

EXPRO National Manual for Projects Management

Volume 11, Chapter 4

Project Respiratory Protective Equipment Procedure

Document No. EPM-KSH-PR-000004 Rev 003



Project Respiratory Protective Equipment Procedure

Document Submittal History:

Revision:	Date:	Reason For Issue
000	04/10/2017	For Use
001	03/12/2017	For Use
002	19/11/2018	For Use
003	09/08/2021	For Use



Project Respiratory Protective Equipment Procedure

THIS NOTICE MUST ACCOMPANY EVERY COPY OF THIS DOCUMENT

IMPORTANT NOTICE

This document, ("Document") is the exclusive property of Government Expenditure & Projects Efficiency Authority.

This Document should be read in its entirety including the terms of this Important Notice. The government entities may disclose this Document or extracts of this Document to their respective consultants and/or contractors, provided that such disclosure includes this Important Notice.

Any use or reliance on this Document, or extracts thereof, by any party, including government entities and their respective consultants and/or contractors, is at that third party's sole risk and responsibility. Government Expenditure and Projects Efficiency Authority, to the maximum extent permitted by law, disclaim all liability (including for losses or damages of whatsoever nature claimed on whatsoever basis including negligence or otherwise) to any third party howsoever arising with respect to or in connection with the use of this Document including any liability caused by negligent acts or omissions.

This Document and its contents are valid only for the conditions reported in it and as of the date of this Document.



Project Respiratory Protective Equipment Procedure

Table of Contents

1.0	PURPOSE	5
2.0	SCOPE	5
3.0	DEFINITIONS	5
4.0	REFERENCES	7
5.0	GENERAL REQUIREMENTS	7
6.0	RESPONSIBILITIES	7
6.1	Construction Contractor Project Manager or Designee	7
6.2	HSSE Representative	7
6.3	Supervisors	8
6.4	Employees	8
7.0	RISK ASSESSMENT	9
8.0	REQUIREMENTS – GENERAL	9
8.1	Records	9
8.2	Medical Evaluations	10
8.3	Training	10
8.4	Respirator Fit Test	11
8.5	Frequency	11
8.6	Documentation	11
8.7	Fit Testing Methods	11
9.0	CLEANING, MAINTENANCE, STORAGE AND INSPECTION	11
9.1	Respirator Selection	12
9.2	Use and Limitations	13
9.3	Precautions	14
9.4	Voluntary Use	14
10.0	BREATHING AIR QUALITY SYSTEM	14
11.0	CASCADE SYSTEMS	15
12.0	PROGRAM EVALUATION	16
13.0	ATTACHMENTS	16
	Attachment 1 - EPM-KSH-TP-000001 - Respirator Wearer Clearance Form Template	17
	Attachment 2 - EPM-KSH-TP-000002 - Respirator User Medical Questionnaire Template	18
	Attachment 3 - EPM-KSH-TP-000003 - Employee Statement of Medical Condition Form Template	18
	Attachment 4 - EPM-KSH-TP-000004 - Respirator Fit Test Record Template	19
	Attachment 5 - EPM-KSH-TP-000005 - Respirator Maintenance Log Template	21



Project Respiratory Protective Equipment Procedure

1.0 PURPOSE

The purpose of this procedure is to outline the requirements for work activities undertaken when having to wear Respiratory Protection. It establishes the requirements for individuals to complete, and the documentation required, before an individual wear the equipment.

2.0 SCOPE

The scope of this procedure applies to all works performed under the National Project Management Organization throughout the Kingdom of Saudi Arabia.

3.0 DEFINITIONS

Definitions	Description
Air-Line Supplied Respirator (ALSR)	An atmosphere-supplying respirator for which the source of breathing air is not designed to be carried by the user but is provided via an umbilical air-line (hose) system from a fixed source.
Air-Purifying Respirator	A respirator with an air-purifying filter, cartridge, or canister that physically or chemically removes specific air contaminants by passing ambient air through the air-purifying element.
Atmosphere-Supplying Respirator	A respirator that supplies the respirator user with breathing grade air from a source independent of the ambient atmosphere, and includes air-line supplied-air respirators (ALSARs) and self-contained breathing apparatus (SCBA) units.
Canister or Cartridge	A container with a filter, sorbent, or catalyst, or combination of these items, that removes specific contaminants from the ambient air prior to that air passing through the inhalation valve on negative pressure respirators or prior to being forced through the user's breathing zone in powered air purifying respirators (PAPRs).
Demand Respirator	An atmosphere-supplying respirator that admits breathing air to the face piece only when a negative pressure is created inside the face piece by inhalation.
Doff	To take off one's respiratory protection equipment.
Don	To put on one's respiratory protection equipment.
Egress Bottle	See Escape bottle .
Emergency	Any occurrence such as, but not limited to, failure of control equipment that may result in an uncontrolled significant release of an airborne contaminant. A hazardous situation requiring immediate attention to protect life, property or the environment.
Employee Exposure	Exposure to a concentration of an airborne contaminant that would occur if the employee were not using respiratory protection. Employee exposure means exposure to noise without regard to use of hearing protection.
End-of-Service-Life Indicator (ESLI)	A system that warns the respirator user of the approach of the end of adequate respiratory protection—for example, that the sorbent is approaching saturation or is no longer effective.
Escape Bottle	A cylinder of breathing air worn by the user which may provide air to an ALS respirator user under emergency conditions should the air source or air-line be compromised or fail.
Escape-Only Respirator	A respirator intended to be used only for emergency exit.
Field Fit Check	The positive and negative pressure check to ensure a good fit and proper working condition of the respirator by the user each time a respirator is donned and throughout the shift as the device is readjusted on the face.



