in the respirators effectiveness

Any condition that might affect the need for respiratory protection, for example, by diminishing

the effectiveness of the current program, or increasing the need for additional protective measures, or even negating the need for mandatory respirator use, will be noted and forwarded to the Program Administrator.

8.4 Respirators for Routine and Non-IDLH Atmospheres

Where there are non-IDLH (not Immediately Dangerous to Life or Health) atmospheres, appropriate respirators will be selected that are NIOSH certified and adequate to protect the health of the employee and ensure compliance with all other OSHA statutory and regulatory requirements, under routine and reasonably foreseeable emergencies.

Respiratory protection may also be provided for substances not regulated by OSHA, but may be of concern due to their toxicity (i.e. hazardous substances used in research, cytotoxic or other hazardous drugs).

Gas and Vapor Respirators

For protection against gases and vapors, employees will be provided an atmosphere- supplying respirator or an air-purifying respirator equipped with appropriate cartridges or canisters for the respiratory hazard.

Cartridges and canisters for air purifying respirators will have an End-of-Service-Life Indicator (ESLI) certified by NIOSH if available. Currently, there are few ESLI's commercially available. So far, NIOSH has approved only four cartridges or canisters (mercury vapor, carbon monoxide, ethylene oxide, and hydrogen sulfide).

Change-Out Schedules
For all other cartridges and canisters without ESLI's, change out schedules will be developed by the employee's responsible supervisor and must be approved by the Program Administrator.

- Cartridges change out schedules will be developed based on available data and information that can be relied upon to ensure that cartridges are changed before the end of their useful service life.

Break through, or the employees' ability to detect the odor or taste of an air contaminant cannot be used as an indicator for cartridge change out.

Why not just rely on the employee's ability to detect the odor of a substance when the gas or vapor breaks through?

- You may not rely on the detection of odor as protection against respiratory hazards posed
- by gases and vapors because:
- Most toxic substances do not have appropriate sensory (odor or irritant) warning properties.

Some chemicals have odors that are only detectable above their established exposure limits, meaning the employee will smell the chemical only after they have already been exposed to unsafe levels of the contaminant.

- Individuals' abilities to perceive odors may differ quite markedly from the population average due to a variety of innate, chronic or acute physiological conditions. For example, about 10% of the people have a markedly impaired sense of smell.
- There is no good screening mechanism to identify persons with sensory receptor problems.
- Continuing exposure to the odor usually results in diminishing or even loss of the smell sensation. This phenomenon is known as olfactory fatigue. When this happens, the worker unknowingly gets used to the contaminant breaking through the cartridge or canister and loses the ability to detect its smell.

Cartridges may be re-used if documentation of use and care demonstrates the cartridge or canister has not become saturated or my otherwise allow chemicals to break through. Factors to be considered in determining change schedules include:

- The contaminants the respirator is used for
- The concentration of contaminants in the work area
- Frequency of use (i.e. is the respirator used continuously or intermittently throughout the work shift).
- Temperature, humidity and air flow through the cartridge or canister.
- The employees' level of exertion affecting breathing rate
- The presence of other potentially interfering chemicals

Gas and vapor cartridges or canisters will be changed prior to each use for non-routine, highly infrequent, and emergency situations.

Additional information useful in developing change-out schedules is available from OSHA.

Particulate Respirators

For protection against particulates, employees will be provided an atmosphere supplying

respirator or air purifying equipped with an appropriate filter certified by NIOSH under 30 CFR part 11 as a high efficiency particulate air (HEPA) filter, or an air-purifying respirator equipped with a filter certified for particulates by NIOSH under 42 CFR part 84.

There are nine filter types certified under 42 CFR 84 for non-powered air purifying respirators. These are based on three levels of filter efficiency and three levels of resistance to degradation by oil. The three levels of filter efficiency are 95, 99, and 99.97 (referred to as 95, 99 and 100 respectfully). The three levels of oil resistance are N (non- oil resistant) R (oil resistant) and P (oil proof). The most common commercially available filters are "N-95" and "P-100". The P-100 is comparable to the HEPA filter used in powered air purifying respirators. (PAPR).

