

## **Section 32**

### ***Respiratory Protection Program***

#### **32.1 Scope**

This section establishes the minimum requirements for a Bureau of Reclamation (Reclamation) Respiratory Protection Program (RPP) to ensure respiratory safety and occupational health hazards are appropriately addressed. The RPP applies to all employees working at, or visiting, facilities that are exposed to airborne contaminants anticipated to meet, or exceed, 50% of the Occupational Safety and Health Administration (OSHA) permissible exposure limit (PEL) or American Conference of Government Industrial Hygienists (ACGIH) threshold limit value (TLV).

#### **32.2 General Requirements**

##### **32.2.1 Identify and Evaluate Respiratory Hazards**

The evaluation shall include an estimate of exposures to respiratory hazard(s) (e.g., fumes, mists, dusts, vapors, gases, smoke, sprays) and an identification of the contaminant's chemical state and physical form. Where exposures cannot be estimated, the atmosphere shall be considered immediately dangerous to life or health (IDLH) until an evaluation is conducted and determined not to be IDLH.

##### **32.2.2 Hierarchy of Controls**

When a suspected respiratory hazard is reported to safety professionals or supervisors, any feasible engineering and/or administrative controls to reduce the hazard must be attempted prior to selecting personal protective equipment (PPE) to reduce employee exposure. PPE is the final means of protection and used only if the other control methods are not feasible.

##### **32.2.3 Job Hazard Analysis (JHA)**

A JHA must be completed for all tasks that require the use of respiratory protection and must, at a minimum, address the perceived respiratory hazard, anticipated employee exposure, what type of respirator is required, appropriate cartridge and/or filter, engineering and administrative controls to reduce the hazard.

### **32.2.4 Written Program**

Respiratory PPE shall not be used until a written program is implemented and must be updated when changes in workplace conditions affect respirator use. At a minimum, the written program shall include procedures for the following elements:

- Employee medical requirements;
- User training including proper use of respirators, proper way to put on and take off a respirator, and respirator types and their limitations;
- Selecting, cleaning, storing, and maintaining respirators;
- Proper routine and emergency use of respirators;
- Ensuring tight-fitting respirators using OSHA-accepted fit testing protocols from OSHA 29 CFR 1910.134, Appendix A *Fit Testing Procedures (Mandatory)*;
- Ensuring breathing air for atmosphere-supplying respirators (SARs) is of adequate quality, quantity, and flow;
- Evaluating the effectiveness of the RPP; and
- voluntary use.

## **32.3 Responsibilities**

### **32.3.1 Area Office Managers**

**32.3.1.1** Shall ensure all affected employees complete training and comply with the RPP.

**32.3.1.2** Shall designate a Program Coordinator (PC) to implement the RPP.

### **32.3.2 Regional/Area Office PCs**

**32.3.2.1** Shall develop and maintain a written RPP and list of participants for their site(s).

**32.3.2.2** Shall work with the regional Industrial Hygienist (IH) to identify, evaluate, and monitor the respiratory hazards, including the contaminants' chemical state and form, and employees' potential exposure at their site(s) as required by a workplace assessment and/or Federal/State OSHA regulatory requirements.

**32.3.2.3** Shall collaborate with the supervisor(s) to ensure only National Institute for Occupational Safety and Health (NIOSH) certified respirators are selected and used, consistent with respiratory hazards, environmental factors, and user activities that affect respiratory performance and reliability, in compliance with the conditions of the respirator's certification.

**32.3.2.4** Shall schedule, or designate an individual to schedule, monthly inspections of emergency respirators and ensure escape-only respirators are inspected prior to each use, according to the manufacturer's recommendations.

- 32.3.2.5** Shall conduct or arrange for the regional IH or other qualified person to conduct, and document annual training and fit tests for RPP participants.
- 32.3.2.6** Shall assist the supervisor(s) and physician or other licensed health care professional (PLHCP) in scheduling initial and/or follow-up, for employees whose initial examination deems it necessary for clearance, medical evaluations/examinations and provide the OSHA 29 CFR 1910.134, Appendix C *Respirator Medical Evaluation Questionnaire (Mandatory)*.
- 32.3.2.7** Shall annually evaluate the workplace with the supervisor(s) to review the implementation of the elements of the RPP. At a minimum, workplace observations, document review, and consultation with participants shall be used, and any findings must be entered into the Inspection Abatement System (Section 41.2, *Safety Inspection and Abatement General Requirements*) for tracking corrective actions.

