Lewis Energy Group®

STANDARD OPERATING PRACTICE

Respiratory Protection

Lewis Energy Group
Version 1.3
June 2024

Table of Contents

1. Purpose:

The purpose of this Standard Operating Practice (SOP) document is to provide a guide for Lewis Energy Group (LEG) Team Members on respiratory hazards and proper protection in accordance with applicable regulations and best practices.

LEG Policy Statement

Lewis Energy Group (LEG) has developed and implemented a written **Standard Operating Practice (SOP) for Respiratory Protection.** This practice applies to Team Members when respirators are worn to protect worker health from exposure to air contaminants or oxygen deficient atmospheres. All Team Members with work that involves the use of a respirator shall be examined and be medically approved by a physician or licensed health care provider (PLHCP), fit tested with the proper respirator and trained in the proper use and maintenance of respiratory protection equipment.

2. Applicability:

This program applies to Team Members when respirators are worn to protect their health from exposure to air contaminants or oxygen deficient atmospheres, whether required by statute, by company policy or worn voluntarily. All Team Members whose work involves the use of respirators shall be medically certified, fit tested, and trained on the proper use and maintenance of respiratory protection equipment in accordance with 29 CFR 1910.134. The list below, although not all inclusive, provides information on when appropriate respiratory protection is required.

Appropriate respiratory protection is required when:

- Engineering and administrative controls are not feasible;
- Engineering and administrative controls cannot effectively control contaminants;
- Engineering and administrative controls are being instituted; or
- Emergency situations arise that require the use of respiratory protection.

3. OSHA Requirements

The Occupational Safety and Health Administration (OSHA) requires that a written respiratory protection program be developed and implemented with specific worksite procedures for proper use of respirators. This SOP serves as the written program as required under 29 CFR 1910.134.

At Lewis Energy Group (LEG) each business unit (BU) will conduct a hazard assessment in their respective work area(s) to determine if potential exposure to respiratory hazards exist. Industrial hygiene (IH) sampling may be required to determine if the OSHA permissible exposure limits (PELs) are

exceeded. Based on the results of the hazard assessment and IH sampling, a determination can be made on the need for and the specific type of respirator that will be used in the BU work area(s). The LEG Safety Department will assist the BU's with their hazard assessment and IH sampling.

4. Roles and Responsibilities:

- **Safety Department - Program Administrator (PA):**
    - Conduct hazard assessments to identify potential airborne hazards.
    - Select appropriate respirators based on the hazard assessment and OSHA Respirator Selection Guides (e.g., Z1A, Z2)
    - Conduct and document initial (29 CFR 1910.134(f)) and follow-up fit testing using approved methods (qualitative or quantitative).
    - Maintain the respiratory protection program, including records and equipment.
    - Provide respirator training to Team Members (29 CFR 1910.134(g)(2)).
    - Oversee medical evaluations as needed.
    - Evaluate program effectiveness and address identified issues.
- **Team Members**
    - Follow this SOP and all safety instructions regarding respirator use.
    - Attend mandatory respirator training.
    - Report any respirator malfunctions or concerns to the Safety Department.
    - Conduct user seal checks before each use.
    - Notify a supervisor and/or the Safety Department immediately if experiencing difficulty breathing, discomfort while using a respirator, or other symptoms that relate to the ability to use a respirator.
- **Supervisors:**
    - Ensure Team Members under their supervision understand and follow this SOP and all safety instructions related to respirator use.
    - Identify tasks or activities requiring respirator use within their area of responsibility.
    - Inform the Safety Department of any changes in work processes or conditions that may impact respiratory hazards.
    - Monitor Team Members for proper respirator use and adherence to safety procedures.
    - Encourage Team Members to report any respirator malfunctions, concerns, or difficulties breathing while using respirators.
    - Promptly communicate respirator-related concerns or incidents to the Safety Department.
    - Participate in respirator training as required.

5. Respirator Selection:

- Respirators with filtering capabilities appropriate for the identified airborne contaminant will be chosen based on 29 CFR 1910.134(b)(1).

- A NIOSH-certified respirator shall be selected for use. The respirator shall be used in compliance with the conditions of its certification. During the selection process, the assigned protection factor (APF) will be used to determine the maximum use concentration (MUC) of the respirator. See Table I in Appendix A for additional information.
- Refer to the Safety Department for assistance in selecting the appropriate respirator.

6. Medical Evaluation for Respirator Use:

General

LEG shall provide a medical evaluation to determine the Team Member's ability to use a respirator, before the Team Member is fit tested or required to use the respirator in the workplace. Clearance of the medical evaluation must be verified before fit testing. The use of Team Member evaluations may be discontinued when the Team Member is no longer required to use a respirator.

Medical Evaluation Procedures

The physician or other licensed health care provider (PLHCP) shall perform medical evaluations using a medical questionnaire or an initial medical examination that obtains the same information as the medical questionnaire.

The medical evaluation shall obtain the information requested by the questionnaire on the form in Appendix C of this SOP.

Administration of the Medical Questionnaire and Examinations

The medical questionnaire and examinations shall be administered confidentially during the Team Member's normal working hours. The medical questionnaire shall be administered in a manner that ensures that the Team Member understands its content.

Team Members shall be provided with an opportunity to discuss the questionnaire and examination results with the PLHCP.

Medical Determination

In determining the Team Member's ability to use a respirator, LEG Safety management shall obtain a written recommendation regarding the Team Member's ability to use the respirator from the PLHCP.

The recommendation will provide the following information:

- Any limitations on respirator use related to the medical condition of the Team Member, or relating to the work place location conditions in which the respirator shall be used including whether or not the Team Member is medically able to use the respirator;

- At a minimum, follow-up medical evaluations may be conducted over the telephone between the PLHCP and Team Member;
- A statement that the PLHCP has provided the Team Member with a copy of the PLHCPs written recommendation.

Additional Medical Evaluations

At a minimum, LEG Safety shall provide the initial medical evaluations that comply with the requirements of this section unless the following conditions apply. If any of the following conditions apply, the Team Member will report it to the supervisor who will comply with the medical re-evaluation protocol.

- A Team Member reports medical signs or symptoms that are related to ability to use a respirator;
- A PLHCP or informs LEG Safety that the Team Member needs to be reevaluated;
- Information from the respiratory protection program, including observations made during fit testing and program evaluation, indicates a need for Team Member re-evaluation;
- A change occurs in workplace or location conditions (e.g., physical work effort, protective clothing, and temperature) that may result in a substantial increase in the physiological burden placed on a Team Member.
- New medical condition that prevents the Team Member from performing their job.

7. Fit Testing:

Before a Team Member may be required to use a respirator with a negative or positive pressure tight-fitting facepiece, the Team Member shall be fit tested with the same make, model, style, and size of respirator that will be used. Fit testing can be achieved by internal or external qualified person with the approval of the PA. Reevaluation will be conducted whenever there is a significant change in facial features/weight or as otherwise deemed necessary by the PA or PLHCP.

OSHA Fit testing procedures are provided in Appendix D of this SOP.

