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PVC PLANT SAFETY & HEALTH MANUAL
ABERDEEN, MS

SUBJECT: Respiratory Protection Program

EFFECTIVE DATE: March 9, 1984

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References: 1. CRF 1910.134

2. OSHA "Industrial Hygiene Manual - Chapter III"
Dated 7/15/82

3. Conoco Chemicals Aberdeen Plant "Respiratory Protection
Program," Dated 11/2/81

I. PURPOSE

Normal plant operation necessarily involves routine, employee contact with airborne concentrations of potentially harmful materials. In addition, less frequent, but potentially more serious, exposures may occur during emergencies and repair of equipment. Because of this, an effective plant respiratory protection program is an essential part of safe, plant operation.

II. SELECTION AND APPROVAL

Selection of respirators is to be based on the hazards to which employees are exposed, and according to American National Standard Practices for Respiratory Protection Z 88.2-1980. In addition, the devices selected must be approved for the intended use by appropriate authority (MESA, NIOSH, Bureau of Mines, and/or as prescribed by regulation), unless no such device is available.

Each respirator must be used as intended; i.e: unauthorized intermixing of components or failure to use all components as designed and approved is strictly forbidden.

A list of respirators approved for plant use appears in Table I (attached).

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III. STORAGE AND CLEANING

Respirators must be stored in a convenient location for the user and kept in a clean, sanitary condition prior to use.

Routinely used respirators must be cleaned and disinfected to insure safe use by the wearer. Respirators issued to more than one employee must be cleaned and disinfected between each issue.

A. Central Cleaning

Except for 3M "Airhats", all respirator cleaning is to be done by a Building Attendant that has been assigned that task. In this capacity, his job duties are:

1. Daily retrieval of dirty respirators from the respirator distribution points which are:
 - a. Compound Supervisor's Office Area
 - b. Maintenance Shop
 - c. 1st Floor, Northwest Corner of V-11 Building
 - d. Northwest Corner of New Reactor Area
 - e. South of VCM Tank Farm Unloading Racks
2. Cleaning and disinfecting of all dirty respirators:
 - a. Routinely Used Respirators - After each use.
 - b. Emergency Respirators - After each use and monthly.
3. Routine inspection for obvious defects and replacement of damaged components that he has been authorized to replace by the Safety Inspector. No other repairs or replacements are to be attempted by him.
4. Placing clean respirators inside plastic bags for re-issue.
5. Distribution of clean, packaged respirators to the distribution points, in the types and amounts specified by the Safety Inspector.
6. Maintaining the respirator cleaning area in a clean, orderly condition.
7. Monthly inspection, maintenance and cleaning of 3M "Airhats".

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III. STORAGE AND CLEANING

B. Distribution Point Storage

Departments having respirator distribution points are required to maintain and use storage compartments or other facilities that will protect the equipment from dust, sunlight, damaging chemicals, and excesses of heat, cold and moisture.

C. User Temporary Storage

Except for 3M "Airhats", employees are expected to use respirators only one shift before returning them to the distribution points for cleaning. During their shift, they are also expected to take reasonable care to minimize damage to respirators and to prevent unnecessary contamination of facepieces and air hoses with foreign materials, including oils and greases.

D. 3M "Airhats"

3M Airhats are to be assigned for use on an individual basis. Each individual assigned an Airhat is expected to perform daily airflow checks and limited maintenance and cleaning, including filter changes. They must also place their Airhat inside their assigned Airhat storage cabinet at the end of their work period.

Each airhat so issued must be turned in monthly for thorough inspection, maintenance, and cleaning by the Building Attendant assigned the task (see III A above).

IV. WEARING & FITTING

Employees provided with respirators selected for specific hazards are required to wear such devices at all times when they are in danger of overexposure because of those hazards. The devices must be worn as originally intended and approved; no modifications, mixing of components, or alterations are permitted.

Employees are required to check facepiece fit each time a respirator is donned. The respirator is not to be worn when conditions prevent a good face seal.

See Appendices for the manufacturer's use instructions concerning fitting. The use instructions represent minimum standards and are, in some cases, exceeded by local procedures concerning donning technique, facial hair restrictions, cleaning of emergency-use respirators, and parts interchange to permit fittings compatibility.

V. INSPECTIONA. Routinely Used Respirators

Respirators used on a routine basis are to be inspected by three (3) people:

1. User - Inspects for cleanliness and obvious defects before each use. 3M "Airhat" users must also check airflow.
2. Respirator Cleaner - See III A-3 above.
3. Safety Inspector - Conducts monthly inspection of all routinely used respirators for cleanliness and serviceability, including the tightness and condition of all components.

B. Self-Contained Breathing Units (Scott Air Paks and Sling Paks)

These units are to be inspected after each use and monthly by the Safety Inspector.

1. Cylinder pressure
2. Regulator setting
3. Cleanliness of respirator and case
4. Serviceability of breathing tube, facepiece and straps
5. Cylinder condition
6. Regulator serviceability and function
7. Warning alarm serviceability and function

C. Records

The Safety Inspector will make and retain records of the following respirator inspections:

1. Scott Air Paks
 - a. After each use
 - b. Monthly
2. Routinely Used Respirators - Monthly

The Safety Inspector and the Compound Department Operations Supervisor will maintain records of 3M "Airhat" assignments.

VI. BREATHING AIR QUALITY

- A. Breathing air supplied from cylinders or by breathing air compressors must be grade "D" (or better) per "Compressed Gas Association Commodity Specification G-7.1, 1966," as follows:

Oxygen Content	19-23%, by Vol.
Hydrocarbons (Condensed)	5 MG/M ³ , Max.
Carbon Monoxide	20 ppm, Max.
Carbon Dioxide	1,000 ppm, Max.

B. Breathing air compressors must meet the following criteria:

1. Compressor must be a breathing air type.
2. Construction must be such as to avoid entry of contaminated air into the system.
3. A receiver of sufficient capacity to enable the respirator wearer to escape from a contaminated atmosphere in event of compressor failure shall be installed in the system.
4. Alarms to indicate compressor failure must be installed in the system.
5. Breathing air line couplings and connections must be incompatible with couplings and connections for all other piping.

C. The use of pure oxygen as a substitute for breathing air is expressly forbidden.

D. Scott Air Pak bottles may be charged only by or under the direction of the Safety Department.

E. Breathing Air System Preventive Maintenance

Preventive maintenance inspections and repairs of the plant breathing air system will be performed each quarter by the Mechanical and Safety departments. Items to be checked include all compressors, regulators, relief valves and filters. Records of all inspections will be kept by the Safety Inspector.

VII. TRAINING

All employees whose job duties require the use of respirators will be instructed in the selection, use, and care of respiratory equipment. This training will be done annually by department supervisors, with assistance from the Safety Department. New employees will be given the training during initial indoctrination by the Safety Department.

VIII. PROGRAM INSPECTION/EVALUATION

All supervisory personnel are responsible for the continual observation and evaluation of the respiratory program as it pertains to their area of plant responsibility. All discrepancies must be promptly corrected and program deficiencies reported to the Safety Department, which is charged with the administration of the entire program.

IX. MEDICAL EXAMINATION

Employees will not be assigned work tasks which require the use of respirators until a company physician has determined that they are physically able to perform the work and use the respiratory equipment. Thereafter, each such respirator user's medical status will be reviewed at least annually.

TABLE I

APPROVED RESPIRATORY EQUIPMENT

<u>EQUIPMENT</u>	<u>DESCRIPTION/USE</u>
1. Scott Presur Pak IIa Part No. 9001401 Referred to as "Scott Air "Pak"	A pressure-demand, self-contained breathing apparatus. Used where self-contained air supply is mandatory. In VCM environments, it is to be used in concentrations above 1,000 ppm or unknown.
2. Mine Safety Appliance Co. Constant Flow Airline Respirator, Part No. 460865 Referred to as "Air Line Respirator"	A constant flow, air-line-supplied respirator. Used in VCM atmospheres of up to 1,000 ppm VCM.
3. Scott Sling-Pak IIa	A light weight, 15-minute duration, version of Scott Presur Pak IIa.
4. 3M Airhat Part No. W-316	A powered, air-purifying device using a high efficiency composite filter. For use during work involving lead dusts, asbestos, and all blender charging.
5. Mine Safety Appliance Co. Paint Spray Respirator Part No. 448849 (Complete) 465667 (Prefilters), 464031 (GMA Cartridges)	An air-purifying device using cartridge type filters and particulate prefilters. For use during spray painting in open air.
6. Mine Safety Appliance Co. Dustfoe 66 Respirator Part No. 46183 (Complete) Nos. 457486 and 457485 (Filters)	An air-purifying device using particulate filters. For non-hazardous situations of convenience; e.g.: cold air, elective overprotection against minor dusting, etc.
7. Scott Presur-Pak 2.2	Same as Scott Pressure Pak II, except unit is pressure-demand only.
8. Bullard System 999 Supplied Air Respirator	A constant flow, air-line supplied, hood-type respirator. For use during dust collector entry.