Note: To help you remember the filter series use the following guide:

N for **N**ot resistant to oil
R for **R**esistant to oil
P for oil **P**roof

Particulate Filters Levels			
	95	99	100
N	N-95	N-99	N-100
R	R-95	R-99	R-100
P	P-95	P-99	P-100

For respirators worn for protection from particulates, filters should be changed according to the manufacturer's recommendations, when the wearer detects an increase in breathing resistance (i.e. has difficulty breathing due to lack of air being drawn through the filter), they become damaged or otherwise unsuitable for use.

8.5 Respirators for IDLH atmospheres

IDLH means an atmosphere that poses an immediate threat to life, would cause irreversible health effects, or would impair an individual's ability to escape from a dangerous atmosphere.

Currently at NSU, there is NO Routine use of respirators in IDLH atmospheres.

If potentially hazardous contaminants cannot be determined, if the exposure level cannot be identified, or reasonably estimated or if no exposure limit or guidance is available and estimates of the toxicity cannot be made, the atmosphere should be considered IDLH, and respirator choice should be made accordingly.

EHS staff may be able to demonstrate, through information on the processes and reasonable assumptions about potential maximum concentrations that IDLH concentrations would not occur. In this case, respiratory protection selection will be based on this estimated exposure. All oxygen-deficient atmospheres (less than 19.5% O_2 by volume) are considered IDLH.

IDLH environments require the highest level of respiratory protection and reliability. Either of the following two types of respirators must be provided and worn in IDLH atmospheres:

- Full facepiece pressure-demand SCBA's that are certified by NIOSH for a minimum service life of 30 minutes
- Combination full-facepiece pressure-demand supplied-air respirator with auxiliary self-contained air supply

Under no circumstances may an air-purifying respirator be used in an IDLH atmosphere.

Where exposures cannot be identified or reasonably estimated, the atmosphere is considered **Immediately Dangerous to Life or Health (IDLH)** and respiratory protection is selected on that basis.

Respirators for Escape from IDLH atmospheres

Respirators must be NIOSH certified for escape from the atmosphere in which they will be used. For example, for formaldehyde exposures, escape respirators may be full facepiece with chin style with front or back mounted industrial canister approved against formaldehyde (29 CFR 1910.1048).

8.6 Respirators for Emergency Situations

Only a contracted HazMat response team is authorized to use respirators in an emergency situation that may require SCBA

An emergency is a sudden or unforeseen situation that requires immediate action. An emergency may be regarded as a remotely possible circumstance for which respirators are available as part of a contingency plan. Any department or responsible supervisor doing so, must ensure the establishment of a site specific written Respiratory Protection Plan designed by a specialist in emergency response and respiratory protection. The written plan must include site-specific procedures for the use, inspection, and maintenance of the respiratory equipment on hand. They are also responsible for ensuring these procedures are implemented and followed. Employee and supervisor training must be arranged by the department or responsible supervisor and be specific to the equipment on hand. Any employees designated to use respirators in the event of an emergency must participate in the NSU Respiratory Protection Program including medical evaluation, fit testing, and training.

Respirator Failure During Use

At other times, a situation may develop during routine respirator use that causes the respirator to fail. Whenever an employee suspects their respirator is no longer providing adequate protection they must immediately go to an area with fresh air and notify the responsible supervisor. The respirator or filters/cartridges can be checked for damage or functioning only after leaving the contaminated area.

Recognizing an Emergency:
Be alert for the following danger signals.
If any of these occur, get to fresh air immediately.

- Breathing becomes more difficult
- You detect any odor, taste or irritation that might indicate the contaminant is getting into your respirator
- The respirator becomes extremely uncomfortable
- You become ill, with symptoms such as dizziness, nausea, weakness, shortness of breath or coughing

Section 9: TYPES OF RESPIRATORS AND THEIR LIMITATIONS

The purpose of a respirator is to prevent the inhalation of harmful airborne substances or to an oxygen deficient atmosphere. Respirators provide protection either by removing contaminants from the air before it is inhaled, or by supplying an independent source of respirable (clean, oxygen sufficient) air. In addition, respirators are designed to be tight fitting or loose fitting.

