

	OFFICE OF MARINE AND AVIATION OPERATIONS	PROCEDURE 1701-07	VERSION 3.0	
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	AUTHORIZED BY: /s/ RDML Anita L. Lopez, NOAA		ISM CODE REFERENCE Section 7	
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MARINE OPERATIONS RESPIRATORY PROTECTION PROGRAM

1. PURPOSE

- 1.1 This procedure establishes the minimum requirements for the Marine Operations (MO) Respiratory Protection Program.
 - 1.2 This revision satisfies triennial review and adds section 3 “Responsible Positions.”
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2. SCOPE

- 2.1 This procedure applies to all ships in the National Oceanic and Atmospheric Administration (NOAA) fleet.
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3. RESPONSIBLE POSITIONS

- 3.1 The following positions have action item responsibilities within this procedure:
 - Chief, Safety Management Branch
 - Ship Commanding Officer
 - Department Heads
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4. RESPONSIBILITIES AND PROCEDURES

4.1 Responsibilities

- 4.1.1 The ship Commanding Officer implements and maintains the respiratory protection requirements listed in this document.
- 4.1.2 Department heads ensure crew members are provided with and properly use required respiratory protection.
- 4.1.3 Each person aboard the ship must use the appropriate respiratory protection equipment when required.
- 4.1.4 The MO Safety Management Branch (SMB) staff reviews the Respiratory Protection Program every three (3) years, with consultation from employees participating in the program.

Respiratory hazards can occur in the form of harmful dusts, fogs, fumes, mists, gases, smoke, sprays, and vapors. The best means of protecting personnel from being exposed to respiratory hazards is through the use of accepted engineering control measures such as local exhaust ventilation. When these controls are not feasible, respiratory protection is required.

4.2 Respirator Usage Requirements

Some shipboard operations and various emergency situations generate airborne contaminants or oxygen deficient atmospheres. Before personnel are assigned duties that require the use of a respirator, the following requirements must be met in the sequence listed:

- Complete a respirator medical evaluation.
- Receive respirator medical clearance.
- Receive instruction of respirator types.
- Receive instruction in proper respirator selection.
- Complete a respirator qualitative fit test.
- Receive respirator user training.

An appropriate respirator is provided to each crew member to protect the user against a specific hazard when required. When respirator use is required in a specific shipboard space, all personnel entering or working in the space must use a respirator, regardless of the duration of time spent in the space.

4.3 Respirator Medical Evaluation

Respirator users must be physically able to perform work while wearing a respirator.

- The department head completes NOAA Form (NF) 57-17-01 - *Respirator Medical Evaluation Employer Provided Information Form*, when an employee is assigned duties that require the use of a respirator. This form indicates to the physician, or other licensed health care professional (PLHCP) who will provide the medical evaluation, the duties and parameters associated with respirator use.
- The department head provides a completed NF 57-17-01 and a blank NF 57-17-02 - *Respirator Medical Evaluation Questionnaire* to the employee.
- The employee completes the NF 57-17-02 confidentially and sends or hands both forms directly to the PLHCP for review. PLHCP review of the NF 57-17-02 must be completed within one month of the employee's signature date. The employee may have an initial medical examination that has the same information as the questionnaire. Medical evaluations may be discontinued when the employee is no longer required to use a respirator.

4.4 Respirator Medical Clearance

Based on the review of the employer provided information and the questionnaire, the PLHCP completes Part B, Section II of the NF 57-17-02. A follow-up medical examination is required for any employee who gives a positive response to any question among 1-8 in Part A, Section II on the NF 57-17-02. If needed, the follow-up medical examination is provided to the employee. The PLHCP determines the detail and composition of the follow-up medical examination. Other circumstances that require medical examinations may include, but are not limited to:

- An employee reports medical signs or symptoms related to their ability to use a respirator;
- A licensed health care provider, program administrator, or supervisor recommends reevaluation;
- Information from the respirator program, including observations made during fit testing and program evaluation, indicates a need for an examination; or
- Changes occur in workplace conditions that may substantially increase the physiological burden on the employee.

4.5 Respirator Types

The two basic types of respirators are air purifying respirators and atmosphere-supplying respirators. .

- 4.5.1 Air purifying respirators have filters or cartridges to remove contaminants. There are three types of air purifying respirators.
- A. Particulate removing respirators, which use mechanical filters or sorbent chemical cartridges to filter out dust fibers and mists;
 - B. Gas and vapor removing respirators, which remove specific contaminants or combinations of contaminants. Gas and vapor removing respirators must only be used for the specific contaminant or combination per the manufacturer's instruction; and
 - C. Combination air purifying respirators, which remove particulates, gases, and vapors.