### **32.3.3 First-Line Supervisors**

- 32.3.3.1** Shall coordinate with the PC to ensure RPP participants attend scheduled training, medical evaluations, and fit tests.
- 32.3.3.2** Shall notify the PC when a respiratory hazard is discovered in their responsible work area(s).
- 32.3.3.3** Shall ensure, within their area(s) of responsibility, that all respiratory hazard engineering controls are working properly and that malfunctioning controls are either reported and repaired immediately or replaced by other controls that offer the same or higher protection.
- 32.3.3.4** Shall ensure all JHAs in their area(s) of responsibility identify potential respiratory hazards and the appropriate controls for those hazards.
- 32.3.3.5** Shall ensure the PC is included in the review for all JHAs involving respiratory hazards in their area(s) of responsibility.
- 32.3.3.6** Shall ensure employees within their area(s) of responsibility participate in workplace exposure/task assessments that may include wearing exposure monitoring equipment.

### **32.3.4 Employees**

- 32.3.4.1** Shall notify their supervisor or team lead whenever a respiratory hazard is suspected/discovered.

- 32.3.4.2** Shall attend scheduled medical evaluations and examinations, initial and annual fit tests, and training.
- 32.3.4.3** Shall maintain and store their respirator in a clean, sanitary container, or other device, protect it from adverse conditions or air contaminants that would compromise its integrity, and report any damage/defects to the supervisor for replacement.
- 32.3.4.4** Shall report health concerns, or any suggestions regarding the RPP, to their supervisor and/or PC.
- 32.3.4.5** Shall not enter atmospheres that are oxygen deficient and/or contain contaminants that their respirator will not provide protection.
- 32.3.4.6** Shall be clean-shaven before they put on a tight-fitting respirator so that facial hair does not interfere with the respirator's seal.

### **32.3.5 Regional Safety Managers**

- 32.3.5.1** Shall appoint a PC, as deemed necessary, for their region.
- 32.3.5.2** Shall assist in developing and establishing the RPP when necessary and perform periodic spot checks to ensure compliance with this section.

### **32.3.6 Regional IHs**

- 32.3.6.1** Shall provide technical assistance that includes, but is not limited to, workplace evaluations, exposure monitoring, respirator selection, fit tests, and training.

### **32.3.7 Project Managers/Acquisitions**

- 32.3.7.1** Shall coordinate with the PC to purchase only NIOSH-certified respirators.

### **32.3.8 Human Resources**

- 32.3.8.1** Shall ensure that pre-employment physicals include a medical evaluation when required by specific physical job requirements according to paragraph 32.6.3 *Medical Evaluation*.
- 32.3.8.2** Shall maintain all respirator medical evaluation results in the employee's medical folder for 30 years, or for at least 20 years after termination of employment, whichever is longer.

## **32.4 Training Requirements**

### **32.4.1 Initial Training**

Employees who are required to wear respiratory protection shall be medically qualified per paragraph 32.6.3 *Medical Evaluation*, properly trained, and fit tested per paragraph 32.6.4 *Fit Testing* before wearing any protective respiratory equipment. At a minimum, training shall include the following topics:

- Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect;
- Limitations and capabilities of the respirator;
- Selecting, maintaining, and storing the proper respirator and cartridge/filter for the job task;
- How to inspect, put on and remove, use, and check the seals of the respirator;
- Effective respirator use in an emergency situation, including respirator malfunctions;
- Recognizing medical signs and symptoms that may limit or prevent the effective use of the respirator;
- Voluntary respirator use requirements from OSHA 29 CFR 1910.134, Appendix D, *Information for Employees Using Respirators When Not Required Under Standard*;
- Proper and improper function of engineering controls in their area(s); and
- The requirements outlined in this section.

