





## NORTHERN WAKE FIRE DEPARTMENT

### STANDARD OPERATING PROCEDURES

<b>TITLE:</b> Respiratory Protection Program	<b>SECTION/TOPIC:</b> PERSONNEL
<b>NUMBER:</b> 200-17	<b>ISSUE DATE:</b> 7/1/17
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#### I. PURPOSE

- A. The purpose of this Standard Operating Procedure is to establish a department wide program for using respiratory protection to protect the health and safety of personnel from respiratory hazards.
- B. This includes both SCBA respirators and disposable particulate respirators (N95 Masks).

#### II. SCOPE

- A. This Standard Operating Procedure applies to all members of the Northern Wake Fire Department (NWFD).
- B. It will be the responsibility of each member, regardless of rank or position, to ensure full implementation of this program.
- C. It will be the responsibility of each member to immediately report any unsafe act or condition to his/her supervisor.

#### III. REFERENCE

- A. 29 CFR 1910.134, "Respiratory Protection"
- B. NFPA 1981 (2013 ed.), "Standard on Open-Circuit Self-Contained Breathing Apparatus (SCBA) for Emergency Services.
- C. NFPA 1500 (2013 ed.) "Standard on Fire Department Occupational Safety and Health Program"
- D. ANSI / CGA G-7.1, "Commodity Specification for Air"

#### IV. DEFINITIONS

- A. Aerosol - Particles, solid or liquid, suspended in air.
- B. Airline Respirator - An atmosphere-supplying respirator in which the respirable gas is not designed to worn by the wearer.
- C. American Industrial Hygiene Association (AIHA) - Professional organization of industrial hygiene.
- D. Approved - Evaluated and listed as permissible by NIOSH/MSHA, for the respirator's intended use.
- E. Contaminant - A harmful, irritating, or nuisance airborne material.
- F. Disposable Respirator - A respirator for which maintenance is not intended and that is designed to be discarded after excessive resistance, sorbent exhaustion, physical damage, or end-of- use-service-life renders it unsuitable for its intended use.
- G. Dust - An aerosol consisting of mechanically produced solid particles derived from the breaking up of larger particles.
- H. Exposure Limit - The maximum allowable concentration of a contaminant in the air to which an individual may be exposed. These may be time-weighted averages, excursion limits, ceiling limits and short-term limits.
- I. Filter - A component used in respirators to remove solid or liquid aerosols from the inspired air.
- J. Fit Check - A test conducted by the wearer to determine if the respirator is properly sealed to the face.
- K. Fit Factor - A quantitative measure of the fit of a respirator to an individual.
- L. Fit Test - The use of challenge agent or negative pressure system to evaluate the fit of a respirator on an individual.
- M. Fume - Solid aerosols formed by the condensation of gas or vapor.
- N. Hazardous Atmosphere - An atmosphere that contains a contaminant(s) that are unknown, in excess of the exposure limit, or is oxygen deficient.
- O. **Respiratory Biological Hazardous Atmosphere - An atmosphere containing an airborne contamination/virus that could result in an elevated risk of an inhalation exposure to personnel.**
- P. High-Efficiency Filter - A filter that removes from the air 99.97 percent or more of the aerosols having a diameter of 0.3 micrometers. These items are often referred to as a HEPA (High-Efficiency Particulate Arresting) filter.

- Q. Immediately Dangerous to Life or Health (IDLH) - Any atmosphere that poses an immediate hazard to life or poses immediate irreversible debilitating effects on health.
- R. Permissible Exposure Limit (PEL) - Regulatory limits for contaminants that include:
  - 1. Eight-hour time weighted average (TWA)
  - 2. Short Term Exposure Limit (STEL)
  - 3. Ceiling (TLV-C)
  - 4. Excursion Limits.
- S. Qualified Person - Any member who has formal training and experience in air monitoring, exposure assessment, and workplace evaluations. (A Certified Industrial Hygienist or experienced Safety Professional will meet these requirements).
- T. Workplace Exposure Evaluation - Air monitoring for contaminants in the workplace that is performed by a qualified person (Safety Officer, Safety Engineer, Industrial Hygienist, etc.).