9.1 Air Purifying Respirators

Air purifying respirators (APR's) use filters, canisters or cartridges to remove contaminants from the air. Elements that remove particles are called filters, while vapor and gas removing elements are called either chemical cartridge or canisters. Each cartridge or canister is designed for use to a specific gas, vapor or particulate hazard, with some offering protection against a combination of hazards. Filters or canisters are the functional part of the respirator and can generally be removed and replaced once their effective service life has expired. The exception is filtering facepiece respirators (dust masks), which cannot be cleaned, disinfected, or re-supplied with filter elements.

A**dvantages of Air Purifying Respirators:** Air purifying respirators are lighter, less restrictive and easier to use than atmosphere supplying respirators. They are also less expensive to purchase, use, maintain and replace.

Disadvantages of Air Purifying Respirators: While most of the respiratory protection needs at NSU are met by air purifying respirators, they cannot be used in any of the following situations.

- Oxygen deficient atmospheres (i.e. less than 19.5% oxygen)
- IDLH atmospheres
- When a substance specific standard mandates use of a different type of respirator
- When the contaminant, or concentration of the contaminant is unknown

9.2 Powered Air Purifying Respirators (PAPR)

Powered air purifying respirators function like other air purifying respirators in that they use

filters, canisters, or cartridges to remove contaminants from the air. Their difference lies in the belt-mounted, battery-operated blower that delivers a supply of purified air to the facepiece.

Advantages of PAPR's Since purified air is delivered to the facepiece of the user, the user does not have to draw air directly through the filters. Consequently, PAPR's tend to be more tolerated by the user than negative pressure APR's. The constant flow of fresh air can also make the user more comfortable in hot environments or when worn with protective clothing. Users who may not be medically qualified to use negative pressure respirators in some instances may use PAPR's when approved by a physician or other licensed health care professional (PLHCP).

Disadvantages of PAPR's Batteries must be fully charged before using the blower. Like tight fitting negative pressure APR's, models that rely on a good face seal cannot be used with beards or other conditions that might interfere with this seal. They are significantly more expensive to purchase and maintain. The general use limitations for air purifying respirators apply to PAPR's as well.

Atmosphere Supplying Respirators

Atmosphere supplying respirators provide breathing air from a source independent of the surrounding atmosphere.

Use of Atmosphere Supplying Respirators must be approved by EHS

There are three **Types of Atmosphere Supplying Respirators**:

- **Air-Line Respirators:** Also called supplied air respirator (SAR): The respirator is connected to a stationary source of compressed breathing air by a hose. The air is delivered in a sufficient volume and pressure to meet the user's breathing requirements.

- **Self-Contained Breathing Apparatus: (SCBA)** The air is supplied from a compressed gas cylinder, usually through a full-face mask, which is worn on the wear's back. (Not to be confused with what a SCUBA diver might use)

- **Combination Respirators**: Consist of a small auxiliary self-contained breathing air supply (SCBA) that is normally used in atmospheres that are or may be IDLH. The auxiliary unit can be used if the primary air supply fails.

Advantages of Atmosphere Supplying Respirators

- Atmosphere supplying are the only respirators that can be used in IDLH or oxygen deficient atmospheres.

Disadvantages of Air Atmosphere Supplying Respirators:

- Air-line respirators supply breathing air to the user by a hose connected to an air compressor or cylinders. The user is limited by the length of the hose and the dangers of damage to the hose.
- If breathing air from a fuel-generated compressor is used, the supply air must be

continuously monitored with audible alarm for carbon monoxide. Airline respirators may not be used in an IDLH atmosphere unless the worker also wears an emergency escape SCBA.

A SCBA is limited due the cylinders of compressed air that must be carried by the wearer. This makes SCBA's heavy and bulky, and the duration of air supply is limited, typically 30 minutes. These respirators are expensive to purchase and maintain.

All employees who use or may need to use an airline or SCBA must receive specialized training, conducted by person a credentialed and knowledgeable in the subject matter.

9.3 Types of Respirator Facepieces

The degree of protection offered by a respirator and its acceptability by workers varies according to facepiece style. Respirator facepieces may be tight fitting, half mask or full facepiece; or loose fitting hood or helmet.

