

EXXON COMPANY, U.S.A.

POST OFFICE BOX 2180 • HOUSTON, TEXAS 77252-2180

LATE COMMENT

ENVIRONMENTAL AND SAFETY DEPARTMENT

December 6, 1995

Docket H-049

VIA AIRBORNE EXPRESS

Mr. John Steelnack
U.S. Department of Labor
Occupational Safety & Health Administration
Room N3718
200 Constitution Avenue, Northwest
Washington, D.C. 20210

Dear Mr. Steelnack:

This letter contains late comments in response to questions that the OSHA panel asked Exxon Company, U.S.A. at the June Hearings on Respiratory Protection and not in response to the NICAS study. Please find the following information:

- Questions concerning the number of employees who might fail an annual fit test are answered in Attachment I. This information supports our position that few employees, who are infrequent respirator users, change the size of their respirator from year to year. Furthermore the attachment shows that 230 employees were given quantitative fit-tests and less than one percent (two employees) failed the annual quantitative fit-test. The data would also suggest that annual quantitative fit-testing should not be necessary and such testing may be done on a less frequent basis than once per year.
- Questions associated with the costs of individual quantitative fit-tests and of maintaining an expanded breathing air system are addressed in Attachment II. Individual respirator fit-tests conducted by our contractor, have a base charge of \$50 plus either \$20 per hour or \$9 per test for a contractor to conduct tests. The \$90k costs associated with maintaining an expanded breathing air system per the proposed standard as presented in our testimony, represents technicians' salaries and additional respirator replacement parts.

- Attachment III contains written Respiratory Protection Training Programs from our Baytown and Billings Refineries as examples of respirator training programs for a large and small refinery, respectively. The enclosed video is a component of the Baytown Refinery Respirator Training Program.
- As described in Attachment IV, we have enclosed two pairs of the Chriss Optical Manufacturing's Mag Spectacles with thin rubber straps. These spectacles secure the prescription eye wear on the respirator user. They can safely be worn with a full face respirator as long as the user is fit tested with these spectacles in place during the respirator fit test. On June 28, 1995, I discussed this Exxon program with OSHA's expert witness, Jim Johnson of the Lawrence Livermore Laboratory. We agreed upon two points:
 1. Philosophically, anything that is placed between a respirator users face and the seal of the respirator can potentially interfere with the seal of the mask.
 2. But in reality, these Chriss Spectacles with thin rubber strap can be safely worn if the individual user passes a respirator fit test while wearing these spectacles.

If there are any questions, please call me at (713) 656-3904.

Sincerely,


Stephen E. Killiany, Jr.

Enclosures & Attachments

c - w/attachment IV only:

J. Johnson (Lawrence Livermore Laboratory)

Attachment I
POST HEARING RESPONSE and COMMENTS
PROPOSED OSHA RESPIRATORY PROTECTION STANDARD

EUSA Baton Rouge Refinery
Respirator Fit Testing Experience
August to October, 1995

In response to OSHA's question, "How many people in the subsequent year after their initial fit come back and ask for a re-test? or need to be retested because of a failed fit test? (transcript page 562, lines 1-5), our Baton Rouge Refinery modified the data collected during respirator fit-testing to identify why individuals failed an annual fit-test. Prior information identified the number of employees that changed respirator size but not the "why" for the change. This modification made it possible to determine the number of employees failing an annual respirator fit test.

Two hundred and thirty (230) employees were fit-tested during the months of August, September and October, 1995. Each employee initially donned their respirator size from their 1994 selection. The employee evaluated the respirator for comfort and then performed a positive and/or negative fit-check. If the employee passed the fit-check and was satisfied with the comfort of the respirator, they were given the quantitative fit-test using the Portacount Test System. The following data summarizes the results:

Number of employees that did not change respirator size.	225
Number of employees that changed respirator size after passing the fit check. (percent of total tested)	3 (1.3%)
Number of employees that changed respirator size because of failing the quantitative fit test. (percent of total tested)	2 (0.9%)
Total number of employees tested during Aug., Sep., & Oct., 1995	230

These results demonstrate that less than 1% of the respirator users fail the annual quantitative fit test. This also supports Exxon's testimony which indicated that few employees change respirator sizes from the previous year.

Exxon's Annual Fit-test Program results and its experience of the past years indicate that employees are able to achieve a comfortable, safe and adequate fit on at least one size of a company provided respirator brand. We believe that these data indicate that the importance of fit-testing lies in initially identifying an appropriate respirator brand and size for each employee who is expected to wear a respirator. After the initial fit testing, employee training and conducting respirator fit checks when donning a respirator becomes of greater importance than annual fit testing. This standardized approach in a respirator program should decrease the necessity for annual fit-testing.

Attachment II
POST HEARING RESPONSE and COMMENTS
PROPOSED OSHA RESPIRATORY PROTECTION STANDARD

Costs Associated with Respiratory Protection Programs

In the June public hearings, the OSHA panel asked two sets of questions focusing on costs of individual quantitative fit-tests and further breakout of additional technician costs referred to in our Table III presented at the hearing. The following are the questions and/or requests (refer to pages and lines of the transcript of testimony) with our response:

- Is that a fee per fit test or is there a range based upon a certain minimum of employees or tests (Pages 543, lines 18 -25 and 544, lines 10- 14)?

The contractor that our Baton Rouge Refinery uses, for respirator fit testing charges \$50 plus \$20 per hour as a minimum or \$50 plus \$9 per test for conducting respirator fit tests on location. The contractor does not have a sliding scale and these costs are the same regardless of the number of employees taking the test or regardless of the number of fit tests given per location in one year. This seemed to be the best competitive price in the Baton Rouge area at the time.

Other Exxon locations either conduct the testing with Exxon Staff personnel or hire other local contractors. Contractor prices vary by location and range from a base administrative charge of \$50 to \$500 per year depending upon record keeping responsibilities with price per test set at \$6.50 to \$25 depending upon the specific contractor and geographical location.

- OSHA requested more details for the \$90k entry identified as "Annual recurring cost for additional Technicians to manage/maintain expanded breathing air system" presented in Table III during the Exxon testimony at the public hearings (pages 557 - 558, line 21 to 21 and 1 to 3 respectively).

This \$90k cost can further be broken down as follows:

- Salary and benefits for added resources to manage and maintain equipment are approximately equal to \$65k.
- Additional replacement parts for expanded breathing air system are approximately equal to \$25k

**Attachment III
POST HEARING RESPONSE and COMMENTS
PROPOSED OSHA RESPIRATORY PROTECTION STANDARD**

Examples of Respiratory Protection Training Programs

In response to the request, " Could Exxon provide a copy of the training programs for a large and small operation?" (transcript pages 549 and 550, line 23 to 25 and 7 to 8 respectively), examples of the following are enclosed:

Respiratory Protection Program Including training from a large Exxon refinery (Baytown). This example includes a training manual for air purifying respirators and a video.

Respiratory Protection Program Including training from a small Exxon refinery (Billings). This example includes the respirator section of the refinery's safety manual.

Attachments
rpscomm5
October 19, 1995

RESPIRATORY Protection PROGRAM

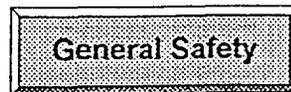
INCLUDING TRAINING

LARGE REFINERY EXAMPLE

FOR

OSHA RESPIRATORY PROTECTION

PROPOSED STANDARD - DOCKET H-049



Respiratory Protection

Training Topic

Air Purifying Respirators

Training Course # 1161

Reference Source

**Safety Practice 4060, (PUI R6/FPM R7)
Refinery Safety Manual, section 11
OSHA 29 CFR 1910.134**

Training Procedures

Please complete the following steps for this Safety Training module:

- **Read the written material**
- **Watch the video presentation**
- **Complete the review exercise**
- **Return the completed review exercise to your Shift Supervisor**

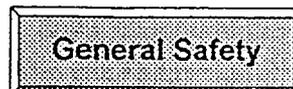
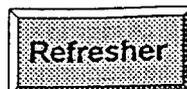
Training Schedule

The video accompanying this refresher training topic will be shown on CCTV from June 23 to August 31, 1995. The video will be removed from the CCTV program schedule and all training must be completed by August 31.

Learning Objectives

Upon completion of this training, the participant will be able to

- State the conditions for use of air purifying respirators.
- Explain the limitations of air purifying respirators.
- Explain cartridge and filter selection.
- Describe the danger signals when using air purifying respirators.
- Explain how to inspect air purifying respirators.
- Describe attaching cartridges and filters.
- Describe and demonstrate donning air purifying respirators.
- Perform negative pressure tests on air purifying respirators.



Introduction

When engineering or work practice control measures cannot provide adequate employee protection against toxic mists, dusts, vapors, gases, and oxygen deficient atmospheres, respiratory protection must be used.

The Baytown Refinery written respiratory protection program is contained in the SP 4060, (PUI R6/FPM R7). Related respiratory protection material and requirements are located in the Refinery Safety Manual section 11. Additional OSHA requirements are found in the 29 CFR 1910.134. Anyone wishing a copy of any of these documents can contact the Refinery Industrial Hygiene or Training sections.

Anyone using any respiratory protection must be medically evaluated, trained in the use of the equipment, fit tested for mask size and type, and adhere to the Refinery clean shaven policy.

Training

All Refinery employees who may be required to use respiratory protection equipment must attend refresher training every three years. This training is divided into two training courses; hands-on air supplied respirator training conducted by fire team members, and this air purifying respirator training.

Refinery Respiratory Program (SP-4060)

The written Refinery respiratory protection program has recently been revised. Previously part of the PUI-R6 and the FPM-R7, the program is now located in the Refinery Safety Practices manual as SP-4060.

While the content has not changed significantly, some revisions have been made. The following items reflex the notable changes to the program.

- **Contact Lenses:** The wearing of SOFT or GAS PERMEABLE contact lenses while wearing respiratory protection is permissible in the BTRF. The use of HARD lenses is prohibited. It is mandatory that all contact lens wearers obtain a hard hat sticker from the Health Services Department and display the sticker on their hard hat prior to wearing contacts in the field (including office personnel).

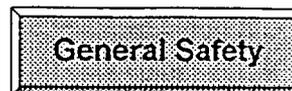
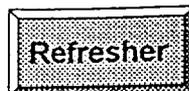
- **Fit Testing:** Fit testing for atmosphere supplying respirators and air purifying respirators must be conducted annually. Employee must wear only the type (manufacture) and size of mask for which they have been fit tested.
- **Medical Surveillance:** The Health Services Department (HSD) will administer a Respirator User Medical Surveillance Program for all Refinery employees. The completion of the Respirator Questionnaire (Attachment 6) is required annually and will be administered by HSD at the time of audiometric analysis. HSD will provide a Pulmonary Function Test prior to an employee's first fit test and every three (3) years thereafter.
- **Program Compliance:** To ensure compliance with this program, semi-annual (every 6 months) inspections of work requiring the use of respirators will be conducted. Industrial Hygiene will coordinate these audits. A report detailing the results of each inspection will be sent to the appropriate Department Head.
- **Responsibility Matrix:** This is an addition to the written program. The matrix spells out the responsibilities and the expectations for everyone involved in the program.

Types of Protection

Respiratory protection can be provided by either air purifying respirators or air supplying respirators. As their names imply, air supplying respirators provide the wearer with an independent source of air, while air purifying respirators filter the surrounding air before use by the wearer.

Air supplying respirators can be of two types. At the Baytown Refinery, the Scott Pressur-Pak 4.5 Self-Contained Unit and the Scott SKA-PAK Low Pressure Hoseline Unit are used.

Air purifying respirators can be of several types. Here at the Refinery there are two full face respirators, three half mask respirators and one dust mask type respirator available from the Refinery Storehouse. A listing of the available respirators can be found in the Safety Manual and in table 1-b of SP-4060.



Air Purifying Respirators

Conditions of Use

Air purifying respirators (APR's) can only be used when all of the following conditions are met:

1. The oxygen concentration is equal to or greater than 19.5%.
2. The type and concentration of all contaminants are known and the airborne concentration of contaminants does not exceed the operational limits of the respirator (See limitations section below).
3. The concentration of contaminants is stable and not expected to change significantly during the course of work.
4. The contaminants do not include any concentration of hydrogen sulfide, carbon dioxide, carbon monoxide, or chlorine.

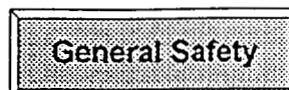
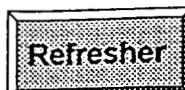
Limitations

Air purifying respirators cannot be used if either the protection factor of the respirator OR the maximum use concentration of the cartridge are exceeded. The protection factors of half mask and full mask air purifying respirators are shown in the table below.

TYPE OF FACE PIECE	PROTECTION FACTOR
Half Mask	10
Full Mask	50

Protection factors in combination with the permissible exposure limits are used to determine which type of APR is necessary to provide adequate protection from exposure to a specific hazardous chemical.