#### **IV. PROGRAM**

- A. This program applies to all members who, as a result of their job duties, are exposed to airborne contaminants or hazardous atmospheric environments where contaminants are unknown, or exceed the Permissible Exposure Limit (PEL), or are Immediately Dangerous to Life and Health (IDLH).
- B. NWFd will provide a place of employment/membership that is free from recognized hazards that may cause or are likely to cause death or serious physical harm to personnel or the public.
- C. Personnel will use respirators when engineering and/or administrative controls are unable to reduce air contaminants below their PEL or failed to eliminate IDLH conditions.
- E. When respiratory hazards exist that cannot be eliminated, safe work practices and additional member training related to Respiratory Protection will be implemented to reduce exposures below the PEL.
- F. Safe work practices and additional member training will be implemented to minimize those hazards in order to ensure the safety of personnel.

#### **V. PROCEDURE**

- A. This section provides applicable definitions, establishes general provisions, and identifies specific responsibilities required within NWFd's program on Respiratory Protection.
- B. General Provisions - This section details the provisions of this program with each provision discussed in a separate subsection.
- C. These provisions are:

1. Training
2. Written Respirator Program
3. Administration
4. Hazard Assessment
5. Respirator Selection
6. Record keeping
7. Purchasing
8. Medical
9. Fit Testing
10. Respirator Use
11. Respirator Maintenance

## **VI. TRAINING**

- A. Personnel who use or who are assigned respirators shall be trained in:
  1. Respirator limitations under various conditions
  2. Protection factors of the various types of respirators
  3. Proper use, maintenance, cleaning, disinfection, and storage of respirators
  4. Fit testing of the respirator face seal
- B. This training shall be provided upon initial job assignments requiring the use of respirators.
- C. Retraining shall be provided when job conditions change.
- D. Periodic refresher training shall be provided at the discretion of the officer.
- E. Fit testing of respirators shall be conducted at least annually.

## **VII. WRITTEN RESPIRATOR PROGRAM**

- A. This program provides an overview of the key components of respiratory protection.
- B. The specifics of respiratory protection are included in NWFDF's Respiratory Protection Program which is administered by the Division Chief of Risk Reduction.
- C. The key elements of this written respirator program are:
  1. Using standard operating procedures for respirator training, selection, use, maintenance, storage, procurement, and medical examinations;
  2. Selecting respirators based upon member exposure hazards;
  3. Training respirator users on the proper use and limitations of respirators;
  4. Assigning respirators to individual workers for their exclusive use;
  5. Cleaning and disinfecting respirators on a regular basis;
  6. Storing respirators in convenient, clean and sanitary locations;
  7. Inspecting respirators during routine cleaning for worn or damaged parts;
  8. Conducting surveillance of work area conditions and degrees of member exposure or stress;

9. Conducting regular inspections and evaluations to determine the continued effectiveness of the program;
10. Not assigning respirators until it has been determined that the member is physically able to perform the work and use the equipment.

#### **VIII. ADMINISTRATION**

- A. Administration of the respiratory program may be delegated to the NWFD's Health and Safety Officer(s).
- B. The Health and Safety Officers may assist in the implementation of the respirator program, selection of approved respirators, training, and record-keeping.

#### **IX. HAZARD ASSESSMENT**

- A. A qualified person shall assess potential and actual member exposures to airborne contaminants prior to the member using a respirator.
- B. Based on the assessment, the proper respirator shall be selected to control the exposure.
- C. Exposure assessments shall be based on air monitoring data, process information, work environment, historical data, and work practices relative to the type of contaminant.
- D. The PEL of an air contaminant does not have to be exceeded for a member to use a respirator.
- E. The member may request the use of a respirator because of a nuisance exposure or for personal reasons.
- F. These circumstances should be evaluated, and respirator use approved if the circumstances favor the use of a respirator.

#### **X. RESPIRATOR SELECTION**

- A. The department will provide, at no cost to the members, the appropriate type of SCBA and N-95 respirators.
- B. The types of respirators that may possibly be used in the NWFD are:
  1. Disposable or single use type,
  2. Negative pressure air purifying,
  3. Self-contained breathing apparatus (SCBA)
- C. The types of cartridges used on air purifying respirators are:
  1. Dust, particulate - welding, cutting, nuisance dust,
  2. HEPA - asbestos and radionuclides; lead; silica,
  3. Organic - solvent vapors,
  4. Acid gas - hydrogen sulfide, chlorine, sulfur dioxide

- D. Only Mine Safety Health Administration (MSHA) / National Institute of Occupational Safety and Health (NIOSH) approved SCBA type respirators shall be used by NWFD to protect personnel from airborne and respiratory contaminants.
- E. **N-95 disposable masks shall be made available on all apparatus.**
- F. The respirators shall be selected to provide the protection factor to achieve compliance with a PEL for the airborne contaminant(s) that are known.
- G. Surgical and Medical barrier mask do not apply to this program.