Project Respiratory Protective Equipment Procedure

Definitions	Description
Filter or Air-Purifying Element	A cartridge or filter component used on a respirator to remove solid or liquid aerosols from the inspired air.
Filtering Face Piece (Dust Mask)	A negative pressure particulate respirator with a filter as an integral part of the face piece or with the entire face piece composed of the filtering medium.
Fit Factor	A quantitative estimate of the fit of a respirator make and model to a specific individual, derived from the ratio of the concentration of a substance in ambient air to its concentration inside the respirator during the quantitative fit test. NOTE: The fit factor shall never be used in place of the assigned protection factor for determination of the maximum use concentration (MUC) of any respirator use scenario.
Helmet	A rigid respiratory inlet covering that also provides head protection against impact and penetration.
High Efficiency Particulate Air (HEPA) Filter	A filter that is at least 99.97% efficient in removing monodispersed particles of 0.3 micrometers in diameter.
Hood	A respiratory inlet covering that completely covers the head and neck and may also cover portions of the shoulders and torso.
HSSE	Health, Safety, Security and Environment
HWP	Hazardous Work Permit
Immediately Dangerous to Life or Health (IDLH)	An atmosphere that poses an immediate threat to life that would cause irreversible adverse health effects, or that would impair an individual's ability to escape from a dangerous atmosphere.
JHA	Job Hazard Analysis
Loose-Fitting Face Piece	A respiratory inlet covering that is designed to form a partial seal with the face.
Maximum Use Concentration (MUC)	The highest ambient contaminant concentration against which a given respirator system can be used for protection of the user. It is determined by multiplying the permissible exposure limit (PEL) by the assigned protection factor for the selected respirator
Negative Pressure Respirator (Tight Fitting)	A respirator in which the air pressure inside the face piece is negative during inhalation with respect to the ambient air pressure outside the respirator.
OHRMS	Occupational Health Records Maintenance System
Oxygen Deficient Atmosphere	An atmosphere with an oxygen content below 19.5% by volume.
Physician or other Licensed Health Care Professional (PLHCP)	Means an individual whose legally permitted scope of practice (i.e., license, registration or certification) allows him or her to independently provide or be delegated the responsibility to provide some or all the necessary health care services applicable to respiratory protection.
Positive Pressure Demand Respirator	A positive pressure atmosphere- supplying respirator that admits breathing air to the face piece when the positive pressure is reduced inside the face piece by inhalation.
Positive Pressure Respirator	A respirator in which the pressure inside the respiratory inlet covering exceeds the ambient air pressure outside the respirator.
Pounds per Square Inch (psig)	Gauge that indicates the pressure is relative to atmospheric pressure.
Powered Air-Purifying Respirator (PAPR)	An air-purifying respirator that uses a blower to force the ambient air through air- purifying elements to the inlet covering.
Protection Factor (PF)	Ratio of the airborne concentrations inside the respirator piece to the airborne concentrations outside the respirator piece. Assigned PF is established by the testing agency and is the designated level of protection for a given respiratory type.



Project Respiratory Protective Equipment Procedure

Definitions	Description
Qualified Person	One who by extensive knowledge, training, and experience is competent in administering the respiratory protection program (i.e., the HSSE Representative).
Qualitative Fit Test (QLFT)	Determination of respirator leakage by use of a test agent outside of the respirator face piece such as isoamyl acetate (banana oil), sucrose, or irritant smoke (stannic chloride). If the test subject senses the test agent, leakage is indicated. A qualitative fit test does not result in assignment of a fit factor, but does provide for assignment of the given respirator's protection factor if the test is successful.
RPA	Respirator Program Administrator
SCBA	Self-Contained Breathing Apparatus
STARRT	Safety Task Analysis and Risk Reduction Talk
WMS	Work Method Statement

4.0 REFERENCES

1. OSHA CFR 29 1910 Subpart I Respiratory Protection
2. OSHA CFR 29 1910 Subpart Z Toxic and Hazardous Substances
3. EPM-KSH-PR-000003 Occupational Health Records Maintenance System (OHRMS)
4. EPM-KSS-PR-000001 General Safe Work Requirements Procedure
5. EPM-KSS-PR-000003 Personal Protective Equipment Procedure
6. EPM-KSS-PR-000007 Confined Space Entry Procedure

5.0 GENERAL REQUIREMENTS

Whenever respiratory protective equipment, including military protective masks and emergency use self-rescuer devices, is required, a written respiratory protection program shall be developed and implemented. Before use, an industrial hygienist, health physicist, or certified safety professional (or equivalent professional certification) should determine the suitability of a respirator for any intended purpose. Respirators shall not be substituted for Engineering or environmental control methods without approval of the Respirator Program Administrator (RPA).