8. Respirator Use:

- Follow manufacturer instructions for each respirator type for donning, doffing, and user seal checks.
- Inspect the respirator before each use, checking for damage, leaks, and proper filter selection.
- Leave the work area immediately if you experience difficulty breathing, dizziness, or face-seal leakage.
- Refer to 29 CFR 1910.134(g) for general respirator use procedures.

9. Maintenance and Care:

This section refers to providing for the cleaning and disinfecting, storage, inspection, and repair of respirators used by Team Members.

- Each respirator user shall have a respirator that is clean, sanitary, and in good working order. Cleaning and disinfection procedures recommended in the Standard or by the respirator manufacturer are to be used.
- Respirators issued for the exclusive use of a Team Member shall be cleaned and disinfected as often as needed to be maintained in sanitary condition.
- Respirators issued to more than one Team Member shall be cleaned and disinfected before being worn by different individuals. See appendix E for cleaning and sanitizing respirators.
- Respirators maintained for emergency use shall be cleaned and disinfected after each use.
- Respirators used in fit testing and training shall be cleaned and disinfected after each use.
- Respirators shall be stored to protect them from damage, contamination, dust, sunlight, extreme temperatures, excessive moisture, and damaging chemicals, and they shall be packed and stored to prevent deformation of the face piece and exhalation valve.
- Emergency respirators shall be kept accessible to the work area, stored in compartments or in covers clearly marked as containing emergency respirators and stored in accordance with any applicable manufacturer instructions.
- All respirators used in routine situations shall be inspected before each use and during cleaning.
- If needed, emergency escape-only respirators shall be inspected before being carried into the work place location for use. They shall be inspected by certifying the respirator by documenting the date of the inspection, name or the inspector, findings, requiring remedial action, serial number and other means of identifying the inspected respirator.

Appendix E provides information for respirator care and a maintenance checklist.

10. Breathing Air Quality:

Compressed breathing air used for respiration shall be in accordance with the following specifications:

- Compressed breathing air shall meet at least the requirements for Type 1-Grade D breathing air described in ANSI/Compressed Gas Association Commodity Specification for Air, G-7-1-1989, to include:
    - Oxygen content (v/v) 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 content of 1,000 ppm or less.
    - Have a lack of noticeable odor.

- Compressed oxygen must not be used in atmosphere-supplying respirators that have previously used compressed air.
- Oxygen concentrations greater than 23.5% must be used only in equipment designed for oxygen service or distribution.
- Cylinders used to supply breathing air to respirators shall meet the following requirements:

  - Cylinders are tested and maintained as prescribed in the Shipping Container Specification Regulations of the Department of Transportation (DOT) (49 CFR part 173 and part 178).
  - Cylinders of purchased breathing air will have a certificate of analysis from the supplier that the breathing air meets the requirements of Type 1-Grade D breathing air.
  - The moisture content in the cylinder does not exceed a dew point of -50 deg F (-45.6 deg C) at 1 atmosphere of pressure.
- Breathing air couplings must not be compatible with outlets for non-respirable worksite air or other gas systems. No asphyxiating substance shall be introduced into the breathing air lines.
- Breathing gas containers must be marked in accordance with NIOSH respirator certification standard, 42 CFR part 84.

11. Training and Information:

The LEG Safety department shall provide training to Team Members who are required to use respirators. The training shall be comprehensive, understandable, and recur annually and more often if deemed necessary.

Each Team Member shall demonstrate knowledge of but not limited to the following:

- Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator;
- What the limitations and capabilities of the respirator are;
- How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions;
- How to inspect, put on and remove, use, and check the seals of the respirator;
- What the procedures are for maintenance and storage of the respirator;
- How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators.

The general requirements of this section are:

- Training shall be conducted in a manner that is understandable to the Team Member.
- Training shall be provided prior to requiring the Team Member to use a respirator in the work area.
- Team Members that have documentation of respiratory training within the last 12 months are not required to repeat such training provided that the Team Member can demonstrate knowledge of those element(s). Previous training not repeated initially must be provided no later than 12 months from the date of the previous training.
- Retraining shall be administered annually, and when the following limitations occur:
  - Changes in the work area or the type of respirator render previous training obsolete;
  - Inadequacies in the Team Member's knowledge or use of the respirator indicate that the Team Member has not retained the requisite understanding or skill; or,
  - Any other situation that arises in which retraining appears necessary to ensure safe respirator use.

12. Program Evaluation:

Evaluations of the work area shall be conducted as necessary to ensure that the provisions of the current written program are being effectively implemented and that it continues to be effective.

The Safety Department will periodically evaluate the effectiveness of this SOP and the overall respiratory protection program.

Factors to be assessed include, but are not limited to:

- Respirator fit (including the ability to use the respirator without interfering with effective work area performance);
- Appropriate respirator selection for the hazards to which the Team Member is exposed;
- Proper respirator use under work area conditions the Team Member encounters.

13. Recordkeeping:

The LEG PLHCP shall establish and retain written information regarding medical evaluations, while the LEG Safety Department will retain written information on the fit testing and the respirator program. This information shall facilitate Team Member involvement in the respirator program, assist in auditing the adequacy of the program, and provide a record for compliance determinations by OSHA.

Respirator Maintenance

A copy of the maintenance checklist is provided in Appendix E.

Medical Evaluation Records

Records of medical evaluations required by this section shall be retained and made available in accordance with 29 CFR 1910.1020.

Fit Testing Records

A record of the qualitative and quantitative fit tests administered to a Team Member shall include but not be limited to:

- The name or identification of the Team Member tested;
- Type of fit test performed;
- Specific make, model, style, and size of respirator tested;
- Date of test; and
- The pass/fail results for QLFTs or the fit factor and strip chart recording or other recording of the test results for the QNFTs.

Fit test records shall be retained in the LEG Safety Department.

Respirator Program Record

A written copy of this respirator program shall be kept in by the LEG Safety Department and made available to all Team Members.

14. Definitions:

Air-Purifying Respirator: a respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element.

Appropriate Protection Factor (APF): is the workplace level of respirator that a respirator or class or respirators is expected to provide to Team Members when LEG implements a continuing, effective respiratory protection program.

Atmosphere-Supplying Respirator: a respirator that supplies the respirator user with breathing air from a source independent of the ambient atmosphere, and includes supplied-air respirators (SARs) and self-contained breathing apparatus (SCBA) units.

Cartridge: a container with a filter, sorbent, or catalyst, or combination of these four items, which removes specific contaminants from the air passed through the container.

Emergency Situation: an occurrence such as, but not limited to, equipment failure, rupture of containers, or failure to control equipment that may, or does result in an uncontrolled significant release of an airborne contaminant.

Employee Exposure: an exposure to a concentration of an airborne contaminant that would occur if the employee were not using respiratory protection.

Escape-Only Respirator: a respirator intended to be used only for emergency exit.

Filter or Air-Purifying Element: a component used in respirators to remove solid or liquid aerosols from the inspired air.

Fit Factor: a quantitative estimate of fit of a particular respirator to a specific individual and typically estimates the ratio of the concentration of a substance in ambient air to its concentration inside the respirator when worn.