NOTE: Respiratory protection devices vary in design, protection capabilities, and application. The selection will be based on assessment of the expected or identified inhalation hazard and an understanding of the specific use and limitations of the equipment.

## **XI. RECORD KEEPING**

- A. Records shall be kept on each member who receives training and fit testing **for both SCBA and N-95 masks.**
- B. This record will include the name, NWFD I.D., location of respirator use, type of contaminant(s), respirator type, tester, medical evaluation, and results of fit testing. See Appendix A for the form.
- C. Records will also be maintained for the following:
  - 1. All work or repair orders
  - 2. Compressed air quality analysis
  - 3. Maintenance records
  - 4. Inventory records

## **XII. PURCHASING**

- A. Only approved type respirators shall be purchased and kept in stock along with an adequate supply of cartridges and replacement parts as needed.
- B. Respirator evaluation and approval forms shall be forwarded to the Fire Chief from the Division Chief of Risk Reduction.
- C. Unapproved respirators shall be removed from inventory control.

## **XIII. MEDICAL**

- A. All personnel who are candidates for a respirator shall receive a medical examination by a Professionally Licensed Health Care Provider (PLHCP) or a licensed physician.
- B. NWFD will follow the Wake County Medical Evaluation Program for respiratory evaluations and examinations.

- C. Under No Circumstances, will personnel wear a respirator until a medical exam is conducted and formal fit testing is completed.

#### XIV. FIT TESTING

- A. Fit testing will be conducted annually on all members **who are medically cleared to wear SCBA respirators.**
- B. **All departmental members will be fit-tested annually for N-95 disposable masks.**

#### XV. RESPIRATOR USE

##### A. SCBA Use

1. All departmental members who may encounter unknown varieties and quantities of toxic materials and combustion by-products during firefighting, hazardous material responses, and rescue situations will utilize SCBA.
2. Members who are designated as firefighting or rescue personnel will don SCBA while responding to the emergency or immediately upon arrival on the scene where a hazardous atmosphere may exist.
3. Members will wear the SCBA according to the manufacturer's requirements and the requirements of this operating guideline.
4. Members wearing SCBA will operate in teams of two or more.
  - a) Communication will be maintained within each team through visual, audible, physical, safety rope, electronic, or other means to stay in control.
  - b) Team members will stay close to one another to provide emergency assistance if needed.
  - c) Team members will enter and leave together.
  - d) During a SCBA operations, the Incident Commander (IC) will insure the following:
    - In cases of a fire beyond the incipient phase, a RIT team will be utilized for backup of personnel wearing SCBAs and functioning in the hazard area.
    - Maintaining a constant knowledge of the number and identity of personnel using SCBA.
    - Tracking the location and function of personnel using SCBA.
    - Tracking time of entry of the SCBA team(s).

- Ensuring additional, necessary personnel, with SCBA, will be on standby outside of the hazard area for emergency assistance.
  - Providing ample SCBA at the scene to ensure one unit for each member who may be exposed to respiratory hazards.
  - The SCBA will not be removed until the following conditions no longer exist or until the member is in a safe atmosphere:
    - Confirmed hazardous atmospheres.
    - Atmospheres suspected of being hazardous.
    - Atmospheres that may rapidly become hazardous or have a potential to become hazardous.
5. In incidents involving interior structural firefighting, all members will wear SCBA when working in the interior areas of the structure or structural areas when the following conditions exist:
- a) A fire beyond the incipient phase
  - b) Visible smoke is present
6. The member will continue to wear the SCBA following fire extinguishment, during the overhaul phase.
7. The member will only remove the SCBA when the IC deems the environment safe through visual smoke conditions present, established ventilation, atmospheric monitoring, or a combination of all the preceding.
8. SCBAs may be worn in all temperature and humidity extremes. The amount of times per day the SCBA will be worn is incident dependent.
9. In most cases, when a SCBA is donned with other protective fire equipment, heavy physical exertion will be expected due to a combination of equipment weight and the manually intensive duties performed by a firefighter.
10. Members who have facial hair such as a mustache, sideburns, or a beard that passes between the skin and the sealing surface of the respirator face piece will not be permitted to wear a SCBA or any other type of respirator.
11. Other items such as eyeglasses and protective hoods will not be allowed to extend between the sealing surface of the face piece and the face.
12. Personal Alert Safety Devices (PASS) will be activated when SCBA are used.
13. SCBAs will be worn at ALL vehicle fires by firefighter in the hazard zone.