6.0 RESPONSIBILITIES

Below are the responsibilities applicable to the implementation this procedure:

6.1 Construction Contractor Project Manager or Designee

The Construction Contractor's Project Manager or Designee, has the responsibility for implementing this procedure and is responsible for supporting it and ensuring that all project/facility entities actively participate.

6.2 HSSE Representative

The HSSE Representative, in conjunction with the Respirator Program Administrator (RPA), is responsible for supporting the Project Manager or Designee in the implementation and administration of this procedure and will:

- Conduct a step-by-step evaluation (Job-hazard analysis) to ensure that only respiratory protection appropriate for the conditions of exposure is utilized.
- Determine the process necessary to medically qualify employees.
- Coordinate fit testing of each employee for the respirator selected.
- Ensure the issuance of proper clearance to qualified employees.



Project Respiratory Protective Equipment Procedure

- Identify approved respiratory protective equipment.
- Coordinate instruction and training in the use, basis of selection, inspection, maintenance, sanitary care, storage, cartridge or canister replacement protocol, and limitations of respiratory protective equipment being used.
- Coordinate the repair or replacement of respiratory protective equipment as may be required due to wear and deterioration.
- Ensure that routinely used respiratory equipment is regularly cleaned, inspected, and sanitized.
- Ensure that the applicable employee supervisors are trained by the guidelines of this procedure and are monitoring to ensure that their employees are complying with user responsibilities.
- Establish a site-specific Respiratory Protection Program meeting the requirements of applicable regulatory requirements (country/region specific). In the absence of any specific regulation, the requirements contained herein provide the minimum acceptable requirements for a written Respiratory Protection Program.
- Establish the medical evaluation process required to approve employees for respirator use. The medical evaluation process for the site shall be outlined in the HSSE Execution Plan. The Medical Questionnaire (Attachment 2) shall be used.
- Ensure that each employee designated to wear a respirator has the appropriate medical clearance documented. Periodically review the status of respirator wearers and update as needed. A list shall be developed by craft and shall be supplied to the facility used to issue and clean respirators. The User Clearance Form (Attachment 1) along with the Employee Statement of Medical Condition Form (Attachment 3) shall be used for this purpose.
- Ensure that employees designated to use respirators are fit tested.
- Refer to the guidelines for fit testing (per applicable country regulations) and the Respirator Fit Test Record (Attachment 4).
- Define the respirators to be used at the project and coordinate the resources for issuance, maintenance, cleaning, and repair (Attachment 5).
- Ensure that routinely used respiratory protective equipment is regularly inspected, cleaned, and sanitized (refer to Attachment 5).
- Provide a regularly updated list of approved respirator wearers by craft to the respirator issuer. Ensure that respirator issuer is trained and qualified to dispense respiratory protective equipment.
- Coordinate a periodic review of the status of respirator wearers and update as needed.
- Establish record keeping as required by applicable federal/national guidelines.
- Set up a site procedure for submitting records to the OHRMS data base system. Send an OHRMS Personnel Action Form to the OHRMS Administrator for each person who will have OHRMS records.
- Review and comment on subcontractor respiratory protection plans, as required by the contract.
- Post the "Notice to Employees-Respirator Records" poster (or local country equivalent) in a conspicuous location.

6.3 Supervisors

Supervision will ensure the HSSE Department is contacted prior to starting work whenever the Hazard Work Permit (HWP), or the applicable Job Hazard Analysis (JHA) and STARRT, requires the use of respiratory protection.

6.4 Employees

Employees must be trained and understand the environmental, safety, and health requirements of this procedure that apply to the work they perform. Employees shall:

- Be clean-shaven and have hair cut to ensure a proper fit.
- Notify the HSSE Department if corrective lenses are needed while wearing a full-face respirator. This shall be determined at the time of the user's fit test.
- Use only approved respiratory equipment.
- Inspect respirators and perform a face piece field fit check each time the respirator is donned and periodically while in use.



Project Respiratory Protective Equipment Procedure

- Use respirators per manufacturer's instructions.
- Not use or pass respiratory equipment from one employee to another.
- Inspect, clean, maintain, and store the respirator as instructed.

7.0 RISK ASSESSMENT

Before any Project Work Activity commences it is important that Risk Assessments are completed.

Risk Assessments must be conducted at the Planning Stage:

- Project Risk Assessment.
- Work Method Statements (WMS)
- Job Hazard Analysis (JHA).
- Safety Task Analysis and Risk Reduction Talk (STARRT)

It is imperative that prior to beginning any work activity, a STARRT briefing occurs to discuss the contents of the WMS/JHA which includes mitigations for any other hazards noted by the crew at the jobsite. The discussion shall also include job steps, expected hazards associated with the activity, and the mitigation and protection methods that shall be implemented to prevent incidents.

