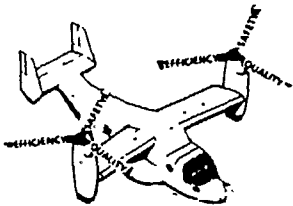


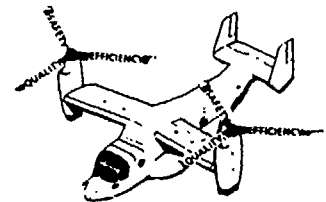
OBSOLETE

PROCEDURE NO: 20



BELL HELICOPTER TEXTRON

SAFETY AND HEALTH PROCEDURE



SUBJECT: RESPIRATORY PROTECTION

DATE ISSUED: 11/1/88

REVISION NO:

APPROVED:

Timothy R. Racicot

REVISED:

PAGE

1 OF 12

PURPOSE

To establish standard procedures and practices for the use of respiratory protective equipment to control possible health hazards to the respiratory system. This operating procedure establishes the respirator program for use at all Fort Worth Bell Helicopter Textron facilities. This procedure includes training and fitting, exclusive employee use of respirators, cleaning and disinfecting, where applicable, storage, inspection and maintenance, work area surveillance, evaluation of the program, medical examinations and selection of approved respirators. The regulation requiring this program is Title 29 C.F.R. 1910.134, Respiratory Protection, while guidelines for the administration of this program are found in the OSHA Industrial Hygiene Manual, Chapter 111, OSHA Standard Method for Determination of Respiratory Protection Program Acceptability. Respirator selection guidelines are found in the aforementioned Industrial Hygiene Manual and the NIOSH/OSHA Pocket Guide to Chemical Hazards. Respiratory equipment used at Bell Helicopter Textron shall have the approval of NIOSH and MSHA. This Health and Safety Procedure is not intended to nullify the efforts of Bell Helicopter Textron in controlling hazards, but rather augments the Industrial Safety/Hygiene program in providing protection wherein no engineering or administrative controls are feasible during the interim of implementation of such controls or during emergencies when respiratory protective equipment is required.

SCOPE

This procedure applies to all operations and employees of Bell Helicopter Textron.

DEFINITIONS

NIOSH - National Institute for Occupational Safety and Health

MSHA - Mine Safety and Health Administration

OSHA - Occupational Safety and Health Administration

TLV/PEL - Threshold Limit Value/Permissible Exposure Limit. The concentration of an airborne toxic material to which nearly all workers may be repeatedly exposed, day after day, without adverse effect.

PLAINTIFF'S EXHIBIT

BELL-11

BHT 00018

		PROCEDURE NO: 20
SUBJECT: RESPIRATORY PROTECTION	DATE ISSUED: 11/1/88	PAGE 2 OF 12

PF - Protection Factor. The protection factor is the ratio of the ambient airborne concentration of the contaminant to the concentration of that contaminant inside the face piece.

MUC - Maximum Use Concentration

SCBA - Self Contained Breathing Apparatus

PAPR - Powered Air Purifying Respirator

I. PROCEDURES

A. Health Hazards

1. Approved respiratory equipment shall be worn by employees whenever they are required to work in areas where health hazards exist as determined by industrial hygiene monitoring or in areas due to operations performed and/or environmental conditions that are suspect to be hazardous to the employee's respiratory system.
2. Whenever there is any doubt as to whether respiratory protection is needed, or as to the material which is causing the hazard, the Industrial Safety/Hygiene Department shall be contacted for consultation and recommendations.
3. Whenever existing engineering or administrative controls are suspect for not adequately maintaining safe and healthy working conditions, the Industrial Safety/Hygiene Department shall be contacted for further evaluation.

B. Enforcement

1. Departmental supervision shall assure compliance with this program to effect the protection of employees from airborne health hazards.
2. Ultimately each employee is also responsible for the protection of his or her health and safety in this compliance program.
3. Since the program follows mandatory regulations as set forth by OSHA and BHTI, noncompliance or nonparticipation in this program may result in disciplinary action.

