

DEPARTMENT OF THE ARMY
SAVANNAH DISTRICT, CORPS OF ENGINEERS
PO BOX 889
SAVANNAH, GA 31402-0889

DISTRICT REGULATION
NO. 385-1-9

9 Oct 01

Safety and Occupational Health Office
RESPIRATORY PROTECTION PROGRAM

1. Purpose. To prescribe the policy, responsibilities, and procedures for the selection, use, care, and maintenance of respirators.
2. Applicability. This regulation applies to all Savannah District team members required to wear respirators in the performance of their duties. It does not apply to team members whose only use of respirators involves the voluntary use of filtering face pieces (dust masks) to reduce their exposures to nuisance dusts and other non-hazardous levels of particulates because the Occupational Safety and Health Administration (OSHA) does not require a written program for dust masks used in this manner. It does not apply to emergency escape type respirators.
3. References. See Appendix A.
4. Discussion. Certain work processes produce airborne contaminants in sufficient quantity that a health hazard is created (i.e. based upon IH monitoring the Action Level is exceeded, exposures are unknown and no history exists, new process requires documentation as to exposure levels and level of respiratory protection required). Certain airborne contaminants have specific respiratory protection requirements (i.e. asbestos, methylene chloride, welding fume, spray painting). Certain events may trigger the use of respiratory protection or an upgrade in respiratory protection (i.e. core sampling at a hazardous waste site/investigation). Appropriate use and selection of respiratory protection is required to protect personnel from potentially hazardous levels of airborne contaminants.
5. Policy. Whenever its team members are potentially exposed to harmful levels of airborne contaminants in the workplace, Savannah District's policy is to provide them engineering controls (i.e., enclosures, mechanical ventilation, and substitution of less toxic materials) in order to reduce their exposures to occupationally acceptable levels. Whenever engineering controls are

inadequate, a Respiratory Protection Program (RPP) shall be used to protect team members from respiratory hazards. Each Respiratory Protection Program Coordinator (RPPC) for the Hazardous Toxic Waste (HTW) or at power plant projects shall have a written program to address the following program elements.

a. Procedures For Selecting Respiratory Protection: Personnel shall select respiratory protection from a decision logic tree, selection chart provided by their program coordinator or material safety data sheet recommendations. Respiratory protection must bear a National Institute for Occupational Safety and Health (NIOSH) approval and must be appropriate for the task.

b. Medical Evaluations: Personnel shall have an annual medical evaluation consisting of at least a medical questionnaire such as that found in Appendix C of the OSHA standard. Use of screening tools such as pulmonary function testing is not mandatory. The licensed healthcare provider must provide a written determination of the employee's fitness to wear respiratory protection and any limitations on DA Form 4700 overprint with copy forwarded to Safety Office (SO).

c. Fit-Testing: Personnel must be fit-tested annually using a protocol (qualitative or quantitative) appropriate for the type of respirator and filter/cartridge the employee predominately will use. Records of fit-test must be kept on ENG Form 4937 and a copy forwarded to the SO.

d. Task Specific Standard Operating Procedures (SOP): The RPPC shall develop SOPs specific to their work operations with specific respirator and/or filter/cartridge requirements. For tasks or areas where work is commonly conducted in respiratory protection the SOP should be posted. SOPs shall be forwarded to SO for review.

e. Maintenance and Use SOP: RPPCs shall develop SOPs specific to their location and frequency of use to include cleaning, disinfecting, storing, inspection and maintenance of respirators. The SOP shall also contain a cartridge change out schedule specific to location and type/manufacturer of respirators at that location.

f. Procurement of Grade D Breathing Air: Where supplied air respirators or self-contained breathing apparatus is used the RPPC must assure that the breathing air source meets Grade D quality standards. Air compressors providing air source must have a carbon monoxide and high-temperature alarm and must be tested at least semi-annually.

g. Respiratory protection training: The RPPC shall provide respirator users annual training to include respiratory hazards unique to their location, limitations of respiratory protection, donning and maintenance of their respirators. This training must be documented.

h. Program evaluation: The RPPC and the District Industrial Hygienist shall evaluate local subordinate programs (HTRW, power plant projects) annually.