If circumstances change by way of the environment, other work crews are in the area, additional hazards are now present, change of methodology of the task etc..... another STARRT briefing shall occur.

The Hierarchy of control shall be used to reduce the likelihood of an incident occurring.

- **Elimination** (Remove the Hazard)
- **Substitution/Isolation** (Replacing material, process or hazard with a lower risk one/ separate people from the hazard (such as suitable guarding, distance, etc.)
- **Engineering Controls** (Redesign or replacement of plant and equipment)
- **Administration Controls** (Procedures, training, signage)
- **PERSONAL PROTECTIVE EQUIPMENT**

No work is to commence until the above has been implemented and signed by the relevant Supervisor in charge.

8.0 REQUIREMENTS – GENERAL

No employee can be assigned work that requires the use of a respirator unless it has been determined that the employee is physically able to perform the work while using the designated equipment, except for employees who voluntarily use filtering face pieces (dust masks).

The name of the RPA, respirator issuer(s) (if any), and responsible parties for the cleaning, inspection, and repair of respirators shall be determined and identified in the HSSE Execution Plan.

The HSSE Representative, in coordination with the RPA, shall determine the appropriate respiratory protection to be used, and based on the information available (manufacturer's data, site air monitoring data, work methods, etc.), develop the cartridge change-out schedule for air purifying respirators. Respirators to be used on the project, along with the cartridge change-out schedule and any supporting data, shall be identified and included in the HSSE Execution Plan.

Any employee who cannot wear a negative pressure respirator shall be given a powered air-purifying respirator (PAPR), or his/her job scope changed to one that does not require a respirator. If a PAPR is supplied, care should be taken that all requirements associated with it shall be followed.

8.1 Records



Project Respiratory Protective Equipment Procedure

Medical records will be maintained by the Physician or other Licensed Health Care Professional (PLHCP). An opportunity shall be afforded the employee to discuss the questionnaire and evaluation with the PLHCP. Medical records are to remain confidential.

8.2 Medical Evaluations

No employee can be assigned work that requires a respirator until it has been determined that they are physically able to perform the work required while wearing a respirator.

All employees required to wear a respirator shall be given a baseline and an annual medical assessment by a PLHCP. A variety of Health Care Professionals may perform this assessment, depending on the scope of practice permitted by the licensing, registration, or certification agencies.

The PLHCP shall make this determination after evaluating the following employee information:

- Respirator User Medical Questionnaire (Attachment 2).
- Complete a physical and fit test as specified by the PLHCP. This shall include:
 - o Respirator user wearer clearance form (Exhibit B)
 - o A complete physical examination, with emphasis on the respiratory and cardiovascular systems and digestive tract.
 - o Blood pressure, pulse rate, height, weight, etc.
- X-rays, but only if required by specific requirements (e.g., acrylonitrile, asbestos, etc.).
- Medical evaluations and fit testing are required to be completed at least annually or as required by changes in the employee's physical condition (some respiratory protection usage may require semi-annual fit testing per applicable regulatory requirements).
- After the evaluation, the attending physician will sign off on the appropriate form and forward it to the HSSE representative.

8.3 Training

The training coordinator, designee, qualified person, or environmental, HSSE Representative shall train each respirator user in the proper respirator donning and doffing techniques, user fit check methods, use, limitations, inspection, maintenance, cleaning, storage, and care of the respirators to be used.

Training shall include potential emergency situations that may occur on site and the actions the user should take if an emergency occurs. It is recommended that this training is to be repeated annually.

A training attendance roster must be completed and signed by the trainer and employee attending the training.

Prior to use, the Respirator Program Administrator shall perform, or cause to have performed, the appropriate fit test on everyone expected to become a respirator user. Fit testing may not occur prior to the medical evaluation and approval for respirator use by the PLHCP.

Evaluation procedures used to determine the effectiveness of this procedure and a respirator user's part in the evaluation shall be included in training of employees.

Refresher training will be administered at least annually, or when one of the following conditions occurs:

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



Project Respiratory Protective Equipment Procedure

8.4 Respirator Fit Test

Each respirator shall be fit tested to the wearer to ensure minimum face piece leakage.

The fit test shall be conducted for both half-face and full-face respirators, as needed. The fit test shall be performed on the respirator type, make, model, and size the employee will wear.

Only clean-shaven persons will wear a respirator.

As a minimum, qualitative fit testing shall be performed before workers use any tight-fitting face piece (negative pressure) respirators. The preferred method, however, is quantitative. Employees shall be allowed to pick the most comfortable respirator from a selection including respirators of various sizes and models.

8.5 Frequency

Fit testing will be completed annually, except when regulations require more frequent testing (i.e., when respirators are used for protection against asbestos, benzene, lead, vinyl chloride, etc.). Using the OHRMS data base system, the RPA shall maintain records of fit testing and medical qualification. Fit testing is also required if there is a change in facial appearance (i.e., gain or loss of weight, extensive dental work, etc.), or when a type, make, model, or size change in respirator occurs.

8.6 Documentation

Each respirator fit test shall be documented. This record shall be submitted to OHRMS for retention for a period of two years. All subsequent fit test records will also be forwarded to OHRMS. Copies of the most current fit test shall also be kept onsite.