Air purifying respirators are not used for operations in oxygen deficient atmospheres or conditions are immediately dangerous to life and health (IDLH).

- 4.5.2 Atmosphere-supplying respirators provide a source of clean air directly to the user through a hose or self-contained unit. Atmosphere-supplying respirators are only used by NOAA ships' crews for fire suppression and emergency rescue. Compressed breathing air must meet the requirements for Grade D breathing air described in the American National Standards Institute (ANSI)/Compressed Gas Association Commodity for Air (G-7.1) and in 29 CFR 1910.134(i).
- A. Self-contained breathing apparatus (SCBA) respirators use pressure demand, continuous positive pressure within the face piece, to prevent leakage from the environment.

Self-contained breathing apparatus (SCBA) use is reserved for fire suppression and emergency rescue in highly contaminated or oxygen deficient atmospheres. SCBAs are not used for routine work. Refer to Office of Marine and Aviation Operations (OMAO) Procedure 1701-21 - *Self-Contained Breathing Apparatus*, for more information.

- B. Supplied-air respirators (SARs) use a compressor located in a source of clean air and a hose to provide air to the user. SARs are not approved for use aboard NOAA ships by NOAA employees.

- 4.5.3 Mechanical filter respirators, such as dust masks made of cellulose or wool are not considered air purifying respirators. Mechanical filter respirators must not be used when a work area has been declared a hazardous atmosphere and respirator use is required.

4.6 **Respirator Selection**

Each person required to use a respirator selects a respirator that protects against the type of hazard to be encountered and provides the most acceptable fit. Only respirators approved by the National Institute for Occupational Safety and Health (NIOSH) or Mine Safety and Health Administration (MSHA) are used. The respirator selected must be approved by the manufacturer for use with the hazard to be encountered. If you are working with chemicals, must review the Safety Data Sheet (SDS) to determine if and what type of respirator to use while working with a particular product. SMB personnel complete a job hazard assessment for conditions that have not been previously encountered or documented which require respirator selection. Table A. provides a listing of some common exposures that require the use of a respirator and the respirator to be used.

Table A.

Respirator Selection for Hazardous Atmospheres	
Hazard or Exposure	Type of Respirator Required
Acidic Gases and Organic Vapors ¹	Air-purifying: Chemical Cartridge
Paint Spray and Vapors	Air-purifying: Chemical Cartridge and Refilter
Dusts, Mists, and Fumes (with TWA ≥ 0.05 mg/m ³)	Air-purifying: High Efficiency Filter Cartridge
Welding and Metal Fumes	Air-purifying: High Efficiency Filter Cartridge
Radionuclides, Bacteria, and Viruses	Air-purifying: High Efficiency Filter Cartridge
Asbestos Removal (emergency only)	Air-purifying: High Efficiency Filter Cartridge
Emergency Response; Fire Suppression/Smoke, IDLH Conditions, and Oxygen Deficient Atmospheres	Atmosphere-supplying: Pressure-demand SCBA (National Fire Protection Association (NFPA) approved)
Hazardous Operations ² (e.g., welding, painting, or sandblasting in confined spaces)	Atmosphere-supplying: SAR

¹ Vapor cartridges are only used when the available cartridge is specific for the hazard present. Some gases may not be suitable for cartridge respirators, regardless of the concentration. Refer to cartridge and SDS for specific applicability.

² Hazardous operations are only conducted by licensed contractors. NOAA personnel do not participate in activities that require supplied-air respirators.

3.7 Respirator Qualitative Fit Test

The employee completes a respirator qualitative fit test after medical clearance. The fit test is repeated annually or whenever physical changes to the user affect the fit of the respirator. All respirator fit tests are recorded on NF 57-17-03 - *Respirator Qualitative Fit Test Record*. A designated trained representative aboard the ship or a representative of MO Health Services completes the fit test following the Occupational Health and Safety Administration (OSHA) Fit Test Procedures. A sufficient number of models and sizes must be made available for each type of respirator tested or used to allow for an acceptable and proper fit. A fit test should not be confused with a seal check, which is a self evaluation conducted by the respirator user to determine if the respirator is properly sealed to the face each time the respirator is donned. Fit testing of tight-fitting atmosphere-supplying respirators is accomplished by performing qualitative fit testing in the negative pressure mode, regardless of the mode of operation that is used for respiratory protection (e.g., positive pressure SCBAs).