6. Glossary. A glossary of terms used in this regulation is provided in Appendix B.

7. Responsibilities.

a. The District Safety Office (SO) will:

(1) Provide program oversight and technical assistance to ensure compliance with the RPP.

(2) Evaluate the RPP at least annually to determine if its requirements are being fulfilled and if any changes to the program are necessary.

(3) Conduct annual industrial hygiene surveys of hazardous workplaces, identify job positions that require respirators, and recommend appropriate respiratory protective equipment.

(4) Upon request, provide for or coordinate industrial hygiene investigations to determine team members' exposure levels.

(5) Serve as the technical approving authority for all requests for medical clearances for respirator use and other medical surveillance requests.

b. The Geotechnical & HTRW Branch and each Area/Resident/Project Office or other activity requiring a RPP will:

(1) Appoint a RPPC in writing.

(2) Allocate the resources to ensure that the RPPC and respirator users are properly trained, that an adequate supply of respiratory protective equipment is available, and that other RPP requirements are met.

(3) Submit its RPP SOP to the SO for review initially and each time a change is made to that document.

c. The RPP Coordinators will:

- (1) Serve as the administrative point of contact for the RPP.
- (2) Estimate and request the purchase of the required types and numbers of respirators and other equipment needed for the RPP.
- (3) Establish an inventory of respiratory protective equipment and issue respirators and replacement parts.
- (4) Provide respiratory protection training, including fit-testing of respirators, to team members requiring respirators and document this training on ENG Form 4937.
- (5) Maintain records of medical clearances for respirator use, fit-tests, respirator training, dates of issuance and return of respirators, inspection results, and any air monitoring data associated with respirator use.
- (6) Request technical advice from SO for respirator requirements for unusual conditions or activities where respiratory protection has not yet been specified but may be required.
- (7) Request assistance from the SO in conducting air monitoring to determine if team members are exposed to contaminant levels in excess of threshold limit values and permissible exposure limits.
- (8) Monitor the inspections, cleaning, sanitizing, maintenance, storage, and use of respiratory protective equipment at least annually and document their findings and related corrective actions.
- (9) Revise their organization's respirator SOP each time a change is necessary and submit their revised SOP thru channels to SO for technical review and acceptance. The SOP will be work-site specific describing the task and the specific respirator required.

d. Supervisors of respirator users will:

- (1) Ensure that all team members under their control comply with all of the requirements of the RPP.
- (2) Ensure that only qualified, adequately trained, and medically cleared team members are assigned tasks requiring respirators.

(3) Enforce the proper use, storage, and maintenance of respirators and ensure their team members document their respirator inspections before and after each time they are used.

(4) Ensure engineering controls are used, whenever possible, to reduce or eliminate exposures to hazardous levels of airborne contaminants.

(5) Coordinate with their RPPC when preparing an Activity Hazard Analysis (AHA) involving respiratory hazards and thereby ensure that the AHA contains the appropriate type of respiratory protective equipment and, when applicable, a change-out schedule for filters, cartridges, and other respirator parts.

e. All team members shall:

(1) Use, clean, disinfect, and maintain respirators as required by this regulation and their respirator SOP.

(2) Notify supervisors about any respiratory disorders and any problems with respirators.

(3) Report for training and medical surveillance examinations.

8. Procedures.

a. Respirator Selection.

(1) Team members will only use respiratory protective equipment certified by the NIOSH for the hazards to which they are exposed.

(2) Each RPPC will use the most current NIOSH respirator standards, information from respirator manufacturers, and guidance from SO to select new respirators. Information for selecting respirators is in Appendix B.

b. Fit-Testing.

(1) The RPPC will ensure that all team members who would be required to wear a negative pressure respirator are fit-tested for the tight-fitting respirators assigned to them prior to initial use and at least every 12 months thereafter. Team members will also have their respirators fit-tested anytime they experience facial structural changes due to surgery, weight changes of 15 pounds or more, new dentures, etc.

(2) All respirator fit-testing will comply with Appendix A, 29 CFR 1910.134, and be annotated on ENG Form 4937.