APPENDIX I
MANUFACTURER'S USE INSTRUCTIONS
SCOTT PRESSURE PAK IIa

WARNING

IMPROPER USE OF THIS APPARATUS IN A HAZARDOUS ATMOSPHERE MAY RESULT IN INJURY OR DEATH. PERSONNEL MUST RECEIVE ADEQUATE TRAINING PRIOR TO USE.

The Scott Pressure Pak II self-contained breathing apparatus is designed to provide maximum mobility and approximately 30 minutes of breathable air to personnel. The apparatus provides using personnel with maximum respiratory protection while performing work in objectionable and unbreathable toxic atmospheres regardless of concentration or oxygen deficiency. The breathing regulator is equipped with a Pak-Alarm which will warn the user of diminishing air supply by ringing and vibrating, thus allowing sufficient time for egress from the hazardous area. The apparatus is National Institute of Occupational Safety and Health (NIOSH) and Mining Enforcement and Safety Administration (MESA) approved for use in temperatures ranging to 25°F below zero with the addition of a nose cup assembly in the facepiece.

WARNING

IN ADDITION TO THIS APPARATUS, CERTAIN GASES SUCH AS HYDROGEN CYANIDE, WHICH POISONS THROUGH THE SKIN, OR AMMONIA WHICH IRRITATES THE SKIN, REQUIRE PROTECTION CLOTHING TO PROVIDE COMPLETE PROTECTION TO THE USER.

SERVICE LIFE

The apparatus is approved by NIOSH/MESA as a "1/2-hour duration" unit, based on the fact that the apparatus was found to last 30 minutes or more when worn by men performing a variety of moderate-to-heavy tests.

The user should not expect to obtain exactly 30 minutes service life from this apparatus on each use. The work being performed may be more or less strenuous than that used in the NIOSH/MESA tests. Where work is more strenuous, the duration may be shorter, possibly as short as 15 minutes.

The duration of the apparatus will depend on such factors as:

1. The degree of physical activity of the user;
2. The physical condition of the user;
3. The degree to which the user's breathing is affected by excitement, fear or other emotional factors;
4. The degree of training or experience which the user has had with this or similar equipment;
5. Whether or not the cylinder is fully charged at the start of the work period;
6. The possible presence, in the compressed air, of carbon dioxide concentrations greater than .04% normally found in atmospheric air;
7. The atmospheric pressure; if used in a pressurized tunnel or caisson at 2 atmospheres (15 psi gauge) the duration will be one-half as long as when used at 1 atmosphere; and at 3 atmospheres will be one-third as long;
8. The condition of the apparatus.

APPENDIX I (Cont.)PREPARATION FOR USE

The following procedure should be followed prior to donning the apparatus:

1. Check cylinder pressure gauge for "FULL" indication. If indicated cylinder pressure is below "FULL", recharge cylinder or replace with a fully charged cylinder.

WARNING

CYLINDERS WHICH SHOW EVIDENCE OF EXPOSURE TO HIGH HEAT OR FLAME, SUCH AS PAINT TURNED BROWN OR BLACK, DECALS CHARRED OR MISSING, GAUGE LENS MELTED OR ELASTOMERIC BUMPER DISTORTED, SHALL BE REMOVED FROM SERVICE AND RETESTED PRIOR TO RECHARGING.

2. Check that regulator by-pass valve (red knob) is closed (full clockwise), regulator shut-off valve (yellow knob) is open (full counterclockwise) and control level is in "OFF" position.

CAUTION

DO NOT USE TOOLS TO OPEN OR CLOSE THE BY-PASS AND SHUT-OFF VALVES. CLOSE OR OPEN FINGER TIGHT ONLY.

3. Open cylinder valve knob $1\frac{1}{2}$ turns. The cylinder gauge and the regulator gauge should indicate the same pressure.
4. Connect quick connect coupling to the regulator and breathe from the face-piece to ensure proper operation.
5. Check for positive pressure operation by placing the control lever in the "ON" position. A positive pressure should be sensed in the facepiece.
6. Return control lever to "OFF" position.
7. Disconnect quick connect coupling from the regulator.
8. Push in and rotate the cylinder valve knob clockwise to close the valve. Release residual air pressure by gradually opening the by-pass valve (red knob); Pak-alarm will ring momentarily. After residual air is purged, close by-pass valve.

NOTE

If the Pak-Alarm does not ring, remove the equipment from service and tag for repair.

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APPENDIX I (Cont.)NORMAL OPERATION

1. Open the carrying case lid, remove the facepiece and place on corner of the open lid, exercising care not to scratch lens.
2. Check cylinder gauge for "FULL" indication. Stand to the right of the opened case, lean forward and grasp both edges of the backplate just above waist belt area.
3. Swing the apparatus straight up and over the head, keeping your elbows close to your body. Rest the apparatus on your back while still slightly bent over. The shoulder straps will slide along arms and fall into place on shoulders. Connect the chest buckle; then while straightening up, pull down on the side straps to adjust the harness to body fit.
4. Connect and adjust the waist belt.
5. Check that control lever is in "OFF" position.
6. Open the cylinder valve knob $1\frac{1}{2}$ turns and don the facepiece as follows:
 - a. Adjust the head straps to a full outward position.
 - b. Hold the head harness out of the way with one hand or back over the lens.
 - c. Place the facepiece on the face with chin properly located in the chin pocket.
 - d. Pull the head harness over the head and tighten the neck straps by pulling on the two appropriate tabs.
 - e. Stroke the head harness down to the back, using one or both hands.
 - f. Tighten the two temple straps.
 - g. Retighten neck straps if required.
 - h. In most cases, the top head strap will be tight on the "FULL OUT" position.
 - i. Check the seal by closing off the breathing tube with your hand and slowly inhale. No leakage should be detected and the facepiece should be drawn onto the face.

WARNING

RESPIRATORS SHOULD NOT BE WORN WHEN CONDITIONS, SUCH AS GROWTH OF BEARD, SIDEBURNS, A SKULL CAP THAT PROJECTS UNDER THE FACEPIECE, OR TEMPLE PIECES ON GLASSES PREVENT A GOOD FACE SEAL.

7. Connect the breathing tube on the regulator at the quick connect coupling when ready to enter the contaminated area; tighten finger tight. Place regulator control level in the "ON" position for positive pressure operation.

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APPENDIX I (Cont.)NOTE

"OFF" position of regulator control. Lever shall only be used for donning or doffing the apparatus.

8. Check the regulator pressure gauge occasionally for remaining air supply, to allow sufficient time for egress from the contaminated area.

WARNING

WHEN THE PAK-ALARM STARTS TO RING, IT WARNS THE USER THAT APPROXIMATELY 20-25% OF THE AIR REMAINS IN THE CYLINDER. IN HIGH NOISE AREAS OR WHERE MORE THAN ONE APPARATUS COULD BE RINGING, TOUCH THE PAK-ALARM ASSEMBLY WITH YOUR HAND TO SENSE VIBRATION. LEAVE THE CONTAMINATED AREA AT ONCE.

9. After use and when in a safe area, place control lever in "OFF" position, uncouple the facepiece at the regulator quick connect coupling, remove the facepiece, push in and rotate the cylinder valve knob clockwise to close the valve. Bleed the residual system pressure by momentarily opening the by-pass valve (red knob).

EMERGENCY OPERATION

Should the regulator become damaged or inoperative during use, proceed as follows:

1. Open the by-pass valve (red knob) to allow an acceptable flow.
2. Depress the locking tab under the regulator shut-off valve (yellow knob) and turn the valve off (full clockwise).

WARNING

THIS PROCEDURE IS FOR EMERGENCY USAGE ONLY: CONSEQUENTLY, THE DURATION OF THE AIR SUPPLY IS GREATLY REDUCED WHEN THE UNIT IS OPERATING THROUGH THE BY-PASS VALVE. ONLY USE THIS OPERATING MODE TO ESCAPE FROM THE CONTAMINATED AREA.