14. In situations, other than listed above (woods fires, etc.), the decision to use SCBAs will be evaluated by the Incident Commander.

**B. N-95 Disposable Mask Use**

1. At any event in which an Airborne Biological Hazardous Atmosphere is suspected, departmental personnel shall utilize a N-95 disposable mask.
2. Personnel will wear the N-95 disposable mask according to the manufacturer's requirements and the requirements of this Standard Operating Guideline.

**C. Air-purifying Respirator (APR) or Powered Air-purifying Respirator (PAPR) Use**

1. APRs and PAPRs may be used in special situations.
2. The following criteria will be met before employees are permitted to use these types of respiratory protection:
  - a) Identification of the atmospheric contaminant(s) and their concentrations.
  - b) Concentrations shall not exceed the IDLH for the atmospheric contaminant present.
  - c) Oxygen concentrations will be between 19.5% and 23.5%. Any concentration less than or greater than the above specified limits will prohibit the use of the APR or PAPR.
  - d) Identification of the "change-out" schedule, ESLI (End of Service Life) indicator, or chart for the canister or cartridge used for end of service life information indicating the usable time of the canister or cartridge.

**D. Corrective Lenses**

1. Additional requirements for corrective lenses and/or contact lenses are:
  - a) Corrective lenses that have temple or straps will not be used when a full-face piece is worn.
  - b) Frames (lens kit) that can be used with face pieces should be worn.
  - c) Employees who wear contact lenses will not be permitted in contaminated atmospheres without full-face respiratory protection.
  - d) The fire department will provide, at no cost to the member, corrective lens inserts for the SCBA masks as necessary.

## **XVI. RESPIRATOR MAINTENANCE**

- A. Each member will be trained in the cleaning and disinfecting of the respirator, including their assigned facepiece.
- B. Members are required to clean and disinfect their respirators and facepieces after each use.
- C. Respirators will be cleaned and disinfected according to the specific procedures of the manufacturer's recommendations.
- D. Members will store all Respirators in their assigned locations (i.e. on proper vehicle).
- E. Members will inspect all Respirators at the beginning of each shift, after each use, and during cleaning.
- F. Thorough inspections will be conducted on Respirators monthly.
- G. Members will notify their supervisor of any needed Respirator repairs, including the replacement of defective parts, and a repair request will be initiated.
- H. The Respirators will be "flow tested" at least annually to insure proper operation.
- I. Respirator repairs or part replacement will be done only by qualified personnel.
- J. Breathing Air and Cylinder Requirements:
  - 1. All compressed breathing cylinders will be marked and will meet U.S. Department of Transportation requirements for interstate shipment as required by MSHA/NIOSH 49 CFR, Part 178.
  - 2. All breathing air will meet or exceed the requirements of Grade D breathing air as specified in the Compressed Gas Association Pamphlet G-7.1 - 1966.
  - 3. Enough reserve air supply will be provided by use of spare tanks or by on-scene refill capabilities or a combination of both.
  - 4. On emergency scenes, spare cylinders will be brought to a designated change-out area outside of the hazard area.
  - 5. Mobile air system operation and refilling will be set up in a designated location away from the hazardous area.
- K. N-95 masks will be of the single use type and should be disposed of as with any other suspected biological hazardous waste, i.e. red biohazard bins.

#### XIV. SPECIFIC RESPONSIBILITIES

##### A. Fire Chief

1. The Fire Chief is responsible for ensuring that adequate funds are available and budgeted for the purchase of respiratory protection equipment and related supplies.
2. The Fire Chief will ensure that all intended respirators and supplies purchases comply with current safety regulations and this safety policy and procedure.
3. The Fire Chief will ensure compliance with this program through an auditing process.