(3) Team members unable to pass a fit-test shall not be permitted to wear a tight-fitting respirator. The supervisor may offer them available loose-fitting respirators, such as Powered Air-Purifying Respirators (PAPRs) with loose-fitting hoods or helmets, if these respirators are protective against the respiratory hazards of concern.

c. Maintenance, Care, Storage, and Use.

(1) Routinely used respirators will be assigned to individual team members for their exclusive use.

(2) Team members will inspect their respirators for defects before and after each use to ensure they are in good working order. Inspections shall include, as applicable, a check of the face piece, valves, connecting tube, canister, cartridge, and tightness of the connections. All rubber and elastic parts shall be inspected for pliability and signs of deterioration.

(3) Every time team members don a tight-fitting respirator, they shall conduct a user seal check consisting of the positive and negative pressure checks described in 29 CFR 1910.134, or the respirator manufacturer's recommended user seal check method.

(4) If a spectacle, goggle, face shield, or welding helmet must be worn with a face piece, it shall be worn so as not to adversely affect the seal of the face piece. The cost of such appliances will be borne by the section.

(5) Respirators shall be regularly cleaned and disinfected. Those issued for the exclusive use of one worker shall be cleaned after each day's use. Emergency-use respirators and those used by more than one person shall be thoroughly cleaned and disinfected after each use. Respirators shall be washed with a soft brush in warm detergent water, rinsed thoroughly in clean water, rinsed in a disinfectant solution, rinsed again in clean water to prevent skin irritation, and air-dried in a clean place. Disinfectant solutions shall be compatible with respirators, as recommended by their manufacturers.

(6) Respirators not routinely used shall be centrally stored in sanitary locations to protect them against dust, sunlight, heat, extreme cold, excessive moisture, and damaging chemicals. Non-emergency respirators shall be stored in sealed plastic bags. Respirators shall not be stored in toolboxes and lockers unless they are in carrying cases or other protective containers.

(7) When respirators are stored, their face pieces and exhalation valves must be in an upright or resting position. If stored in a bent, folded, or abnormal position, these items can warp or become deformed.

(8) Defective respirators shall be tagged, removed from service, and returned to the RPPC.

(9) Each SCBA, in regular use, shall be inspected at least monthly. Their air cylinders shall be fully charged according to the manufacturer's instructions, and their regulators and warning devices shall be checked to ensure they properly function. Emergency-use SCBAs will be readily accessible and stored in clearly marked compartments built for such purposes. Air cylinders will bear documentation of hydrostatic testing.

(10) Breathing air compressors shall be equipped with necessary safety and standby devices. If an oil-lubricated compressor is used, it shall have a high temperature, equipment failure and carbon monoxide alarm, a particulate filter, an activated charcoal canister for organic vapors and an oil moisture separator. All airline couplings must be incompatible with outlets for other gas systems. On all gasoline and diesel compressors, the exhaust and inlet ducts shall be separated by a minimum of 10 feet.

(11) If airline respirators are used, the supplied air source shall not be able to be expended and the hose length cannot exceed 300 feet from the source to the user.

(12) Prior to use, supervisors shall ensure that breathing air for respirators supplied from cylinders or air compressors has been tested for compliance with the specifications for Grade D air: Oxygen 19.5-23.5 percent, hydrocarbons <5 milligrams per cubic meter, carbon monoxide (CO) <10 parts per million (PPM), carbon dioxide <1000 PPM, and a lack of odor. The RPP Coordinator shall obtain a certificate of analysis for Grade D breathing air from the supplier of breathing air in cylinders or a laboratory which has conducted analyses of the breathing air from an air compressor. Laboratory analyses of breathing air from compressors need to be conducted prior to initial use of each compressor and, thereafter, at least every 6 months. Oxygen must never be used with an airline respirator or SCBA.

(13) Supervisors shall ensure that manufacturers' instructions are followed to maintain and inspect breathing air compressors. The CO alarms shall be set at 10 PPM and tested with a calibration source of CO. The RPPC shall retain the related records of preventive maintenance, repairs, and calibration for 2 years. These records shall include the nature of the work, the date, and the name of the person performing the work.