Fit Test: the use of a protocol to qualitatively or quantitatively evaluate the fit of a respirator on an individual.

H2S: Hydrogen Sulfide

Immediately Dangerous to Life or Health (IDLH): an atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual's ability to escape from a dangerous atmosphere.

Maximum Use Concentration (MUC): the maximum atmospheric concentration of a hazardous substance from which a Team Member can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC is usually determined mathematically by multiplying the assigned protection factor specified for a respirator by the permissible limit (PEL), short-term exposure limit, ceiling limit, peak limit, or any other exposure limit used for the hazardous substance.

Medical Evaluation: having a PLHCP perform a review of the medical questionnaire filled out by the Team Member.

Medical Examination: an exam by a PLHCP, which may include medical tests, consultations, or diagnostic procedures.

Negative Pressure Respirator: a respirator in which the air pressure inside the face piece is negative inhalation with respect to the ambient air pressure outside the respirator.

Oxygen Deficient Atmosphere: an atmosphere with oxygen content below 19.5% by volume.

Physician or other Licensed Health Care professional (PLHCP): an individual whole 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 of the health care services required by the medical evaluation section of this program.

Positive Pressure Respirator: a respirator in which the pressure inside the respiratory inlet cover exceeds the ambient air pressure outside of the respirator.

Qualitative Fit Test (QLFT): pass/fail fit test to assess the adequacy of respirator fit that relies on the individual's response to the test agent.

Quantitative Fit Test (QNFT): an assessment of the adequacy of respirator fit, by numerically measuring the amount of leakage into the respirator.

Self-Contained Breathing Apparatus (SCBA): an atmosphere-supplying respirator for which the breathing air source is designed to be carried by the user.

Service Life: the period of time that a respirator, filter or sorbent, or the respiratory equipment provides adequate protection to the wearer.

Supplied-Air Respirator (SAR): an atmosphere-supplying respirator for which the source of breathing air is not designated to be carried by the user.

Tight-Fitting Face Piece: a respiratory inlet covering that forms a complete seal with the face.

User Seal Check: an action conducted by the respirator user to determine if the respirator is properly sealed to the face

15. Document Control

Version	Change Date	Change Description	Changed by	Approved by	Approval Date
1.1	8/20/19	• Added Policy Statement • Revised Purpose Statement • Capitalize Team Member	Colin Clark	Ken Phillips	8/20/19
1.2	10/17/19	• Update Cover Page • Update TOC • Update Appendix Section	Colin Clark	Ken Phillips	10/17/19
1.3	6/20/24	• Added reevaluation for TM health conditions • PLHCP retains medical evaluations	Colin Clark	Ken Phillips	6/20/24

NOTE: Changes to this document shall be reviewed by the Sub-Committee and approved by the Executive Safety Committee (ESC). Any document revisions are to be noted on the Document Review Change Log. This form shall be kept current to maintain audit compliance.

This SOP provides general guidelines for respiratory protection within the LEG Team. It is not intended to be a substitute for compliance with applicable laws and regulations. Refer to relevant regulatory agencies for specific requirements

Appendix A

42 CFR PART 84

Assigned Protection Factors (APF)/Maximum Use Concentration (MUC)

Table I: Assigned Protection Factors[5]					
Type of Respirator[1,2]	Quarter mask	Half-mask	Full face piece	Helmet/Hood	Loose-fitting face piece
1. Air-purifying Respirator	5	10[3]	50	-	-
2. Powered Air-purifying Respirator (PAPR)	-	50	1,000	25/1,000[4]	25
3. Supplied-air Respirator (SAR) or Airline Respirator					
* Demand mode	-	10	50	-	-
* Continuous flow mode	-	50	1,000	25/1,000[4]	25
* Pressure-demand or other positive-pressure mode	-	50	1,000	-	-
4. Self-contained Breathing Apparatus (SCBA)					
* Demand mode	-	10	50	50	-
* Pressure demand or other positive-pressure mode (e.g., open/closed circuit)	-	-	10,000	10,000	-

Notes:

1. LEG may select respirators assigned for use in higher workplace concentrations of a hazardous substance for use at lower concentrations of that substance, or when required respirator use is independent of concentration.
2. The assigned protection factors in Table I above are only effective when LEG implements a continuing effective respirator program as required by this section (29 CFR 1910.134), including training, fit testing, maintenance, and use requirements.
3. This APF category includes filtering face pieces and half masks with elastomeric face pieces.
4. LEG must have evidence provided by the respirator manufacturer that testing of these respirators demonstrates performance at a level of protection of 1,000 or greater to receive an APF of 1,000. This level or performance can be demonstrated by performing a WPF or SWPR study or equivalent testing. Absent such testing, all other PAPRS and SARs with helmets/hoods are to be treated as loose-fitting face piece respirators, and receive an APF of 25.
5. These APFs do not apply to respirators used for escape. For escape respirators used in association with specific substances covered by 29 CFR 1910 subpart Z, LEG must refer to the appropriate substance-specific standards in that subpart. Escape respirators for other IDLH environments are specified by 29 CFR 1910.134(d)(2)(ii).

Classes of Filters

While 30 CFR Part 11 classifications were substance-specific (dust, fume, mist, etc.), 42 CFR Part 84 classifies particulate filters by efficiency and performance characteristics against non-oil and oil-containing hazards. There are nine classes of filters (three levels of filter efficiency, each with three categories of resistance to filter efficiency degradation). Levels of filter efficiency are 95%, 99% and

99.97%. Categories of resistance to filter efficiency degradation are labeled N, R, and P. Use of the filter will be clearly marked on the filter, filter package, or respirator box (e.g., N95 means N-series filter at least 95% efficient).

Selection

Selection of N-, R-, and P-series filters depends on the presence or absence of oil particles (oil mists) as follows:

- If no oil particles are present, use any series (N-,R-, or P)
- If oil particles are present, use only R or P series
- If oil particles are present and the filter is to be used for more than one work shift, use only P series.
- N for Not resistant to oil
- R for Resistant to oil
- P for oil Proof

Selection of filter efficiency (i.e., 95%, 99% or 99.97%) depends on how much filter leakage can be accepted.

	95% efficient	99% efficient	99.97%efficient (HEPA)
N-series	N95	N99	N100
R-series	R95	R99	R100
P-series	P95	P99	P100

Appendix B

CARTRIDGE CHANGE-OUT-SCHEDULE

Cartridge Change-Out-Schedule

Lewis Energy Group

Cartridges are used in air-purifying respirators for protection against vapors and gases. The cartridge contains sorbents that interact with the gases and vapors to remove these potentially harmful molecules from the air. Sorbents are granular porous materials that use interactions known as removal mechanisms to absorb, or chemically react to remove gases or vapors. Activated carbon is commonly used for protection against organic vapors. For other gases or vapors, sorbents may be impregnated with chemical reagents to make them more selective.