8.7 Fit Testing Methods

Qualitative fit testing shall be performed and documented using a method as prescribed by applicable regulatory agencies.

Quantitative fit testing is mandatory with certain country's regulations and preferred in lieu of qualitative testing for all other applications.

Positive pressure respirators must be fit tested in the negative pressure mode, regardless of the mode normally used.

The HSSE Representative shall notify employees when annual re-testing is required.

9.0 CLEANING, MAINTENANCE, STORAGE AND INSPECTION

The project shall establish a system to ensure that respirators are properly stored, maintained, inspected, and cleaned per manufacturer's recommendations.

Respirator users who have respirators assigned for their personal use must inspect and clean their respirators at least daily when used, or more frequently, if necessary.

Respirators, including self-contained breathing apparatus (SCBA) used for emergency purposes and respirators used for escape, will be inspected monthly or after each use, whichever is more frequent. These respirators will be protected from the elements. A tag shall be maintained affixed to the device or its protective case or housing. Each inspection shall be logged on the tag and include:

- Inspector's initials.



Project Respiratory Protective Equipment Procedure

- Inspection date.
- Status and inspection findings with comment as necessary.

Inspection information shall also be entered in the respiratory protection maintenance log.

The HSSE Representative or designee will conduct and document frequent random inspections to ensure that respirators are properly maintained.

Respirators shall always be placed on a flat surface; respirators are not to be hung by their straps and shall be stored in a cool, dry location with moderate temperatures.

Respiratory protection equipment shall not be subjected to extreme temperatures, hot or cold, and shall be stored to protect against direct sunlight or heat, chemical contamination, or distortion of its pliable synthetic materials.

Respirator parts from one respirator manufacturer shall not be exchanged with those of another.

Respirators found to be defective during inspection shall be repaired immediately or tagged "out of service" or discarded.

Air purifying chemical cartridges, available for protection against specific chemical compounds, are to be used for that hazard only. Further, the sorbent service life and, hence, the effectiveness will depend on the activity of the wearer (breathing rate etc.) and the specific type, volatility, and concentration of the chemical.

All air-purifying respirators cleaned onsite shall be inspected frequently and results of inspection recorded on the respirator maintenance log. Respirators cleaned offsite by subcontractors shall be subject to periodic QA/QC inspection by the program administrator or designee, and a review of the facilities and procedures used by subcontractors may be conducted. Subcontractor inspections shall be documented in the log (see Attachment 5).

Self-contained breathing apparatus and other emergency respirators shall additionally be inspected before each use and during periods of storage. The complete airline respiratory system will be inspected before each use. Hose masks and blower, when used, shall be inspected at least monthly and before each use for proper operation.

When replacing worn or deteriorated parts, only those made specifically for the device shall be used, and the repair work shall be recorded. Respirator certification is voided if parts other than the specified part for a specific respirator are used.

Air-purifying cartridges shall be replaced when an end-of service life indicator (ESLI) indicates, or per the replacement schedule specified for the job. They should also be replaced at the first trace of contaminant odor, other user-detected warning property, or any increased resistance to breathing while wearing the respirator.

9.1 Respirator Selection

Respiratory protective devices will be used whenever engineering controls are not feasible and when airborne contaminants exceed or are anticipated to exceed published regulatory standards.

These devices will be specified per the concentration and type of the airborne contamination present or expected at each work site. Consideration of other job site conditions such as heat stress, visibility and lighting, low temperatures, and other safety issues will be factored into the selection process.

Before a respirator can be issued to protect the worker from a respiratory hazard, the HSSE Department must be contacted to evaluate chemical or radiological hazards present at the work area.

In the selection of respiratory protective equipment, the following factors will be considered:



Project Respiratory Protective Equipment Procedure

- Nature and basis of the hazard (e.g., dust, mist, spray, fume, vapor, gas, or combination).
- Potential for an oxygen deficient atmosphere.
- Potential for other IDLH atmospheric conditions.
- Extent of the hazard.
- Contaminant(s) present.
- Concentration of the contaminant(s).
- Characteristics and limitations of the available respirators.
- Expected activity of the worker.
- Fit testing.

The following respiratory protective equipment will be used in atmospheres that are oxygen-deficient or immediately dangerous to life or health:

- Positive-pressure demand self-contained breathing apparatus (SCBA). All SCBAs must be inspected and documented every 30 days and after each use.
- Positive-pressure demand combination airline respirator with 15-minute escape (egress) provision.
- Airline continuous flow, helmet, hood, or suit with escape provisions.
- When the device is a combination SCBA and airline respirator, either a manual or automatic valve will be provided to change to the self-contained air supply if the airline supply fails.
- A standby person, equipped with an SCBA, is required for work immediately dangerous to life or health (IDLH), types of confined spaces that require an airline with escape pack and respiratory protection for purposes other than nuisance odor or nuisance dust (NOTE: 15-minute SCBA units will be used only for emergency egress and not for rescue work or re-entry).