#### **32.4.2 Annual Refresher Training**

Annual refresher training and fit tests are required for all employees identified in the RPP. Additional training is required when there are changes in the workplace or in the type of respiratory protection.

#### **32.4.3 Proficiency**

Respirator users must know what type of respirator cartridge/filter is acceptable for the airborne contaminants they could potentially be exposed to, what type of respirator is required for the job task, and what types of controls need to be implemented to reduce the airborne contaminant level.

#### **32.4.4 Lack of Proficiency**

Retraining is necessary when the respirator user demonstrates a lack of knowledge of correct respirator use, improper cartridge selection, or the program elements in this section.

#### **32.4.5 Records Management**

All Reclamation training records shall be kept in the Department of the Interior (DOI) system for tracking training.

### **32.5 Hazard Identification, Assessment, and Safety Measures**

#### **32.5.1 Hazard Identification and Assessment**

Work areas and activities must be assessed as outlined in paragraph 32.3.2.2

*Regional/Area Office PCs Responsibilities* to determine if real or potential respiratory hazards exist and to provide the appropriate controls to reduce employee exposure.

### **32.5.2 Respiratory Hazard Work Site Evaluation**

The work site evaluation, at a minimum, shall include:

- Identification of the respiratory hazard, the chemical and physical form, and an estimate or measurement of employee exposure;
- The exposure limit as dictated by the OSHA PEL or ACGIH TLV or NIOSH *Pocket Guide to Chemical Hazards*;
- The hazard ratio (airborne concentration to exposure limit);
- Eye irritation and skin absorption; and
- Any IDLH or unknown atmospheres.

### **Respirator User and Environmental Factors Evaluation**

The evaluation of user and environmental factors, at a minimum, shall include:

- Work activities and stress (heavy, medium, light);
- Configuration and size of the workspace;
- Equipment within the workspace;
- Mobility requirements of the employee;
- Workspace temperature and humidity; and
- Employee communication methods.

### **32.5.3 Safety Measures**

Respirator users shall be aware of, and abide by, the following safety measures:

- Never use a filtering facepiece (aka dust mask) or an air-purifying respirator (APR) in an oxygen-deficient atmosphere;
- Never enter IDLH atmospheres without the proper equipment or training;
- APRs approved for protection against organic vapors or acid gases may only be used when the air contaminant is known and has adequate warning properties such as smell, irritation, or taste;
- Ensure cartridge/canister/filter is appropriate for the airborne contaminant; and
- Notify the PC and supervisor of any changes in the workplace or your physical condition that would make the current respiratory protection inadequate.

## **32.6 Safe Practices**

### **32.6.1 Respirator Selection, Use, and Maintenance**

**32.6.1.1 Selection.** Respirators shall be selected and provided according to the worksite-specific respiratory hazard(s) that an employee is potentially exposed to and any user or environmental factors that affect respirator performance and reliability.

Respirator selection must be based on assigned protection factors that meet or exceed the required level of protection (OSHA 1910.134(d)(3)(i)(A), Table 1 “Assigned Protection Factors”).

**32.6.1.2 APR.** An APR with an End of Service Life Indicator (ESLI) cartridge/cannister will be selected, if possible. Respirators not using ESLI cartridges/canisters must develop a change-out schedule and/or follow the manufacturer’s recommendations. The following are examples of filters/cartridges that may be used with APRs.

- **Particulate filters.** These filters capture dusts, mists, and fumes, but they do not protect against gases and vapors. Particulate filters must be certified according to 42 CFR 84, *Respiratory Protective Devices*.
- **Gas and vapor cartridges.** These cartridges are typically used when only hazardous gases and vapors are present in the air, because they do not protect against particulates.
- **Combination cartridges.** These cartridges are normally used in atmospheres that contain hazards of particulates, gases, and vapors.

**32.6.1.2.1 Change-Out Guidance for a Vapor Cartridge/Canister.** One tool that can be used to estimate organic vapor cartridge life is the “Rule of Thumb” from the American Industrial Hygiene Association publication *The Occupational Environment — Its Evaluation, Control and Management*. This method is a guide and not meant to be the only method for determining service life. The “Rule of Thumb” states:

- If the concentration of the chemical is less than 200 parts per million (ppm) and the chemical’s boiling point is greater than 70°C, you can expect a service life of 8 hours at a normal work rate (assume a shorter service life with greater work rates);
- Reducing air contaminant concentrations by a factor of 10 will increase the service life by a factor of 5; and
- Humidity above 85% reduces service life by 50%.