In both cases the removal mechanisms are basically 100% efficient until the sorbents ability to remove the contaminant is exhausted. At this time, breakthrough occurs as the contaminant passes through the cartridge into the respirator onto the user. At this point the users may or may not detect the presence of a contaminant. This odor threshold for substance has been used to alert the respirator users that the cartridge is no longer removing the contaminant from the air. Individuals can differ in their smell sensitivity, due to a variety of chronic or acute physiological conditions. Also, the continuing exposure to an odor usually results in a gradual loss or even disappearance of the smell sensation. This is known as olfactory adaption or smell fatigue.

The reliance on odor thresholds and other warning properties is no longer explicitly permitted as the sole basis for determining that air-purifying respirators will provide adequate protection against exposure to gas and vapor contaminants. As a result, cartridges must either be equipped with end of service life indicators (ESLI) or data must be developed to indicate when change-out must occur.

The service life of cartridges is based on several factors:

- Quality and amount of sorbent
- Packing and uniformity and density
- Exposure conditions, including breathing rate of the wearer
- Relative humidity
- Temperature
- Contaminant concentration
- Affinity of the gas or vapor for the sorbent
- Presence of other gases and vapors

Appendix C

RESPIRATOR MEDICAL EVALUATION QUESTIONNAIRE (RMEQ)

OSHA Respirator Medical Evaluation Questionnaire (Mandatc Appendix C to Sec. 1910.134:

Print Form

Part A. Section 1. (Mandatory) Every employee who has been selected to use any type of respirator (please print) must provide the following information.

Today's date _____ Date of Birth: _____

Name _____ SSN: _____

Job Title _____ Sex: Male ◯ Female ◯

Home Phone: _____ Height: ___ (ft) ___ (in) Weight ___ (lbs)

Work Phone: _____

Can you read English? . . . . . Yes ◯ NO ◯

Has your employer told you how to contact the health care professional who will review this? Yes ◯ NO ◯

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

☐ Half-face ☐ Powered-air purifier

☐ Full-facepiece type (includes gas mask) ☐ Supplied-air

☐ Self-contained breathing apparatus

Have you worn a respirator in the past?: . . . . . Yes ◯ NO ◯

If ``yes,'' what type(s): _____

Physical exertion while wearing a respirator ☐ Mild ☐ Moderate ☐ Strenuous

Maximum time you wear a respirator in a single day?: ___ hours

Do you exercise? . . . . . Yes ◯ NO ◯

If ``yes,' describe how often and what exercise activities are: _____

Part A. Section 2. (Mandatory) Questions 1 through 9 below must be answered by every employee who has been selected to use any type of respirator (please select ``yes'' or ``no'').

1. Do you currently smoke tobacco, or have you smoked tobacco in the last month? Yes ◯ NO ◯

If Yes, how many packs per day? ☐ 1/2 or less ☐ 1 ☐ 2 ☐ 2 or more

How many years have you smoked? ☐ 1-9 ☐ 10-19 ☐ 20-29 ☐ 30 or more

2. Have you ever had any of the following conditions?

Seizures (fits) Yes ◯ NO ◯

Diabetes (sugar disease) Yes ◯ NO ◯

Allergic reactions that interfere with your breathing Yes ◯ NO ◯

Claustrophobia (fear of closed-in places) Yes ◯ NO ◯

Trouble smelling odors Yes ◯ NO ◯

3. Have you ever had any of the following pulmonary or lung problems?

Asbestosis Yes ◯ NO ◯

Asthma Yes ◯ NO ◯

Chronic bronchitis: Yes ◯ NO ◯

Emphysema: Yes ◯ NO ◯

Pneumonia Yes ◯ NO ◯

Tuberculosis Yes ◯ NO ◯

Silicosis Yes ◯ NO ◯

Pneumothorax (collapsed lung) Yes ◯ NO ◯

Lung cancer Yes ◯ NO ◯

Broken ribs: Yes ◯ NO ◯

Any chest injuries or surgeries: Yes ◯ NO ◯

Any other lung problem that you've been told about: Yes ◯ NO ◯

Name _____

4. Do you currently have any of the following symptoms of pulmonary or lung illness?

Shortness of breath:	Yes ◯ NO ◯
Shortness of breath when walking fast on level ground or walking up a slight hill/incline	Yes ◯ NO ◯
Shortness of breath when walking with other people at an ordinary pace on level ground:	Yes ◯ NO ◯
Have to stop for breath when walking at your own pace on level ground:	Yes ◯ NO ◯
Shortness of breath when washing or dressing yourself:	Yes ◯ NO ◯
Shortness of breath that interferes with your job:	Yes ◯ NO ◯
Coughing that produces phlegm (thick sputum):	Yes ◯ NO ◯
Coughing that wakes you early in the morning:	Yes ◯ NO ◯
Coughing that occurs mostly when you are lying down:	Yes ◯ NO ◯
Coughing up blood in the last month:	Yes ◯ NO ◯
Wheezing:	Yes ◯ NO ◯
Wheezing that interferes with your job:	Yes ◯ NO ◯
Chest pain when you breathe deeply:	Yes ◯ NO ◯
Any other symptoms that you think may be related to lung	Yes ◯ NO ◯

5. Have you ever had any of the following cardiovascular or heart problems?

Heart attack	Yes ◯ NO ◯
Stroke:	Yes ◯ NO ◯
Angina:	Yes ◯ NO ◯
Heart Failure:	Yes ◯ NO ◯
Swelling in your legs or feet (not caused by walking):	Yes ◯ NO ◯
Heart arrhythmia (heart beating irregularly):	Yes ◯ NO ◯
High blood pressure:	Yes ◯ NO ◯
Any other heart problem that you've been told about:	Yes ◯ NO ◯

6. Have you ever had any of the following cardiovascular or heart symptoms?

Frequent pain or tightness in your chest :	Yes ◯ NO ◯
Pain or tightness in your chest during physical activity	Yes ◯ NO ◯
Pain or tightness in your chest that interferes with your job	Yes ◯ NO ◯
In the past two years, have you noticed your heart skipping or missing a beat :	Yes ◯ NO ◯
Heartburn or symptoms that is not related to eating	Yes ◯ NO ◯
Any other symptoms that you think may be related to heart or circulation problems:	Yes ◯ NO ◯

7. Do you currently take medication for any of the following problems?

Breathing or lung problems:	Yes ◯ NO ◯
Heart trouble:	Yes ◯ NO ◯
Blood Pressure:	Yes ◯ NO ◯
Seizures(fits)::	Yes ◯ NO ◯

8. If you've used a respirator, have you ever had any of the following problems? (If you've never used a respirator, check the following space and go to question 9)

Eye irritation:	Yes ◯ NO ◯
Skin allergies or rashes:	Yes ◯ NO ◯
Anxiety:	Yes ◯ NO ◯
General weakness or fatigue:	Yes ◯ NO ◯
Any other problem that interferes with your use of a respirator:	Yes ◯ NO ◯

9. Would you like to talk to the health care professional who will review this questionnaire about your answers to this questionnaire: Yes ◯ NO ◯

Respirator Medical Evaluation Questionnaire (RMEQ)

Lewis Energy Group

Name _____

SUPPLEMENTAL: If you are required to use a full-face peice respirator or a Self-Contained Breathing Aparatus (SCBA), complete the following: (If you do not, please sign below.)