3. Adjust the by-pass valve to suit the requirements of the user.
4. Tag and remove the apparatus for repair.

APPENDIX I (Cont.)CYLINDER REPLACEMENT PROCEDURE

1. Place the control lever in the "OFF" position, then push in and rotate the cylinder valve knob clockwise to close the valve.
2. Bleed residual system pressure by momentarily opening by-pass valve (red knob).
3. Uncouple regulator hose coupling from the cylinder valve.
4. Pull the cylinder clamping lever down to release the cylinder and valve assembly from the backplate.
5. Lift the cylinder and valve assembly out of the backplate and replace with a fully charged cylinder and valve assembly. Start at the top of the backplate and lower until properly positioned.
6. Raise and push cylinder clamping lever up to secure the cylinder and valve assembly.
7. Attach and tighten the regulator hose coupling to the cylinder valve; open the cylinder valve.
8. The apparatus is ready for reuse.

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APPENDIX IIMANUFACTURER'S USE INSTRUCTIONS-MSA CONSTANT FLOW AIR LINE RESPIRATOR-

Approved for respiratory protection in any atmosphere not immediately dangerous to life or health from which the wearer can escape without the aid of the respirator. This approval applies only when the respirator is supplied with respirable air through 25 to 50 feet of hose within the pressure range of 10 to 15 pounds per square inch as specified by the manufacturer.

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This respirator must not be worn in any atmosphere immediately dangerous to life or health. Follow the manufacturer's instructions for providing a supply of respirable air.

In making renewals or repairs, parts identical with those furnished by the manufacturer under the pertinent approval shall be maintained. This respirator shall be selected, fitted, used and maintained in accordance with the Mining Enforcement and Safety Administration, the Occupational Safety and Health Administration, and other applicable regulations.

WARNING

1. This device may not provide a satisfactory face seal with certain physical characteristics (such as beards or gross sideburns), as outlined in ANSI Z88.2-1980, resulting in leakage in connection with the facepiece, which voids or limits the protection. If such a condition exists, the user assumes all risks of death or serious bodily injury which may possibly result.
2. Under no circumstances should the apparatus be used as an underwater device.

BEFORE USE

1. Thoroughly check out the apparatus on receipt prior to use.
2. For use only by qualified trained personnel.
3. CAUTION: Do not use when concentrations or contaminants are unknown or immediately dangerous to life or health or from which the wearer cannot escape without respiratory equipment (Air-Line respirators provide no protection if air supply fails).

APPENDIX II (Cont.)INSTRUCTIONS FOR USE AND CAREAir Supply

1. Air Hose - Any one or combination of the following air supply hoses which does not exceed 50 feet in length may be used:

Part No. 455021 - 25 foot air hose

Part No. 455022 - 50 foot air hose

See air hose connection instruction sheet Part No. 995602 for airline connections.

2. Pressure - Air must be supplied to the inlet end of the air hose at a pressure between 10 PSIG and 15 PSIG. If the pressure at any point in the supply system exceeds 125 PSIG, the user must provide a pressure-release mechanism that will prevent the pressure at the hose connection from exceeding 125 PSIG under any conditions.
3. Air Source - The most desirable air source is a compressor having no internal lubrication. If an internally lubricated air source is used, an air line filter such as the MSA Air Line Filter should be used. Since this filter does not remove carbon monoxide which may occur, a carbon monoxide alarm such as the MSA Carbon Monoxide Alarm and Accessory Kit should also be used.
4. The purity of the air supply is the responsibility of the user, but it must be at least Grade D, Compressed Gas Association Commodity Specification for Air G-7.1.

Permissable Usage

1. Do not use when concentrations of contaminants are unknown or immediately dangerous to life or health or from which the wearer cannot escape without respiratory equipment (Air-line respirators provide no protection if air supply fails).
2. Adequate respiratory protection must include hazard assessment, selection and proper usage instruction and training, maintenance, inspection and replacement, and approval agency identification.

Fitting The Ultravue Facepiece

Pull out Headband Straps, especially the front of forehead straps, so that their ends are at the buckles. Then grip the Facepiece between the thumb and fingers and insert the chin well into the lower part pulling the Headharness back over the head. To obtain a firm and comfortable fit against the face at all points, adjust the Headbands as follows:

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APPENDIX II (Cont.)Fitting The Ultravue Facepiece (Cont.)

- a. See that the straps lie flat against the head.
- b. Tighten lower or "NECK" straps.
- c. Tighten "SIDE" straps. (Don't touch forehead or "FRONT" strap).
- d. Place both hands on Headband Pad and push it towards the neck.
- e. Repeat operations (b) and (c).
- f. Tighten forehead or "FRONT" strap a few notches, if necessary.
- g. Attach Flow Control Valve over Belt on left hip.
- h. Adjust air flow for maximum comfort within approved pressure range.

Fitting The COMFO CUSTOM Facepiece

The COMFO CUSTOM facepiece is easily adjusted to fit the wearer. For best results, place the chin cup of the facepiece on the chin. Swing the nose section into position along the bridge of the nose, form Metal Yoke around the nose for the most comfortable fit. Place headbands in the most comfortable position over head and back of neck, and adjust for proper tightness of the facepiece by moving the adjusting slides in either direction. Attach Flow Control Valve over belt on left hip.

Test For Tightness

Test the Respirator Facepiece for tightness by squeezing the corrugated breathing tube tightly. Inhale gently so that the Facepiece collapses slightly and hold breath for ten seconds. The facepiece will remain collapsed while breath is held, providing the assembly is gas tight. If any leakage is detected around the facial seal, readjust the headharness straps. If other than facial seal leakage is detected, investigate the condition and correct. The Facepiece should be subjected to a tightness test before each use.

Storage

The Respirator should be stored in a clean, dry place to prevent dust from settling in the interior of the Facepiece and being stirred up and breathed during the next use of the device. The place of storage should be away from direct sunlight and moderately cool, since heat and sunlight will shorten the life of the rubber parts.

APPENDIX IIIMANUFACTURER'S USE INSTRUCTIONSSCOTT SLING-PAK IIaWARNING

IMPROPER USE OF THIS APPARATUS IN A HAZARDOUS ATMOSPHERE MAY RESULT IN INJURY OR DEATH. PERSONNEL SHOULD RECEIVE ADEQUATE TRAINING PRIOR TO USE.

The Scott Sling-Pak IIa, positive pressure, self-contained breathing apparatus (SCBA) is designed to provide maximum respiratory protection in objectionable or toxic atmospheres, regardless of concentration (*), or oxygen deficiency, with a NIOSH/MSHA rated duration of 15 minutes when properly DONNED, USED, AND MAINTAINED BY TRAINED PERSONNEL. The regulator is equipped with an audible Pak-Alarm which will warn the user of diminishing air supply. The Pak-Alarm will activate when approximately 20-25% of the air supply remains. YOU MUST EGRESS IMMEDIATELY TO THE NEAREST SAFE, RESPIRABLE AREA WHEN THE PAK-ALARM RINGS. The apparatus is certified by NIOSH/MSHA for use in temperatures to -25°F with the installation of a Scott Nosecup Assembly, P/N 801432-00, in the facepiece. The nosecup assembly is required for use in temperatures at or below freezing or whenever lens fogging may occur.

* WARNING

IN ADDITION TO THIS APPARATUS, ADDITIONAL PROTECTIVE CLOTHING AND/OR SPECIAL EQUIPMENT SHALL BE PROVIDED, AS REQUIRED, FOR COMPLETE PROTECTION TO THE USER AND APPARATUS. (CERTAIN GASES POISON THROUGH THE UNBROKEN SKIN, SUCH AS HYDROGEN CYANIDE, OR ARE EXTREMELY IRRITATING TO THE SKIN, SUCH AS AMMONIA.) EVERY APPLICATION SHALL BE THOROUGHLY EVALUATED BY QUALIFIED PERSONNEL, PRIOR TO ENTRY OR USE OF THE APPARATUS.

Service Life (Duration Of Air)

This apparatus is certified by NIOSH/MSHA to provide a "15 minute" duration of air, based on actual machine testing simulating men performing a variety of moderate-to-heavy work tasks.

The user should not expect to obtain exactly 15 minutes duration from this apparatus during each use. The work being performed may be more or less strenuous than the work-rates used in the NIOSH/MSHA tests. The duration may be shorter, possibly as short as 10 minutes, where the individual's work is more strenuous than the NIOSH/MSHA tests.

APPENDIX III (Cont.)Service Life (Duration of air) (Cont.)