DR 385-1-9
9 Oct 01

(14) Supervisors shall visually inspect cylinders to ensure they meet the Department of Transportation (DOT) requirements of 49 CFR 173 and 178. When these DOT requirements are not applicable, the inspections shall be conducted in accordance with ANSI/Compressed Gas Association Specification G-7.1.

(15) When the failure of a supplied air respirator (SAR) or SCBA respirator would result in a team member being exposed to an oxygen deficient or otherwise Immediately Dangerous to Life or Health (IDLH) atmosphere, one or more team members shall be located outside the IDLH environment, maintaining visual, voice, or signal line communications with the team members within it. The team member(s) outside shall be trained and equipped with a pressure demand or positive pressure SCBA or SAR with SCBA and/or retrieval equipment to conduct an effective rescue. If the IDLH atmosphere is in a permit-required confined space, the entry supervisor shall ensure that all of the requirements of DR 385-1-13 are implemented.

(16) If the selected respirator does not have an end-of-service-life indicator (ESLI) certified by NIOSH for the contaminant(s) or if there is no ESLI data available from the manufacturer for the contaminant(s), and if the respirator is used in an atmosphere at or above the Action level, the change out schedule is deemed to be daily, unless increased resistance or breakthrough is achieved.

d. Training.

(1) Each RPPC and other team members designated to train respirator users shall become "competent persons" in RPP by attending a RPP course provided by NIOSH, OSHA, or the American Industrial Hygiene Association or be qualified by appropriate training and experience that is commensurate with the complexity of the program.

(2) Prior to wearing respirators, team members shall be trained by their RPPC or other competent person in the selection, use, inspection, maintenance, and storage of respirators. The RPP training will be documented on ENG Form 4937, Respiratory Fit Test/Training Record. The training will include a review of DR 385-1-9, the activities RPP SOPs, the donning/doffing of respirators; procedures and schedules for cleaning, maintaining, storing, and disposing of respiratory protective equipment; dealing with emergency situations and IDLH atmospheres, evaluating breathing air quality, the limitations of respirators, air monitoring, and hazard communication about their respiratory hazards. During training, team members shall have their respirators properly fit-tested and be permitted to wear, breakdown, assemble, inspect, clean, and disinfect them.

DR 385-1-9
9 Oct 01

(3) After receiving RPP training, each individual respirator wearer must be able to demonstrate:

(a) Why his/her respirator is necessary and how its improper fit, usage, or maintenance can compromise its protective effects.

(b) What the limitations and capabilities of the respirator are.

(c) How to use the respirator effectively in emergency situations, including when the respirator malfunctions.

(d) How to inspect, put on and remove, use, and check the seals of the respirator.

(e) What the maintenance and storage procedures are.

(f) How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators.

(g) The general requirements of 29 CFR 1910.134.

(4) Retraining shall be administered annually, and when:

(a) Changes in the workplace or type of respirator render previous training obsolete or if a team member fails to demonstrate an adequate understanding of RPP requirements.

(b) Any other situation arises in which retraining appears necessary to ensure safe respirator use.

e. Medical Surveillance.

(1) Prior to being fit-tested, every team member requiring a respirator shall receive a complete medical examination and a physician's medical clearance meeting the requirements of DR 385-1-12, EP 385-1-58, 29 CFR 1910.134, and any other applicable Federal regulations.

(2) Supervisors of team members reporting to medical facilities for respirator physicals (and medical surveillance) will provide those facilities a copy of 29 CFR 1910.134(e), their RPP SOP; a DA Form 4700, Medical Records Supplemental Medical Data, approved by SO; and

DR 385-1-9
9 Oct 01

the other documents required by DR 385-1-12. U.S. Army occupational health clinics will already have a copy of 29 CFR 1910.134.

(3) Each team member reporting for a respirator physical to a contract medical facility shall also provide the examining physician a completed OSHA Respirator Medical Evaluation Questionnaire from Appendix C, 29 CFR 1910.134. For subsequent evaluations, the team member will only need to provide the forms required by DR 385-1-12 and information about answers that have changed on the above questionnaire.