10. Have you ever lost vision in either eye (temporarily or permanently): Yes ◯ NO ◯

11. Do you currently have any of the following vision problems?

- Wear glasses: Yes ◯ NO ◯
- Wear contact lenses: Yes ◯ NO ◯
- Color blind: Yes ◯ NO ◯
- Any other eye or vision problem: Yes ◯ NO ◯

12. Have you ever had an injury to your ears, including a broken ear drum: Yes ◯ NO ◯

13. Do you currently have any of the following hearing problems?

- Difficulty hearing: Yes ◯ NO ◯
- Wear a hearing aid: Yes ◯ NO ◯
- Any other hearing or ear problem: Yes ◯ NO ◯

14. Have you ever had a back injury: Yes ◯ NO ◯

15. Do you currently have any of the following musculoskeletal problems?

- Weakness in any of your arms, hands, legs, or feet: Yes ◯ NO ◯
- Back pain: Yes ◯ NO ◯
- Difficulty fully moving your arms and legs: Yes ◯ NO ◯
- Pain or stiffness when you lean forward or backward at the waist: Yes ◯ NO ◯
- Difficulty fully moving your head up or down: Yes ◯ NO ◯
- Difficulty fully moving your head side to side: Yes ◯ NO ◯
- Difficulty bending at your knees: Yes ◯ NO ◯
- Difficulty squatting to the ground: Yes ◯ NO ◯
- Climbing a flight of stairs or a ladder carrying more than 25 lbs: Yes ◯ NO ◯
- Any other muscle or skeletal problem that interferes with using a respirator: Yes ◯ NO ◯

Any additional comments you would like to make:

To the best of my knowledge, the information I have provided is true and accurate.

Employee Signature _____ **Date** _____

TO BE COMPLETED BY THE EXAMINER/REVIEWER:

This employee has been found to be physically able to use the following (check each [ ] that applies):

- ☐ Single use, filter mask (four attachment points)
- ☐ Half-faced cartridge-type, negative pressure
- ☐ Full-faced cartridge-type respirator, negative pressure
- ☐ Half-faced powered cartridge-type (PAPR)
- ☐ Full-faced powered cartridge-type (PAPR)
- ☐ Self-contained breathing apparatus (SCBA)
- ☐ Hood/helmet powered cartridge-type (PAPR)
- ☐ Half-faced/Full-faced/Hood/Helmet (NOT positive pressure)

Restrictions / Limitations (if any) when wearing a respirator:

_____

- ☐ ***This employee has been found to be physically NOT able to use a respirator***
- ☐ ***There is insufficient information to make a determination at this time***
- ☐ ***The mandatory questionnaire has been reviewed, and the employee has been found to be physically able to use a respirator.***
- ☐ ***The mandatory questionnaire has been reviewed but there is insufficient information to make a determination at this time.***

This respirator clearance expires 1 ◯ 2 ◯ 3 ◯ years from the date below. (*If not marked, clearance expires in 1 year*)

Reviewer's Name (Print) _____ **Reviewer's Signature** _____ **Date:** _____

OSHA Respirator Quesionnaire (3)

Reset Form

Appendix D

FIT TEST PROCEDURES

OSHA Fit Test Procedures

29 Code of Federal Regulations – Part 1910.134 – Appendix A

Lewis Energy Group

Part I. OSHA-Accepted Fit Test Protocols

A. Fit Testing Procedures—General Requirements

The employer shall conduct fit testing using the following procedures. The requirements in this appendix apply to all OSHA-accepted quantitative fit test method (QNFT) which is LEG's preferred method.

1. The test subject shall be allowed to pick the most acceptable respirator from a sufficient number of respirator models and sizes so that the respirator is acceptable to, and correctly fits, the user.

2. Prior to the selection process, the test subject shall be shown how to put on a respirator, how it should be positioned on the face, how to set strap tension and how to determine an acceptable fit. A mirror shall be available to assist the subject in evaluating the fit and positioning of the respirator. This instruction may not constitute the subject's formal training on respirator use, because it is only a review.

3. The test subject shall be informed that he/she is being asked to select the respirator that provides the most acceptable fit. Each respirator represents a different size and shape, and if fitted and used properly, will provide adequate protection.

4. The test subject shall be instructed to hold each chosen face piece up to the face and eliminate those that obviously do not give an acceptable fit.

5. The more acceptable face pieces are noted in case the one selected proves unacceptable; the most comfortable mask is donned and worn at least five minutes to assess comfort. Assistance in assessing comfort can be given by discussing the points in the following item A.6. If the test subject is not familiar with using a particular respirator, the test subject shall be directed to don the mask several times and to adjust the straps each time to become adept at setting proper tension on the straps.

6. Assessment of comfort shall include a review of the following points with the test subject and allowing the test subject adequate time to determine the comfort of the respirator:

a) Position of the mask on the nose
b) Room for eye protection
c) Room to talk
d) Position of mask on face and cheeks

7. The following criteria shall be used to help determine the adequacy of the respirator fit:

a) Chin properly placed;
b) Adequate strap tension, not overly tightened;
c) Fit across nose bridge;
d) Respirator of proper size to span distance from nose to chin;
e) Tendency of respirator to slip;
f) Self-observation in mirror to evaluate fit and respirator position.

8. The test subject shall conduct a user seal check, either the negative and positive pressure seal checks described in this section or those recommended by the respirator manufacturer which provide equivalent protection. Before conducting the negative and side-to-side and up and down slowly while taking in a few slow deep breaths. Another facepiece shall be selected and retested if the test subject fails the user seal check tests.

9. The test shall not be conducted if there is any hair growth between the skin and the facepiece sealing surface, such as stubble beard growth, beard, mustache or sideburns which cross the respirator sealing surface. Any type of apparel which interferes with a satisfactory fit shall be altered or removed.

10. If a test subject exhibits difficulty in breathing during the tests, she or he shall be referred to a physician or other licensed health care professional, as appropriate, to determine whether the test subject can wear a respirator while performing her or his duties.

11. If the employee finds the fit of the respirator unacceptable, the test subject shall be given the opportunity to select a different respirator and to be retested.

12. Exercise regimen. Prior to the commencement of the fit test, the test subject shall be given a description of the fit test and the test subject's responsibilities during the test procedure. The description of the process shall include a description of the test exercises that the subject will be performing. The respirator to be tested shall be worn for at least 5 minutes before the start of the fit test.

13. The fit test shall be performed while the test subject is wearing any applicable safety equipment that may be worn during actual respirator use which could interfere with respirator fit.

14. Test Exercises.

a) The following test exercises are to be performed for all fit testing methods prescribed in this appendix, except for the CNP method. A separate fit testing exercise regimen is contained in the CNP protocol. The test subject shall perform exercises, in the test environment, in the following manner:
    1) Normal breathing. In a normal standing position, without talking, the subject shall breathe normally.