**32.6.1.2.2 Change-Out Requirements for a Filtering Facepiece and a Cartridge/Canister.** For filtering facepieces and cartridges/cannisters, use the following requirements and manufacturer’s recommendations to change-out when:

- The filter is damaged and is no longer protective or becomes soiled and is no longer clean/sanitary;
- Breathing resistance noticeably increases, causing discomfort; or
- The user experiences a breakthrough and notices either a smell, irritation, or taste.

**32.6.1.3 SAR.** The following types of SARs are used:

- **Supplied- Air or Airline.** Delivers clean, breathable air from an uncontaminated source for long periods of time and is used for extended work times in non-IDLH atmospheres.
- **Combination.** Has an auxiliary self-contained air supply that is used if the primary supply fails.
- **Self-Contained Breathing Apparatus (SCBA).** Consists of a wearable clean air supply pack and is used when there is a short time to enter and escape from a space with atmospheres that are, or may be, IDLH.

#### 32.6.1.3.1

***Breathing Air Quality and Use.*** Compressed breathing air shall meet the requirements for Grade D breathing air described in American National Standards Institute/Compressed Gas Association CGA G-7.1-2018, *Commodity Specification for Air*.

- Oxygen content of 19.5–23.5%;
- Hydrocarbon (condensed) content of 5 milligrams per cubic meter of air or less;
- Carbon monoxide (CO) content of 10 ppm or less;
- Carbon dioxide (CO<sub>2</sub>) content of 1000 ppm or less; and
- No noticeable odor.

#### 32.6.1.3.2

***Cylinders for Breathing Air.*** Cylinders used to supply breathing air must:

- Be tested and maintained as prescribed in the Department of Transportation (DOT) 49 CFR 180, *Continuing Qualification and Maintenance of Packagings*;
- Have a certificate of analysis from the supplier that the breathing air meets Grade D requirements;
- Not exceed a dew point of –50°F at 1 atmosphere pressure; and
- Have been hydrostatically tested and maintained according to DOT 49 CFR 173 *Shipments and Packagings*, 49 CFR 178 *Specifications for Packagings*, and must have been marked according to 42 CFR 84.

#### 32.6.1.3.3

***Compressor Requirements for Supplied Breathing Air.***

Compressors used to supply breathing air shall be constructed and situated to meet the following requirements:

- Contaminated air cannot enter the air-supply system;
- The dew point at 1 atmosphere pressure is 10°F (5.56°C) below the ambient temperature;
- Have suitable in-line air-purifying sorbent beds and filters to further ensure breathing air quality;
- A tag showing the date of the most recent change signed by the person authorized to perform the change;
- Compressors, hoses, vortex heaters/coolers, connectors, filters, and valves are restricted to this use only and stored properly to prevent contamination with dusts, mists, vapors, fumes, toxic gases, heat, and intense light;

- Prevent the use of couplings or make them incompatible so they cannot attach to non-respirable worksite air or other gas systems;
- For compressors that are not oil-lubricated, ensure that carbon monoxide levels in the breathing air do not exceed 10 ppm; and
- For oil-lubricated compressors, use either or both a high-temperature or carbon monoxide alarm to monitor carbon monoxide levels (if using only high-temperature alarms, monitor the air supply at intervals to prevent carbon monoxide in the breathing air from exceeding 10 ppm).

### **32.6.2 Respirator Types and Entries into an IDLH Atmosphere**

The atmosphere will be considered IDLH when any of the following conditions apply:

- A JHA is not complete and employees will wear respirators for the job task;
- Contaminant concentration has not been measured or estimated with confidence;
- Atmospheric contaminant exceeds an established IDLH concentration; or
- The atmosphere is oxygen deficient.