II. RESPIRATOR SELECTION

A. Approved Respirators

		PROCEDURE NO: 20
SUBJECT: RESPIRATORY PROTECTION	DATE ISSUED: 11/1/88	PAGE 3 OF 12

1. The selection of proper respiratory equipment is made by the Industrial Safety/Hygiene Department based on the following criteria:
 - a. Physical state(s) and chemical properties of the substance.
 - (1) Particulate dust, mist, fume, smoke or fog.
 - (2) Gas or vapor.
 - (3) Combination of (1) and (2).
 - b. Industrial hygiene data on the substance.
 - (1) Permissible Exposure Limits (PEL) Title 29 C.F.R. 1910.1000, Subpart Z. Threshold Limit Value (TLV) ACGIH.
 - (2) Exposure measurements.
 - (3) Oxygen deficiency.
 - c. Evaluation of the selected respirator for the substance.
 - d. Maximum Use Concentration.
 - (1) Protection Factor (PF) for particulate filter respirators and/or gases or vapor respirators must be known.
 - (2) The MUC is found from the product PF and the TLV/PEL.
 - e. Specific requirements may limit or restrict respirator selection for individually regulated contaminants such as asbestos, vinyl chloride, etc., as found in Title 29 C.F.R. 1910.1000 Subpart Z.
 - f. Approved respirators shall display the applicable approval number and labels.
2. The selection of respirators is made considering the capabilities and limitations of respirators.
3. The warning properties of different contaminants must be considered in respiratory selection.
 - a. Some gases and vapors, e.g., carbon monoxide, exhibit poor warning properties and may necessitate the use of end-of-service life indicators.

		PROCEDURE NO: 20
SUBJECT: RESPIRATORY PROTECTION	DATE ISSUED: 11/1/88	PAGE 4 OF 12

b. Warning properties dependent upon human senses are not foolproof though they do provide some indication to the employee of possible sorbent exhaustion, poor face piece fit or other respirator malfunction.

(1) Warning properties include odor, eye irritation (except full face piece respirators) and respiratory irritation. These warning properties are adequate when they are detectable below the TLV/PEL, though some substances cause olfactory fatigue and therefore cannot be considered to have adequate warning properties.

(2) An odor or irritation threshold above the TLV/PEL but less than three times the TLV/PEL and for which there is no ceiling limit is considered to have adequate warning properties if no serious or irreversible health effects can occur at these levels.

(3) Poor warning properties are ascribed where the odor or irritation threshold is many times the TLV/PEL.

(4) Quarter or half-mask chemical cartridge respirators shall not be used to protect against any material present at concentrations that may be highly irritating to the eyes.

4. High toxicity or carcinogenic potential of a substance may invalidate the use of a chemical cartridge or particulate respirators unless there is a specific OSHA standard allowing their use.

5. Supplied air respirators are to be used where there are no chemical cartridge or particulate respirators available which satisfy the requirements of 3.b.(3) and 4. above.

B. Unapproved Respirators

1. Respirators that do not have the NIOSH/MSHA approval are unapproved and shall not be used.

2. Chemical cartridge respirators, gas masks or particulate respirators shall be considered "unacceptable" or "unapproved" for gaseous and particulate contaminants

		PROCEDURE NO: 20
SUBJECT: RESPIRATORY PROTECTION	DATE ISSUED: 11/1/88	PAGE 5 OF 12

which have either inadequate warning properties or such a toxicity as described in A.3.b.(3) and/or A.4. above. These respirators shall not be used to protect the employees where they are so considered "unacceptable" or "unapproved".

3. NIOSH/MSHA approved respirators are considered unapproved when any component is missing or damaged and shall not be worn until they have been repaired. If the repair does not allow the respirator to pass the fit test, they shall not be worn and shall be properly disposed if they can not be properly repaired.
4. NIOSH/MSHA approved respirators are considered unapproved when the respirator is improperly worn, i.e., the respirator will not pass the fit test due to improper wear or interfering facial hair or the respirator is worn without both head straps properly in place or where one head strap is missing.
5. NIOSH/MSHA approved respirators shall not be used with components from more than one manufacturer. Respirators that have parts from more than one manufacturer do not meet approval specifications and are therefore "unapproved". For example, a North brand respirator fitted with 3M brand headstraps would be an "unapproved" respirator.

III. TRAINING AND FIT TESTING

A. Education and Fit Testing

Employees using respirators shall be instructed in respirator selection based on the nature of the hazard and the resulting health effect from overexposure to the hazardous materials.