2) Deep breathing. In a normal standing position, the subject shall breathe slowly and deeply, taking caution so as not to hyperventilate.
3) Turning head side to side. Standing in place, the subject shall slowly turn his/her head from side to side between the extreme positions on each side. The head shall be held at each extreme momentarily so the subject can inhale at each side.
4) Moving head up and down. Standing in place, the subject shall slowly move his/her head up and down. The subject shall be instructed to inhale in the up position (i.e., when looking toward the ceiling).
5) Talking. The subject shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The subject can read from a prepared text such as the Rainbow Passage, count backward from 100, or recite a memorized poem or song.

Rainbow Passage

When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow.

6) Grimace. The test subject shall grimace by smiling or frowning. (This applies only to QNFT testing; it is not performed for QLFT)
7) Bending over. The test subject shall bend at the waist as if he/she were to touch his/her toes. Jogging in place shall be substituted for this exercise in those test environments such as shroud type QNFT or QLFT units that do not permit bending over at the waist.
8) Normal breathing. Same as exercise 1).

b) Each test exercise shall be performed for one minute except for the grimace exercise which shall be performed for 15 seconds. The test subject shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become unacceptable, another model of respirator shall be tried. The respirator shall not be adjusted once the fit test exercises begin. Any adjustment voids the test, and the fit test must be repeated.

B. Quantitative Fit Test (QNFT) Protocols

The following quantitative fit testing procedures have been demonstrated to be acceptable: Quantitative fit testing using a non-hazardous test aerosol (such as corn oil, polyethylene glycol 400 [PEG 400], di-2-ethyl hexyl sebacate [DEHS], or sodium chloride) generated in a test chamber, and employing instrumentation to quantify the fit of the respirator; Quantitative fit testing using ambient aerosol as the test agent and appropriate instrumentation (condensation nuclei counter) to quantify the respirator fit; Quantitative fit testing using controlled negative pressure and appropriate instrumentation to measure the volumetric leak rate of a facepiece to quantify the respirator fit.

1. General

a) The employer shall ensure that persons administering QNFT are able to calibrate equipment and perform tests properly, recognize invalid tests, calculate fit factors properly and ensure that test equipment is in proper working order.
b) The employer shall ensure that QNFT equipment is kept clean, and is maintained and calibrated according to the manufacturer's instructions so as to operate at the parameters for which it was designed.

2. Generated Aerosol Quantitative Fit Testing Protocol

a) Apparatus.
1) Instrumentation. Aerosol generation, dilution, and measurement systems using particulates (corn oil, polyethylene glycol 400 [PEG 400], di-2-ethyl hexyl sebacate [DEHS] or sodium chloride) as test aerosols shall be used for quantitative fit testing.
2) Test chamber. The test chamber shall be large enough to permit all test subjects to perform freely all required exercises without disturbing the test agent concentration or the measurement apparatus. The test chamber shall be equipped and constructed so that the test agent is effectively isolated from the ambient air, yet uniform in concentration throughout the chamber.
3) When testing air-purifying respirators, the normal filter or cartridge element shall be replaced with a high efficiency particulate air (HEPA) or P100 series filter supplied by the same manufacturer.
4) The sampling instrument shall be selected so that a computer record or strip chart record may be made of the test showing the rise and fall of the test agent concentration with each inspiration and expiration at fit factors of at least 2,000. Integrators or computers that integrate the amount of test agent penetration leakage into the respirator for each exercise may be used provided a record of the readings is made.
5) The combination of substitute air-purifying elements, test agent and test agent concentration shall be such that the test subject is not exposed in excess of an established exposure limit for the test agent at any time during the testing process, based upon the length of the exposure and the exposure limit duration.
6) The sampling port on the test specimen respirator shall be placed and constructed so that no leakage occurs around the port (e.g., where the respirator is probed), a free air flow is allowed into the sampling line at all times, and there is no interference with the fit or performance of the respirator. The in-mask sampling device (probe) shall be designed and used so that the air sample is drawn from the breathing zone of the test subject, midway between the nose and mouth and with the probe extending into the facepiece cavity at least 14 inch.
7) The test setup shall permit the person administering the test to observe the test subject inside the chamber during the test.
8) The equipment generating the test atmosphere shall maintain the concentration of test agent constant to within a 10 percent variation for the duration of the test.

9) The time lag (interval between an event and the recording of the event on the strip chart or computer or integrator) shall be kept to a minimum. There shall be a clear association between the occurrence of an event and its being recorded.
10) The sampling line tubing for the test chamber atmosphere and for the respirator sampling port shall be of equal diameter and of the same material. The length of the two lines shall be equal.
11) The exhaust flow from the test chamber shall pass through an appropriate filter (i.e., high efficiency particulate filter) before release.
12) [Corrected at 63 FR 20099, June 23, 1998]
13) When sodium chloride aerosol is used, the relative humidity inside the test chamber shall not exceed 50 percent.
14) The limitations of instrument detection shall be taken into account when determining the fit factor.
15) Test respirators shall be maintained in proper working order and be inspected regularly for deficiencies such as cracks or missing valves and gaskets.

b) Procedural Requirements.
1) When performing the initial user seal check using a positive or negative pressure check, the sampling line shall be crimped closed in order to avoid air pressure leakage during either of these pressure checks.
2) The use of an abbreviated screening QLFT test is optional. Such a test may be utilized in order to quickly identify poor fitting respirators that passed the positive and/or negative pressure test and reduce the amount of QNFT time. The use of the CNC QNFT instrument in the count mode is another optional method to obtain a quick estimate of fit and eliminate poor fitting respirators before going on to perform a full QNFT.
3) A reasonably stable test agent concentration shall be measured in the test chamber prior to testing. For canopy or shower curtain types of test units, the determination of the test agent's stability may be established after the test subject has entered the test environment.
4) Immediately after the subject enters the test chamber, the test agent concentration inside the respirator shall be measured to ensure that the peak penetration does not exceed 5 percent for a half mask or 1 percent for a full facepiece respirator.
5) A stable test agent concentration shall be obtained prior to the actual start of testing.
6) Respirator restraining straps shall not be over-tightened for testing. The straps shall be adjusted by the wearer without assistance from other persons to give a reasonably comfortable fit typical of normal use. The respirator shall not be adjusted once the fit test exercises begin.
7) The test shall be terminated whenever any single peak penetration exceeds 5 percent for half masks and 1 percent for full facepiece respirators. The test subject shall be refitted and retested.
8) Calculation of fit factors.
i. The fit factor shall be determined for the quantitative fit test by taking the ratio of the average chamber concentration to the concentration measured inside the respirator for each test exercise except the grimace exercise.
ii. The average test chamber concentration shall be calculated as the arithmetic average of the concentration measured before and after each test (i.e., 7 exercises) or the arithmetic average of the concentration measured before and after each exercise or the true average measured continuously during the respirator sample.
iii. The concentration of the challenge agent inside the respirator shall be determined by one of the following methods:
A. Average peak penetration method means the method of determining test agent penetration into the respirator utilizing a strip chart recorder, integrator, or computer. The agent penetration is determined by an average of the peak heights on the graph or by computer integration, for each exercise except the grimace exercise. Integrators or computers that calculate the actual test agent penetration into the respirator for each exercise will also be considered to meet the requirements of the average peak penetration method.
B. Maximum peak penetration method means the method of determining test agent penetration in the respirator as determined by strip chart recordings of the test. The highest peak penetration for a given exercise is taken to be representative of average penetration into the respirator for that exercise.
C. Integration by calculation of the area under the individual peak for each exercise except the grimace exercise. This includes computerized integration.
D. The calculation of the overall fit factor using individual exercise fit factors involves first converting the exercise fit factors to penetration values, determining the average, and then converting that result back to a fit factor. This procedure is described in the following equation:

Overall Fit Factor = (Number of exercises)/(1/ff1+1/ff2+1/ff3+1/ff4+...1/ffn)

Where ff1 , ff2 , ff3 , etc. are the fit factors for exercises 1, 2, 3, etc.