For oxygen-deficient atmospheres, if it can be demonstrated that under all foreseeable conditions the oxygen concentration can be maintained within the ranges specified in OSHA 29 CFR 1910.134(d)(3)(iv)(C), Table II, "Assigned Protection Factors," then any atmosphere-supplying respirator may be used.

**32.6.2.1 Types of Respirators for IDLH Conditions.** A full-face pressure demand SCBA, certified by NIOSH, with a minimum service life of 30 minutes or a combination full-face pressure demand SAR, with an auxiliary self-contained air supply, shall be used in IDLH situations.

**32.6.2.2 Requirements for Entries into an IDLH Environment.** Any entries into an IDLH environment shall adhere to the following requirements:

- The PC shall be notified and provide assistance before any trained employee(s) enter the IDLH atmosphere to provide emergency rescue;
- One or more employees shall be located outside the IDLH atmosphere that are trained and equipped with either (1) a pressure demand or other positive pressure SCBA or (2) pressure demand or other positive pressure SAR with auxiliary SCBA and emergency rescue equipment; and
- Voice or visual communication shall be maintained between the employee in the IDLH atmosphere and the employee(s) outside the IDLH atmosphere.

### **32.6.3 Medical Evaluation**

Before using a respirator, employees must be medically evaluated by a PLHCP using OSHA 29 CFR 1910.134, Appendix C to determine the employee's ability to wear a respirator. The following information shall be provided to the PLHCP before the evaluation:

- Type and weight of respirators to be used;
- Duration and frequency of use;
- Expected physical effort during use;
- Expected additional PPE;
- Expected temperature and humidity to be encountered; and
- Anticipated workplace hazards and potential exposures.

**32.6.3.1 PLHCP-Provided Information.** The PLHCP must provide the following information about the employee's ability to use a respirator:

- Whether the employee is medically able to use a respirator;
- Any limitations related to an employee's medical condition or the workplace where the respirator will be used;
- Whether there is a need for a follow-up medical evaluation; and
- Any recommendations provided to the employee.

**32.6.3.2 Additional PLHCP Determination of Respirator Use.** If the PLHCP finds a medical condition that may place the employee's health at increased risk if a negative pressure respirator is used, then a powered air purifying respirator (PAPR) shall be provided. If a subsequent medical evaluation finds that the employee is medically able to use a negative pressure respirator, then a PAPR is no longer required.

**32.6.3.3 Additional Medical Evaluations Not Specified by the PLHCP.** An additional medical evaluation or consultation must be coordinated with Human Resources, per Reclamation Manual Directives and Standards HRM 02-01 *Qualification Requirements (Medical)*, and provided in the following circumstances:

- An employee requires an explanation or consultation regarding the evaluation results or reports medical signs or symptoms related to their ability to use a respirator;
- Workplace conditions or expectations change and substantially increase the employee's physiological burden; and
- A PLHCP, supervisor, or PC determines the need for an additional evaluation (e.g., observations made during fit tests and program evaluation).

## **32.6.4 Fit Testing**

Before first use, and annually thereafter, employees shall be fit tested with the type, size, and model of respirator they will use. A loose-fitting respirator (e.g., PAPR) does not require a fit test. Fit testing shall be conducted using an OSHA-accepted quantitative fit test (QNFT) protocol according to the requirements in the following paragraphs. The OSHA-accepted QNFT protocols and procedures are contained in OSHA 29 CFR 1910.134, Appendix A, Part I C. *Quantitative Fit Test (QNFT) Protocols*.

**32.6.4.1 QNFT.** QNFT shall be used to fit test all respirators. QNFT for full-facepiece respirators shall meet, or exceed, a fit factor of 500, and half-mask respirators shall meet, or exceed, a fit factor of 100.

**32.6.4.2 Tight-Fitting Positive Pressure SAR and PAPR.** Fit testing for these types of respirators can be done using QNFT protocol in negative pressure mode regardless of whether the respirator is used in the negative or positive pressure mode.

**32.6.4.3 Retesting.** Fit testing is required annually or whenever the following occurs:

- The employee requests testing;
- A change in the employee's physical condition that affects facepiece fit (e.g., significant weight loss/gain, dental work);
- Use of a different facepiece configuration is required; and/or
- OSHA standards require more frequent testing.