The duration of the apparatus will depend on such factors as:

1. The degree of physical activity of the user;
2. The physical condition of the user;
3. The degree of training or experience which the user has had with this or similar equipment;
4. The degree to which the user's breathing is affected by excitement, fear, or other emotional factors;
5. Whether or not the cylinder is fully charged at the start of the work period;
6. The possible presence, in the compressed air, of carbon dioxide concentrations greater than .04% normally found in atmospheric air;
7. The condition of the apparatus;
8. The atmospheric pressure; Example: when used in a pressurized tunnel or caisson at 2 atmospheres (15 psi gauge) the rated duration will be one-half as long (7.5 minutes) as when used at 1 atmosphere; and at 3 atmospheres will be one-third as long (5 minutes).

Regular Operational Inspection

The following procedure shall be used for incoming and daily inspection of the apparatus. An apparatus not routinely used, but kept for emergency use, shall be inspected at least monthly. All apparatus shall be inspected after each use.

1. Visually inspect the complete apparatus for worn or aging rubber parts and damaged components.
2. Check the latest cylinder hydrostatic test date to ensure it is current (within 5 years).
3. Visually inspect cylinder for large dents or gouges in metal. Cylinders which show exposure to high heat or flame, such as paint turned brown or black, decals charred or missing, gauge lens melted or elastomeric bumper distorted, shall be removed from service.
4. Check cylinder pressure gauge for "FULL" indication. If cylinder pressure is less than "FULL", replace with a fully charged cylinder.
5. Check to ensure regulator hose coupling is hand tightened to the cylinder valve outlet.

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NOTE

Wrenches shall not be used, as damage to the coupling gasket may result.

6. Close regulator BY-PASS valve (red knob) by turning clockwise.
7. Close regulator MAIN-LINE valve (yellow knob) by depressing lock-tab and turning valve knob clockwise.
8. Check to ensure regulator cover is tight and not lifted. If cover is loose or lifted, remove regulator from service, tag and have repaired by authorized personnel.
9. Unthread breathing hose from regulator.
10. Verify diaphragm integrity as follows:
 - a. Place mouth over regulator outlet probe and gently inhale on regulator outlet. This negative pressure shall be maintained with no leakage (flow) through the regulator.
 - b. Gently blow into regulator outlet. This positive pressure shall be maintained with no leakage (flow) through the regulator.

WARNING

IF LEAKAGE IS PRESENT, RECHECK BY-PASS AND MAIN-LINE VALVES TO BE SURE THEY ARE FULLY CLOSED AND RETEST PER STEPS 10a AND 10b. IF LEAKAGE IS STILL PRESENT, REMOVE APPARATUS FROM SERVICE, TAG, AND HAVE REPAIRED BY AUTHORIZED PERSONNEL.

11. Open regulator MAIN-LINE valve (yellow knob), by turning full counterclockwise. A clicking sound shall be audible, indicating the lock-tab is functioning.
12. Open cylinder valve knob a minimum of 1-1/2 turns. The Pak-Alarm shall ring momentarily. The regulator gauge shall indicate "FULL". Check for leakage at cylinder valve, regulator and all connections.
13. Properly don facepiece and place palm over end of quick connect coupling. Inhale slightly. A negative pressure (suction) shall be created, pulling the facepiece toward the face. Hold for 5-10 seconds. If leakage is noted, remove facepiece from service and return for repair by authorized personnel.
14. Place breathing tube quick connect coupling close to palm of hand and exhale. If any air flows from breathing tube, remove facepiece from service and return for repair by authorized personnel.
15. Connect breathing tube coupling to regulator outlet securely. Inhale. Air should be delivered with very slight effort.
16. Place selector lever in "ON" position. A slight increase in facepiece pressure shall be noted (positive pressure). Inhale several times. Place control lever in "OFF" position. Disconnect breathing tube and remove facepiece.

APPENDIX III (Cont.)Regular Operational Inspection (Cont.)

17. Push in and rotate the cylinder valve knob clockwise to close valve.
18. Release residual air pressure by slowly placing selector lever in "ON" position. Pak-Alarm shall ring momentarily. After pressure is released (no flow), place lever in "OFF" position.

WARNING

IF THE PAK-ALARM DOES NOT RING, REMOVE APPARATUS FROM SERVICE, TAG, AND RETURN FOR REPAIR BY AUTHORIZED PERSONNEL.

CAUTION

IF ANY DISCREPANCIES ARE FOUND USING THESE PROCEDURES, THE APPARATUS SHALL BE REMOVED FROM SERVICE, TAGGED, AND REPAIRED BY AUTHORIZED PERSONNEL.

MAKE SURE BY-PASS IF FULLY CLOSED AND MAIN-LINE IS FULLY OPENED.

DONNING AND NORMAL OPERATIONWARNING

ALL PERSONNEL USING THIS APPARATUS SHALL BE THOROUGHLY TRAINED BY QUALIFIED PERSONNEL IN DONNING, OPERATION AND EMERGENCY OPERATION.

1. Open carrying case and check cylinder gauge for "FULL" indication. Replace cylinder assembly if required.
2. Remove facepiece and breathing tube assembly; place next to case, exercising care not to scratch lens.
3. Check to ensure all strap assemblies, side and waist, are fully extended and waist belt hook and "D" ring are not attached (open).
4. Lean forward, lift the unit from the carrying case with the right hand at the shoulder strap.
5. Swing the shoulder strap over the head from the left, while supporting the cylinder with the left hand. To adjust, pull the shoulder strap with the right hand while positioning the cylinder with the left.
6. Snap hook to "D" ring and adjust waist belt by pulling end.
7. Place selector lever in "OFF" position.
8. Check to ensure BY-PASS valve is fully closed (full clockwise) and MAIN-LINE valve is fully open (full counterclockwise).

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APPENDIX III (Cont.)DONNING AND NORMAL OPERATION (Cont.)WARNING

OBSTRUCTION OF THE REGULATOR OUTLET WITH THE BY-PASS TURNED ON AND FLOWING MAY CAUSE REGULATOR OR DIAPHRAGM DAMAGE.

9. Open the cylinder valve knob a minimum of 1-1/2 turns. Pak-Alarm shall ring momentarily. Check regulator gauge for "FULL" indication, and don Scottoramic facepiece as follows:

WARNING

RESPIRATORS SHOULD NOT BE WORN WHEN CONDITIONS, SUCH AS A GROWTH OF BEARD, SIDE-BURNS, A SKULL CAP THAT PROJECTS UNDER THE FACEPIECE, OR TEMPLE PIECES ON GLASSES, PREVENT A GOOD FACE SEAL.

- a. Adjust all headstraps to a full outward position.
- b. Hold the head harness out of the way with one hand or back over the lens.
- c. Place the facepiece on the face with chin properly located in the chin pocket.
- d. Pull the head harness over the head and tighten neck straps and temple straps by pulling on the appropriate tabs.
- e. STROKE the head harness down toward the neck, using one or both hands.
- f. Retighten neck straps and then temple straps.
- g. In most cases, the top head strap will be tight in the full out position. Tighten only if necessary.
- h. Close off breathing tube quick connect coupling with your hand and slowly inhale. No leakage shall be noted and the facepiece shall be drawn toward the face.

NOTE

Refer to Scott Instruction Sheet, P/N 89027-00, supplied with each Scottoramic facepiece, for donning and maintenance procedures.

10. Connect breathing tube connection to the regulator outlet coupling. Tighten securely.
11. Place selector lever in the "ON" position. THERE SHALL BE NO AUDIBLE FLOW OF AIR FROM THE REGULATOR OR FLOW OF AIR THROUGH THE FACEPIECE. ANY FLOW INDICATES LEAKAGE--DO NOT PROCEED INTO CONTAMINATED AREA. CHECK FACEPIECE SEAL. IF LEAKAGE IS STILL PRESENT, REMOVE APPARATUS AND HAVE CHECKED AND REPAIRED BY AUTHORIZED PERSONNEL. THE "OFF" POSITION OF THE SELECTOR LEVER SHALL ONLY BE USED FOR DONNING AND DOFFING OF THE APPARATUS.
12. Check the regulator pressure gauge, during use, for remaining air supply to allow sufficient time for egress from the contaminated area.

APPENDIX III (Cont.)WARNING

IMMEDIATELY EGRESS FROM THE CONTAMINATED AREA WHEN THE PAK-ALARM STARTS TO RING. IT WARNS THE USER WHEN APPROXIMATELY 20-25% OF THE AIR SUPPLY REMAINS IN THE CYLINDER. IN HIGH NOISE AREAS OR WHERE MORE THAN ONE APPARATUS IS BEING USED, TOUCH THE REGULATOR WITH YOUR HAND TO FEEL THE VIBRATION OF THE PAK-ALARM.