For example, the permissible exposure limit (PEL) for benzene is 1 ppm. To calculate what concentration a half mask APR will provide adequate protection from exposure to benzene, multiply the protection factor (10) by the PEL (1 ppm). A half mask APR will provide adequate protection up to 10 ppm.



The other limiting factor in selection of APR's is the maximum use concentration of the cartridge. This limitation does not apply to particulate cartridges (i.e., dust/mist/fume and HEPA). The sorbent material used in APR chemical cartridges is capable of adsorbing a limited quantity of gases / vapors. Each type of chemical cartridge has been assigned what is called a maximum use concentration. The maximum use concentration for several chemical cartridges used in the Refinery appear in the table below.

TYPE OF CARTRIDGE	MAXIMUM USE CONCENTRATION
Ammonia	300 ppm
Organic Vapor	1000 ppm ¹
Sulfur Dioxide	50 ppm

¹ Maximum use concentrations are lower for organic vapors which produce atmospheres immediately dangerous to life or health at concentrations equal to or lower than this concentration.

Cartridge/ Filter Selection

Select the appropriate cartridge or filter suitable for the contaminants(s) present in the atmosphere or likely to be released in the atmosphere. Failure to select the proper cartridge may result in the respirator providing little or no protection against the contaminated atmosphere.

Respirator cartridges labeled for protection against airborne particles only, must not be used for gases or vapors. Cartridges labeled for protection against gases or vapors only must not be used for protection against airborne particles. Always read the cartridge labels prior to use and be certain that the cartridges and or filters selected will provide the required protection.

When changing cartridges or filters, always replace both cartridges or filters. Check to make certain they are the correct type and make sure all connections are airtight.

**Cartridge/
Filter Selection
(continued)**

The following chart contains the air purifying respirator cartridge type and color for the most common airborne contaminants present in the Refinery. For additional assistance with cartridge selection, refer to Table 11-2 in the Refinery Safety Manual or contact the Industrial Hygiene section.

Note: When concentrations exceed or are expected to exceed either the protection factor of the respirator or the maximum use concentration of the cartridge, supplied air respirators are required.

CHEMICAL NAME	CARTRIDGE	COLOR
Hydrocarbon Vapors	Organic Vapor (OV) or Acid Gas (AG)	Black Yellow
Benzene	Organic Vapor or Acid Gas	Black Yellow
Sulfur Dioxide	Acid Gas	Yellow
Welding fumes ¹	Dust/Mist/Fume	White/Yellow
Catalyst Dusts	Dust/Mist/Fume	White/Yellow
Non-Asbestos Insulation	Dust/Mist/Fume	White/Yellow
Refractory Dust (non ACM ²)	Dust/Mist/Fume	White/Yellow
Lead Dust/Fume	HEPA	Purple
Asbestos Fibers	HEPA	Purple
Dust / Organic Vapor	HEPA with OV	Purple with Black

¹ For welding in confined spaces, ventilation rate of 2000 cfm per welder or local exhaust must be provided in order to use negative pressure respirators.

² ACM = Asbestos Containing Material

³ HEPA = High Efficiency Particulate Air



**Danger
Signs**

Never use air purifying respirators (negative pressure) for protection against substances with poor warning properties such as Hydrogen Sulfide, or Carbon Monoxide.

If you sense any of the following danger signals, **IMMEDIATELY RETURN TO FRESH AIR**. Your cartridge or filter may be used up, or abnormal conditions may be creating vapor concentrations which are beyond the limitations of your respirator:

- You smell or taste chemicals, or if your eyes, nose, or throat becomes irritated;
- It becomes difficult to breath;
- The air you are breathing becomes uncomfortably warm;
- You feel like vomiting or become dizzy.



AIR PURIFYING RESPIRATORS

Donning and Removing Procedures

Always select and use the same type (manufacturer) and size of respirator for which you were fit tested.

1. Inspection:
 - A. Examine the face piece to make sure it is complete and in serviceable condition.
 - B. Check for :
 - distortion of the shape of the face piece
 - missing diaphragms
 - cracked face piece
 - worn straps
 - missing gaskets
2. Attaching Filters/Cartridges
 - A. Attach pre-filters to cartridges, if used
 - B. Thread cartridges and/or filters onto face piece by turning clockwise until firmly seated against gaskets.
3. Donning the Respirator
 - A. Adjust the head straps to the full outward position; for respirators with VELCRO make sure the temple straps are attached to the VELCRO strip (approximately 1 ").
 - B. Hold the head harness out of the way with one hand while placing the face piece on the face with the other. Make sure the chin is properly located in the chin pocket.
 - C. Pull the head harness over the head and make sure the straps are lying flat against the head with no twists.
 - D. Tighten the neck straps by pulling on the two strap ends toward the back of the head.
 - E. For respirators with harness netting, stroke the head harness net down the back of the head using one or both hands. Re-tighten the neck straps.
 - F. For respirators with temple straps, adjust the temple straps by pulling on the two strap ends toward the back of the head. For respirators with VELCRO, refasten VELCRO ends to mating VELCRO strip on the back of head harness net.

4. Positive and Negative Pressure Tests

A. **Always perform a positive and negative pressure leak test each time the respirator is donned.**

B. Positive Pressure Leak Test:

- Close opening in the exhalation valve guard by placing palm of one hand over the face of guard;
- Exhale slowly, maintaining slight positive pressure.
- No leakage should be detected between the face seal and the face.

C. Negative Pressure Leak Test:

- Close off both inlet connections with palms of hands;
- Inhale slowly and hold breath momentarily.
- No leakage should be detected and the face piece should be drawn slightly to the face, and a slight positive pressure should be felt.

D. Should any leakage be noticed:

- Adjust the head straps and/or the face piece slightly, recheck for leakage;
- Check condition of the exhalation valve and seat. Check that both gaskets are present and in proper condition.

E. In the event the face piece cannot be adjusted so that there is no leakage, **DO NOT ENTER THE AREA REQUIRING PROTECTION.** A different style, size or manufacturer may be required to obtain a proper facial fit. Never tighten a face piece until it is painful in order to obtain a fit.

5. Removing the Respirator

A. Always remove the respirator in a fresh air environment.

B. Loosen the neck straps:

- Lift buckle release levers outward (away from the head) and lift face piece away from the face.
- For respirators with VELCRO, release the elastic temple straps from the VELCRO strip at the back of the head.

C. Remove the respirator by pulling the head harness up and forward over the head.

- To avoid damaging the face piece, do not pull on the cartridges or adapters.
- Prepare the respirator for quick re-donning by folding the head harness over the face piece lens.
- Clean respirator.



Review Exercise

The following review exercise is verification that you have received the information and understand the key points about the following mandatory safety training.

Title: Air Purifying Respirators Course # 1161 Date: _____

1. I have viewed the video "Respiratory Protection" (Summit Video) _____
(initial)
2. List the conditions required for using air purifying respirators.
 - a.
 - b.
 - c.
 - d.
3. The protection factor of a full face mask is _____; for a half mask the protection factor is _____.
4. What type of respiratory protection will be required for 100 ppm of SO₂? (The PEL for SO₂ is 2).
5. What type of cartridge is used with an air purifying respirator for Benzene?
6. When must a positive and positive pressure leak test be performed?
7. List the steps of a negative pressure leak test.
 - a.
 - b.
 - c.
8. As part of this refresher training I have demonstrated inspecting, donning, and performing a positive and negative pressure leak test for an air purifying respirator. _____
(initial)

Please print your social security number, sign your name and return to your Shift Supervisor.

(signature)

(supervisor signature)

(social security number)

(unit)

	<i>Respiratory Protection</i>	<i>SP-4060</i>
	<i>Owner: Industrial Hygiene S.S.</i>	

Purpose To provide the minimum requirements for use of respiratory protection.

Primary Users and Responsibilities

- Mechanical
- Process
- Technical

Safety and Environmental Precautions

- None

References

- None

Definitions

- None

Documentation and Records

- None

Procedure

1. Review Attachment 1, Respiratory Protection Program - Baytown Refinery.
2. Perform a negative and positive fit check prior to entering a potentially hazardous atmosphere.
3. Ensure respirators are cleaned and disinfected after each use and properly stored and maintained.
4. Report damaged or malfunctioning equipment to supervisor.

5. Report any medical conditions which may affect employees ability to safely wear respiratory protection to supervisor.
6. If wearing contact lenses in the plant, obtain a hard hat sticker from Medical and display on hard hat.

Attachments

- Attachment 1, Respiratory Protection Program - Baytown Refinery
- Attachment 2, Facial Hair Policy - Application and Guidelines
- Attachment 3, Monthly Inspection for Self-Contained Breathing Apparatus
- Attachment 4, Weekly Inspection for Emergency SCBA
- Attachment 5, Exxon Baytown Refinery Unable to Fit Test Form
- Attachment 6, Medical Questionnaire for Respirator Users
- Attachment 7, Respiratory Protection Compliance Review Process/Mechanical/Contractor

****End of Safety Practice****

1
2
3

Attachment 1, Respiratory Protection Program - Baytown Refinery

1.0

Scope Refinery practice limits

This guideline outlines the requirements of the Exxon Baytown Respiratory Protection Program. When engineering and/or work controls cannot reduce exposures below acceptable exposure respiratory protection will be required.

This guideline specifies minimum requirements for employee and contractor use of respiratory protection and provides information for the correct selection, use and care of these devices.

2.0

Responsibility Matrix

The Baytown Refinery Mechanical Manager has overall administrative responsibility for the Refinery Respiratory Protection Program. Other organization responsibilities (Supervisor, Medical Dept., Industrial Hygiene, Storehouse, Training Dept., Employee) are detailed in the following responsibility matrix.

Responsibility Matrix Table

Supervisor	<ul style="list-style-type: none"> • Ensure appropriate respiratory protection is provided and utilized when such equipment is necessary to protect the employee • Facilitate functioning of program, control of respirator use, assist in program evaluation and report deficiencies • Ensure that the appropriate, properly fitted respirators are worn when required • Ensure that employees scheduled for respiratory protection training and fit testing attend these sessions • Ensure that respirators kept in process or mechanical areas are properly stored and maintained and that the equipment designated for emergency or escape is properly stored in the prescribed location and inspected as appropriate.
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Attachment 1, Respiratory Protection Program - Baytown Refinery (cont.)

Responsibility Matrix Table (cont.)

Medical	<ul style="list-style-type: none"> • Administer the Respirator User Medical Surveillance Program • Provide a pulmonary function test prior to an employee's first fit test and every three (3) years thereafter. * • Administer the Respirator Questionnaire (Attachment 6) annually at time of audiometric testing. • Inform Industrial Hygiene and the employee's supervisor when an employee is determined unfit for respirator use. • Provide hard hat stickers for employees who intend to wear contact lenses in the plant
Industrial Hygiene	<ul style="list-style-type: none"> • Serve as the overall technical administrator of the Respiratory Protection Program • Review and approve any respiratory protective equipment used at the BTRF • Review and approve any respiratory protection training given to BTRF employees • Coordinate periodic evaluations to determine the continued effectiveness of the program
Storehouse	<ul style="list-style-type: none"> • Maintain an adequate supply of symbolized and approved respiratory protective equipment, replacement parts, chemical cartridges, filters, and care and maintenance materials • Purchase only respiratory protective equipment which has been reviewed and approved by Industrial Hygiene • Ensure respiratory protective equipment is not issued to contract personnel. It is the responsibility of contractors to provide respiratory protective equipment for their personnel
Training	<ul style="list-style-type: none"> • Schedule, conduct and document initial and refresher respiratory protection training for Exxon Baytown Refinery employees • Schedule and maintain documentation of employee respirator fit testing

*In accordance with the requirements of OSHA Benzene Standard (29 CFR 1910.1028).

Attachment 1, Respiratory Protection Program - Baytown Refinery (cont.)

Responsibility Matrix Table (cont.)

Contract Administration	<ul style="list-style-type: none">• Request in bid specifications that contractors submit their written Respiratory Protection Program• Review adequacy of contractor Respiratory Protection Program during contractor selection process
Employee	<ul style="list-style-type: none">• Utilize the respiratory protective equipment provided in accordance with the training and instructions received. This includes performing a negative and positive fit check prior to entering a potentially hazardous atmosphere• Ensure respirators are cleaned and disinfected after each use and properly stored and maintained• Report damaged or malfunctioning equipment to supervisor• Report to supervisor any medical conditions which may affect the employees ability to safely wear respiratory protection.• Obtain a hard hat sticker from Medical and display on hard hat if wearing contact lenses in the plant• Attend/complete all required training and fit testing.

Attachment 1, Respiratory Protection Program - Baytown Refinery (cont.)

3.0

General

Requirements The following are general requirements of the Exxon Baytown Refinery Respiratory Protection Program (RPP):

3.1 Facial Hair Policy

The wearing of any respiratory protective device with facial hair (beards, mustaches, sideburns, long hair, etc.) that contacts any portion of the sealing surface of the respirator face piece or interferes with the operation of the respirator is prohibited.

The policy requires that individuals who may be required to wear respiratory protective equipment be clean shaven where the sealing surface of the respirator contacts the face. Any facial hair within the respirator must be trimmed to avoid interference with the function of the inhalation and/or exhalation valves.