9) The test subject shall not be permitted to wear a half mask or quarter facepiece respirator unless a minimum fit factor of 100 is obtained, or a full facepiece respirator unless a minimum fit factor of 500 is obtained.
10) Filters used for quantitative fit testing shall be replaced whenever increased breathing resistance is encountered, or when the test agent has altered the integrity of the filter media.

3. Ambient aerosol condensation nuclei counter (CNC) quantitative fit testing protocol.

The ambient aerosol condensation nuclei counter (CNC) quantitative fit testing (PortacountTM) protocol quantitatively fit tests respirators with the use of a probe. The probed respirator is only used for quantitative fit tests. A probed respirator has a special sampling device, installed on the respirator, that allows the probe to sample the air from inside the mask. A probed respirator is required for each make, style, model, and size that the employer uses and can be obtained from the respirator manufacturer or distributor. The CNC instrument manufacturer, TSI Inc., also provides probe attachments (TSI sampling adapters) that permit fit testing in an employee's own respirator. A minimum fit factor pass level of at least 100 is necessary for a half-mask respirator and a minimum fit factor pass level of at least 500 is required for a full facepiece negative pressure respirator. The entire screening and testing procedure shall be explained to the test subject prior to the conduct of the screening test.

a) Portacount Fit Test Requirements.
   1) Check the respirator to make sure the sampling probe and line are properly attached to the facepiece and that the respirator is fitted with a particulate filter capable of preventing significant penetration by the ambient particles used for the fit test (e.g., NIOSH 42 CFR 84 series 100, series 99, or series 95 particulate filter) per manufacturer's instruction.
   2) Revised at 63 FR 20099, June 23, 1998]
   3) Instruct the person to be tested to don the respirator for five minutes before the fit test starts. This purges the ambient particles trapped inside the respirator and permits the wearer to make certain the respirator is comfortable. This individual shall already have been trained on how to wear the respirator properly.
   4) Check the following conditions for the adequacy of the respirator fit: Chin properly placed; Adequate strap tension, not overly tightened; Fit across nose bridge; Respirator of proper size to span distance from nose to chin; Tendency of the respirator to slip; Self-observation in a mirror to evaluate fit and respirator position.
   5) Have the person wearing the respirator do a user seal check. If leakage is detected, determine the cause. If leakage is from a poorly fitting facepiece, try another size of the same model respirator, or another model of respirator.
   6) Follow the manufacturer's instructions for operating the Portacount and proceed with the test.
   7) The test subject shall be instructed to perform the exercises in section I. A. 14. of this appendix.
   8) After the test exercises, the test subject shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become unacceptable, another model of respirator shall be tried.

b) Portacount Test Instrument.
   1) The Portacount will automatically stop and calculate the overall fit factor for the entire set of exercises. The overall fit factor is what counts. The Pass or Fail message will indicate whether or not the test was successful. If the test was a Pass, the fit test is over.
   2) Since the pass or fail criterion of the Portacount is user programmable, the test operator shall ensure that the pass or fail criterion meet the requirements for minimum respirator performance in this Appendix.
   3) A record of the test needs to be kept on file, assuming the fit test was successful. The record must contain the test subject's name; overall fit factor; make, model, style, and size of respirator used; and date tested.

4. Controlled negative pressure (CNP) quantitative fit testing protocol.

The CNP protocol provides an alternative to aerosol fit test methods. The CNP fit test method technology is based on exhausting air from a temporarily sealed respirator facepiece to generate and then maintain a constant negative pressure inside the facepiece. The rate of air exhaust is controlled so that a constant negative pressure is maintained in the respirator during the fit test. The level of pressure is selected to replicate the mean inspiratory pressure that causes leakage into the respirator under normal use conditions. With pressure held constant, air flow out of the respirator is equal to air flow into the respirator. Therefore, measurement of the exhaust stream that is required to hold the pressure in the temporarily sealed respirator constant yields a direct measure of leakage air flow into the respirator. The CNP fit test method measures leak rates through the facepiece as a method for determining the facepiece fit for negative pressure respirators. The CNP instrument manufacturer Dynatech Nevada also provides attachments (sampling manifolds) that replace the filter cartridges to permit fit testing in an employee's own respirator. To perform the test, the test subject closes his or her mouth and holds his/her breath, after which an air pump removes air from the respirator facepiece at a pre-selected constant pressure. The facepiece fit is expressed as the leak rate through the facepiece, expressed as milliliters per minute. The quality and validity of the CNP fit tests are determined by the degree to which the in-mask pressure tracks the test pressure during the system measurement time of approximately five seconds. Instantaneous feedback in the form of a real-time pressure trace of the in-mask pressure is provided and used to determine test validity and quality. A minimum fit factor pass level of 100 is necessary for a half-mask respirator and a minimum fit factor of at least 500 is required for a full facepiece respirator. The entire screening and testing procedure shall be explained to the test subject prior to the conduct of the screening test.

a) CNP Fit Test Requirements.
   1) The instrument shall have a non-adjustable test pressure of 15.0 mm water pressure.
   2) The CNP system defaults selected for test pressure shall be set at -15 mm of water (-0.58 inches of water) and the modeled inspiratory flow rate shall be 53.8 liters per minute for performing fit tests.
      [Corrected at 63 FR 20099, June 23, 1998]
      (Note: CNP systems have built-in capability to conduct fit testing that is specific to unique work rate, mask, and gender situations that might apply in a specific workplace. Use of system default values, which were selected to represent respirator wear with medium cartridge resistance at a low-moderate work rate, will allow inter-test comparison of the respirator fit.)
   3) The individual who conducts the CNP fit testing shall be thoroughly trained to perform the test.
   4) The respirator filter or cartridge needs to be replaced with the CNP test manifold. The inhalation valve downstream from the manifold either needs to be temporarily removed or propped open.
   5) The test subject shall be trained to hold his or her breath for at least 20 seconds.
   6) The test subject shall don the test respirator without any assistance from the individual who conducts the CNP fit test.
   7) The QNFT protocol shall be followed according to section I. C. 1. of this appendix with an exception for the CNP test exercises.

b) CNP Test Exercises.
   1) Normal breathing. In a normal standing position, without talking, the subject shall breathe normally for 1 minute. After the normal breathing exercise, the subject needs to hold head straight ahead and hold his or her breath for 10 seconds during the test measurement.
   2) Deep breathing. In a normal standing position, the subject shall breathe slowly and deeply for 1 minute, being careful not to hyperventilate. After the deep breathing exercise, the subject shall hold his or her head straight ahead and hold his or her breath for 10 seconds during test measurement.
   3) Turning head side to side. Standing in place, the subject shall slowly turn his or her head from side to side between the extreme positions on each side for 1 minute. The head shall be held at each extreme momentarily so the subject can inhale at each side.