13. After egress and when in a SAFE, RESPIRABLE AREA, place selector lever in "OFF" position, uncouple the breathing tube quick connect coupling from the regulator outlet, remove facepiece, push in and rotate cylinder valve knob clockwise to close valve.
14. Bleed residual system pressure from the system by slowly placing selector lever in "ON" position. After pressure is released (no flow), place lever in "OFF" position.

EMERGENCY OPERATION

Should the regulator become damaged or inoperative during use, proceed as follows:

1. Open BY-PASS (red-knob) counterclockwise. Adjust the flow of air to sufficiently supply the breathing requirements of the user.

WARNING

EXCESSIVE BY-PASS FLOW WILL SUBSTANTIALLY REDUCE THE SERVICE LIFE (DURATION) OF THE APPARATUS.

2. Depress the lock-tab under the MAIN-LINE valve (yellow knob) and turn fully closed (clockwise).
3. IMMEDIATELY egress from the area to a SAFE, RESPIRABLE AREA.

WARNING

DO NOT OBSTRUCT THE OUTLET OF THE REGULATOR WHILE IN THE BY-PASS MODE. THE BY-PASS MODE SHALL BE USED FOR EMERGENCY OPERATION ONLY. DO NOT USE FOR OTHER PURPOSES.

4. Tag and remove apparatus for repair by authorized personnel.

CYLINDER REPLACEMENT PROCEDURE

1. Place regulator selector lever in the "OFF" position, disconnect facepiece from regulator.
2. Push in and rotate the cylinder valve knob fully clockwise to close the valve.
3. Bleed residual system pressure by slowly placing selector lever in "ON" position. After pressure is released (no flow), place lever in "OFF" position.
4. Rotate regulator hose coupling counterclockwise, removing it from the cylinder valve outlet.

APPENDIX III (Cont.)CYLINDER REPLACEMENT PROCEDURE (Cont.)CAUTION

ATTEMPTING TO UNCOUPLE REGULATOR HOSE COUPLING WHILE PRESSURIZED MAY RESULT IN DAMAGE TO, OR LOSS OF, COUPLING GASKET.

5. Pull the cylinder clamping lever down while holding cylinder to release the cylinder and valve assembly from the backplate.
6. Lift the cylinder and valve assembly out of the backplate and replace with a fully charged cylinder and valve assembly. Start at the top of the backplate and lower cylinder assembly until properly positioned.
7. Raise and push up cylinder clamping lever to secure the cylinder and valve assembly in the backplate.
8. Reconnect regulator hand disconnect to the cylinder valve.

NOTE

Wrenches shall not be used, as damage to coupling gasket may result.

9. Open cylinder valve knob a minimum of 1-1/2 turns by rotating counterclockwise. No constant leakage shall be noted. If leakage occurs, and cannot be stopped, the unit shall be removed from service, tagged, and repaired by authorized personnel.
10. The unit is now ready for use and may be returned to service.

STAND-BY CLEANING AND STORAGE

NOTE: The following procedure, in addition to the REGULAR OPERATIONAL INSPECTION, shall be used after each use and for preparing the apparatus for storage/standby.

1. Inspect the apparatus for worn or aging rubber parts or damaged components.
2. If in good condition, carefully wash facepiece assembly with warm soap and water or mild detergent solution. A soft brush may be used to scrub the rubber components. DO NOT use on the lens.
3. Rinse the facepiece assembly including the exhalation valve thoroughly. Flush water through the breathing tube, letting it flow out through opening onto lens.
4. Disinfect the face piece by submersion, using one of the following solutions:

APPENDIX III (Cont.)WARNING

DO NOT MIX THE SOLUTIONS, ONLY USE ONE.

- a. 70% solution of ethyl, methyl or isopropyl alcohol.

OR

- b. Hypochlorite solution, two tablespoons chlorine bleach per gallon

OR

- c. Aqueous solution of Iodine, one teaspoon of tincture of Iodine per gallon of water.

NOTE

Maximum cleaner and disinfectant temperature should not exceed 120°F.

5. Rinse facepiece thoroughly and allow to completely air-dry.
6. Damp sponge dirt accumulation from the rest of the apparatus.
7. Follow REGULAR OPERATIONAL INSPECTION PROCEDURE.
8. Replace the apparatus in the carry case, making sure all components are thoroughly dry, the cylinder is fully charged, the cylinder valve is fully closed, the BY-PASS valve is fully closed, the MAIN-LINE valve is fully open and the control lever is in the "OFF" position.

NOTE

If repair information is required, contact an Authorized Scott Distributor or Service Center.

APPENDIX IVMANUFACTURER'S USE INSTRUCTIONS3M AIRHATTO USE

1. Adjust the waist belt to fit as necessary. Put on the waist belt and battery pack.
2. Place the properly fitted Airhat on your head with the face shield latched in the up position, and with the chin strap comfortably under the chin.
3. Start the Airhat by simply connecting the Airhat cord to the battery pack cord. To stop the Airhat, simply grasp the cord connectors and pull apart. Do not pull directly on the cords.
4. Before entering the work area, lower the face shield until it latches firmly in the down position.

WARNING

1. Not for use by unqualified persons or by persons not properly trained in the Airhat's use and maintenance.
2. Not for use in any way other than in accordance with the use and maintenance instructions in this manual.
3. Do not use with any part missing or damaged.
4. Do not use with parts or accessories other than those manufactured by 3M for the Airhat.

RESPIRATORY PROTECTION

The 3M W-316 Airhat System is NIOSH approved for respiratory protection against:

1. Dusts (1) having a Permissible Exposure Limit (time weighted average) not less than 0.05 milligrams per cubic meter of air, including, but not limited to, coal, cadmium, chromium, lead, and manganese; or (2) dusts having a Threshold Limit Value (time weighted average) not less than 2 million particles per cubic foot, including, but not limited to, aluminum, flour, iron ore, and free silica.
2. Mists of materials having a Permissible Exposure Limit (time weighted average) not less than 0.05 milligrams per cubic meter or 2 million particles per cubic foot, e.g., mists produced by spray coating with vitreous enamels, chromic acid mist produced during chromium plating, and other mists of materials whose liquid vehicle does not produce harmful gases or vapors.

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APPENDIX IV (Cont.)RESPIRATORY PROTECTION (Cont.)

3. Asbestos containing dusts and mists.

WARNING

1. This powered air purifying helmet does not supply oxygen.
2. Use only in adequately ventilated areas containing at least 19.5% oxygen.
3. Do not use for respiratory protection against gases or vapors.
4. Do not use for respiratory protection when atmospheric concentrations of contaminants are unknown or immediately dangerous to life or health.
5. This powered air purifying helmet does not provide any respiratory or face protection with the face shield other than in the latches down position.
6. Leave work area immediately if:
 - a) Helmet becomes damaged.
 - b) Air flow into helmet stops.
 - c) Breathing becomes difficult.
 - d) Dizziness or other distress occurs; or
 - e) You taste or smell contaminants or an irritation occurs.
7. Never alter or modify this helmet.
8. Only for use by trained qualified personnel in accordance with a respirator program as outlined in ANSI Z88.2-1970.
9. Use strictly in accordance with the instructions, labels, and limitations pertaining to this helmet. If you have any doubts about the applicability of the 3M W-316 Airhat System powered air purifying helmet to your job situation, it is recommended you consult an industrial hygienist or call 3M OH&SP Technical Service toll free on 1-800-328-1300.

HEAT PROTECTION

The 3M W-2940 Airhat powered air purifying helmet passes impact and penetration tests as specified by ANSI Standard Z89.1-1969.

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APPENDIX IV (Cont.)HEAD PROTECTION (Cont.)WARNING

1. The W-2940 Airhat does not meet electrical requirements of Z89.1-1969.
2. If helmet is subjected to severe impact, THE ENTIRE HELMET MUST BE REPLACED AND THE DAMAGED HELMET MUST BE DESTROYED. The helmet is designed to absorb the shock of an impact through damage or destruction of the outer shell, inner shell, and head suspension. The helmet must be replaced even though any damage may not be readily apparent.

EYE AND FACE PROTECTION

The 3M W-2940 Airhat powered air purifying helmet passes eye protection tests as specified by ANSI Standard Z87.1-1970.

WARNING

1. The face shield, face shield frame, and face shield hinge must be inspected for damage before each use. If any cracks, gauges, or other damage is found, the damaged parts must be replaced before using the helmet. Failure to do so could result in serious eye and/or face injury in the event of an accident.
2. This powered air purifying helmet does not provide any respiratory or face protection with the face shield other than in the latched down position.
3. The helmet's face shield must not be altered or modified in any way.
4. Do not use with parts or accessories other than those manufactured by 3M as specified in the 3M Manual.