Tight Fitting Respirators Tight fitting respirators include both half mask and full facepiece models that rely on the face-to-facepiece seal for adequate protection. They cannot be used when facial hair or other conditions interfere with this seal. Fit testing is required before an employee is assigned a respirator with tight fitting facepiece. Tight fitting respirators may be either negative pressure APR's or PAPR's.

Loose Fitting Respirators Loose fitting respirators are powered air purifying units that deliver purified air to a hood, helmet or other loose-fitting face covering. They may be used by employees with facial hair or other conditions that might prohibit a good face-to-facepiece seal. Fit testing is not required for loose fitting respirators.

Section 10: RESPIRATOR USE

Though the specific procedures for using respirators vary with the type of respirator being used, there are general requirements common for all respirator use. These requirements include respirator certification, prohibiting conditions that may result in facepiece seal leakage, preventing employees from removing respirators in hazardous environments and taking actions to ensure continued effective respirator operation throughout the work shift.

10.1 NIOSH Certification

All respirators used by NSU employees, for required or voluntary use, must be certified by the National Institute of Occupational Safety and Health (NIOSH) or under a current FDA Emergency Use Authorization. All respirators must be used in compliance with the conditions of its certification and according to the manufacture's specifications. Substitution of filters or parts from a different brand or type of respirator violates OSHA requirements, invalidates NIOSH approval and may cause the respirator to malfunction**.**

10.2 Facepiece Seal

Facepiece seals and valves are important in tight-fitting respirators. The proper function of these respirators depends on maintaining a complete seal to the wearer's face. If there is a leak in the face-to-facepiece seal or in a valve, then the respirator cannot protect against exposure to airborne contaminants. Consequently, facial hair or any other conditions that can interfere with the seal or the valve are prohibited when using tight- fitting respirators.

Conditions that can interfere with the seal or valve include:

- Facial Hair
- Facial Scars
- Jewelry or headgear that projects under the facepiece seal
- Missing dentures
- Corrective glasses or goggles or other PPE (i.e. face shields, protective clothing)

Facial Hair: Employees who have facial hair that comes between the sealing surface of the facepiece and the face or that interferes with valve function may not wear tight fitting respirators.

These restrictions apply only to tight-fitting respirators. Several alternatives such as loose-fitting hoods or helmets are commercially available to accommodate workers with facial hair, scars, or other conditions that interfere with the seal of the respirator facepiece to the face of the wearer. Similarly, workers wearing full-facepiece respirators who also need glasses (corrective lenses) either can wear contact lenses or the supervisor must provide the employee special corrective lenses (corrected to the employee's prescription) mounted inside the facepiece of the respirator. The responsible supervisor must insure that if an employee wears glasses, goggles or other personal protective equipment, it is worn in such a manner that does not interfere with the face seal.

User Seal Checks or Fit Check

The responsible supervisor must be sure that workers perform user seal checks each time they put on a tight-fitting respirator.

To conduct a seal check, the worker must follow either the procedures for a user seal check that are contained in the appendices of the Respiratory Protection Standard or an equally effective procedure that the respirator manufacturer recommends.

A user fit check is NOT a substitute for a fit test. Fit testing is a more rigorous procedure that is used to determine whether the respirator fits the face of the worker. The section on Fit Testing in this document contains a complete discussion of respirator fit testing and additional information may be found in the OSHA Standard.

How are fit checks conducted?

For a ***negative pressure check***, the worker:

Covers the respirator inlets (cartridges, canisters or filters) with the palms
Gently inhales
Holds breathe for 10 seconds
The facepiece should collapse on the workers face and remain collapsed

For a ***positive pressure check***, the worker:

Covers the respirator exhalation valve with the palms
Gently exhales into the facepiece
The facepiece should hold the positive pressure for a few seconds. During this time, the worker should not hear or feel the air leaking from the facepiece seal.

Continuing Respirator Effectiveness

The responsible supervisor must be aware of the conditions in their respective work areas where employees are using respirators. Employees must be allowed to leave the respirator use area to perform any activity that involves removing or adjusting the respirator facepiece, or if there is any indication that a respirator may not be fully effective. If there is any indication that respirators are not functioning properly, the Program Administrator must be notified. After consultation with the Program Administrator, the responsible supervisor must replace, repair, or discard the respirator as indicated, before allowing the employees to return to the respirator use area.