(4) After completing the required examination, the physician shall provide the Contracting Officer Representative (COR) the medical documents required by DR 385-1-12, including a completed DA Form 4700. The licensed health care provider on DA Form 4700 shall note that the individual is or is not medically able to wear the respirator; any limitations on respirator use related to the individual's medical condition or workplace conditions; the need, if any, for any further medical evaluation; and a statement that the employee has been provided a copy of the completed form.

(5) The COR shall provide the above documents to the supervisor who will provide a copy of the DA Form 4700 to the RPPC. The original copies of all of the above documents shall be sent to SO for updating of the District's medical surveillance roster and inclusion of the medical documents in the individual's medical file located at a commercial healthcare provider facility or military clinic.

(6) If the completed DA Form 4700 prohibits the use of a negative pressure respirator but permits the use of a PAPR, the individual, according to 29 CFR 1910.134(e), shall be provided a PAPR.

(7) In order to wear contact lenses inside a respirator, a team member, the RPPC, with assistance of SO or other Industrial Hygienist will provide exposure data to the healthcare provider, who will provide a medical clearance, stating under what environmental conditions the lenses may be worn in a specific type of respirator.

f. Program Evaluation. In addition to SOs annual evaluations of the RPP, each RPPC shall conduct and document periodic evaluations of the written RPP to ensure it is being properly implemented. The RPPC shall consult at least annually with team members who use respirators to assess their views on the program's effectiveness and to identify and correct any problems.

DR 385-1-9
9 Oct 01

Factors to be assessed include respirator fit and the ability to use the respirator without interfering with effective work performance; appropriate respirator selection; proper respirator use under workplace conditions; and proper respirator maintenance.

g. Record keeping: The RPPC will retain documents as follows:

(1) Medical Clearances for Respirator Use and Air Monitoring Data - Duration of Respirator User's Employment. This data will be a part of the medical record maintained by medical personnel.

(2) ENG Form 4937, Fit-Tests/Respirator Training - Duration of Respirator User's Employment. The RPPC shall provide SO a copy of this form when it is updated and the original annotated form to SO when a respirator user ends employment with Savannah District

(3) The RPPCs and SOs Program Inspection Results - 2 years.

(4) Respirator Inspection Results - 2 years.

(5) Records of Issuance and Return of Respirators - 2 years after return of respirator.

(6) Maintenance Records for Breathing Air Compressors - 2 years.

(7) Records of Breathing Air Analyses - 5 years.

3 Appendices
App A - References
App B - Glossary
App C - Respirator Selection
Guide

/s/
ROGER A. GERBER
COL, EN
Commanding

DISTRIBUTION A & D

APPENDIX A

REFERENCES

1. 29 CFR 1910.134, Respiratory Protection, Occupational Safety and Health Standards, Occupational Safety and Health Administration, 8 Jan 98.
2. 30 CFR 11, Respiratory Protective Devices; Tests for Permissibility; Fees; Mine Safety and Health Administration, 1 Jul 97
3. 42 CFR 84, Approval of Respiratory Protective Devices, National Institute for Occupational Safety and Health (NIOSH), 1 Oct 97.
4. 49 CFR 173, Shippers-General Requirements for Shipments and Packaging, Department of Transportation (DOT), 1 Oct 98.
5. 49 CFR 178, Specifications for Packaging, DOT, 1 Oct 98.
6. AR 385-10, Army Safety Program, 28 May 88.
7. AR 11-34, The Army Respiratory Protection Program, 15 Feb 90.
8. EM 385-1-1, USACE Safety and Health Requirements Manual, 3 Sep 96.
9. SAD Suppl 1, 30 Sep 85, to ER 385-1-40, Occupational Health Program, 28 Jul 80.
10. ER 385-1-90, Respiratory Protection Program, 28 Mar 83.
11. EP 385-1-58, Medical Surveillance Handbook, 19 Mar 92.
12. DR 385-1-12, Medical Surveillance Program, 31 Jan 94.
13. DR 385-1-13, Confined Space Entry Regulation, 26 Oct 95.
14. TB MED 502, Occupational and Environmental Health-Respiratory Protection Program, Feb 92.