Atmosphere supplying respirators will be used in areas where the contaminant levels are expected or have been determined to exceed the maximum airborne concentration for the air-purifying respirator to be used, if the contaminant airborne concentration is unknown, or if the contaminant of concern is considered to have "poor" warning properties.

Protection against particulate contaminants shall be selected based on particulate filter elements.

Respirators used in non-IDLH atmospheres require an end of service life indicator (ESLI) or a change schedule documented and implemented that will ensure that filter cartridges are changed out before the end of their service life. This change schedule will be documented in the HSSE Execution Plan along with the decision logic used to determine the appropriate time/use limitations. The change-out schedule is highly site-specific and will consider such factors as workplace contaminant concentration, the presence of other contaminants, airflow through the filters, temperature, and humidity.

9.2 Use and Limitations

Air-purifying respirators will not be used for rescue work when atmospheric contaminants are unknown; in IDLH or oxygen deficient environments; when the contaminants of concern have 'poor' warning properties; or when air monitoring data does not exist to document the ambient contaminant levels. (Exception: Certain escape respirators or gas masks selected for a given emergency escape purpose). Due to their inability to protect against oxygen deficiency, APRs are intended for use with no more than 2 percent by volume of most toxic gases.

Chemical cartridge respirators are intended for limited use in a toxic atmosphere. Regardless of the written change schedule, cartridges will be changed whenever the wearer detects the odor of the contaminant or has an increased resistance to breathing.

Respirators issued for the exclusive use of an employee will be marked with the employee's name, badge number, or other unique identification number.

Respirator user will not be allowed to select respirator type or cartridge, and will only use the respiratory protection equipment specified.



Project Respiratory Protective Equipment Procedure

Canisters and cartridges will be specifically selected for the toxic gas and concentration to be encountered. Canister masks that bear the label "ALL-SERVICE," "UNIVERSAL," or something similar will not be used.

An effective seal between the face piece and face to prevent inward leakage must be obtained. Air-purifying respirators, along with demand-type respirators, operate under negative pressure when the wearer inhales; thus, some inward leakage of contaminant may be possible in the absence of an airtight seal.

Temple bars of eyeglasses will not extend through the sealing edge of the full-face respirator. Full-face masks that have been developed with systems for mounting corrective lenses inside the face piece are preferred.

The wearer's use of eyeglasses or goggles should not interfere with a half-mask face piece.

User seal checks shall be performed each time a user dons a respirator.

9.3 Precautions

Respirators usually provide a satisfactory pathway for speech transmission over short distances in relatively quiet areas. An alternate form of communication between workers will be established where respirators are to be used in high noise areas.

To prevent face pieces from fogging up in low temperature, anti-fog compounds may be used to coat the inside of the full-face-piece lens. Several respirator manufacturers also provide nose cups for their full-face-piece respirators which channel the moisture-laden exhaled air directly out through the exhalation valves.

Pure oxygen will not be used for respiratory protection.

Hoses for air supply will be selected to resist chemicals to which they may be exposed.

All air fittings associated with airline supply and SCBA equipment shall be incompatible with other gas systems onsite.

9.4 Voluntary Use

An employee may request to use a respirator in situations where respirator use is not required by regulation or by program procedure. In such a case, the employer must determine that such respirator use will not in itself create a hazard. Factors such as heat stress and limited visibility are among the issues to be considered. When voluntary respirator use is permitted, the following items apply:

- The Company, when allowing such use, must establish and implement those elements of a written respiratory protection program necessary to ensure that any employee using a respirator voluntarily is medically able to use that respirator, and that the respirator is cleaned, stored, and maintained so that its use does not present a health hazard to the user.
- **Exception:** When employees sole use of respirators involves the voluntary use of filtering face pieces (dust masks), the Company is not required to maintain a written respiratory protection program.

10.0 BREATHING AIR QUALITY SYSTEM

Compressor Supplied Breathing Air - Compressed air that is used in supplied air respirators, such as SCBAs, shall be high purity.

Regardless of country/region of operation, Compressed breathing air shall meet at least the requirements for Grade D breathing air described in ANSI/Compressed Gas Association Commodity Specification for Air, G-7.1-1989 (unless local regulations are more stringent). Pure oxygen shall never be substituted for compressed air.



Project Respiratory Protective Equipment Procedure

The specifications for Grade D breathing air are:

- Oxygen content of 19.5% - 23.5%.
- Hydrocarbon (condensed) of 5 mg per cubic meter of air or less.
- CO content of 10 ppm or less.
- CO₂ content of 1000 ppm or less.
- Lack of noticeable odor.
- Air supplied in cylinders shall not have a dew point greater than -45.6°C.

Breathing air may be supplied to respirators from cylinders or compressor systems. Oxygen content shall not exceed 23.5% except in systems specifically designed for oxygen distribution.