B. Pressure Fit Testing-Instructors

Employees are to be instructed in the proper wearing of respirators.

1. Each employee, when required, shall be shown how to don the respirator, as originally intended, by the instructor.
2. All functional parts including straps must be in place and worn in the appropriate positions and secured.
3. The employee shall be instructed that modification of the respirator is not allowed.

		PROCEDURE NO: 20
SUBJECT: RESPIRATORY PROTECTION	DATE ISSUED: 11/1/88	PAGE 6 OF 12

- a. Respirator straps shall not be replaced with strings or rubber band since this voids the respirator approval.
- b. Facelets of knitted coverings over the face seal shall void the approval of the respirator.

- 4. The instructor shall demonstrate both positive and negative pressure tests for fit with the respirator.

C. Pressure Fit Testing-Employees

Employees shall properly don and wear the respirator so as to determine that the fitting has been performed properly.

- 1. The employee shall demonstrate to the instructor that he or she is able to verify that all functional parts of the respirator are intact and in good repair.
- 2. The employee shall wear the respirator with the straps in the proper position and secured.
- 3. The employee shall perform a positive pressure test for fit by closing or covering the exhalation valve and by gently exhaling into the face piece. The face piece fit is considered satisfactory if a slight positive pressure can be built up inside the face piece without any evidence of outward leakage of air at the seal. For most respirators, this method of leak testing requires that the wearer first remove the exhalation valve cover (where applicable) and then carefully replace it after the test.
- 4. The employee shall perform a negative pressure test for fit by closing off the inlet opening of the canister or cartridge(s) by covering it (them) with the palm(s). Upon the employee gently inhaling, the face piece will collapse slightly. The inhaled breath shall be held for approximately 10 seconds. If the respirator remains slightly collapsed, the fit of the respirator is considered satisfactory.
- 5. Approved, disposable respirators of the particulate type are to be checked by the employee objectively assessing good respirator/face seal. By inhaling and then exhaling into a properly worn respirator, the positive and negative pressure test fit is attained.
- 6. The employees are instructed to assure that the aforementioned items are performed each time before the respirator is worn.

		PROCEDURE NO: 20
SUBJECT: RESPIRATORY PROTECTION	DATE ISSUED: 11/1/88	PAGE 7 OF 12

D. Qualitative Fit Testing

Instructors or supervisors are to qualitatively check the respirator fit for each employee by exposing the employee to a test atmosphere, while his or her respirator is on and after the positive and negative pressure test performed by the employee indicate(s) a satisfactory fit.

1. Isoamyl acetate, supplied in ampoules designed for respirator fit test, is used as the test atmosphere for checking the fit of respirators equipped with organic vapor canisters.
 - a. If the odor of isoamyl acetate is not detected by the employee the qualitative test is satisfactory and the test is complete.
 - b. If the odor of isoamyl acetate is detected by the employee, the qualitative test is not satisfactory and the employee must readjust the respirator and perform satisfactory positive and negative pressure tests again. The test atmosphere is applied again and the above aforementioned procedure repeated if necessary until the employee is able to achieve a good qualitative fit test.
2. Isoamyl acetate shall be the test atmosphere to use with supplied air respirators, powered air purifying respirators (PAPR), combination type respirator cartridges or gas mask canisters where one of the approved filtration sections is for organic vapors. An example is a combination of organic vapor and acid gas filter sections.
 - a. Same as 1.a. above.
 - b. Same as 1.b. above.
3. The 3M Brand 9912 Qualitative Face Fit Kit is to be used to provide the test atmosphere for checking the fit of respirators equipped with high-efficiency particulate cartridges or gas masks with high-efficiency particulate canisters as well as the 3M Brand 8710 and Moldex Brand 2300 dust respirators and the 3M Brand 9925 welding fume respirator.
 - a. The test solution is atomized by the instructor/supervisor using the kit's nebulizer. If the sweet taste of the test atmosphere is not detected by the employee, the qualitative test is satisfactory and the test is complete.