After the turning head side to side exercise, the subject needs to hold head full left and hold his or her breath for 10 seconds during test measurement. Next, the subject needs to hold head full right and hold his or her breath for 10 seconds during test measurement.

4) Moving head up and down. Standing in place, the subject shall slowly move his or her head up and down for 1 minute. The subject shall be instructed to inhale in the up position (i.e., when looking toward the ceiling). After the moving head up and down exercise, the subject shall hold his or her head full up and hold his or her breath for 10 seconds during test measurement. Next, the subject shall hold his or her head full down and hold his or her breath for 10 seconds during test measurement.
5) Talking. The subject shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The subject can read from a prepared text such as the Rainbow Passage, count backward from 100, or recite a memorized poem or song for 1 minute. After the talking exercise, the subject shall hold his or her head straight ahead and hold his or her breath for 10 seconds during the test measurement.
6) Grimace. The test subject shall grimace by smiling or frowning for 15 seconds.
7) Bending Over. The test subject shall bend at the waist as if he or she were to touch his or her toes for 1 minute. Jogging in place shall be substituted for this exercise in those test environments such as shroud-type QNFT units that prohibit bending at the waist. After the bending over exercise, the subject shall hold his or her head straight ahead and hold his or her breath for 10 seconds during the test measurement.
8) Normal Breathing. The test subject shall remove and re-don the respirator within a one-minute period. Then, in a normal standing position, without talking, the subject shall breathe normally for 1 minute. After the normal breathing exercise, the subject shall hold his or her head straight ahead and hold his or her breath for 10 seconds during the test measurement. After the test exercises, the test subject shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become unacceptable, another model of a respirator shall be tried.

c) CNP Test Instrument.
1) The test instrument shall have an effective audio warning device when the test subject fails to hold his or her breath during the test. The test shall be terminated whenever the test subject failed to hold his or her breath. The test subject may be refitted and retested.
2) A record of the test shall be kept on file, assuming the fit test was successful. The record must contain the test subject's name; overall fit factor; make, model, style and size of respirator used; and date tested.

Appendix E

RESPIRATOR CARE AND MAINTENANCE CHECKLIST

Respirator Care and Maintenance Checklist

29 Code of Federal Regulations – Part 1910.134 – Appendix E

Lewis Energy Group

USER SEAL CHECK PROCEDURES (Mandatory)

The individual who uses a tight-fitting respirator is to perform a user seal check to ensure that an adequate seal is achieved each time the respirator is put on. Either the positive and negative pressure checks listed in this appendix, or the respirator manufacturers recommended user seal check method shall be used. User seal checks are not substitutes for qualitative or quantitative fit tests.

I. Facepiece Positive and/or Negative Pressure Checks

A. Positive pressure check. Close off the exhalation valve and exhale gently into the facepiece. The face fit is considered satisfactory if a slight positive pressure can be built up inside the facepiece without any evidence of outward leakage of air at the seal. For most respirators this method of leak testing requires the wearer to first remove the exhalation valve cover before closing off the exhalation valve and then carefully replacing it after the test.

B. Negative pressure check. Close off the inlet opening of the canister or cartridge(s) by covering with the palm of the hand(s) or by replacing the filter seal(s), inhale gently so that the facepiece collapses slightly, and hold the breath for ten seconds. The design of the inlet opening of some cartridges cannot be effectively covered with the palm of the hand. The test can be performed by covering the inlet opening of the cartridge with a thin latex or nitrile glove. If the facepiece remains in its slightly collapsed condition and no inward leakage of air is detected, the tightness of the respirator is considered satisfactory.

II. Manufacturer's Recommended User Seal Check Procedures

The respirator manufacturer's recommended procedures for performing a user seal check may be used instead of the positive and/or negative pressure check procedures provided that the employer demonstrates that the manufacturer's procedures are equally effective.

Cleaning and Disinfecting Respirators

- Wash components in warm (110°F maximum) water with a mild detergent or with a cleaner recommended by the manufacturer. A stiff bristle brush may be used to facilitate the removal of dirt.

- Rinse components thoroughly in clean, warm (110°F maximum) preferably running water and drain.

- If the cleaner used does not contain a disinfecting agent, respirator components should be immersed for two minutes in one of the following : Hypochlorite solution (50 ppm of chlorine) made by adding approximately one milliliter of laundry bleach to one liter of water at 110°F; or Aqueous solution of iodine (50 ppm iodine) made by adding approximately 0.8 milliliters of tincture of iodine (6-8 grams ammonium and/or potassium iodide/100 cc of 45% alcohol) to one liter of water at (110°F); or other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer.

- Rinse components thoroughly in clean, warm (110°F maximum), preferably running water. Drain. The importance of through rinsing cannot be overemphasized. Detergents or disinfectants that dry on facepieces may result in dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts if not completely removed.

- Components should be hand-dried with a clean lint-free cloth or air-dried.

- All respirators shall be stored to protect them from damage, contamination, dust, sunlight, extreme temperatures, excessive moisture, and damaging chemicals, They shall be stored to prevent deformation of the facepiece and exhalation valves.

Respirator Care and Maintenance Checklist

29 Code of Federal Regulations – Part 1910.134 – Appendix E

Lewis Energy Group

Maintenance Checklist

Inspected by: **Date:**

Type of Respirator:

Check Respirator			
Facepiece	☐Approved	☐Defective	☐N/A
Inhalation Valve	☐Approved	☐Defective	☐N/A
Exhalation Valve	☐Approved	☐Defective	☐N/A
Headbands	☐Approved	☐Defective	☐N/A
Harness Assembly	☐Approved	☐Defective	☐N/A
Speaking Diaphragm	☐Approved	☐Defective	☐N/A
Gaskets	☐Approved	☐Defective	☐N/A
Connections	☐Approved	☐Defective	☐N/A
APRs/PAPRs			
Cartridge Holder	☐Approved	☐Defective	☐N/A
Hose Assembly	☐Approved	☐Defective	☐N/A
SCBAs or Airline Respirators			
Regulator	☐Approved	☐Defective	☐N/A
Low Pressure Alarm	☐Approved	☐Defective	☐N/A
Air Supply	☐Approved	☐Defective	☐N/A

RESPIRATOR Inspection and Care PROCEDURES (Mandatory)

****FOLLOW MANUFACTURERS RECOMMENDATIONS.**

Each respirator should be inspected during cleaning and sanitizing. This form should be completed and enclosed with the respirator, and should be discarded the next time the respirator is used. In addition, respirators maintained on-site for emergency use to escape toxic atmospheres must be inspected monthly. Immediately remove any respirator with a Defective finding from service.