OSHA Fit Test Procedures are listed in 29 CFR 1910.134, Appendix A, Part I.A.

- Conduct the fit test only if the area of the face covered by the seal of the respirator is smooth and allows for a tight seal.
- Conduct the fit test while the test subject is wearing any applicable safety equipment that may be worn during actual respirator use that could interfere with the respirator fit.
- Do not conduct the fit test if there is any hair growth (e.g., stubble, beard, mustache or sideburns) that crosses the respirator sealing surface and prevents a complete seal of the respirator. Facial hair cannot lie between the surface of the face and the sealing surface of the respirator mask. In such cases, the hair will need to be shortened or shaved to allow a complete seal of the respirator. Respirators that do not rely on a tight face seal, such as hoods or helmets, may be used by bearded personnel.
- Do not conduct the fit test if any skin condition (e.g., folliculitis or rash), dental condition, or vision correction appliance (e.g., glasses) prevents a complete seal of the respirator.
- Do not conduct the fit test if any type of apparel interferes with an acceptable fit of the respirator.
- Stop the fit test if the test subject finds the respirator fit unacceptable. The test subject is allowed to select another respirator and then be retested.
- Stop the fit test if the test subject exhibits difficulty in breathing during the fit test.

If the test administrator observes the test subject having difficulty in breathing, the medical clearance is rescinded and the test subject referred to MO Health Services for medical reevaluation.

3.8 Respirator User Training

Personnel required to use a respirator must receive training before initial use and annually thereafter. Training is recorded on NF 57-17-04 - *Respirator User Training Record*. The training includes:

- Explanation of the two types of respirators and associated limitations
- Implications of respirator non-use or improper use
- Engineering controls and the additional need for respiratory protection
- The nature and evaluation of hazards
- Proper selection of the correct type of respirator for the expected hazard
- Proper methods to don, adjust, and remove a respirator
- Proper methods to check the fit and face seal of a respirator
- Proper methods to operate or use a respirator
- Proper methods to maintain a respirator, which includes inspection, cleaning, and storage
- Proper response to emergency situations that may arise while wearing a respirator

Respirator training is provided with practical demonstrations and a video presentation of *Respiratory Protection, Another World* by an instructor approved by SMB. Upon completion of the requirements listed above, shipboard personnel may be assigned duties that require the use of a respirator. Only the specific make and model of the respirator for which a satisfactory fit test was obtained may be used. Before using a respirator in a work situation, the user must be given the opportunity to handle, wear, adjust, and become familiar with the respirator.

3.9 Respirator Operations and Emergency Procedures

Respiratory protection is mandatory whenever personnel may be exposed to harmful air contaminants and/or oxygen deficient atmospheres regardless of the duration of time spent in the area. The respirator user operates the respirator per the instructions provided by the manufacturer and training. If any condition exists, other than normal operation of the respirator, the user must immediately leave the contaminated area, proceed to an area of fresh air, remove the respirator, and report the problem to the department head. Consult medical personnel if exposure to a contaminate is suspected. Re-entry into the contaminated atmosphere may take place only after the cause of the malfunction is determined and corrected. Replace filters, cartridges, or canisters as needed, perform a seal check, and ensure the contaminate concentration has not exceeded the design specifications of the respirator.

- 3.9.1 User Protection – Air purifying respirator users are monitored during respirator operations. Atmosphere-supplying respirator users are accompanied by at least one other atmosphere-supplying respirator user upon entry into a dangerous atmosphere.
- 3.9.2 Breathing Difficulty – Respirator users may demonstrate or experience breathing difficulty during operations. If this occurs, the other respirator user assists the user with difficulty breathing to a source of fresh air.
- 3.9.3 User Apprehensiveness – Respirator users may become apprehensive while wearing a respirator. If this occurs, the other respirator user assists the apprehensive user to a source of fresh air.
- 3.9.4 Face Seal
 - Tight Seal Capability – When assigned duties requiring the use of a respirator, users must maintain the capability of a tight seal at all times by keeping a smooth face along the respirator sealing surface (e.g., crewmembers assigned to a fire team as a hoseman, nozzleman, or alternate must keep a smooth face when the ship is at sea).
 - Seal Check – Respirator users must perform a seal check before each use, immediately after donning and regularly throughout the period of respirator use.

- Compromised Face Seal – The face seal may be compromised at any time during respirator operations and allow contamination into the facepiece. The face seal is considered compromised if a respirator user detects any odor, taste, or irritation to the eyes, nose, mouth, throat, lungs or skin.