ELECTRICAL (INTRINSIC SAFETY)

The W-316 Airhat System has been approved by MSHA (Approval No. 2G-3243) for use in gassy mines and tunnels. It has been submitted to Underwriters Laboratories for testing to meet the requirements of the National Electric Code (Class I Group D, Class II Group's E, F and G, and Class III).

WARNING

The Battery Pack must be charged in fresh air with no combustible vapors present.

AFTER USE

1. Recharge the battery.
2. Clean the helmet, face shield, and face seals.
3. Inspect helmet, face shield, and face seal for any damage and replace as necessary.
4. Inspect the pre-filter and filter for any obvious damage and replace as necessary.

DAILY CHECKS BEFORE USE

1. Inspect the helmet and face shield for damage. Replace immediately if any damage is found.
2. Make sure the face seal is attached to the face shield frame properly.
3. Make sure the pre-filter and filter are in place properly. Replace if any damage is found.
4. Make sure the battery pack is fully charged. A charge time of 14-16 hours using the W-2933 charger is required to achieve full charge.
5. Check the airflow using the W-2955 Flow Test Plate. If Airhat fails airflow check, filter may need replacing.

AIRFLOW CHECK

The minimum allowable airflow for the W-2940 Airhat, as required by NIOSH, is 6 cubic feet per minute. When the battery pack is fully charged and the filter and pre-filter are new, the airflow is approximately 14 cubic feet per minute. As the filter becomes loaded with dust and the battery approaches the end of its service time, the Airhat's airflow decreases. It is essential that the Airhat's airflow be checked at least daily. Checking the airflow is the only accurate way of determining when the filter needs replacing.

To check the airflow, proceed as follows:

1. Turn the helmet upside down.
2. Place the W-2955 Flow Test Plate flat against the air intake cover. Make sure the flow test plate is resting freely on the cover.
3. Start the Airhat by connecting the Airhat cable to the battery pack cable.
4. Turn the helmet over to the horizontal upright position.
5. If the flow test plate stays against the air intake cover, the airflow is greater than 6 cubic feet per minute. If the flow test plate falls, change the pre-filter and filter.
6. After replacing filter, repeat steps 1 through 4. If the flow test plate still falls, refer to the troubleshooting chart.

PARTS REPLACEMENTPRE-FILTER (W-2951)

To replace the pre-filter, proceed as follows:

1. Remove the two thumb screws and the air intake cover.
2. Remove the pre-filter and discard.
3. Place a new pre-filter and discard.
4. Replace the intake cover and screws.

APPENDIX IV (Cont.)FILTER (W-2953)

To replace the filter, proceed as follows:

1. Remove the two thumb screws and the air intake cover.
2. Remove the pre-filter and discard.
3. With the helmet upside down, grasp the motor/filter assembly and lift until it stops.
4. Using your thumbs, disengage the inner shell from the motor/filter assembly by pushing the inner shell forward from the back of the helmet.
5. Remove the inner shell.
6. Remove the motor/filter assembly from the outer shell.
7. Remove the W-2946 Filter Strap.
8. Carefully remove the old filter. Remember that the filter is full of hazardous dust and must be discarded properly. Be careful not to inhale dust from the filter.
9. Carefully slide a new W-2953 Filter onto the motor/filter assembly as far as possible.
10. Wrap the filter strap around the filter at the base of the assembly. Make sure the strap is placed over the ridge on the filter holder and located between the positioning tabs on both sides of the assembly. Tighten the strap snugly and secure.
11. Place the motor/filter assembly back into the outer shell.
12. Place the inner shell into the outer shell, hooking the inner shell's front brim into the hook in the outer shell. Make sure both inner and outer shells are properly located in the grooves of the motor/filter assembly.
13. Place a new W-2954 Pre-Filter over the intake opening.
14. Replace the intake cover and screws.

APPENDIX VMANUFACTURER'S USE INSTRUCTIONSMSA PAINT SPRAY RESPIRATORLimitations

Approved for respiratory protection against (1) mists of paints, lacquers, and enamels; (2) not more than 1,000 parts per million organic; or (3) any combination thereof.

Not for use in atmospheres containing less than 19.5 percent oxygen. Do not wear for protection against organic vapors with poor warning properties or those which generate high heats of reaction with sorbent material in the cartridge. Maximum use concentrations will be lower than 1,000 parts per million where that concentration or organic vapors produces atmospheres immediately dangerous to life or health.

CAUTION

Follow the preceding instructions carefully. They were prepared for your protection.

Do not enter into any atmosphere with this mark unless you KNOW that:

- a. Cartridges are the proper type for the contaminants present.
- b. Amount of oxygen is sufficient to support life (that is, at least 19.5 percent oxygen by volume at sea level). If oxygen concentration sufficient to support life is questionable, use Self-Contained Breathing Apparatus only.
- c. Mask does not leak (see test for tightness).
- d. Cartridges do not need replacing.
Discard used or exhausted cartridges.

WARNING

1. This device does NOT supply oxygen.
2. Use only in adequately ventilated areas containing at least 19.5 percent oxygen.
3. Do not use when concentrations of contaminants are unknown or immediately dangerous to life or health.
4. Leave area immediately if:
 - a. Breathing becomes difficult.
 - b. Dizziness or other distress occurs.
 - c. You taste or smell contaminant.

APPENDIX V (Cont.)

5. Use strictly in accordance with instruction, labels and limitations pertaining to this device.
6. This device may not provide a satisfactory face seal with certain physical characteristics (such as beards or gross sideburns) as outlined in ANSI Z88.2 1970, resulting in leakage in connection with the facepiece, which voids or limits the protection. If such a condition exists, the user assumes all risks of death or serious bodily injury which may possibly result.
7. Never alter or modify this device.

Instructions For Use And Care By Properly Trained And Qualified PersonnelPreparations For Use

- A. Remove appropriate cartridges from storage bags and insert into threaded cartridge receptacles, making sure that the gaskets are in their proper position in the cartridge receptacles. Hand tighten the cartridge with CAUTION to prevent damage to threads and to insure a good seal against the gaskets.
- B. For Type F filters, insert a filter pad into each filter cover. Never "load" filters into the receptacles. Snap filter cover onto receptacles on both sides of facepiece with caution to prevent damage to filters.

Fitting The Mask

Mount cartridge assembly on belt so that breathing tube goes over left shoulder (for belt-mounted respirator only).

Fit facepiece on nose bridge, making sure that you are able to breathe through nose. Then swing bottom of facepiece into contact with the chin. Position headbands with longest straps above the ears and the shortest strap below the ears then adjust for comfortable fit by moving adjustment slides either way.

Test For Tightness

THE FACEPIECE MUST BE SUBJECTED TO THE FOLLOWING TIGHTNESS TEST BEFORE EACH USE:

Test respirator for leakage, using a positive pressure method. Remove exhalation valve cover and hold rubber valve against seat. Create a slight positive pressure inside face cushion exhaling. If any leakage is detected around the facial seal, readjust head harness straps and repeat test until there is no leakage. If other than facial seal leakage is detected, the condition must be investigated and corrected before another test is made. The facepiece must pass the tightness test before the user should attempt to enter any toxic atmosphere. The mask will not furnish protection unless all inhaled air is drawn through suitable cartridges. Replace valve cover after

APPENDIX V (Cont.)Test For Tightness (Cont.)

completion of test.

Replacing Cartridges

When odors of vapors or gases becomes noticeable or when breathing resistance becomes excessive, it is a sign that the cartridges have served their useful life and should be replaced.

To replace cartridges proceed as follows:

- a. Remove the expended cartridges and discard.
- b. Remove the placement cartridges from storage bags and insert into the threaded receptacles, making sure gaskets are in place in the cartridge holders.
- c. Hand tighten the cartridges with CAUTION to prevent damage to threads and to insure a good seal against the gaskets.

To replace type "F" filters proceed as follows:

- a. Remove the snap-type filter covers and discard filters.
- b. Replace a new filter into each filter cover. Never "load" filters into the receptacles.
- c. Replace filter covers with CAUTION so as to prevent damage to the filters.

The Complete Comfo II Paint Respirator Assembly consists of the following:

<u>Item</u>	<u>Description</u>	<u>MSA Pt. No.</u>	<u>Required</u>
1	Comfo II		1
2	GMA Cartridge (10/Pkg.)	464031	2
3	Pre-Filter (10/Pkg.)	448845	2
4	Filter Cover	448844	2

APPENDIX VIMANUFACTURER'S USE INSTRUCTIONSMSA DUSTFOE 66 RESPIRATOR

The Dustfoe 66 Respirator has been approved by the Mining Enforcement and Safety Administration (MESA) and by National Institute of Occupational Safety and Health (NIOSH) under Approval TC-21C-156 for protection against dusts and mists having a Time Weighted Average not less than 0.05 mg per cubic meter, or 2 million particles per cubic foot. Not for use in atmospheres containing toxic gases or vapors.