Contract personnel who may be required to wear respiratory protective equipment must comply with all of the requirements of this policy.

Work groups required to follow this policy and work groups exempt from this policy are identified in Attachment 2. Guidelines are also provided to facilitate interpretation of the Refinery's Facial Hair Policy.

The application of this policy may be revised based on changes in or Management reassessment of the nature and scope of the job requirements. Revisions, whether temporary or permanent, must be reviewed and approved by the appropriate Department Head, the Safety Advisor, and the appropriate Manager.

Attachment 1, Respiratory Protection Program - Baytown Refinery (cont.)

2 Fit Testing

Respiratory protection must not be worn by persons who have not been fit tested. This includes breathing air equipment, air purifying respirators, and disposable dust respirators. A facepiece leak check does not qualify as a fit test.

Fit testing for atmosphere supplying respirators and air-purifying respirators must be conducted annually. Fit testing can be scheduled through the Training Section of the Human Resources Department, which is responsible for ensuring compliance with this requirement.

Wallet size respirator fit test cards, which identify the make, model and size of respirator facepiece(s) a person is authorized to wear, will be issued to all persons fit tested.

The procedures required when an employee is unable to achieve an adequate respirator fit are included in Attachment 5.

3.3 Eyeglasses/Contact Lenses

The wearing of eyeglasses with temple pieces while wearing a full-facepiece respirator is prohibited. Individuals who need corrective lenses inside the facepiece can obtain an adapter from the Storehouse to mount corrective lenses inside the facepiece (Symbol Number 77701-342). An additional pair of glasses with the temple pieces removed should be obtained, using the normal safety glass procurement procedure.

The wearing of SOFT or GAS PERMEABLE contact lenses while wearing respiratory protection is permissible in the BTRF. The use of HARD contact lenses is prohibited. It is mandatory that all contact lens wearers obtain a hard hat sticker from the Health Services Department and display the sticker on their hard hat prior to wearing contacts in the field (including office personnel).

Attachment 1, Respiratory Protection Program - Baytown Refinery (cont.)

3.0 General Requirements continued

3.4 Medical Surveillance

The Health Services Department (HSD) will administer a Respirator User Medical Surveillance Program for all Refinery employees. The completion of the Respirator Questionnaire (Attachment 6) is required annually and will be administered by HSD at the time of audiometric analysis. HSD will provide a Pulmonary Function Test prior to an employee's first fit test and every three (3) years thereafter.*

3.5 Contractor Requirements

Every Contractor company must supply their own respiratory protection equipment (i.e., facepieces, cartridges, etc.). The use of Exxon's respiratory protection equipment by contractor personnel is prohibited.

Every contractor company performing work that may require the use of respiratory protection devices must have a written respiratory protection program that meets all of the requirements of the OSHA Respiratory Protection Standard. A copy of the written respiratory protection program must be maintained on site and readily available for inspection.

The quality of a contractor's respiratory protection program must be evaluated as part of the contractor selection process. Bid specifications shall request contractors to submit their written respiratory protection program for review by Contract Administration.

3.6 Training

All personnel who may be required to use respiratory protection equipment must be adequately trained and training records must be maintained by the Training Department.

*In accordance with the requirements of OSHA Benzene Standard (29 CFR 1910.1028).

Attachment 1, Respiratory Protection Program - Baytown Refinery (cont.)

3.0

General

Requirements 3.6 Training - continued
continued

Refresher training for air supplying and air purifying respirators is required every three (3) years. Training should include the following information:

- Overview of respiratory hazards/need for respiratory protection
- Respirator capabilities and limitations
- Selection, use, maintenance and storage of respirators
- Instructions for recognizing and dealing with emergency situations.
- Review of the Refinery's written Respiratory Protection Program.
- Practice how the respirator should be worn, how to adjust it, and how to determine if it fits properly (opportunity to handle respirator).

3.7 Miscellaneous Requirements

Exxon personnel are only allowed to use respiratory protective devices listed in this program (Tables 1-a and 1-b). Use of any other respirator must be approved by the Safety Advisor and Industrial Hygiene.

All repairs or mechanical adjustments to any respiratory protective devices will be performed **ONLY** by personnel assigned to the Breathing Air Equipment Section of the Storehouse or their authorized outside repair vendors. Any questions pertaining to operation or upkeep of equipment should be referred to the Breathing Air Equipment Shop, Extension 4014.

Attachment 1, Respiratory Protection Program - Baytown Refinery (cont.)

3.0

General

Requirements 3.8 Program Compliance Reviews

continued

To ensure compliance with this program, semi-annual inspections of work requiring the use of respirators will be conducted. Industrial Hygiene will coordinate these audits. A form for conducting this review is provided in Attachment 7.

A report detailing the results of each inspection will be sent to the appropriate Department Head. The report will include program effectiveness, wearer acceptance, any deficiencies noted, any actions taken to correct, and target dates for implementing change (if needed).

4.0

Atmosphere

Supplying

Respirators

4.1 Capabilities and Limitations

Non-Emergency

Use

Atmosphere-supplying respirators (breathing-air) afford protection against oxygen deficient and toxic atmospheres. The breathing atmosphere is independent of the ambient atmospheric conditions.

Two types of breathing air equipment are utilized, self-contained breathing apparatus (SCBA or Scott Air-Paks) and hose-line respirators with an emergency air supply (Ska-Paks).

All forms of compressed breathing air (both bottled and from breathing air compressors) must meet the requirements of the specification of Grade D Breathing Air as described in ANSI/Compressed Gas Association Commodity Specification G-7.1-1989. Table 3 describes the criteria for Grade D Breathing Air.

Respirator Requirements - Scott Air-Paks allow the wearer to carry his own breathing apparatus. Chief limitations of Scott Air-Paks are their weight or bulk and limited service life.

Attachment 1, Respiratory Protection Program - Baytown Refinery (cont.)

Atmosphere Supplying Respirators

4.1 Capabilities and Limitation - continued

Non-Emergency Use continued

Hoseline respirators are lighter in weight than Scott Air-Paks and the air supply is not limited to the quantity the individual can carry. However, the wearer is restricted in movement by the hose and the hose is subject to being severed or pinched off.

4.2 Selection and Use

Table 1-a lists the different breathing air equipment available and the respective storehouse symbol numbers.

Recommended use of this equipment is specified in various Refinery work procedures including RMP-711, Hydrogen Sulfide Handling Guidelines and RMP-702, Benzene Handling Guidelines. In addition, respirators are also required whenever exposure to a hazardous material has the potential to exceed the OSHA Permissible Exposure Limit, Exxon Occupational Exposure Limit, or toxic material limits specified in the Hazardous Materials Section of the Safety Manual.

When entering an environment with unknown concentrations of hazardous materials the only respiratory protection allowed is either Scott air paks or hoseline respirators equipped with 5-minute escape paks.

When respiratory protection is required for routine process duties and short-duration mechanical work, the standard equipment required is the Scott Pressure-Pak 4.5 equipped with a 30 or 60 minute air cylinder.

Attachment 1, Respiratory Protection Program - Baytown Refinery (cont.)

Atmosphere

Supplying

Respirators 4.2 Selection and Use - (continued)

Non-Emergency

Use continued Work that will require extended periods of time or work that is performed in areas of restricted mobility or egress should be performed with a hoseline respirator.

All supplied air respirators will be inspected prior to each use as outlined in the following procedure.

Prior to each use	<ul style="list-style-type: none"> • Check cylinder to assure pressure is adequate for intended use. • Inspect all respirator parts for damage or deterioration, (i.e., straps, belts, harness, mask, hoses, and fittings/connectors.)
Prior to entering a contaminated atmosphere	<ul style="list-style-type: none"> • Don the facepiece. • Before attaching the regulator to the respirator facepiece, place your hand over the regulator opening or attach the regulator to the facepiece and depress and hold the donning switch. • Inhale gently. A negative pressure should be created inside the facepiece, causing it to pull tightly to the face.

Attachment 1, Respiratory Protection Program - Baytown Refinery (cont.)

Atmosphere

Supplying

Respirators 4.3 Standby Requirements

Non-Emergency

Use continued A breathing-air bottle watch standby is required any time hoseline equipment is being used. This standby will monitor the air bottles to ensure an adequate supply of air is maintained to the worker(s)

A breathing-air standby equipped with a Pressure-Pak 4.5 or Ska-Pak hoseline respirator with 5-minute escape pak is required any time work is performed using breathing air equipment:

- In a confined space.
- In an environment in which the concentration of contaminants exceeds or is likely to exceed the IDLH limits (see Table 2 for IDLH Limits) or if the oxygen content is less than 19.5 percent. The standby is required to wear breathing air equipment and have the regulator attached to the facepiece, ready for immediate donning and rescue.
- As specified by the RMP-711, H₂S Handling Guidelines.

4.4 Monthly Inspection

All SCBAs must be thoroughly inspected at least monthly. Inspection checklist forms are provided in Attachment 3. These forms must be maintained by the equipment owner at the control center for at least one (1) year.

Attachment 1, Respiratory Protection Program - Baytown Refinery (cont.)

Atmosphere

Supplying

Respirators 4.5 Maintenance and Care

Non-Emergency

Use continued After use, all respirators shall be inspected, cleaned and disinfected. Clean the external components, i.e., straps, harness, frame and facepiece. Facepiece cleaning and disinfection can be accomplished by using antiseptic wipes or spray. Storehouse symbol numbers for disinfectants are provided in Table 1-d.

Technicians assigned to the Breathing Air Equipment Section of the Storehouse and their authorized vendors are the ONLY persons allowed to perform any repairs on breathing air equipment within the Baytown Refinery. Field personnel are not authorized to perform any repairs or parts replacement on this equipment other than changing air cylinders.

5.0

Emergency

Respirators 5.1 Purpose

Emergency Scott Air-Paks are an integral part of the Refinery's system for responding to emergencies. This section provides guidelines to ensure that personnel are familiar with the equipment and the equipment is readily available and properly maintained for immediate use.

5.2 General Requirements

The standard emergency respirator is the 30-minute Scott Pressur-Pak 4.5.

Emergency respirators are stored in yellow cabinets and must contain all three respirator face masks (small, large and extra-large).

Emergency respirators must never be used for planned work.

Attachment 1, Respiratory Protection Program - Baytown Refinery (cont.)

5.0 Emergency Respirators continued

5.3 Location Guidelines

The general guideline that should be used for determining the location and number of Scott Air-Paks at operating units in the Baytown Refinery are as follows:

One or more Air-Paks, depending on the size of the unit, should be located in the area where Process Technicians and others generally enter the unit. If the control center is located near the entrance to several units, one installation of emergency Air-Paks near the exit of the control center could be used to serve all of the units in the immediate area.

Emergency Air-Paks should be located near equipment installations handling toxic materials that have an increased potential for release, such as compressors, pumps, etc.

Judgment must be exercised in determining the specific location of the Scott Air-Paks relative to the equipment described above. Consideration must be given to factors such as normal wind direction, most probable approach path, congestion of equipment, etc. In some cases, more than one Scott Air-Pak installation may be required to serve the same area because the approach to that area may be complicated by congestion or other factors.

5.4 Weekly Inspection

Weekly visual inspections are required for Emergency Scott Air-Paks as specified in Attachment 4. The use of area task books is sufficient to comply with this requirement. This is in addition to the monthly inspection requirement specified in Section 4.4. Inspection records for each emergency respirator must be maintained for twelve (12) months.

Attachment 1, Respiratory Protection Program - Baytown Refinery (cont.)

5.0 Emergency Respirators continued

5.5 Donning Practice

Personnel assigned to Process units where the use of emergency Scott Air-Paks may be required must practice donning the equipment at least twice per month. Donning records, including donning times, must be maintained for twelve(12) months.

6.0 Air Purifying Respirators

6.1 Capabilities and Limitations

Air-Purifying respirators offer a much lower level of protection than the supplied air equipment (such as the Scott Air-Pak.) This is because air-purifying respirators use filters or cartridges to remove contaminants from the atmosphere rather than provide a source of fresh breathing air.

Unlike the air supplying respirator, air purifying respirators are only approved for use at certain contaminant levels. Air-purifying respirators can ONLY be used when ALL the following conditions exists:

- The atmosphere within the work area has an oxygen content of at least 19.5 percent.
- The type and concentration of all contaminants are known and the airborne contaminant concentration does not exceed the maximum use limit assigned to the respirator (see Table 4).
- The concentration of all contaminants is stable and not expected to change significantly during the course of the work.
- The contaminants do not include materials with inadequate warning properties (i.e., hydrogen sulfide, carbon dioxide, carbon monoxide, chlorine). See Refinery Safety Manual, Table 11-2, Respirator Selection Chart.

Attachment 1, Respiratory Protection Program - Baytown Refinery (cont.)

6.0

Air Purifying Respirators

6.2 Selection and Use

Table 4 is a guide for use in the selection of the proper type of respirator and filtering cartridge. Tables 1-b and 1-c provide the Storehouse symbol numbers needed for ordering equipment.