##### B. Program Administrator

1. The Division Chief of Risk Reduction will be the Respiratory Protection Program Administrator and will be responsible for implementing the Respiratory Protection Program, selecting approved respirators, ensuring proper training and record keeping.

##### C. Division Chief of Risk Reduction

1. Will be responsible for identifying the personnel affected by this program and ensuring that those personnel are provided a medical examination before being issued a respirator and being allowed to use a respirator in a hazardous atmosphere.
2. Use of respirators in non-hazardous environments is acceptable.
3. Will obtain and coordinate the required training for all affected personnel.
4. Will submit to the Fire Chief, any recommended updates and/or modifications to the Respiratory Protection Program and will submit a list of approved respirators as required.
5. Will coordinate the provision of training, expertise, and guidance to the qualified person on air monitoring, exposure control, and risk assessment strategies.
6. Will coordinate consultative and audit assistance to ensure effective implementation of this Respiratory Protection Program.

##### D. Division Chief of Logistics

1. Will maintain an adequate inventory of approved respirators, respirator facepieces and N-95 Masks for NWFD use.
2. Will be responsible for ensuring that an adequate supply of respirators, cartridges, and replacement parts are available.

E. Captains

1. Will not allow any member who has not received the required training or medical evaluation to perform any of the tasks or activities requiring respiratory protection.
2. Will ensure that respirators are properly worn and maintained and that an adequate supply of N-95 disposable masks are kept on each apparatus.
3. Will be responsible for communicating the appropriate respiratory equipment needs to Division Chief of Risk Reduction and Division Chief of Logistics.

F. Members

1. Will comply with all applicable guidelines contained in this Respiratory Protection Program.
2. Will properly maintain and clean the respirators that are assigned to them and properly store the respirator when not in use.

G. Qualified Persons

1. Members designated as "Qualified Persons" will be the Health and Safety Officers or any other member that is designated by the Respiratory Protection Program Administrator.
2. Will be responsible for conducting air monitoring when required and where there is suspicion of air contamination.
3. Will perform exposure assessments, workplace evaluation, and recommend exposure controls as needed.

H. Health and Safety Officers

1. Will provide prompt assistance to the Captains or others as needed, on any matter concerning the Respiratory Protection Program.
3. Will assist in developing or securing the required training of members regarding respiratory protection.
3. Will maintain the Respiratory Protection Program and provide assistance to the Division Chiefs, Captains, and other members as related to respirator fit testing, program review, and training.
4. Will maintain a quality assurance program for respiratory protection through field evaluations.

**APPENDIX A**  
**NWFD Respirator Documentation Form**

Respirator Manufacturer: **MSA**

Respirator Model: **FIREHAWK M7XT**

N-95 Mask Manufacturer: **3M**

Pre-Assessment Medical Questionnaire: **REQUIRED ANNUALLY - MAINTAINED BY SITEMED**

Medical Assessment: **REQUIRED ANNUALLY - SITEMED CLEARANCE FORM ON-FILE**

Pulmonary Function Test: **REQUIRED ANNUALLY - MAINTAINED BY SITEMED**

Respirator Fit Test: **REQUIRED ANNUALLY – FIT TEST FORM ON-FILE**

N-95 Mask Fit Test: **REQUIRED ANNUALLY - FIT TEST FORM ON-FILE**

**APPENDIX B**  
**NWFD Pre-Evaluation Medical Questionnaire**

The Pre-Evaluation Medical Questionnaire can be found in the NWFD Medical Evaluation Procedure.

**APPENDIX C**  
**Physician's Respirator Use Evaluation Form**

The Physician's Respiratory Use Evaluation Form can be found in the NWFD Medical Evaluation Procedure.

**APPENDIX D**  
**Examples of Atmospheres Where N-95 Masks are Warranted**

The following list is not limited or exhaustive but merely lists examples of environments where an N-95 mask should be worn:

Any environment where any of the following may be present:

**Mycobacterium Tuberculosis (TB)**  
**Influenza (Any strain)**  
**Sever Acute Respiratory Syndrome**  
**Measles**  
**2019 Novel Coronavirus**