DR 385-1-9
APP A
9 Oct 01

15. NIOSH Guide to the Selection and Use of Particulate Respirators Certified under 42 CFR 84, Jan 96, Centers for Disease Control (CDC), Public Health Service (PHS), U.S. Department of Health and Human Services (USDHHS).
16. NIOSH Publication 87-108, May 87, NIOSH Respirator Decision Logic, CDC, PHS, USDHHS.
17. ANSI Z88.2, Practice for Respiratory Protection, American National Standards Institute (ANSI), 6 Aug 92.
18. ANSI/CGA G-7.1-1989, American National Standard for Commodity Specification for Air.

APPENDIX B

GLOSSARY

1. Respirator Protection Program (RPP): Guidance document governing the District program and providing instruction to subordinate field and HTW program coordinators.
2. Respirator Protection Program Coordinator (RPPC): Each field activity (powerplants) and HTRW section shall have an RPPC appointed in writing who is responsible for implementing the District program at their activity.
3. ENG 4937, Respiratory Fit Test/Training Record: Document in which respiratory protection fit-test results are recorded.
4. DA Form 4700: Multipurpose medical form which is frequently overprinted with data relevant to the task at hand. DA Form 4700, when used in a respiratory protection program, lists the type of respirator to be used, amount of time used and severity of work, healthcare providers evaluation and clearance date.
5. Standard Operating Procedure (SOP): A document prepared by competent person with expertise in subject matter. SOPs are designed to convey specific data about specific subjects to personnel.
6. Fit-Test: Method of ensuring that a respirator actually fits the employees face without gross leakage. A fit test may be qualitative (employee cannot taste or smell the fit-test media) or quantitative (comparison is made of the quality of air outside of the respirator and inside the respirator, requires a challenge media in which to make the comparison, a measuring instrument, and probed respirators). Frequently used qualitative fit-test medias are irritant smoke, banana oil or saccharin mist.
7. Medical Surveillance: Respirator users must annually be medically qualified to use respirators. A medical history questionnaire (Appendix D of the OSHA standard) is required. A tool frequently used by the healthcare provider is the spirometer which provides pulmonary function testing results.
8. Grade D Breathing Air: Quality standard of air produced by a breathing air compressor. The breathing air compressor must be equipped with a high temperature and Carbon Monoxide

DR 385-1-17
APP B
9 Oct 01

alarms (oxygen 19.5-23.5%, hydrocarbons <5mg/m³, carbon monoxide <10 ppm, carbon dioxide < 1000ppm and no distasteful odor).

9. Supplied Air Respirator (SAR): A positive pressure respirator in which Grade D breathing air is provided. The air source is either a respirator hose or an air tank. An air tank respirator is called a Self Contained Breathing Apparatus (SCBA).

10. Negative Pressure Respirators: A negative pressure respirator is provided air through a cleansing media (filter or cartridge) by the breathing efforts of the user. The space within the respirator contains negative pressure compared to ambient air outside the respirator.

11. End-of-Service-Life Indicator: A mechanism to warn the respirator user that the capability of the respirator is at its end of service life and that the protection afforded can/will cease.

12. Change Out Schedules: An instruction provided by respirator manufacturer that explains how long the cleansing media will last for specific contaminants under specific loading conditions before the end-of-service occurs.

APPENDIX C

RESPIRATOR SELECTION GUIDE

1. In order to select the proper respirator for a specific activity posing respiratory hazards, obtain the following information about the specific airborne contaminant(s) of concern.
 - a. Airborne concentrations and exposure times.
 - b. Physical, chemical, and toxicological properties, including carcinogenicity, additive and synergistic toxicological effects, and availability of oxygen.
 - c. Related odor threshold data.
 - d. The most stringent permissible exposure limits (PELs) as OSHA PELs, American Governmental Industrial Hygienists' threshold limit values, or other applicable limits.
 - e. The immediately dangerous to life or health (IDLH) concentrations.
 - f. Any potential for eye irritation.
 - g. Any available service life information for cartridges.
2. If the respirator will be used for fire fighting, protection against a carcinogen, or in or for emergencies in an oxygen deficient or other IDLH environment, it must be a SCBA or SAR with auxiliary SCBA. Both the SCBA and SAR must have a full-face piece operated in a pressure demand or positive pressure mode. The SCBA must have a minimum service life of 30 minutes; the auxiliary SCBA, a service life of at least 15 minutes.
3. If a contaminant is an eye irritant, select a respirator with a full face piece, helmet, or hood.
4. In any case, determine the required respiratory protection factor (PF) by dividing the concentration anticipated in the work place by the exposure limit. If more than one respiratory hazard exists, calculate the PF for each hazard and use the highest PF to select the appropriate type of respirator and face. The selected type of respirator must have an assigned PF greater than the required PF.