6.3 Type of Air-Purifying Respirators

The following table describes the two types of air purifying respirators used at the Baytown Refinery.

Type	Description
Single-use Disposable Dust	<p>The filter-type respirator removes particulate matter from the inspired air by capture on a fibrous pad. This respirator provides protection against certain dusts, mists and fumes. Single-use dust respirators must be discarded when breathing becomes difficult, if it is damaged, and at the end of each work period.</p> <p>Dust respirators are used as protection when handling solid chemicals such as lime, soda ash, catalyst, coke, fiberglass/non-asbestos insulation and similar dust-producing materials.</p> <p><u>NOTE: DUST RESPIRATORS ARE NOT TO BE USED AS PROTECTION AGAINST VAPORS, GASES OR FOR THE HANDLING OF ASBESTOS.</u></p>
Chemical-Cartridge and Filter Respirators	<p>This type of respirator consists of half facepiece or a full facepiece, onto which are fitted various disposable chemical cartridges or filters (depending on the type of contaminants that are present). Provided the proper chemical cartridge is used, this respirator can provide protection against certain vapors, gases and dusts. When the contaminant is an eye irritant, a full facepiece is required for eye protection. Cartridges are labeled and color coded to identify the contaminant for which they provide protection.</p>

Attachment 1, Respiratory Protection Program - Baytown Refinery (cont.)

Air Purifying Respirators continued

All respirators shall be inspected prior to each use using the following procedure.

Step	Action
1	Check for cleanliness
2	Inspect rubber portions and straps for tears and cracks or signs of deterioration
3	Ensure inhalation and exhalation valves are present and properly aligned over openings

6.5 Fit Check

Prior to entering a contaminated atmosphere with a chemical-cartridge respirator, a facepiece seal check must be performed. **This fit check does not take the place of the fit test.**

The following procedure is required for this test.

Step	Action
1	Don the face piece with filters installed
2	Cover the inlet opening of the respirator's filters with the palms of the hands
3	Inhale gently NOTE: A negative pressure should be created inside the face piece, causing it to pull tightly to the face
4	Cover the respirator exhalation valve opening
5	Exhale gently NOTE: A slight positive pressure should be felt inside the facepiece without evidence of outward leaking.

Attachment 1, Respiratory Protection Program - Baytown Refinery (cont.)

Air Purifying Respirators
continued

6.6 Cartridges/Filter Replacement

Respirator cartridges must be replaced at the end of each work shift. They must also be replaced whenever resistance to breathing is encountered or when the contaminant is detected by odor or taste.

6.7 Maintenance and Care

Air-purifying respirators must be worn by only one (1) person and must be cleaned and disinfected after each day's use. Single-use respirators are to be discarded after use. A cleaning/disinfectant material is available from the Storehouse or respirators may be washed in warm soapy water. Between uses, respirators must be stored in a manner which protects them from dust, sunlight, and extremes of temperature. The respirator should be kept in the reusable storage bag that was supplied with it. No respirator can be adequately protected if stored unsealed in a clothing locker or toolbox. Storehouse symbol numbers for materials used for respirator cleaning, disinfection, and maintenance are provided in Table 1-d.

Half-masks that become defective should be discarded. Full-face masks should be sent to the Breathing Air Equipment Section of the Storehouse for repair or replacement.

Attachment 1, Respiratory Protection Program - Baytown Refinery (cont.)

TABLE 1-a

STOREHOUSE NUMBER FOR SCOTT PRESSUR-PAK 4.5, AND SKA-PAK HOSELINE

Equipment	Symbol Number	Description
Pressure-Pak 4.5, 30 minute	77700-008	Scott Pressur-Pak 4.5, 30-minute Cylinder, 4,500 psi, Alpine-Style Back-Pak, Less Case
Pressure-Pak 4.5, 30 minute, with case	77700-009	Scott Pressur-Pak 4.5, 30-minute Cylinder, 4,500 psi, Alpine-Style Back-Pak, With Case
Pressure-Pak 4.5, One-Hour	77700-010	Scott Pressur-Pak 4.5, One-hour Cylinder, 4,500 psi, Alpine-Style Back-Pak, Less Case
Pressure-Pak 4.5, One-Hour, with case	77700-011	Scott Pressur-Pak 4.5, One-hour Cylinder, 4,500 psi, Alpine-Style Back-Pak, With Case
Ska-Pak Hoseline Unit	77703-300	Scott Ska-Pak Low Pressure Hoseline Unit, with Five-minutes Egress Cylinder
Scott-O-Vista Facepiece, Small Size (green)	77704-300	Facepiece for Use With Scott Ska-Pak or Pressur-Pak 4.5, Color Coded Green
Scott-O-Vista Facepiece, Large Size (black)	77704-301	Facepiece for Use With Scott Ska-Pak or Pressur-Pak 4.5, Color Coded Black
Scott-O-Vista Facepiece, Extra Large Size (red)	77704-302	Facepiece for Use With Scott Ska-Pak or Pressur-Pak 4.5, Color Coded Red
Scott-O-Vista Head Net and Strap Assembly	77704-399	Replacement Head Net and Strap Assembly for all Scott-O-Vista Facepieces
30-Minute Cylinder, 4500 psi	77704-250	Cylinder, Breathing Air, 4500 psi, 30-Minute Duration, for Use With Scott Pressur-Pak 4.5

Attachment 1, Respiratory Protection Program - Baytown Refinery (cont.)

TABLE 1-a

STOREHOUSE NUMBER FOR SCOTT PRESSUR-PAK 4.5, AND SKA-PAK HOSELINE (Continued)

Equipment	Symbol Numbers	Description
One-Hour Cylinder 4500 psi	77700-251	Cylinder, Breathing Air, 4500 psi, One-Hour Duration, for Use With Scott Pressur-Pak 4.5
Scott Ska-Pak Hoseline Unit Kit	77700-018	Scott Ska-Pak Low-Pressure Hoseline for Checkout from B.A.E.R. Section To Be Used With Fixed-Location Breathing Air Systems (Where Available)
Two-Wheel Cart Hoseline Unit* (Requires Drott)	77700-021	Two-Wheel Cart, One Regulator Assembly, One Check tee, One Check Valve, One Hose Assembly, Two 50-Foot Sections of High-Pressure Hose, Two Ska-Paks, Two Wrenches, Two 233-Cubic Foot Breathing Air Cylinders
Two-Person Trailer*	77800-771	Trailer, Two Ska-Paks, One Regulator, Four 50-Foot Sections of High-Pressure Hose, Two Wrenches, Two 233-Cubic Foot Breathing Air Cylinders
Four-Person Trailer*	77800-700	Trailer, Four Ska-Paks, One Regulator, Eight 50-Foot Sections of High-Pressure Hose, Four Wrenches, Six 233-Cubic Foot Breathing Air Cylinders
Eyeglass Adapter	77701-342	Adapter for Mounting Regular Eyeglasses (With earpieces Removed) in Scott-O-Ramic or Scott-O-Vista Masks

- * Note: All the Items formerly found in the standby kit are now stocked in each of the hoseline units. The only additional item required for a standby kit would be a 60-minute Scott Pressur-Pak 4.5 SCBA.

Attachment 1, Respiratory Protection Program - Baytown Refinery (cont.)

TABLE 1-b

STOREHOUSE SYMBOL NUMBERS FOR AIR-PURIFYING RESPIRATORS

Equipment	Symbol Number
Scott-O-Vista Full Mask respirator Small Large Extra Large	77700-107 77700-109 77700-083
Scott-O-Ramic Full Mask Respirator One Size	77701-110
Scott 66 Half Mask Respirator Small Medium Large	77700-081 77700-082 77700-080
North 7700 Half Mask Respirator Small Medium Large	77701-109 77701-107 77701-108
Single Use Dust Respirator (One size Only) 3M 9970	77700-095
3M Easi-Care Single Use Half-Mask respirator With Organic Vapor Cartridge Small Medium Large	77700-139 77700-140 77700-141
3M Easi-Care Single Use Half-Mask respirator With Acid Gas Cartridge Small Medium Large	77700-142 77700-143 77700-144
3M Easi-Care Single Use Half-mask Respirator With Ammonia Cartridge Small Medium Large	77700-145 77700-146 77700-147
3M Easi-Care Single Use Half-Mask respirator Used For Painting Application Small Medium Large	77700-148 77700-149 77700-150
	06/27/91

**Attachment 1, Respiratory Protection Program - Baytown
Refinery (cont.)**

TABLE 1-c

**STOREHOUSE SYMBOL NUMBERS FOR FILTERS AND CHEMICAL
CARTRIDGES
FOR USE WITH AIR-PURIFYING RESPIRATORS**

10	Cartridge Color	Scott-O Vista (AV-2000)	Scott-O-Ramic	Scott 66	North 7700
Organic Vapor	Black	77701-095	77701-099	77701-095	77701-101
Acid Gas	Yellow	77701-104	77701-113	77701-104	77701-105
Ammonia	Green	77701-103	77701-112	77701-103	77701-102
High Efficiency Particulate (HEPA)	Purple	77701-106	77701-090	77701-106	77701-094
HEPA/Organic Vapor	Purple/Black				77701-096
HEPA/Acid Gas	Purple/Yellow				

**Attachment 1, Respiratory Protection Program - Baytown
Refinery (cont.)**

TABLE 1-d

**STOREHOUSE NUMBER FOR RESPIRATOR CARE AND MAINTENANCE
MATERIALS**

Equipment	Symbol Number	Description
Clinipads	77040-505	Antiseptic Towelette
Zepynamic	77701-900	Sanitizing/Deodorizing Antiseptic
Plastic Bag	18103-006	Polyethylene Bag, Used for Mask Storage, 10" by 6" by 22"
Anti Fog	77701-035	Anti-fog Lens Prep

05/20/91

Attachment 1, Respiratory Protection Program - Baytown Refinery (cont.)

TABLE 2
IDLH LIMITS

Chemical Name	IDLH Value (ppm)	
Ammonia	500	
Benzene	2,000	
Carbon Dioxide (CO ₂)	50,000	
Carbon Monoxide (CO)	1,500	
Chlorine	30	
Hydrogen Sulfide	300	
Methyl Ethyl Ketone (MEK)	3,000	
Naphtha's	5,000	50% LEL
Phenol	250	
Refinery Light Ends/Fuel Gas	20,000	Greater than 100% LEL
Sulfur Dioxide	100	
Toluene	2,000	
Xylene	1,000	

IDLH = Immediately Dangerous to Life and Health concentrations represent the maximum concentration from which, in the event of respirator failure, one could escape within 30 minutes without a respirator and without experiencing any escape-impairing (e.g., severe eye irritation) or irreversible health effects.

Attachment 1, Respiratory Protection Program - Baytown Refinery (cont.)

TABLE 3

REQUIRED CRITERIA FOR GRADE D BREATHING AIR

Characteristic	Limit
Percent O ₂ , with balance of predominantly Nitrogen	atmospheric 19.5-23.5
Oil (condensed, mg/m ³ at NTP)	5
Carbon Monoxide (ppm)	10
Odor	No Pronounced Odor
Carbon Dioxide (ppm)	1000

For further information reference the American National Standard Commodity Specification for Air, ANSI/CGA G-7.1-1989 or contact Industrial Hygiene.

Attachment 1, Respiratory Protection Program - Baytown Refinery (cont.)

**TABLE 4
SELECTION GUIDELINES FOR AIR-PURIFYING RESPIRATORS**

Chemical (1) Name	Mask	Maximum Use Limit	Cartridge/ Filter	Cartridge Color
Hydrocarbon vapors(not otherwise specified)	Half Full	1,000 ppm 1,000 ppm	Organic Vapor	Black
Benzene ⁽²⁾	Half Full	10 ppm 50 ppm	Organic vapor	Black
PCB ⁽³⁾ (Polychlorinated Biphenyls)	Half	10 x PEL ⁽⁴⁾	Combination Organic Vapor/High Efficiency Filter or Combination Organic Vapor/Dust Mist Pre-Filter	Black/Purple Black with Pre-Filter
Ammonia	Full	250 ppm	Ammonia	Green
Sulfur Dioxide	Half Full	20 ppm 50 ppm	Acid Gas	Yellow
Coke, Fiberglass, Non asbestos Insulation, Welding Fumes, Catalyst Dusts, and Oil Mists	Dust/Mist/Fume	5 x PEL ⁽⁴⁾	3M-9970	White with Purple Exhalation Valve
Phenol	Half Full	50 ppm 250 ppm	Organic Vapor/HEPA or Organic Vapor/Dust Mist Pre-Filter	Black/Purple or Black with Pre-Filter

(1) For Other Hazardous Materials see Baytown Safety Manual Table 11-2 or Contact Industrial Hygiene for Assistance.

(2) Annual Fit testing Required for Benzene

(3) Air purifying respirator is acceptable for use if PCBs are at ambient temperature. At elevated temperature, Scott Air-Pak must be used.