The responsible supervisor must routinely look for any changes that may affect the effectiveness of the respirator and its use. This includes changes in the work area, such as changes in tasks or processes that can result in changes in the respiratory hazard or the time of exposure, or workers proximity to the hazard. This includes changes in equipment or process that would cause the employee to exert more energy or breathe harder. By observing respirator use under actual workplace it can be determined if:

- Other protective equipment is interfering with respirator use (i.e. eyeglasses)
- Changes in working conditions may result in exposure to new contaminants or concentration of contaminants
- Whether workers are experiencing discomfort, such as skin irritation or breakthrough of contaminants through cartridges or canisters

If any of these conditions exist, the Program Administrator must be notified so that appropriate adjustments may be made. These may include providing a more protective respirator, or a different size or style of respirator, or altering work practices to reduce the stress on workers. This will help insure that all NSU employees continue to receive adequate respiratory protection.

From time-to-time workers must be allowed to leave the respirator use area and go to an area free of respiratory hazards.

Workers must be able to leave the respirator use area:

- If the worker needs to wash his or her face or the respirator facepiece to prevent eye or skin irritation associated with respirator use
- If the worker detects vapor or gas breakthrough (indicating cartridge is saturated)
- If the worker notices the facepiece is leaking

- If the respirator or its parts such as valves and straps are not working properly or need replacement

Section 11: RESPIRATOR INSPECTION, CLEANING, STORAGE AND MAINTENANCE

11.1 General Requirements

All respiratory equipment must be clean, sanitary and in good working order. Regular care and maintenance is important to ensure the equipment functions as designed and protects the user. The responsible supervisor will assure that all employees who wear respiratory protective equipment are provided with the means to clean, disinfect, store and maintain their equipment. Whenever possible, respirators are assigned to individual workers who are primarily responsible for their care and maintenance. The responsible supervisor must assure respirators are regularly cleaned and disinfected according to specified procedures outlined in the OSHA Standard or according to manufacturer specifications, provided they are equally as effective. Equivalent effectiveness simply means that the procedures must ensure the respirator is properly cleaned and disinfected in a manner that prevents damage to the respirator and does not cause harm to the user.

11.2 Respirator Inspection

The most important part of a respirator maintenance program is continual inspection of the devices. If properly performed, inspections will identify damaged or malfunctioning respirators before they can be used. To ensure that respirators remain in proper working condition, users will inspect the respirator immediately before use and during cleaning and disinfecting.

All respirator inspections must include a check of the following:

- Respirator function
- Tightness of the connections
- Conditions of the various parts including the
- Facepiece
- Valves
- Connecting tubes
- Canisters, filters or cartridges
- Pliability and signs of deterioration of elastomeric parts

Inspection of Respirators for Emergency Use:

The responsible supervisor must **certify in writing** that monthly inspection of **respirators maintained for emergency use** is performed. The certification must include:

- The date the inspection was performed
- The name of the person who performed the inspection
- The results of the inspection

- The required remedial action, if any
- The serial number of the respirator or other means of identifying the inspected respirator

In addition, **SCBA air cylinders** must be inspected, fully charged and recharged whenever the pressure falls to 90% of the manufacturer's recommended pressure level. Inspections must include determination that the regulator and warning devices must function properly.

11.3 Cleaning and Disinfecting

The frequency of cleaning and disinfecting or sanitizing respirators will depend in part, on whether respirators are shared by employees or issued for the employee's exclusive use. Worksite conditions also dictate the cleaning frequency (i.e. working in dirty environment will require the respirator to be cleaned more frequently. Respirators must be cleaned and disinfected at the following intervals:

- Individually assigned respirators will be cleaned by the employee as often as necessary to keep them in a clean and sanitary condition and at the end of each shift it is used
- Respirators that may be issued to more than one employee will be cleaned and disinfected before being worn by different individuals
- Respirators for emergency use will be cleaned after each use
- Respirators used for fit testing and training will be cleaned and disinfected between employees.