For example, a respirator for a contaminant with an airborne concentration of 100 milligrams per cubic meter (mg/m³) and a PEL of 5 mg/m³ would have a required respiratory PF of 20 and an assigned PF greater than 20.

5. If an Air-Purifying Respirator (APR) is selected, determine the type of cartridges and/or filters required based on the state and concentration of the contaminant (gas, vapor, dust, mist, or fume). The cartridges and filters need to be NIOSH approved and designated by the manufacturer for use with the selected respirator face piece.

6. Gas/Vapor Cartridges. For respiratory hazards consisting of only gases and vapors, use a chemical cartridge specified for protection against the respiratory contaminant(s) of concern. In Subpart L, 42 CFR 84, these cartridges are designated as ammonia, chlorine, hydrogen chloride, methylamine, sulfur dioxide, vinyl chloride, and organic vapor cartridges. Personnel need to ensure that the concentrations of the gases and/or vapors in the workplace do not exceed the maximum use concentrations of each cartridge and that the cartridges are not worn longer than the service times stipulated for them.

7. Particulate Filters.

a. In the revised 42 CFR 84, NIOSH established nine classes of particulate filters based on three levels of filter efficiency (95 percent, 99 percent, and 99.97 percent) and the following three categories of resistance to filter efficiency degradation:

(1) **N** for Not resistant to oil, for use when no oil particles are present.

(2) **R** for resistant to oil, for use when some oil particles are present.

(3) **P** for oil proof, for mandatory use if oil particles are present and the filter is to be used for more than one shift.

b. Given the above categories of degradation, the most difficult step in selecting a particulate filter is choosing its filter efficiency. The nine classes of particulate filters under 42 CFR 84 are N100, N99, N95, R100, R99, R95, P100, P99, and P95. The N100, R100, and P100 filters all have 99.97 percent

filter efficiencies and are as protective as a HEPA filter. The other filter classes have the filter efficiencies for which they are named; i.e., 99 percent and 95 percent. The use of filters with 99.97 percent efficiency would be most effective for filtering out all particulates, but sometimes would cause unnecessary frequent filter clogging and difficulty breathing. The "100" series filters need to be used whenever an exposure limit for particulates is less than 0.05 mg/m³ and/or the mean diameter of the particulates is equal or less than 2 microns. When an OSHA Standard or other regulation stipulates the use of a HEPA filter, use HEPA filters certified under 30 CFR 11 or, as a substitute, N100 filters certified under 42 CFR 84. If oil aerosols are present, use a R100 or P100 filter. Any particulate filter certified by NIOSH can be used for particulates with mass median diameters greater than 2 µm. Filters with 95 percent efficiencies would be acceptable for protection against particulates of this size.

8. Gas/Vapor Cartridges with Particulate Filters. In some instances, such as in the application of pesticides or spray painting, it may be necessary to have both chemical cartridges and particulate filters. For the above activities, an organic vapor cartridge with a R95 or P95 filter often would be appropriate. A pre-filter would be needed for spray-painting to prevent clogging. A N95 filter would be acceptable only in cases when oil aerosols are not present. In all cases, the chemical cartridges and the particulate filters must be approved for protection against the specific contaminants of concern.

9. Powered APRs. The cartridges and filters for these APRs also must be selected for the specific respiratory hazards of concern, manufactured for the APR being used, and certified by NIOSH. Powered APRs should be offered to respirator users who can use them, but who cannot use a negative pressure APR because of medical reasons or their inability to pass a fit-test.

10. Technical Approval. The RPPCs shall contact SO for assistance in selecting respirators.