### **32.6.5 Respirator Use**

Employee's wearing a tight-fitting facepiece shall not wear their respirators under the following conditions:

- Any physical condition, facial hair, corrective glasses, goggles, or other PPE interferes with the seal of the facepiece or valve function; and
- The employee reports medical signs or symptoms that are related to their ability to use a respirator.

### **32.6.6 Respirator Maintenance, Care, and Inspection**

#### **32.6.6.1 Respirator Cleaning.**

- Respirators are cleaned, disinfected, and maintained in a sanitary condition, according to the manufacturer's instructions and the procedures outlined in OSHA 29 CFR 1910.134, Appendix B-2, *Respirator Cleaning Procedures (Mandatory)*; and
- Respirators for emergency use, fit testing, and training are cleaned and disinfected after each use.

**32.6.6.2 Respirator Inspection.** Employees who routinely use respirators shall inspect before each use and during cleaning. The inspection shall include the following checks:

- Filtering parts (for pliability and deterioration);
- Respirator function and tightness of connections; and
- The condition of various parts, including but not limited to, the facepiece, head straps, valves, connecting tube, and cartridges, canisters, or filters.

**32.6.6.3 Respirator Repairs.** Respirators that fail inspection or are found to be defective shall be removed from service. These respirators shall be discarded, repaired, or adjusted in accordance with the manufacturer's recommendations and specifications for the type and extent of repairs performed. Only the respirator manufacturer's NIOSH-approved parts shall be used in repairs.

### **32.6.7 Voluntary Use of Respirators**

When an employee requests to voluntarily use a respirator, the following conditions must be met:

- There is not an atmospheric hazard that would require respiratory protection;
- Use of the respirator will not create a hazard; and
- Respirator use is not required by the PC or by a specific OSHA regulation.

**32.6.7.1 Voluntary Use Requirements for a Filtering Facepiece.** Employees may voluntarily use filtering facepieces for protection from nuisance dusts, mists, fumes, smoke, pollen, and other particulates. The PC and IH must document that no respiratory hazard exists, and the employees have been trained according to section 32.6.7.1.2 *Training*.

**32.6.7.1.1 Voluntary Use Form.** Before using the filtering facepiece, the employee must submit a written voluntary use request to their supervisor and the PC. Regions shall develop their own form that documents:

- Use is voluntary;
- A JHA that assesses any perceived hazard(s);
- Whether it is possible to introduce hazards by wearing the filtering facepiece; and
- That employee has received OSHA 29 CFR 1910.134, Appendix D.

**32.6.7.1.2 Training.** Basic training on respirators, in OSHA 29 CFR 1910.134(k) "Training and information", and a copy of OSHA 29 CFR

1910.134, Appendix D, shall be provided to all voluntary users. Training shall be documented in the DOI official repository.

- 32.6.7.1.3**      ***Fit Testing and Medical Evaluation.*** The use of filtering facepieces that meet the requirements in paragraphs 32.6.7.1 *Voluntary Use Requirements for a Filtering Facepiece* and are used voluntarily do not require fit testing or medical evaluations.

- 32.6.7.2**      **Voluntary Use Requirements for Respirators Other Than a Filtering Facepiece.** Before using the respirator, the employee must submit a written voluntary use request to their supervisor and PC along with a JHA that assesses any perceived hazard(s) and considers whether it is possible to introduce hazards by wearing the respirator.

- 32.6.7.2.1**      ***Voluntary Use Form*** Regions shall develop their own form that documents:
- Respirator use will not create a hazard;
  - How respirators are properly cleaned, stored, and maintained to not present a health hazard;
  - The employee receives and passes a medical evaluation, paragraph 32.6.3 *Medical Evaluation*, and is medically qualified to wear respirators and a fit test, paragraph 32.6.4 *Fit Testing*, with the requested respirator type and model;
  - The employee has received OSHA 29 CFR 1910.134, Appendix D, and is trained in the program elements of the RPP; and
  - Medical evaluations, fit testing, and training are documented in the DOI official repository.

## **32.7 Definitions in Appendix K and References in Appendix L**