CAUTION

This respirator removes only dispersoids from the air. It gives not protection against gases, vapors or oxygen deficiency.

INSTRUCTIONS

Your Dustfoe 66 Respirator as packaged is completely assembled for our convenience. To fit respirator on face, remove from case and proceed as follows:

1. Pull head bands free from inside body of respirator.
2. Fit respirator on face and adjust headband tension to assure a comfortable facial seal by shortening or lengthening elastic webbing through slides provided on the headbands.
3. Adjust seal on face, if necessary, by bending the metal prongs in the nose portion of the rubber face cushion to suit the contours around the nose bridge.

If the respirator is fitted properly, the wearer should not experience any blow-by of air around the entire periphery of the face cushion during exhalation.

INSTRUCTION FOR REPLACING FILTERS

When resistance to breathing becomes uncomfortable, it is a sign that the filter has served its useful life and should be renewed. To replace filter, proceed as follows:

- (a) Disengage the spring closure clip and remove filter fork.
- (b) Remove and discard the used filter.
- (c) Hold a new filter evenly over fork.
- (d) Insert the fork and filter into filter holder and re-engage spring closure clip.

APPENDIX VI (Cont.)INSTRUCTION FOR REPLACING FILTERS (Cont.)

- (e) Observe exposed edges for adequate seal. FILTER EDGES MUST OVERLAP FILTER HOLDER FOR PROPER SEAL.

The filter holder can be easily removed from the respirator body with a twist-pull action.

The body grommet which holds the filter holder to the body can also be removed by simply unsnapping it out of the body.

Re-assembly of these two components is simply a reverse action of the disassembly procedure.

INSTRUCTIONS FOR REPLACING FILTERS

1. Hold respirator in palm of hand and rubber face cushion in other hand.
2. Lay the rubber face cushion loosely across the open end of the respirator body with the shaped surface towards your face.
3. Insert the two prongs of facepiece into the molded grooves under the nose pads of the rubber face cushion.
4. Fit the rubber face cushion over the exposed edge of the facepiece.
5. Make sure the respirator body seats on the rubber flange of the cushion and hooks under the bottom flange into the groove provided for adequate seal and comfort.

APPENDIX VIIMANUFACTURER'S USE INSTRUCTIONSSCOTT PRESUR-PAK 2.2WARNING

IMPROPER USE OF THIS APPARATUS IN A HAZARDOUS ATMOSPHERE MAY RESULT IN INJURY OR DEATH. PERSONNEL SHOULD RECEIVE ADEQUATE TRAINING PRIOR TO USE.

The Scott Presur-Pak 2.2 self-contained breathing apparatus is designed to provide maximum mobility and approximately 30 minutes of breathable air to personnel. The apparatus provides using personnel with respiratory protection while performing work in objectionable and unbreathable toxic atmospheres regardless of concentration or oxygen deficiency. The breathing regulator is equipped with a whistle alarm which will warn the user of diminishing air supply sounding, thus allowing sufficient time for egress from the hazardous area. The apparatus is National Institute of Occupational Safety and Health (NIOSH) and Mining Enforcement and Safety Administration (MESA) approved for use in temperatures ranging to 25°F below zero F. For temperatures below 32°F, approval required use of P/N 60158-00, Lens Preparation on the inside of the visor.

WARNING

IN ADDITION TO THIS APPARATUS, CERTAIN GASES SUCH AS HYDROGEN CYANIDE WHICH POISONS THROUGH THE SKIN, OR AMMONIA WHICH IRRITATES THE SKIN, REQUIRE PROTECTIVE CLOTHING TO PROVIDE COMPLETE PROTECTION TO THE USER.

SERVICE LIFE

This apparatus is approved by NIOSH/MESH as a "½ hour duration" unit, based on the fact that the apparatus was found to last 30 minutes or more when worn by men performing a variety of moderate to heavy tests.

The user should not expect to obtain exactly 30 minutes service life from this apparatus on each use. The work being performed may be more or less strenuous than that used in the NIOSH/MESH tests. Where work is more strenuous, the duration may be shorter, possibly as short as 15 minutes.

The duration of the apparatus will depend on such factors as:

1. The degree of physical activity of the user;
2. The physical condition of the user;
3. The degree to which the user's breathing is affected by excitement, fear or other emotional factors;
4. The degree of training or experience which the user has had with this or similar equipment;
5. Whether or not the cylinder is fully charged at the start of the work period;
6. The possible presence, in the compressed air, of carbon dioxide concentrations greater than .04% normally found in atmospheric air;
7. The atmospheric pressure; if used in a pressurized tunnel or caisson at 2 atmospheres (15 psi gauge) the duration will be one-half as long as when used at 1 atmosphere; and at 3 atmospheres will be one-third as long;
8. The condition of the apparatus.

PREPARATION FOR USE

The following procedure should be followed prior to donning the apparatus;

1. Check the cylinder pressure gauge for "FULL" indication. If indicated cylinder pressure is below "FULL", recharge cylinder to 2216 psi or replace with a fully charged cylinder.

WARNING

CYLINDERS WHICH SHOW EVIDENCE OF EXPOSURE TO HIGH HEAT OR FLAME, SUCH AS PAINT TURNED BROWN OR BLACK, DECALS CHARRED OR MISSING, GAUGE LENS MELTED OR ELASTOMERIC BUMPER DISTORTED SHALL BE REMOVED FROM SERVICE AND RETESTED PRIOR TO RECHARGING.

2. Check that the breathing regulator purge valve is closed (full clockwise and pointer on knob upward).

CAUTION

DO NOT USE TOOLS TO OPEN OR CLOSE THE PURGE VALVE. CLOSE OR OPEN FINGER-TIGHT ONLY. ROTATION OF THE PURGE VALVE KNOB LIMITED TO $\frac{1}{2}$ TURN.

3. Take a deep breath and hold it while donning the facepiece.
4. Open the cylinder valve knob counterclockwise $1\frac{1}{2}$ turns. Listen for whistle alarm to sound and then stop.
5. Breathe normally from the facepiece to ensure proper operation.
6. Push in and rotate the cylinder valve knob clockwise to close the valve. Inhale on the facepiece and breathe-down the residual air pressure. The whistle alarm will sound as the pressure drops below 500 psi.

WARNING

IF THE WHISTLE ALARM DOES NOT SOUND, REMOVE THE EQUIPMENT FROM SERVICE AND TAG FOR REPAIR.

NORMAL OPERATION

1. Open the carrying case lid.
2. Check the cylinder gauge for "FULL" indication. Stand to the right (top of cylinder end) of the opened case, lean forward, position and spread out the shoulder straps. Grasp the back frame with both hands, the left on the pressure reducer, and the right on the wire frame.
3. Swing the apparatus straight up and over the head, keeping your elbows close to your body. Rest the apparatus on your back while still slightly bent over. The shoulder straps will slide along your arms and fall into place on the shoulders. Straighten up as you pull down on the side straps to adjust the harness to body fit.

APPENDIX VII (Cont.)

4. Connect the waist belt buckle and adjust by pulling forward on the two side-mounted belt ends.
5. Readjust shoulder straps to assure that the weight is carried on the hips.
6. Don the facepiece as follows:
 - a. With head strap adjusted to a full outward position, hold the head harness out of the way with one hand or back over the visor.
 - b. Take a deep breath and hold it.
 - c. Place the facepiece on the face with the chin properly located in the chin pocket.
 - d. Pull the head harness over the head and tighten the neck straps by pulling on the two appropriate tabs.
 - e. Stroke the head harness down to the back, using one or both hands.
 - f. Retighten neck straps if required.

WARNING

RESPIRATORS SHOULD NOT BE WORN WHEN CONDITIONS SUCH AS GROWTH OF BEARD, SIDEBURNS, A SKULL CAP THAT PROJECTS UNDER THE FACEPIECE, OR TEMPLE PIECES ON GLASSES, PREVENT A GOOD SEAL.

7. Open the cylinder knob $1\frac{1}{2}$ turns and listen for the whistle alarm to sound and then stop.

WARNING

IF THE WHISTLE ALARM FAILS TO SOUND OR DOES NOT SHUT OFF, DO NOT USE THE APPARATUS. REMOVE IT FROM SERVICE AND TAG FOR REPAIR.