Where practical, breathing-air compressor shall be used. Compressors shall be situated to avoid entry of ambient contaminated air or exhaust into the breathing-air system and suitable in-line air. An oil-less compressor is preferred over an oil-lubricated compressor. All compressor systems shall be equipped and maintained in accordance with the manufacturer's specifications or better. Oil-lubricated compressors shall be equipped with a high-temperature shut off and/or an alarm system and alarm actuation system to safeguard against exposure to carbon monoxide, compressor failure, and monitor failure. If only a high-temperature alarm is used, the air shall be tested daily for carbon monoxide unless specified otherwise by the RPA. Test results shall be documented (continuous CO monitors are highly recommended). Filters shall be entrained for removal of water and oil from the breathing air. A receiver vessel of sufficient capacity to enable the respirator wearer to escape from a contaminated atmosphere shall be installed in the event of compressor failure.

Additional requirements for compressor supplied breathing air are:

- System constructed to prevent entry of contaminated air into the breathing air system.
- Minimize moisture content so that the dew point at 1 atmosphere is 5.56°C below ambient temperature.
- If equipped with in-line air-purifying sorbent beds and/or filters, these sorbent beds and filters are to be maintained and cleaned or changed, per the manufacturer's recommendations. A tag affixed to the compressor shall indicate the most recent change date and the signature of the individual authorized to make the change.
- Breathing air containers must be marked/indicated as such, in accordance with applicable transportation regulations.

11.0 CASCADE SYSTEMS

Breathing-air cylinders shall be legibly identified, with the word "BREATHING AIR" by means of stenciling, stamping, or labeling as near to the valve end as practical.

Cascade systems shall be equipped with low pressure warning bells (Pak alarm, etc.) or similar warning devices to indicate air pressure in the manifold below 500 psig.

When a cascade system is used to supply breathing air, one employee shall be assigned as safety standby (bottle watch) within audible range of the low-pressure alarm.

When a cascade system is used to recharge SCBA air cylinders, it shall be equipped with a high-pressure supply hose and coupling rated at a capacity of at least 3000 psig.

Air-line couplings shall be incompatible with outlets for other gas-systems to prevent inadvertently supplying air-line respirators with non-respirable gases or oxygen.

The air pressure at the hose connection to positive-pressure respiratory equipment shall be within the range specified in the approval of the equipment by the manufacturer.



Project Respiratory Protective Equipment Procedure

Cylinders shall be stored and handled to prevent damage to the cylinder or valve. Cylinders shall be stored upright with the protective valve cover in place and in such a way as to prevent the cylinder from falling (e.g., supported with substantial rope or chain in the upper one third of the cylinder, or in racks designed for this purpose). Cylinders shall not be dropped, dragged, rolled, or allowed to strike each other or to be struck violently. Cylinders shall never be exposed to temperatures exceeding 52°C. Cylinders with visible external damage, evidence of corrosion damage, or exposure to fire shall not be accepted or used.

Only cylinders within current hydrostatic test periods shall be used. Cylinders must be pressure-tested annually by a certified tester.

Valves and regulators used on cascade delivery to air-line supplied respirators or for SCBA refilling shall not be used for any other service.

Breathing air cylinder source quality shall be verified via vendor or Bechtel certification testing or other QA/QC procedures.

12.0 PROGRAM EVALUATION

All respiratory protection program procedures, will be reviewed on a periodic basis by the RPA. The project respiratory protection program will be evaluated on an ongoing basis by the HSSE Representative to determine the program effectiveness. Evaluation will include the following:

- Review of current airborne contaminant monitoring data to insure sufficient protection is afforded all respirator users.
- Review of technical information.
- Compliance with regulations.
- Review of medical qualifications.
- Review of medical requirements.
- Review of training qualifications.
- Review of training documents and plans.
- Review of respirator fit-test documentation.
- Review of reports of respirator or cartridge failures.
- Review of maintenance and cleaning procedures and logs.
- Review of inspection procedures.
- Record keeping requirements.
- Consultation with respirator wearers to determine their views on the effectiveness of the program.

13.0 ATTACHMENTS

1. EPM-KSH-TP-000001 - Respiratory Wearer Clearance Form Template
2. EPM-KSH-TP-000002 - Respirator User Medical Questionnaire Form Template
3. EPM-KSH-TP-000003 - Employee Statement of Medical Condition Form Template
4. EPM-KSH-TP-000004 - Respirator Fit Test Record Template
5. EPM-KSH-TP-000005 - Respirator Maintenance Log Template



Project Respiratory Protective Equipment Procedure

Attachment 1 - EPM-KSH-TP-000001 - Respirator Wearer Clearance Form Template

Respirator User Clearance for _____

National Identification Number or Iqama Number _____ Company: _____

The above-named individual has completed the required/mandated medical questionnaire, appropriate medical exam(s) and respirator fit test on _____

1. Follow-up medical examination required: ☐ Yes ☐ No

If Yes: Consisting of the following tests/evaluations/results

2. This individual is medically fit for respirator use: ☐ Yes ☐ No

3. Pulmonary function test: ☐ Yes* ☐ No

Type of PFT: ☐ QLFT ☐ QNFT

QLFT: ☐ ISA ☐ Saccharin ☐ Biter ☐ IS ☐ Pass ☐ Fail ☐ NA

QNFT: ☐ GA ☐ CNC(Pulmonary)* ☐ CNP ☐ Fit factor _____ * Preferred

The use of a respirator may be associated with other physical stresses, such as having to wear restrictive protective clothing and to carry heavy equipment. Accordingly, this fit test included these possibilities. If this is a new employee, information for questions 10 through 19 of part B of the medical questionnaire (if used) shall be supplied by a statement from the employer's HSSE Representative or their designee.