(4) OSHA PEL = OSHA Permissible Exposure Limit, Contact Industrial Hygiene

ATTACHMENT 2, FACIAL HAIR POLICY - APPLICATION AND GUIDELINES

Application

This policy will apply to all Baytown Refinery employees as listed below.

Applies to employees assigned to these areas	<ul style="list-style-type: none">• Fuels North• Fuels South• Specialties• Process Services• Maintenance• Shops and Construction• Safety• Shift Superintendents• Fire/Rescue Team Members• Security Personnel• Contact Engineers• Computing and Quality Engineers• Inspectors• Industrial Hygiene
--	--

ATTACHMENT 2, FACIAL HAIR POLICY - APPLICATION AND GUIDELINES (cont.)

Application (cont.)

<p>Does NOT apply to employees assigned to these areas</p>	<ul style="list-style-type: none">• Clerical and Secretarial personnel• Storehouse Personnel• Personnel assigned to the Packaging and Lube Blending Plant in the Specialties Department• Laboratory personnel with the exception of the Sampling Shipping and Technical Services Group• Mechanical personnel whose daily work activities are confined to the Central Shop, Main Office Building, Laboratory, and the Garage and Rigging Building.• Electricians conducting routine maintenance/construction activities inside substations and their related yards.
--	---

ATTACHMENT 2, FACIAL HAIR POLICY - APPLICATION AND GUIDELINES (cont.)

Personnel or work groups who are based in the locations listed below but whose work activities are routinely in the field must comply with the requirements of this policy.

Compliance with the policy is required for these personnel and work groups	<ul style="list-style-type: none">• Detailers• Plumbing/Hot tap Personnel• Compressor Group• Digital Instrument Personnel• Road Repair Personnel• Riggers• Motorized Equipment Operators
--	--

Guidelines

The following guidelines are provided to facilitate interpretation of the facial hair policy.

- Beards of any type that cover portions of the face contacting the sealing surface of the respirator are not permitted.
- A visible facial hair stubble of more than one-day growth is considered unacceptable.
- Sideburns are permitted but must be trimmed so they do not extend into the sealing area of the facepiece. In addition, they must not interfere with the function of the respirator valves.
- Mustaches are permitted but must be trimmed so they do not extend into the sealing area of the facepiece. In addition, they must not interfere with the function of the respirator valves.

ATTACHMENT 2, FACIAL HAIR POLICY - APPLICATION AND GUIDELINES (cont.)

The following guidelines apply to the assignment of individuals from an area or work group that does not have to comply with the clean-shaven segment of the policy to an area or work group that must comply with the policy.

- An individual reassigned, whether temporarily or long-term, to work in an area or work group that must comply with the clean-shaven segment of the policy must be clean shaven in the area of the face that contacts the sealing surface of the respirator when he/she reports to that new assignment. If notice of such reassignment is given after the beginning of a shift, the reassigned employee will be allowed to shave on Company time and premises prior to reporting to the new assignment on that shift.
- An individual accepting an overtime opportunity in an area or work group that must be in compliance with the clean-shaven segment of the policy must meet the requirements and, if not already in compliance, must shave on his own time.
- The presence or absence of facial hair will not be given consideration in the temporary or long-term assignment of personnel.

ATTACHMENT 3, MONTHLY INSPECTION FOR SELF-CONTAINED BREATHING APPARATUS

PAC # _____ CABN # _____
LOCATION _____

REG SER # _____ PR.SER. # _____ Assigned To _____

DATA: CHECK = OK X = NEED ATTENTION

1. MASK INSPECTION (ENSURE ONE OF EACH SIZE MASK IS IN CABINET)

- A. Remove mask from bag. Check for cleanliness of rubber and lenses. _____
- B. Inspect rubber portions for tears, cracks, or other signs of deterioration. _____
- C. Check chin straps and head net for deterioration. _____
- D. Sanitize masks and return to plastic storage bag. _____

2. HARNESS INSPECTION

- A. Lengthen straps fully and inspect for tears or frays. Straighten straps. _____
- B. Assure all harness fittings are in place. _____

3. CYLINDER INSPECTION

- A. Assure cylinder valve is closed completely. _____
- B. Disconnect connector from cylinder. (Should be hand tight.) _____
- C. Inspect sear ring on connector nipple for nicks, cuts or breaks. _____
- D. Reconnect hose cylinder. HAND TIGHTEN ONLY. _____

4. CYLINDER INSPECTION

- A. Inspect cylinder for damage to fiberglass wrapper. _____
- B. Check gauge for FULL indication _____
- C. Check Hydrostatic test date, must be current. (3 years or less) _____

ATTACHMENT 3 - MONTHLY INSPECTION FOR SELF-CONTAINED BREATHING APPARATUS (cont.)

5. FUNCTIONAL CHECK

- A. Attach faceplate to breathing regulator. _____
- B. Ensure purge valve is closed. (Full clockwise with pointer on knob up.) _____
- C. Depress Donning switch and hold. _____
- D. Slowly open cylinder valve to charge hose and regulator assembly. Alarm will activate as Pak pressure increases, and will cease as pressure exceed approximately 1,100 psi. Monitor pressure on auxiliary gauge mounted on harness. _____
- E. After pak is pressured up completely, close cylinder valve completely. Release Donning switch. No air should flow from mask. Crack purge valve. Air should flow from mask. Close purge valve. _____
- F. Hold mask to face and obtain seal. Inhale sharply. Donning switch should be overridden and air flow should begin. Breath normally to depressure pak. As pak pressure decreases to 1,100 psi, alarm should activate and remain on until pak is completely depressured. _____

6. FINAL INSPECTION

- A. Remove mask from breathing regulator. Sanitize and return to plastic storage bag. _____
- B. Assure that cylinder gauge indication is >4,000 psig. Replace with full cylinder if not. _____
- C. Spray breathing regulator with disinfectant. _____
- D. Return unit to storage cabinet. _____

NOTE: Any problems encountered during this inspection should be communicated to the technicians at the Breathing Air Equipment Shop on Extension 4014.

COMMENTS _____

Technician Inspecting Unit _____ Date: _____

Shift Supervisor _____ Date: _____

6/91 forms/selfcont.air

**ATTACHMENT 4, WEEKLY INSPECTION FOR EMERGENCY
SCBA**

STEP	ACTION
1	Ensure that all parts of the respirator are present.
2	Check all parts for wear or other conditions that could interfere with proper donning or operation of the equipment - i.e., straps, belts, buckles, harness, mask, hoses, etc.
3	Make sure that all harness straps are straight and extended fully.
4	Make sure all three (3) face mask sizes are present (small, large and extra large).
5	Inspect masks for cleanliness. Each mask should be stored in a separate sealed plastic bag.
6	Check cylinder gauge for pressure indication. If the pressure indicated is not >4,000 psig, the cylinder should be changed out.
7	Make record of inspection for each unit, date, and sign.

ATTACHMENT 5, EXXON BAYTOWN REFINERY UNABLE TO FIT TEST FORM

Instructions for completing form:

This form is to be completed when the criteria on the reverse side of this page is not met. This form is to be completed by the person performing the respirator fit test (Fit Tester). Copies of the form are to be forwarded from the fit tester to: (1) Employee's First Line Supervisor, (2) Industrial Hygiene, and (3) Training. Questions concerning the use of this form should be directed to 425-4894.

Employee _____

Date: _____

Work Location _____

First Line Supervisor _____

FIT TEST CRITERIA NOT MET

Reason:

Respirators Tested:	<u>Manufacturer</u>	<u>Model</u>	<u>Size</u>
(1)	_____	_____	_____
(2)	_____	_____	_____
(3)	_____	_____	_____

Copies Forwarded To:

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
First Line Supervisor	Industrial Hygiene	Safety Training Coordinator

Respirator Fit Tester: _____
(signature)

jwg/respform
1/20/95

ATTACHMENT 6, MEDICAL QUESTIONNAIRE FOR RESPIRATOR USERS

Name _____ Dept _____

Date ____ / ____ / ____ SSN ____ - ____ - ____ Phone ____ - ____

Please answer the following questions.

Have you experienced:

- Yes No Chest pain when you exert yourself (for example running or climbing stairs) which goes away after a few minutes of rest?
- Yes No Coronary artery disease or other heart disease that would interfere with your ability to wear a respirator?
- Yes No A heart attack or coronary artery by-pass surgery?
- Yes No Borderline high blood pressure which is not being treated?
- Yes No A chronic cough or other respiratory problem (e.g. asthma or emphysema) that would interfere with your ability to wear a respirator?
- Yes No More than you consider normal shortness of breath while climbing or running?
- Yes No Any other medical condition which causes you discomfort or problems when you wear a respirator?
Specify the condition _____
- Yes No Has a Physician told you that you have an abnormal lung function test?
- Yes No Has it been more than 4 years since your last physical examination done by the Medical Department?

Please list all medications (prescription and non-prescription) that you use on a regular basis.

MEDICAL DEPARTMENT FOLLOW-UP **DATE** _____

- ___ OK for respirator use and fit testing. ___ Unable to wear respirator
- ___ May wear respirator for emergency use only

Employee Signature _____

Physician Name & Signature _____

ATTACHMENT 7, RESPIRATORY PROTECTION CHECK LIST PROCESS/MECHANICAL/CONTRACTOR

Instructions: Select a job where respiratory protection is being utilized.
Complete the following information:

Work Group (Circle) Mechanical Process Contractor

Supervisor: _____

Conducted By: _____

Date: _____

Work Location: Dept. _____ Control Center _____ Unit _____

Job Description: _____

Name: _____ Social Security Number: ____ - ____ - ____

Name: _____ Social Security Number: ____ - ____ - ____

Name: _____ Social Security Number: ____ - ____ - ____

- Meets Facial Hair Policy Yes ___ No ___
- Properly Fit Tested and Fit Testing Records Available Yes ___ No ___
- Medically Certified to Use Respirator Yes ___ No ___
- Adequately Trained and Training Records Available Yes ___ No ___
- Written Respiratory Protection Program Available and Adequate Yes ___ No ___

Comments: _____

Section and Use

Was the proper respirator selected for the intended use? Yes ___ No ___

Comments _____

If an air-purifying respirator was used, was the proper filter/chemical cartridge selected? Yes ___ No ___ N/A ___

Comments _____

Was a pre-use fit check conducted by employee? Yes ___ No ___ N/A ___

Comments _____

Standby requirements met? Yes ___ No ___ N/A ___

Comments _____

ATTACHMENT 7, RESPIRATORY PROTECTION CHECK LIST PROCESS/MECHANICAL/CONTRACTOR (Cont.)

Maintenance and Care

Was respirator adequately cleaned and disinfected
after use? Yes ___ No ___ N/A ___
Other _____

Inspection (SCBA)

If SCBA was used, determine if the proper
inspection has been performed? Yes ___ No ___ N/A ___
Process Work Pak (Monthly Inspection) Yes ___ No ___ N/A ___
Process Emergency Work Paks (Monthly and Weekly)
Comments _____

RESPIRATORY Protection PROGRAM
INCLUDING TRAINING
SMALL REFINERY EXAMPLE

FOR

OSHA RESPIRATORY PROTECTION
PROPOSED STANDARD - DOCKET H-049

SECTION VIII. RESPIRATORY PROTECTION

A. GENERAL REQUIREMENTS

OWNER: INDUSTRIAL HYGIENIST

1.0 PURPOSE AND DESCRIPTION

The purpose of this standard is to establish health and safety expectations for practices related to respiratory protection in the Billings Refinery, and to document procedures consistent with the requirements of OSHA respiratory protection regulations (29CFR 1910.134). This standard is based on recognized health and safety principles, as well as good industrial hygiene practices. It is intended to be a guide for the application and use of approved respiratory protection devices.

2.0 APPLICATION

Approved respiratory protection devices are to be used for control of personnel exposure only after considering engineering controls (i.e. local exhaust ventilation, enclosure or isolation of the hazard from the worker), and administrative controls (i.e. substitution of a less hazardous material or process) in the respective order listed above. Respiratory protection should not be used to control exposures for routine, frequently-recurring tasks. These exposures should be controlled through feasible engineering controls. When engineering controls are not feasible, or while they are being instituted, appropriate respiratory protection may be required.

Various categories of respiratory protection devices used in the refinery are listed below:

Air Supplied Respirators:

- Self Contained Breathing Apparatus (SCBA)
- Supplied Air Hose Line
- Emergency Escape SCBA

Air Purifying Respirators:

- Disposable
- Reusable
- Emergency Escape Mouth Bit

2.1 PROGRAM RESPONSIBILITIES

2.1.0 PROGRAM ADMINISTRATOR (INDUSTRIAL HYGIENIST) RESPONSIBILITIES

Refinery Industrial Hygienist has the overall responsibility for the Respiratory Protection Program (RPP). Specifically, the Industrial Hygienist is responsible for and has authority to:

- Serve as the primary technical and regulatory contact and program administrator.

Ensure that the overall program complies with the applicable regulatory standards.

Ensure that an appropriate training and fit testing program is established and conducted for respirator users and that appropriate records are maintained.