8. Check the face seal by listening for flow through the regulator while holding breath. Breathe normally.
9. Check the remote reading pressure gauge on the shoulder strap occasionally for remaining supply, to allow sufficient time for egress from the contaminated area.

WHEN THE WHISTLE ALARM SOUNDS, IT WARNS THE USER THAT APPROXIMATELY 20-25% OF THE AIR REMAINS. LEAVE THE CONTAMINATED AREA AT ONCE. IN AREAS WHERE MORE THAN ONE APPARATUS IS SOUNDING, THE USER CAN IDENTIFY HIS OWN WHISTLE BY CHANGING THE CADENCE OF THIS BREATHING. THE SOUND OF THE WHISTLE IS MODULATED BY INHALATION.

10. After use and when in a safe area, push in and rotate the cylinder valve knob clockwise to close the valve. Remove the facepiece and breathing regulator together.

.APPENDIX VII (Cont.)EMERGENCY OPERATIONWARNING

THESE PROCEDURES ARE FOR EMERGENCY USAGE ONLY; CONSEQUENTLY, THE DURATION OF THE AIR SUPPLY AND THE AUDIBILITY OF THE WHISTLE ALARM MAY BE REDUCED. THE EMERGENCY MODE SHOULD ONLY BE USED TO ESCAPE FROM THE CONTAMINATED AREA.

1. The system has no manual by-pass controls. Instead, the pressure reducer assembly includes a back-up pressure reducer system that is automatically actuated if the primary reducer fails closed. When the back-up system is actuated, the whistle alarm sounds to warn the user.
2. Should the breathing regulator fail closed, open the purge valve (red knob) to provide an acceptable flow.
3. Should the system fail open (free flow), open the purge valve (red knob, pointer down), close the cylinder valve by pushing in and rotating to regulate the flow to satisfy the requirements of the user.
4. Tag and remove the apparatus for repair.

CYLINDER REPLACEMENT PROCEDURE

1. Push in and rotate the cylinder valve knob clockwise to close the valve.
2. Remove the facepiece to bleed down the residual pressure.
3. Uncouple the pressure reducer hose coupling from the cylinder valve by rotating counterclockwise.
4. Release the toggle lever by pulling upward on its pull tab.
5. Grasp the cylinder below the band, push the locking tab below the valve, lift the cylinder free from the bottom hook and remove.
6. Replace with a fully charged cylinder and valve assembly. Slide the top of the cylinder upward under the band. Engage the cylinder hanger in the hook at the bottom of the back pack frame.
7. Push the toggle lever to secure.

NOTE

Do not force the toggle lever. Adjust the band for a snug fit by sliding the band assembly on the angled side rails.

8. Align and tighten the hose coupling to the cylinder valve.
9. The apparatus is ready for reuse.

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APPENDIX VII (Cont.)CYLINDER REPLACEMENT PROCEDURE (Cont.)CAUTION

DO NOT LEAVE THE CYLINDER VALVE OPEN WHEN THE APPARATUS IS NOT IN USE.

STAND-BY INSPECTION, CLEANING AND STORAGE.

1. Clean the apparatus after each use as follows:

- a. Inspect the equipment for worn or aging rubber parts or damaged components.
- b. Remove the breathing regulator from the facepiece.
- c. If in good condition, carefully wash the facepiece assembly with warm soap or detergent solution and thoroughly rinse in clean water.
- d. Disinfect the facepiece by sponging it with a 70% solution of ethyl, methyl, or isopropyl alcohol, a quaternary ammonium solution or a hypochlorite solution.
- e. Rinse and allow to completely air dry.
- f. Connect the breathing regulator to the facepiece quarter-turn coupling and rotate it until it latches in place.
- g. Damp-sponge dirt accumulation from the rest of the apparatus.
- h. Replace the apparatus in the carrying case, making sure all components are thoroughly dry.

APPENDIX VIIIMANUFACTURER'S USE INSTRUCTIONSBULLARD SYSTEM 999 SUPPLIED-AIR RESPIRATOR

All System 999 models come with a starter hose. By adding additional lengths of approved V-10 hose, they may be operated with from 10 feet to no more than 100 feet from the point of attachment. Air pressure at the point of attachment MUST be between 12 and 25 psig.

System 999 respirators MUST be supplied with BREATHABLE AIR at the point of attachment and the user must regulate the air pressure at the point of attachment.

QUALITY - Respirable breathing air must be supplied to the "Point of Attachment" of the Approved air supply hose. U. S. Government regulations require that all breathing air must meet at least the requirements for Type I gaseous air as described in the Compressed Air Association Commodity Specification (Grade D or higher quality), per CFR Title 30, Part 11, Subpart J, 11.121 (b).

PRESSURE - Operator MUST install an air pressure regulator with a reliable pressure gauge at the "point of attachment." It must be set to deliver air at from 12 to 25 psig (pounds per square inch gauge) (or, in metrics, 85 to 125 K Pa). The operator may make adjustments within this pressure range to suit his operating needs.

VOLUME - U. S. Government regulations (CFR Title 30, Part 11, Subpart J, 11.124-7, Table 8) require delivery of breathable air to the operator ranging between a minimum of 6 cubic feet per minute and a maximum of 15 cubic feet per minute. This volume range will not be exceeded when air pressure is supplied between 12 to 25 psig through Approved V-10 hose or hoses between 10 and 100 feet in total length.

HOW TO ASSEMBLE

1. Install the air plenum/air entry assembly into the helmet assembly by snapping all 3 ring fasteners through holes in the brim of cap crown. Be sure both barbs are entirely through holes.

To remove: Press on ring to relieve some tension, then pinch with fingers or pliers before withdrawing from holes. Do not remove by tipping or rocking as this could weaken plastic barbs.

2. Install headband suspension into helmet:
 - a. Unsnap sizing buttons on each side of headband.
 - b. Decrease headband size.
 - c. With buttons still unsnapped, put helmet on your head.
 - d. Remove helmet and snap sizing buttons into nearest hole. This will permanently size the band to fit your head.
 - e. The headband may be raised or lowered, front and/or rear, by removing hangers from helmet keyways and relocating the L-shaped buttons.

APPENDIX VIII (Cont.)HOW TO ASSEMBLE (Cont.)

3. Install chinstrap by inserting end hooks into lugs on side of helmet and adjust slide buckle for a comfortable fit. Be sure to use the chin strap--it improves the feeling of good balance of the entire System 999 respirator assembly.
4. Install the helmet into the cape:
 - a. From the inside, push the air inlet fitting through the entry hole at the back of the cape. Pull the knitted material back inward (toward the inside of the cape).
 - b. Snap the 2 black plastic buttons (located in window frame inside the cape) into the 2 holes in the cap brim. Adjust the long slot over the cap brim. Be sure barbs are entirely through holes.

To remove cape from cap: pinch barbed tops of buttons together with fingers or pliers before withdrawing from holes. Do not remove by tipping or rocking, as this could weaken plastic barbs.
5. Install the .040 thick inner lens into the cape window gasket.
6. Stack up as many as 6 pull-off cover lenses and install into the gasket IN FRONT OF THE INNER LENS.
7. Install outer window frame around the black gasket.
8. Remove the metal belt loop from the snap at the inlet fitting. Install the belt loop on the optional belt. (Part No. 46-12) or install the loop on your own belt. Lace it on so that it will be located toward the rear of one hip.
9. Connect from 10 feet up to 100 feet of V-10 Series Approved hose together between the inlet fitting on the wearer's belt and the "point of attachment." (See page 3)
10. Check out the air pressure at the "point of attachment," while the respirator is in operation and the air is flowing. It must be regulated to be between 12 and 25 psig (See page 3).
11. Place the helmet over your head and smooth out the knitted neck cuffing around your neck. With a good quality seal around this neck area, the System 999 respirator will be able to retain a higher positive pressure inside. This helps prevent the intrusion of the contaminated outside air.

APPENDIX VIII (Cont.)

STORAGE:

This is often a bigger problem than at first appears. In a dirty, dusty, sandy or misty environment, it has been a practice in some operations to lay the respirator hood down almost anywhere while stopping work. This has been all too common in sandblasting operations. Not only is the worker subjecting himself to breathing bad surrounding air, but the respirator itself is accumulating contamination inside. This dirt inside the hood is just waiting to be breathed when the hood is reinstalled.

Good working practice requires the worker to continue to wear the respirator until he has completely withdrawn from the contaminated area. He can then hang it by its top loop in a clean location. Some operators even place the hood, right-side-up, inside a cleaned covered garbage can while it is not being worn.

REMEMBER

THE AIR YOU BREATHE CAN'T BE CLEAN
UNLESS THE HOOD YOU WEAR IS CLEAN!