PROJECTS:

This test has been conducted according to OSHA 29CFR 1910.134 Appendix A and using the information provided in the medical questionnaire mandated by 29CFR 1910.134 Appendix C.

Recommendations (according to ANSI Z 88.6)

Class I _____ (no restrictions) Class II _____ specific restrictions Class III _____ (not permitted)
Class II restrictions _____

APPROVAL IS FOR THE FOLLOWING RESPIRATOR(S)

Type Air Purifying: ☐ 1/2FP ☐ FFP ☐ ~~Filter~~ ☐ PAPR only

Air Supplying: ☐ SAR (airline) ☐ SCBA

Brand _____ Size ☐ SM ☐ MED ☐ LG ☐ XLG

Other/Comments _____

(Signature of authorized PHCR)

(Date)



Project Respiratory Protective Equipment Procedure

Attachment 2 - EPM-KSH-TP-000002 - Respirator User Medical Questionnaire Template

Instructions for use: This Attachment is copied directly from OSHA regulations. The appropriate sections of this questionnaire must be selected by the author and included in the site-specific procedure.

Respiratory Protection- Mandatory Medical Questionnaire

Answers to questions in Section 1, and to question 9 in Section 2 of Part A, do not require a medical examination.

To the employee:

Can you read (circle one)? ☐ Yes ☐ No

To maintain your confidentiality, your employer or supervisor must not look at or review your answers, and your employer must tell you how to deliver or send this questionnaire to the health care professional who will review it.

Part A. Section 1. (Mandatory) The following information must be provided by every employee who has been selected to use any type of respirator (please print).

1. Today's date: _____

2. Your name: _____

3. Your age (to nearest year): _____

4. Sex (circle one): ☐ Male ☐ Female

5. Your height: _____ ft. (or meters) _____ in. (or centimeters)

6. Your weight: _____ lbs. (or kilos)

7. Your job title: _____

8. A phone number where you can be reached by the health care professional who reviews this questionnaire (include the Area Code or country/city codes, as applicable): _____

9. The best time to phone you at this number: _____

10. Has your employer told you how to contact the health care professional who will review this questionnaire (circle one)? ☐ Yes ☐ No

11. Check the type of respirator you will use (you can check more than one category):

a. ☐ N, R, or P disposable respirator (filter-mask, non- cartridge type only).

b. ☐ Other type (for example, half- or full-facepiece type, powered-air purifying, supplied-air, self-contained breathing apparatus).

12. Have you worn a respirator (circle one)? ☐ Yes ☐ No

If "yes," what type(s): _____



Project Respiratory Protective Equipment Procedure

Attachment 3 - EPM-KSH-TP-000003 - Employee Statement of Medical Condition Form Template

(Print Employee Name)

To the best of my knowledge, I, _____, have no medical conditions which would interfere with wearing a respirator while engaged in hazardous exposure situations. I understand that heart disease, high blood pressure, lung disease, or presence of a perforated eardrum require specific medical evaluation by a physician before safe use of a respirator can be determined.

(Signature of Employee)

(Date)

REPORT OF MEDICAL EVALUATION

The employee listed above has been given an examination by me and at this time there is no medical contraindication to the employee named above wearing a respirator to allow working in hazardous exposure environments.

Other Comments: _____

(Physician's Signature)

(Date)



Project Respiratory Protective Equipment Procedure

Attachment 4 - EPM-KSH-TP-000004 - Respirator Fit Test Record Template

Last Name:

First Name:

PORTACOUNT PLUS FIT TEST SOFTWARE

FitPlus Version B

TSI Incorporated

FIT TEST REPORT

SSN (or ID Number):

Test Date:

Next Test Due:

Operator Name:

Respirator Model:

-Type (Half/Full):

-Size:

-Manufacturer:

-Approval Number:

Notes :

Test Date:

Test Time:

TEST DATA

Fit Factor Pass Level: 100

Ex.	Ambient (Part/cc)	Mask (part/cc)	Fit Factor	Pass/Fail
NB	18400	0.27	67900.0	PASS
DB	16300	0.74	22000.0	PASS
SS	15200	0.19	79700.0	PASS
UD	14400	1.20	11900.0	PASS
T	13600	2.45	5550.0	PASS
G	12900	0.24	53700.0	PASS *
B	12200	1.96	6220.0	PASS
NB	11700	1.33	8790.0	PASS

* Not included in overall Fit Factor

Overall Fit Factor = 11400-0

PASS

Operator

Date

Name

Date

Project Respiratory Protective Equipment Procedure

Attachment 5 - EPM-KSH-TP-000005 - Respirator Maintenance Log Template

PROJECT NUMBER:	PROJECT LOCATION:	DEPARTMENT:
-----------------	-------------------	-------------

[illegible]