Evaluate and approve respiratory protection devices for use in the refinery.

Evaluate tasks through periodic monitoring to determine the need for respiratory protection.

2.1.1 EMERGENCY RESPONSE COORDINATOR RESPONSIBILITIES

Refinery Emergency Response Coordinator is responsible for coordinating and maintaining programs and records related to use and maintenance (training, periodic maintenance checks, hydrotesting etc.) of refinery SCBAs and Safe Haven emergency escape paks.

2.1.2 SUPERVISORS' RESPONSIBILITIES

Supervisors of any respirator user is responsible for administering the RPP in his/her area of concern. The responsibilities include:

Ensuring that employees under his/her jurisdiction are instructed in the proper use of respirators and are familiar with and comply with the contents of this standard.

Implementation and enforcement of the clean shaven policy in the supervisors area of responsibility.

Ensuring that inspection schedules for supplied air breathing devices in his/her area of responsibility are maintained.

2.1.3 RESPIRATOR USER RESPONSIBILITIES

The Respirator User is responsible for using and maintaining the respirator supplied to him/her in accordance with the written RPP, manufacturers instructions, and user training, reporting any problems with use or facial fit of the respirator to his/her supervisor.

2.2 RESPIRATOR APPROVAL

Respirators approved for use by Exxon Refinery employees are selected by Industrial Hygiene. Appropriate respirators are approved based on technical reviews of respirator performance, protection factors, NIOSH/MSHA respirator approvals and user input regarding comfort, ease of maintenance, and refinery experience with the respirators. Respiratory protection devices routinely used at the Billings Refinery by Exxon employees will be restricted to those listed in Section XIII of the Refinery Health and Safety Manual.

2.3 RESPIRATOR SELECTION AND LIMITATIONS

The choice of respiratory protection is based primarily on the physical and chemical properties of air contaminants and on the concentrations likely to be encountered. The quality of fit and the nature of the work being done also affects the choice of respirators.

2.3.1 SELF CONTAINED AIR SUPPLIED RESPIRATORS

Self Contained Breathing Apparatus (SCBA) is designed for maximum user protection and for entry into areas of oxygen deficiency and very high or even unknown levels of toxic air contamination. These units were also designed to be portable so that users could easily access and egress hazardous areas in emergencies.

Periodic maintenance checks must be conducted at least monthly on SCBA units designated for immediate emergency response. SCBA checklists must be signed and submitted to the refinery Emergency Response Coordinator when complete.

SCBAs requiring repair or maintenance should be submitted to the mechanical tool room for interim replacement and/or appropriate repairs or bottle replacement.

2.3.2 HOSE LINE AIR SUPPLIED RESPIRATORS

Air line supplied respirators provide a high level of user protection and allow for continuous Grade D air supply from either bottle banks or a breathing air compressor. Air line supplied respirators have the advantage of supplying air for longer duration jobs without changing bottles, unlike in SCBA use. Approved Grade D breathing air sources are listed below:

Refinery Breathing Air Compressors used for supplying breathing air must be equipped with:

- Filtration and desiccant systems to control particulate, water, and oil mists.

- Catalyst systems for carbon monoxide removal.

- Continuous monitors for carbon monoxide and hydrogen sulfide.

- Low pressure, high temperature and emergency shutdown alarms.

Compressors audible alarm must function such that users become immediately aware of compressor malfunction or detection of toxic gases. Users must position the compressor so that intake of toxic gases (e.g. vehicle or compressor exhaust) is avoided and so that users can easily hear the audible compressor alarm. Compressors must be checked quarterly to ensure "Grade D" breathing air criteria is maintained as specified by the Compressed Gas Association.

Hard Piped Breathing Air Systems connections are located at the coker, cat, patch and mechanical shop. These piping systems must only be supplied by

compressors that meet the breathing air compressor specifications above. Refinery instrument or utility air may not be used for breathing air under any condition. Piping and hose specifications for breathing air systems are listed below:

Hard piped systems must be either be equipped with pressure regulation and particulate filtration at the point of hoseline connection with all piping/fittings downstream of particulate filtration constructed of alloy materials (i.e. stainless steel), or one inch (1") Dixon fittings may be installed at respirator hoseline connection points for connection to portable manifold boxes equipped with pressure regulation and filtration.

Portable manifold boxes must be used to regulate pressure and filter particulate on hard piped systems that do not have end point filtration or pressure regulation. Portable manifold boxes must also be used where compressor is located more than three hundred feet (300') from respirator use. In this case, one inch (1") green/yellow striped breathing air hose with Dixon fittings with portable manifold box connected at end must be used to supply pressure regulation closer to the point of use.

Pressure regulators at hoseline connections must be checked and adjusted as necessary to ensure proper respirator function because pressure recommendations for respirators vary depending upon the type and manufacturer of the respirator.

All breathing air hoseline connections must be equipped with either Schraeder type or Dixon positive safety lock type fittings. Use of these fittings for any other application in the refinery is strictly prohibited.

Hoses that supply breathing air from the point of hard piped connection to the respirator must be of the same manufacture as the respirator and must meet the NIOSH/MSHA respirator approval for the particular respirator used.

All endpoint connections on hard piped breathing air systems must be painted black with yellow and green striping and have a sign posted that reads as follows:

Breathing Air
Connect Only
Approved Equipment
Use Only
Approved Fittings

Bottled Air Cascade Systems used for breathing air purposes must have a visible tag or label on the bottle(s) that certifies the air meets "Grade D" criteria. A "bottle watch" must be present to monitor breathing air bottle condition and pressures while bottles are in use.

NOTE: Any air line respirator used for a job where potential for Immediately Dangerous to Life and Health (IDLH) atmospheres exist must be equipped with an egress pak for emergency escape provisions.

2.3.3 AIR PURIFYING RESPIRATORS

Air Purifying respirators utilize mechanical filters or chemical sorbent cartridges to purify outside air as it is drawn into the respirator face piece. This type of respiratory protection is commonly used in the refinery for protection against vapors, dusts, mists, and fumes during specific work activities. Air purifying respirators do not supply air and must not be used in oxygen deficient atmospheres.

Air purifying respirator chemical sorbent cartridges must be replaced, at a minimum, when the odor of contaminant is initially detected inside the respirator and/or when increased breathing resistance is detected.

Users of air purifying respirators with elastomeric face pieces must complete a physical qualification and a qualitative or quantitative fit test annually. Fit testing will be coordinated by the refinery Industrial Hygienist.

Air purifying respirator cartridges will only remove contaminants for which they were specifically designed to remove. Filter-type cartridges are generally designed to remove only dusts, mists, and fumes. Chemical sorbent cartridges are designed to remove only specific contaminants or classes of gas or vapor contaminants. Filter and sorbent combinations may be necessary for certain job applications where dusts/mists/fumes and vapors/gases exist in the same atmosphere (e.g. spray painting, refractory chipping). For additional information regarding respirator cartridge applications, refer to the PPE table in Section XIII of the refinery Health and Safety Manual, manufacturers instructions in printed literature or on side of cartridge, or contact refinery Industrial Hygienist.

Users of air purifying respirators must conduct a negative pressure fit check consistent with manufacturers recommendations prior to each use.

2.3.4 RESPIRATOR SELECTION LIMITS

Respirator selection is largely based on the toxic properties and exposure limits of the contaminant, its concentration in the work area and limitations and protection factors of the respirator and/or cartridges. Table VIII.A.2.3.4 below identifies allowable concentrations for specific respirator applications for some common refinery chemicals.

Table VIII.A.2.3.4 - Allowable Concentrations for Specific Respirator Applications

Substance	Without Respirator Protection	With Air Purifying Respirators		Full Face Pressure Demand	SCBA or Airline w/ escape pack required*
		Half face	Full Face	Air Line Supplied Equipment	
Hydrocarbons	<100ppm	<500ppm	<500ppm	<500ppm	>500ppm
Benzene	<1ppm	<10ppm	<50ppm	<500 PPM	>500ppm
Sulfur Dioxide	<2ppm	<20ppm	<20ppm	<20ppm	>20ppm
Ammonia	<25ppm	<100ppm	<100ppm	<100ppm	>100ppm
Hydrogen Sulfide	<10ppm	Supplied air only		<100ppm	>100ppm
Carbon Monoxide	<35ppm	Supplied air only		<400ppm	>400ppm
Chlorine	<0.5ppm	Supplied air only		<3ppm	>3ppm
HF acid	<3.0ppm	Supplied air only		<10ppm	>10ppm
MTBE	<50.0ppm	<500ppm	<500ppm	<500ppm	>500ppm
Oxygen	20-23.5%	20-23.5%		20-23.5%	< 20% or >23.5% **

NOTE: 1) Persons Must be Physically Qualified and Fit tested Initially and Annually Thereafter for Use of Air Purifying Respirators

2) All Concentrations Should Be Representative of Breathing Zone Atmosphere. For confined space entry applications, pre approval and special hazardous confined space entry permit from the Industrial Hygiene or Safety staff is required.

**Requires Permit Deviation

2.4 ENGINEERING CONTROLS

The preferred method for reducing or eliminating exposure potential is through engineering controls. Special effort should be made to implement engineering controls for tasks identified by refinery Industrial Hygiene as having routine exposure beyond permissible exposure limits (PELs). Non-routine jobs having exposure potential greater than a PEL should be evaluated to determine the feasibility of an engineering solution. Where engineering solutions are not available or are determined not feasible, administrative controls, personal protective equipment, or any combination of control methods may be used to prevent potential exposures. Examples of some controls are listed below:

Task	Engineering control	Protective Equipment
Welding in a confined space	Dilution ventilation (2000cfm/welder) and/or local exhaust ventilation	Half mask, Air purifying dust/mist/fume respiratory protection. Supplied air if poor ventilation.
Collecting Rich DEA sample at Alky	Enclosed sample box with air eductor for removing vapors.	NONE with closed sample point. Supplied air was required prior to installation.
Opening Benzene containing equipment	Depressurize and Drain Equipment to closed system(e.g. temporary hard pipe to sewer with sewer mat in place).	Neoprene or Nitrile Gloves, No respiratory protection. Half mask air purifying respirator required if drained to mat
Opening equipment/flanges with closed block valve leaking on sour streams.	Placement of air mover within one foot (1') of flange(s) with discharge piped to remote/elevated area via flexible duct.	SCBA. Air mover prevents breathing zone concentrations in excess of Attachment III.

Engineering controls for non-routine work can be as easy as temporary piping to a closed system, or temporary placement of an air mover to remove vapors at a known source. Innovation is the key to easy engineering solutions.

2.5 RESPIRATOR TRAINING

Persons required to wear a respirator periodically as part of their assigned duties must receive training initially and periodically thereafter. Volunteer Fire Brigade and Rescue Squad members must receive training on an annual basis.

Employees who are not normally required to wear a respirator, but are assigned to a specific job requiring the use of a respirator must receive training prior to using the respirator.

2.5.1 SUPPLIED AIR RESPIRATOR TRAINING

All Process and Mechanical employees must be trained in the proper use of the Scott 4.5 SCBA annually. Persons required to periodically use airline respiratory protection systems (e.g. PATCH Operators, Plant Trades and Metal Trades) must be trained in the use and operation of the appropriate airline systems initially and periodically thereafter.

Other employees (Technical, Administrative, Employee Relations, etc.) whose job assignments require them to spend time in the Process area must also receive training as necessary to ensure that they remain familiar with the proper use of the respirator.

The Refinery Emergency response Coordinator will coordinate annual SCBA training. Airline system training will be coordinated by the appropriate area supervisors.

2.5.2 AIR PURIFYING RESPIRATORS

Persons whose job assignments may require them to wear an air purifying respirator periodically must receive training in the proper wearing and use of the respirator prior to use and periodically thereafter.

The refinery Industrial Hygienist will coordinate training either through a formal group training session or through individual training reviews at the time of annual fit testing. Air purifying respirator training will include at least the following topics:

- A description of the human respiratory tract.
- Description of the respirators, uses and limitations.
- Proper wearing, fitting and adjustment.
- Cleaning, storage, and inspection.

2.6 RESPIRATOR FITTING AND FIT TESTING

In addition to training requirements, every employee who is periodically required to wear an air purifying respirator (including disposable dust masks) must be physically qualified and fit-tested prior to initial use and annually thereafter.

2.6.1 ANNUAL FIT TESTS AND PRE-USE FIT CHECKS

Annual fit testing will consist of either a quantitative or qualitative respirator fit test consistent with OSHA protocols. The wearer should also perform the Negative and Positive Pressure fit checks in the field immediately prior to each use of the respirator. More frequent quantitative or qualitative tests will be required if conditions occur which affect the fit (e.g. facial scarring, broken facial bones, tooth extraction, dentures, etc.).

When it is determined that an individual cannot be satisfactorily fitted with an air purifying respirator, an air supplied unit must be used to perform required work.

All SCBAs and supplied air hose line equipment shall be operated in a positive pressure mode only. Fit Testing is not currently required for positive pressure air supplied respirators.