3.9.5 Respirator Filters and Cartridges

- Clogged Filters – Particulate air purifying respirator filters may clog during operations and cause difficulty in breathing. If exposure to contamination did not occur, the filter(s) may be replaced and the operations may resume.
- Filter Replacement Stock – Respirator filters and cartridges are not interchangeable between all models. An adequate supply of replacement filters and cartridges must be maintained on board the ship to meet operational requirements.

3.9.6 Respirator Alarms (SCBA only) – A low pressure alarm will sound on the harness of the SCBA when the pressure in the air tank falls below 500 psi. Respirator users must immediately begin an egress from the dangerous atmosphere upon the sounding of any team member's alarm.

3.9.7 Personnel that have or may have been exposed to a dangerous contaminant level or exhibit apprehensiveness about reentering the space are restricted from respirator use until a medical assessment and an equipment inspection is completed.

3.10 Respirator Maintenance

Individual users are responsible for the inspection, cleaning, and storage of shipboard respirators.

3.10.1 Respirator Inspection Requirements

- Inspect respirators before and after each use (during cleaning) or monthly.
- Inspect all respirators maintained for use in emergency situations at least monthly and per the manufacturer's recommendations. Record monthly inspection results on NF 57-17-05 - *Respirator Inspection Record*, retain results in the ship's drill and inspection log, and make them available to fleet inspectors upon request.
- Respirator Inspections include the following checks:
 - Respirator function
 - Tightness of connections
 - Condition of each respirator part
 - Signs of deterioration
- Remove from service and discard or repair respirators that fail an inspection or are otherwise found to be defective per the manufacturer's instructions by trained persons using NIOSH/MSHA approved parts.

3.10.2 Respirators Cleaning Requirements

- Clean respirators with warm soapy water.
- Disinfect respirators with a 50 ppm bleach solution (2ml bleach to 1 liter of water).
- Thoroughly rinse and air dry respirators before storage.
- Clean respirators after each day's use or more frequently if necessary.
- Clean and disinfect respirators maintained for emergency use after each use.
- Clean and disinfect respirators used in fit testing and training after each use.

3.10.3 Respirator Storage Requirements

- Store respirators in a convenient location protected from contaminants, dust, excessive moisture, sunlight, and extreme temperatures.

- Store respirators used exclusively for emergency purposes in an easily accessible and well marked location.

4 . RECORDS AND REPORTS

NF 57-17-01, Respirator Medical Evaluation Employer Provided Information
 NF 57-17-02, Respirator Medical Evaluation Questionnaire
 NF 57-17-03, Respirator Qualitative Fit Test Record
 NF 57-17-04, Respirator User Training Record
 NF 57-17-05, Respirator Inspection Record

Shipboard Records – Each ship maintains a current copy of the NF 57-17-01, NF 57-17-02 and NF 57-17-03 for each respirator user. Each ship maintains a three (3) year record of the NF 57-17-04 and NF 57-17-05 to document training and maintenance.

Shoreside Records – MO Health Services maintains, as a permanent part of the employee's medical folder, a copy of the NF 57-17-01 and the NF 57-17-02 for the length of employment, plus thirty (30) years.

5. REFERENCES

Code of Federal Regulations, 29 CFR 1910.134, Respiratory Protection
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=12716

U.S. Department of Commerce, Occupational Health and Safety Manual
http://hr.commerce.gov/s/groups/public/@doc/@cfoasa/@ohrm/documents/content/dev01_000275.pdf

ANSI / Compressed Gas Association Commodity Specification for Air, G-7.1-1989

DuPont Sustainable Solutions; *Respiratory Protection, Another World*

6. DEFINITIONS

Immediately Dangerous to Life or Health	An atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual's ability to escape from a dangerous atmosphere
Oxygen deficient atmosphere	An atmosphere containing less than 19.5 percent oxygen (O ₂) by volume at sea level
Self-Contained Breathing Apparatus	An atmosphere-supplying respirator in which the breathing air source is designed to be carried by the user
Supplied Air Respirator	An atmosphere-supplying respirator in which the breathing air is provided through a hose directly connected to the facepiece from a compressor located in a source of fresh air.

7. NOTES

Effect on other documents: Supersedes all previous versions of OMAO Procedure 1701-07 - Respiratory Protection.

DOCUMENT HISTORY		
Version	Description of Change	Effective Date
3.0	Triennial review and add Responsible Positions section	7/13/2017
2.0	Reorganizes and reformats information, clarifies tight seal requirements, and establishes five associated forms.	9/25/2012
1.0	Initial Document.	4/25/2011