The responsible supervisor must ensure employees responsible for cleaning their own respirators, or emergency use respirators, are allowed time during work hours to perform this function. Written assignments for cleaning and inspecting respirators must be included in the site-specific respiratory protection plan. A checklist for inspection, cleaning and sanitizing respirators may be useful for employees assigned to cleaning their own respirator.

General cleaning procedures

Disassemble the respirator, removing any filters, canisters or cartridges
Wash the facepiece and associated parts in a mild detergent with warm water
Rinse in clean warm water
Sanitize and disinfect if detergent does not contain disinfecting agent (i.e. bleach or iodine solution or commercially available disinfectant)
Dry with clean cloth, or air dry
Re-assemble respirator
Test to assure the respirator and all components work properly

The clean, dry respirator facepiece should be reassembled and inspected in a clean area. Special emphasis should be given to inspecting the respirators for detergent or soap residue left by inadequate rinsing. This residue appears most often under the seat of the exhalation valve, and can cause valve leakage or sticking. Wiping this surface with a lint- free cloth after rinsing can eliminate the problem. The respirator should be thoroughly inspected, and all defects must be

corrected.

Appropriate cartridges, canisters or filters should be obtained and installed prior to use by the wearer, unless the approved change-out schedule indicates otherwise. The Department or supervisor is responsible for maintaining an on-hand inventory of spare parts and filters, cartridges or canisters that are approved for use by the Program Administrator.

The responsible supervisor must ensure that employees clean their respirators and that cleaning stations are available with the appropriate cleaning materials on-hand. EHS includes information on the cleaning and disinfection of respirators during fit test and training sessions.

Single use disposable respirators must not be cleaned. They must be discarded at the end of the work shift or more frequently if they become dirty or damaged.

11.4 Respirator Storage

When not in use, all respirator facepieces, cartridges, canisters and filters must be stored to protect them from damage and contamination. The responsible supervisor must provide employees with an appropriate area and supplies to store their respirators. Employees with individually assigned respirators are responsible for their storage.

Freshly cleaned and dry respirators should be placed in re-sealable plastic bags (e.g. draw-string or zip lock bags) in a clean, dry location away from direct sunlight. Respirators should be stored in a plastic or paper bag inside a rigid container. Respirators may be stored in their original cartons, but these may provide only minimal protection from mechanical damage.

Gas and vapor cartridges must be kept in a sealable plastic container or bag so they do not passively absorb gases or vapors from the storage area and thereby reduce their useful service life. Cartridges and particulate filters should also be protected from dust and dirt.

Non-routine or emergency use respirators should be stored in a readily accessible, well-marked, storage cabinet or similar container and all workers should be made aware of its location.

11.5 Respirator Maintenance and Repair

Respirators must be properly maintained to ensure they function properly and adequately protect employees. Wearing a poorly maintained or malfunctioning respirator may be more dangerous than not wearing a respirator at all by providing employees with a false sense of protection. The responsible supervisor must ensure respirators used in their respective areas and by their employees are adequately maintained. Employee's assigned individual respirators are responsible for the day-to-day maintenance of their respirators. Respirators that fail an inspection or otherwise is found defective must be removed from service, and discarded or repaired or adjusted in accordance with the following guidelines.

Repairs: If defects are found during any field inspection or use, minor repair or adjustments may be made on the spot. If the defect is major, the device should be removed from service until it can be repaired. Under no circumstance may an employee use a defective respirator.

Repairs and adjustments to respirators may only be made by people appropriately trained to perform such work. Only the respirator manufacturer's NIOSH Certified parts, designed for that respirator, may be used. No components may be replaced or repairs made beyond those recommended by the manufacturer.

Substituting parts from a different brand or type of respirator violates certification of the device.

Repairs or adjustments to regulators, reducing and admission valves, cylinders or alarms, on air-supplied respirators can only be conducted by the manufacturer or other person specifically trained by the manufacturer to perform these activities.

11.6 Breathing Air Quality

Compressed breathing air must meet at least the requirements for **Grade D** breathing air as described in ANSI/Compressed Gas Association Commodity Specifications for Air. Cylinders must be tested as prescribed in DOT regulations 49 CFR 173 and 174.

Responsible supervisors whose employees may use SCBA's or other supplied air equipment must be thoroughly familiar with the requirements pertaining to their equipment and are responsible for obtaining the appropriate maintenance and service.