2.6.2 CLEAN SHAVEN POLICY

Any individual who has occasion to regularly enter any Process block in the refinery (see Figure VIII.A.2.6.2 below), must be clean shaven in the area of the face piece seal of positive pressure fresh air masks (SCBA and Airline). In addition, individuals who wear air purifying respirators (negative pressure) must also be clean shaven in the area of the particular respirator they are wearing. Furthermore, facial hair must be trimmed short enough so as not to interfere with any of the functioning portions of a respirator (inhalation or exhalation valves, etc.). Occasional visitors to the refinery, such as asphalt and LPG truck drivers, need not be clean shaven. Other visitors such as those from ER&E can be exempted from being clean shaven, even though they may spend considerable time in Process Block(s), provided that the individual escorting the visitor obtains the approval of the Section Supervisor(s) of the block(s) involved. The face seal is defined as any part of the face which touches or could potentially touch the respirator and Clean Shaven is defined as having no more than one day growth of beard. An illustration of accepted shaving guidelines is attached as Figure VIII.2.6.2. The Program Administrator will be informed of those employees who cannot achieve an effective face piece to face seal.

2.7 INSPECTION, CLEANING, MAINTENANCE, AND STORAGE

Respirators must be properly maintained to retain their original effectiveness. This can only be accomplished through periodic inspection, repair, cleaning and proper storage of respirators.

2.7.1 INSPECTION

All respiratory protection devices shall be inspected by the user before and after each use and after cleaning to check condition of face piece, head bands, valves and hoses. Disposable/single use respirators (e.g. 3M 9970s) are not subject to post-use inspection.

Process and Mechanical Supervisors should ensure at least once per week that SCBA units are intact and ready for use. Records of these inspections will be maintained by the Refinery Emergency Response Coordinator.

2.7.2 CLEANING

Respirator face pieces must be cleaned after each use. Respirators must be stored clean unless respirator is to be used later in the shift. Where respirator is to be reused during the shift, respirators should at least be wiped as free as possible of residual contamination prior to storage in a respirator bag. Warm water and a mild detergent solution or pre-packaged respirator wipes may be used for cleaning respirator face pieces.

Used respirator filters and cartridges should be discarded at the end of the shift.

The only respirator approved for use in the refinery which does not require cleaning is the 3M-9970 disposable type. All others should be cleaned after each use.

2.7.3 MAINTENANCE

Respirators which do not pass inspection may not be used and must be replaced or submitted for immediate repair. Repair of the respirator by the user is limited to the repair of head straps. All other replacements or repairs are performed by certified personnel using parts manufactured specifically for the respirator to be repaired. No attempt is to be made to replace components, or make adjustments, modifications or repairs beyond the manufacturer's recommendations. Air cylinders are to be recharged (filled) as soon as practical after each use.

2.7.4 STORAGE

All approved respirators will be available from the Tool Room. Disposable single-use respirators shall be stored in their original containers until needed. A limited supply of approved disposable respirators may be stored on those units where employees may require frequent use of respirators. SCBAs are stored in their protective cases at various locations throughout each unit. Additional units are available from the Tool Room on an as-needed basis.

3.0 MATERIALS AND RESOURCES

All approved respiratory protection devices are available from the Tool Room. Air purifying respirators and supplies are also available at the Warehouse. Any exception to those listed must be approved by the Refinery Industrial Hygienist or Safety Advisor. Respirators will not be issued to persons who have not been medically qualified, fit tested and trained in the use of the respiratory protection devices issued. Only those respirators listed in Table VIII.A.3.0 below are approved for use at the Billings Refinery.

Table VIII.A.3.0 - Approved Respiratory Protection Devices

Respirator Type	Approved Devices
SCBAs	
Scott Aviation	Scott 4.5
Hose Line Respirators	
Scott Aviation	Scott-O-Vista(Full Face piece)
Acid King	Acid King(PVC Hood)
3M Corporation	3M-7300(Half-Face piece)
3M Corporation	3M-Whitecap Blasting Helmet
Norstar ASH	Acid Hood
Gralite	Acid Hood
Air Purifying Respirators	
North	North 7700(Half Face piece) North 7600(Full Face piece)
3M Corporation	3M-6000 Series(Half Face piece)
Scott Aviation	Scott-o-Vista(Full Face piece)
Disposable Respirators	
3M Corporation	3M-9970 (Half Face piece)

NOTE: All Airline Hoses and Other Replacement Parts for Respirators
Must Meet Manufacturers Recommendations/Approvals.

4.0 RECORDS

Inspection reports of Scott air paks must be completed weekly by the area of ownership, signed by the inspecting person and the area supervisor and forwarded to the Emergency Response Coordinator.

The Emergency Response Coordinator will maintain records of inspection checklists and hydrotest records for SCBAs and Air supplied safe haven escape packs.

Records of physical qualifications for air purifying respirator users will be maintained in the refinery Health Services files.

Historical respiratory protection program files and fit testing records will be maintained in the Environmental, Safety, Training Section central files administered by the Refinery Industrial Hygienist.

SCBA CLASS OUTLINE

A. HISTORY:

1. Originally designed for use in the mining industry.
2. Closed circuit "Chenox" type SCBA used prior to 1945.
3. Open circuit origin from breathing oxygen systems of high altitude air demand or continuous flow).
4. Positive pressure SCBA: First wide spread use was by military of U.S. Air Force provided positive pressure SCBA for personnel working in Titan Missile Base installations because of highly toxic propellants.
5. July 1, 1983: Only pressure-demand or other positive pressure SCBA shall be worn by Fire Brigade members performing interior structural fire fighting.
NOTE: *July 1, 1984 no longer require lock on cylinder valve.*
6. Positive pressure SCBA use in the fire service has only come into prominence since the mid-1970's.

B. NEED FOR SCBA'S

Four hazardous atmospheres

1. Lack of Oxygen - hypoxia
 - 1.1 Combustion
 - 1.2 Toxic gas release
 - 1.3 Inerting process
 - 1.4 Bacterial action

Effects of reduced oxygen

2. Heat - Elevated Temperatures
 - 2.1 Combustion
 - 2.2 Heated work areas (hot processes)
 - 2.3 Firefighters should not enter atmosphere exceeding 120°-130°F.
 - 2.4 Inhaling heated gases may cause fluid collection in the lungs.
 - 2.5 Damaged air cells of the lung (alveoli) can produce pulmonary edema.
 - 2.6 Tissue damage is not immediately reversible.
 - 2.7 Pneumonia usually develops during recovery.
3. Smoke - Irritant Particles
 - 3.1 Visible smoke - carbon, tar, dust suspended in fire gases - also provides location for condensation of gaseous products.
 - 3.1.1 Formaldehyde
 - 3.1.2 Acetaldehyde
 - 3.1.3 Formic Acid

- 3.1.4 Acetic Acid
- 3.1.5 Acrolein

Combustion of cotton yields at least 37 different compounds.

NOTE: *Some of the vaporized products of combustion remain as droplets that do not condense on carbon particles.*

- 3.2 Large smoke particles - mostly filtered by the mucous membrane of the nose and mouth causing upper respiratory irritation. This material is in turn ingested which causes irritation of the gastrointestinal tract and produce the following symptoms:
 - 3.2.1 Nausea
 - 3.2.2 Vomiting
 - 3.2.3 Diarrhea
- 3.3 Smaller particles enter into the lungs, attach to the alveoli, and inhibit the exchange of oxygen and carbon dioxide.
Result:
 - 3.3.1 Emphysema
 - 3.3.2 Coughing
 - 3.3.3 Increased secretions
 - 3.3.4 Chest pains

4. Toxic Gases - Fire Related

- 4.1 Common products of combustion
 - 4.1.1 Carbon dioxide (CO₂) from complete combustion of carbon based fuels.
Note: *Colorless, odorless, non-flammable; 0.3% normal air; .5% slight increase in respiration; 3.0% breathing rate increased by 100%; 10.0% death within a few minutes.*
 - 4.1.2 Carbon Monoxide (CO) from incomplete combustion of carbon based fuels.
Note: *Odorless, colorless; 0.5% dangerous; 1.28% death within 3 minutes; brain damage may appear any time within 3 weeks; largest killer of fire fighters (NFPA)*
 - 4.1.3 Hydrogen Sulfide (H₂S) from rubber, certain plastics, wool, silk and rayon.
Note: *Colorless, rotten egg odor; irritant; asphyxiant; causes paralysis of respiratory center.*
 - 4.1.4 Hydrogen Cyanide (HCN) from same fuels as hydrogen sulfide.
 - 4.1.5 Hydrogen Chloride
 - 4.1.6 Nitrogen Oxides
 - 4.1.6.1 Nitrogen Dioxide
 - 4.1.6.2 Nitric Acid

- 4.1.7 Phosgene
- 4.1.8 Ammonia
- 4.1.9 Chlorine

5. Hyperventilation

- 5.1 Caused by over-exertion and heavy breathing of normal or above normal oxygenated atmosphere.
- 5.2 Lowers level of (CO₂) carbon dioxide in blood.
- 5.3 Symptoms - dizziness, impaired vision, numbness, tingling, restlessness, giddiness, and unconsciousness if in advanced stages.
- 5.4 Can take place while wearing breathing equipment - take it easy.
Note: *Vapors of all or some of these materials may present respirator health hazards.*

6. Hazardous Materials

- 6.1 Poisons
- 6.2 Corrosives
- 6.3 Non-flammable gases
- 6.4 Flammables
- 6.5 Flammable gases

C. LIMITATIONS OF SCBA

- 1. Visibility - tunnel vision, fogging of lens, scratched lens.
- 2. Protection - missing around facial area not sealed.
- 3. Weight - being reduced, but still added weight to firefighter.
- 4. Cumbersome - bulkiness in tight spaces, movement, mobility.
- 5. Communication - hard communications - MSA speaking diaphragm - other communications system.

D. LIMITATIONS OF AIR SUPPLY

- 1. Physical condition of user - general condition (decent)
- 2. Degree of physical exertion - sitting doing nothing or doing anything
- 3. Emotional stability of user - any emotional problems

4. Condition of apparatus - being serviced and maintained properly
5. Cylinder pressure before use - physically check gauge
6. Training and experience - the difference between expert and novice.

E. REQUIREMENTS OF THE WEARER

1. Physical
 - 1.1 Proper conditioning
 - 1.2 Agility
 - 1.3 Facial features
2. Medical
 - 2.1 Proper conditioning
 - 2.2 Agility
 - 2.3 Facial features
3. Mental
 - 3.1 Adequate training
 - 3.2 Confidence
 - 3.3 Ability to cope
 - 3.4 Phobias

Air pockets on facial hair.
Sealing problems with facial hair.

OSHA 1910.134 E.4.i

Respirators shall not be worn when conditions prevent a good face seal. Such conditions may be a growth of beard, sideburns, skull cap that projects under the face piece, or temple pieces on glasses.

OSHA 1910.134 E.5.ii

Wearing of contact lenses in contaminated atmospheres with a respirator shall not be allowed.

F. PARTS OF THE SCBA

1. Mask - neoprene or silicone rubber, plastic lens, spider straps, breathing tube
2. Cylinder - steel: wrapped fiberglass; fiberglass and aluminum

45 cubic ft.	30 minutes
80-90 cubic ft	60 minutes
2216 psi	low pressure
4500 psi	high pressure

3. Regulator - positive pressure, multi-stage (high pressure to 150 psi; 150 psi to ambient pressures)
4. Backpack and harness - nylon; polypropylene; aluminum
5. Accessories - eyeglass holders, nosecups, communications, quick disconnect, buddy breathing devices

NOTE: *Operating temperatures range from -25°F to 200°F.*

G. OPEN CIRCUIT

1. Demand
2. Pressure demand/positive pressure
 - 2.1 1" water = .04 psi in face piece
 - 2.2 No positive flow during exhalation
 - 2.3 Exhalation part closes during inhalation
 - 2.4 Exhaled breath vented to atmosphere

NOTE: *Leak in mask can severely reduce air supply.*

H. CLOSED CIRCUIT

1. Biopack, Rexnord Safety Products
 - 1.1 Exhaled air is re-breathed by user when carbon dioxide is removed and oxygen is added.
 - 1.2 Durations: 30 minutes, 45 minutes, 1 hour, 2 hours, 4 hours.
 - 1.3 User can expect to attain or exceed rated service life of unit.
 - 1.4 Weight: 21-26 pounds
 - 1.5 Disadvantages - high temperature and humidity of inspired air.

I. DONNING PROCEDURES

1. Overhead or coat method (side to side)
2. Check cylinder gauge pressure
3. Open cylinder valve
4. Check regulator gauge pressure - must be within 100 psi of each other.
5. Don unit
6. Don face piece (check for leaks using negative pressure test)

TO REMOVE REVERSE PROCESS

SCBA TEST

1. What kind of SCBA's do we have in the plant?

2. How much pressure is on a full 30 minute bottle?

3. What is the minimum pressure that you can use this air pak to respond?

4. At what pressure does the auto alarm come on?

5. What straps do you pull first on the face piece?

6. How do you check for a "seal"?

7. What do you do when you activate the face piece?

8. What do you do when you need to change a air cylinder bottle?

9. Where do you find spare bottles?

10. Where are the one-hour bottles kept?

Breathing Air Compressor

**Startup, Operation, and Emergency
Procedures**

NOTICE:

**Users Must Be Familiar with the procedures before using
this life support system - A LIFE MAY DEPEND ON IT!**

C902 Startup and Operations Procedures

Initial Startup:

1. Locate compressor away from potential sources of contamination (i.e. CO H₂S, dust, gasoline or diesel engine exhaust, etc.).
2. Compressor must be level for proper operation.
3. Check oil level; keep between add and full marks. Use only Food Grade oil # CP-4600-32-F from Sullair.

CAUTION!

**DO NOT OVERFILL RESERVOIR
DO NOT OPEN SUMP FILLER WHILE MACHINE IS RUNNING,
OR WHILE THERE IS STILL PRESSURE ON THE SUMP.**

NOTE: If oil consumption is excessive, see maintenance manual section 5.b for probable cause and remedy.

4. Plug in compressor and turn on breaker.
 - a. Alarm lights will come on if polarity is correct.
 - b. If the lights do not come on, shut off breaker, reverse polarity, turn breaker on.
5. Set *Dual Control* to auto.
6. Press *Reset* button; alarm lights will go out.
7. Crack *Shut Off* valve to service line.
8. Press *Start Button* to start:
 - a. Check for air leaks in piping.
 - b. Monitor sump and line pressure; approximately 110 psi.
 - c. Monitor purge cycle; 2.5 minutes per side, 5 minutes total.
 - d. Monitor operating temperature; between 100° over ambient to 210° max. 190° is considered normal.

CAUTION!

If temperature exceeds 210°, shut down compressor immediately. Check cooling system or installation environment.

- e. Check CO and H₂S monitors; green light indicates OK.
- f. Check indicators; primary, filter and bearing filter.
- g. Fully open shut off valve to service line.
- h. Now ready to use.

C902 Startup and Operations Procedures

Subsequent Startups;

1. Check oil level and press start button.
2. Observe instrument panel and maintenance indicators.
3. Re inspect daily for leaks; monitor temperature.

Normal Shutdown Procedure

1. Press the stop button.

Compressor Capacity and Respirator Usage:

This air compressor produces a limited supply of compressed grade D breathing air. The maximum amount of air supplied is based on the type of respirator(s) used and the air consumption of each respirator user. The information below will help users understand the limitations of this air supply.

Compressor Receiver capacity: 120gal @ 100psi
(approx 120 ft³ of air).

Compressor Air Supply Capacity: 120 scfm

Respirator pressures and air demand:

Scott O Vista Full Face = 4-5cfm at 60-100psi

3M Whitecap Sandblast Helmet =10-15cfm at appropriate supply pressures.

3M Half face welding respirator = 4-10cfm @ 7-55 PSIG

NOTE: Respirators must be operated within the appropriate pressure range specified for the type of respirator.

WARNING

RESPIRATORS USED IN AN ATMOSPHERE THAT IS OR MAY BECOME IMMEDIATELY DANGEROUS TO LIFE AND HEALTH (IDLH) MUST BE EQUIPPED WITH AN AUXILIARY SCBA OR EGRESS PAK.

Breathing Air Compressor **Emergency Procedures**

Compressor Warning lights and Audible Alarm

This compressor is equipped with warning lights and a horn that indicate abnormal compressor operations. Warning lights illuminate and the horn will sound for high temperature, low pressure, and CO or H₂S above 10ppm conditions. The horn will also sound under motor overload and powerfailure that results in a low pressure condition.

When a compressor shutdown occurs, 2-3 minutes of air are left available and all personnel using the compressor must evacuate the area until the cause for the shutdown has been determined.

NOTICE

**ALL STANDBY PERSONNEL FOR BREATHING AIR USERS MUST
BE FAMILIAR WITH BREATHING AIR COMPRESSOR ALARMS
AND THESE EMERGENCY PROCEDURES.**

In the event of a compressor alarm or shutdown:

- 1. Immediately inform respirator users to exit work area where respirators are required**
- 2. Discontinue compressor use.**
- 3. Notify the mechanical planning office at ext. 262. For appropriate compressor checkout, repair and/or calibration.**

Emergency Shutdown(i.e. vapor release or fire, etc.):

In the event of an emergency (fire or vapor release) in the immediate vicinity of the compressor, shut the compressor down by turning off the power at the breaker where possible and follow the steps above for compressor alarm or shutdown. This will minimize potential for fire and explosion risks, register at the compressor as a power failure, and cause the compressor warning horn to sound.

Air Purifying Respirator Review

- **Classes of Air Contaminants**
 - Dusts
 - Mists
 - Fumes
 - Gases
 - Vapors
- **Cartridge Types**
 - Acid Gases(yellow)
 - + Sulfur dioxide
 - + HCL
 - + Chlorine
 - Organic Vapors(Black)
 - + Hydrocarbons
 - + Ethyl Mercaptan
 - + MTBE
 - Dust/Mist/Fume(Prefilter type)
 - + Welding Fumes(zinc/stainless)
 - + Catalyst Dust
 - HEPA(Purple)
 - + Welding fumes(zinc/stainless)
 - + Catalyst Dust
 - + Asbestos
 - Ammonia Methylamine(green)
 - + Ammonia Gas
 - + Ammonium Hydroxide(Aqueous Amonia)
 - + Diethanolamine(DEA)
- **Air Purifying Respirator Limitations**
 - Not for use in oxygen deficient conditions(< 20% Oxygen)
 - Not for H₂S protection
 - Chemical cartridges are spent and should be replaced when odor is first detected.
 - Dust/Mist/Fume or HEPA cartridges must be replaced when wearer notices increased breathing resistance.
 - Assigned protection factor is used to determine the maximum protection afforded by the particular respirator type(i.e. half mask vs. full face, etc.)
- **Maintenance Considerations**
 - Fit Checks ensure proper fit immediately prior to use
 - Inspection before and after each use to ensure valves, cartridge seals, facepiece and straps are in good condition.
 - Clean respirator at least after each use and store in clear plastic bag placed inside yellow tote bag

Industrial Hygiene Respiratory Protection Training
Air Purifying Respirator Quiz

Name: _____

SSN: _____

Department: _____

Date: _____

Score: _____

INDUSTRIAL HYGIENE RESPIRATOR QUIZ

Multiple Choice (Some questions may have multiple answers).

1. Which of the following activities always require a 1/2 mask respirator with organic vapor cartridges?
 - a. A benzene stream leak
 - b. A naphtha leak
 - c. Spray Painting
 - d. All of the above

2. Where can quick information on chemical hazards, protective equipment, and direct reading tubes be found?
 - a. The Industrial Hygienists Office
 - b. Hazard Communication Manuals
 - c. OCC
 - d. Fire Chiefs Office

3. What is an assigned protection factor(APF)?
 - a. A value assigned to respirators indicating the amount of protection afforded by a particular respirator type.
 - b. A value assigned to a respirator wearer indicating respirator size.
 - c. A number that indicates the type of contaminant a respirator will protect against.
 - d. A value assigned by the manufacturer indicating the respirator model number.

4. When should a respirator chemical cartridge be replaced?
 - a. During the annual fit-test.
 - b. After each use.
 - c. When the respirator wearer first starts to detect the odor of the contaminant in the mask.
 - d. When the respirator wearer notices increased breathing resistance.

5. When should a particulate(dust/mist/fume) respirator cartridge be replaced?
 - a. When the respirator wearer first starts to detect the odor of the contaminant in the mask.
 - b. When the respirator wearer notices increased breathing resistance.
 - c. During the annual fit-test.
 - d. After each use.

6. When should a 3M 9970 dust/mist/fume respirator be replaced?
 - a. During the annual fit-test
 - b. When the respirator wearer first starts to detect the odor of the contaminant in the mask.
 - c. Daily, or when the respirator wearer notices increased breathing resistance.
 - d. After each use.

7. Which of the following respirators require annual fit-testing?
 - a. Disposable dust masks.
 - b. Half mask air purifying.
 - c. Full mask air purifying.
 - d. SCBA's and airline respirators.

8. What ensures a respirator user a proper fit immediately prior to respirator use?
 - a. New cartridges.
 - b. Annual fit-testing.
 - c. The buddy system.
 - d. Fit-checking.

9. When can air purifying respirators be used for welding in confined spaces(not including inert gas welding or arc gouging)?
 - a. After gas testing for welding fumes.
 - b. Never.
 - c. For carbon steel welding only.
 - d. After adequate ventilation rates have been verified by the Industrial Hygienist.

10. 3M 9970 disposable paper dust masks provide good protection for which of the following tasks?
 - a. Stick welding on alloy steels(outdoors).
 - b. Working downwind of silica sandblasting.
 - c. Working downwind of black beauty blasting.
 - d. Welding/burning/grinding on painted surfaces.
 - e. Asbestos work.
 - f. Stick welding on alloy steels in confined spaces where adequate ventilation has been verified.
 - g. Draining hydrocarbons from equipment.
 - h. Sweeping nuisance dust.

11. Who should know how to select a respirator and cartridges?
 - a. Only the tool room operator.
 - b. Only the Permit writer.
 - c. Only the work group generating the hazard.
 - d. Only the Industrial Hygienist.
 - e. Every respirator user.

12. What type of respirators are good for H₂S protection?
- Scott air purifying escape respirators.
 - Supplied air or SCBA.
 - Full face air purifying respirators with acid gas cartridges.
 - Half mask air purifying respirators with acid gas cartridges.
13. When should a 3M 6000 series half mask respirator facepiece be replaced?
- After each use.
 - During the annual fit-test
 - When the respirator user notices increased breathing resistance.
 - When the respirator valves or facepiece is disfigured or damaged.
 - For respirators that appear to be in good condition, infrequent users(once/month) replace annually, more frequent users (once/week) replace quarterly.

Matching

Match the appropriate respirator/cartridge with the contaminant for which it will provide protection. Some letters may be used multiple times.

- | | |
|--|---|
| A. High efficiency filters for Asbestos, Lead, Dust, Mist, Fumes and Radionuclides | _____ Hydrogen Sulfide
_____ Sulfur Dioxide |
| B. Organic Vapor cartridge for benzene & hydrocarbons | _____ Benzene & Total Hydrocarbons
_____ Diethanolamine(DEA) |
| C. Organic Vapor/Acid gas cartridge for Benzene, Hydrocarbons, Sulfur Dioxide, HCl, Chlorine | _____ Methyl Tertiary-Butyl Ether(MTBE)
_____ Dupont DDA-1000(Octyl Nitrate) |
| D. Ammonia, Methylamine, amines | _____ Catalyst Dust |
| E. Dust, Mist, Fume cartridge | _____ Ammonium Hydroxide
_____ Ethyl Mercaptan |
| F. 3M 9970 HEPA Disposable Dust/Mist/Fume mask for metals, welding fumes, catalyst dusts& non-volatile mists(not for asbestos or silica dust). | |

Using the cartridge list above, match the letter of the appropriate cartridge with the matching color code. Provide only one answer for each blank below.

_____ Green

_____ Yellow

_____ Black

_____ Purple

**Attachment IV
POST HEARING RESPONSE and COMMENTS
PROPOSED OSHA RESPIRATORY PROTECTION STANDARD**

Sample of Eye Wear Compatible with Respiratory Protection

In response to OSHA's request (transcript page 555. lines 15 to 16), for samples of eye wear that would not interfere with the face seal of a respirator, two Mag Spectacles from Chriss Optical Mfg., Inc. are enclosed.

The two Mag Spectacles from Chriss Optical MFG. INC., are equipped with a thin rubber strap to secure the prescription eye wear to the wearer's face. These are spectacles that can safely be worn with a full face respirator. One set has been fitted with clear nonprescription lenses to simulate the actual glasses worn by the respirator user while the second is without lenses and represents the frame that would be taken to an optometrist for fitting with a prescription lens.

Our testimony indicated that these glasses can safely be worn with full face respirators as long as the user is fit tested with these spectacles in place during the respirator fit test.

Additionally, Stephen E. Killiany, Jr. discussed this corrective wear and Exxon fit testing program with OSHA's expert witness, Jim Johnson of the Lawrence Livermore Laboratory. While philosophically placing anything between the face piece of the respirator and an individual's face can potentially interfere with a good respirator fit, there was agreement that respirators used with a thin elastic or rubber band such as the Chriss Mag Spectacles have, is an acceptable practice in a contaminated work environment as long as the individual who wears these spectacles with a respirator, passes a fit-test using the combination of respirator and this eye wear.

Enclosure (Chriss Mag Spectacles)

rpscomm6
October 19, 1995

ADD'L INFORMATION

ACNB: H049

MLIN: 183

STATUS CODE _____

COMMENT CODE _____

COMMENT MESSAGE:

TRAINING TAPE AND CHRISS OPTICAL
GLASSES IN FILE. PLEASE SEE DOCKET
STAFF.