11.7 Respirator Malfunction During Use

Whenever respirator malfunction is suspected (i.e. breakthrough, facepiece leakage, difficulty breathing) the employee must immediately leave a required-use work area and go to an uncontaminated area to inspect and perform needed repair or maintenance. Responsible supervisors must ensure that employees receive the needed parts to repair the respirator or are provided a new respirator before re-entering a required use-area.

Section 12: DOCUMENTATION AND RECORDKEEPING

Written information regarding the medical evaluations, medical opinions related to the worker's ability to wear a respirator, fit testing, inspection of emergency use respirators and the overall respiratory protection program must be maintained. The information is necessary to facilitate employee involvement, to assist in auditing the program, and provide a record for compliance determination.

12.1 Respiratory Protection Program

The responsible supervisor who has an employee included in the Respiratory Protection Program must have a copy along with the unit-specific respiratory protection plan The NSU Respiratory Protection Program document is available on-line at the EHS website.

Unit-Specific Respiratory Protection Plan

The completed Unit-specific Respiratory Protection Plan along with the NSU Program must be available to the employees at all times during their work shift.

12.2 Medical Evaluation

Records of the medical evaluations required by this program must be retained and made available in accordance with OSHA 29 CFR 1910.1020. These records will be maintained by the LHCP for the duration of the employee's employment with NSU plus 30 years.

12.3 Physician's Certification for Respirator Use

The only information the LHCP may provide to the Program Administrator and the employee's responsible supervisor is a written recommendation regarding the employee's ability to use a respirator.

Responsible supervisors must obtain copy of the Medical Certification for Respirator use and provide a copy to the Program Administrator prior to fit testing and training.

12.4 Fit Test/Training Records

A fit test/training record will be established of all qualitative and quantitative fit tests administered to an employee. EHS will send a copy of the fit test/training record with the employee, or through Campus Mail, to the employee's responsible supervisor. These records will be maintained for respirator users until the next fit test is administered. Fit Test records will include the following information:

- Name and identification number of the employee tested
- Type of fit test performed
- Specific make, model, style and size of respirator
- Date of test
- Pass/Fail results for qualitative fit tests or fit factor and a copy of the print-out for quantitative fit tests

Section 13: PROGRAM EVALUATION

Any written program must be reviewed periodically to evaluate its effectiveness. The Program Administrator is responsible for reviewing and updating this Respiratory Protection Program

periodically to assure the provisions of the current written program are being properly implemented and that it continues to be effective. The Program will be updated as needed to reflect current conditions and practices.

The Program Administrator or other authorized personnel will consult individual employees periodically and during fit testing and training sessions to assess the employee's views on the program effectiveness and to identify any problems. Factors to be assessed include:

- Respirator Fit (including the ability to use the respirator without interfering with effective workplace performance)
- Appropriate respirator selection for the hazards the employee encounters
- Proper respirator use under the workplace conditions the employee encounters
- Proper respirator maintenance

The responsible supervisor must ensure the on-going assessment of their work areas, and review and update their individual written Respiratory Protection Plan as necessary to ensure the plan is effectively implemented. Supervisors must notify EHS whenever workplace conditions may exist or change that may affect employee exposure to respiratory hazards.

Section 14: Unit-Specific Respiratory Protection Plan

The Unit-Specific Respiratory Protection Plan is the responsibility of the Supervisor. It must contain work site-specific procedures and hazard assessments addressing the hazards in the workplace and the respiratory protection selected. EHS is available to assist supervisors with this requirement and developed a template to use to create a Unit- Specific Respiratory Protection Plan. Individual departments, units or supervisors can use this document to design a Respiratory Protection Plan customized for their workplace by inserting the appropriate information as needed in the template.

Section 15: Supporting Documents and Forms

15.1 **The OSHA Respiratory Protection Standard 29 CFR 1910.134**

15.2 **Respirator Medical Evaluation Questionnaire**

15.3 **Respirator Selection and Use Worksheet**

15.4 **Information for Employees Using Respirators for Voluntary Use of Respirators**

15.5 **Cleaning and Sanitizing Your Respirator**

15.6 **OSHA Information for Cartridge Change-Out Schedule**