		PROCEDURE NO: 20
SUBJECT: RESPIRATORY PROTECTION	DATE ISSUED: 11/1/88	PAGE 8 OF 12

b. If a sweet taste is noted by the employee, the qualitative test is not satisfactory and the employee must readjust the respirator and perform the test again. This procedure must be repeated until a satisfactory test is attained.

c. Caution is to be exercised by the instructor/supervisor so as not to create an excessive test atmosphere so as to cause eye irritation to the employee.

E. Where applicable, the Industrial Hygienist shall examine during the training selected employees wearing the respirators to determine proper fitting.

F. Respirators shall not be worn when conditions prevent a good face seal. Such conditions may be a growth of beard, sideburns, a skull cap that projects under the face piece or temple pieces of glasses. Also, the absence of one or both dentures can seriously affect the fit of a face piece.

1. Employees required to wear respiratory protective equipment shall be clean shaven.

2. Items that interfere with a good face seal shall not be worn (i.e., skull caps, head bands, glasses, etc.). Specially designed "cheaters", ground to the employee's prescription, may be worn provided that they are designed and worn as part of the respirator.

3. Dentures shall remain in place whenever respiratory protection is utilized.

IV. EXCLUSIVE EMPLOYEE USE OF RESPIRATORS

A. Cartridge respirators and single use dust and fume respirators shall be used by individual employees exclusively. Drawing of the respirators through the Personal Protective Equipment Catalog and/or tool and material cribs by the supervisor or employee, will be considered assignment of the respirators on an individual basis.

B. Gas masks, supplied air respirators, PAPR's and self contained breathing apparatus (SCBA), where this equipment is stored for emergency use, are not assigned to individuals, except during the actual time of usage. This equipment shall be cleaned and disinfected before another employee shall use the same equipment or before the equipment is put into storage.

		PROCEDURE NO: 20
SUBJECT: RESPIRATORY PROTECTION	DATE ISSUED: 11/1/88	PAGE 9 OF 12

V. RESPIRATOR CLEANING AND DISINFECTING

- A. Respirators or infrequently assigned respirators, i.e., as noted in Exclusive Employee Use IV.B. above, issued for the exclusive use of one worker for a period of time, should be cleaned after each day's use, or more often if necessary. This applies to respirators routinely used throughout the day, though cleaning at a frequency less than one day is acceptable, if proper protection is still afforded to the employee.
- B. Infrequently assigned respirators as referenced in IV.B., that shall be used by other employees or that shall be returned to storage after use are to be cleaned and disinfected before the respirator is used by another employee or before it is returned to storage.
- C. The 3M Brand 8710, Moldex Brand 2300 and 3M Brand 9925 respirators, all single use respirators, do not require cleaning. However, they should instead be discarded when necessary and be replaced with a clean one. Replacement may be done as often as necessary during a single day, however the respirator should be discarded after each day's use regardless of the respirator's condition.
- D. Routinely used respirators shall be cleaned and disinfected as frequently as necessary to insure that proper protection is provided for the employee. Each employee is to be briefed on the cleaning procedure, and be assured that he or she shall always receive a clean and disinfected respirator.
- E. Infrequently used respirators (IV.B.) and their component parts, except for chemical cartridges or canisters, filters, or any other part that may be damaged by aqueous cleaning solutions, should be cleaned in warm water solution that has mild detergent added. Parts should be thoroughly rinsed in warm, clean water and then dried. Before parts are reassembled, assure that there is no soap residue left on the components, especially checking the valve seats and diaphragms which may stick or not seal properly with accumulated soap residue. During the assembly of the component parts, each part should be inspected for damage and repaired or replaced as necessary. The cleaned and dried respirator may then be returned to service or be properly stored. The maintenance-free chemical cartridge respirators in use are to be cleaned around the face piece and exhalation valves only, where applicable, taking care not to wet or interfere with the sorbent material of the respirator.

		PROCEDURE NO: 20
SUBJECT: RESPIRATORY PROTECTION	DATE ISSUED: 11/1/88	PAGE 10 OF 12

- F. Clean respirators may be disinfected by wiping the respirator with isopropyl alcohol. After the respirators are dry, they may be returned to service or be properly stored.

VI. RESPIRATOR STORAGE

- A. Respirators shall be stored in a convenient, clean and sanitary location. After inspection and cleaning, or in the case of the infrequently used type of respirators IV.B. where repairs may also be necessary, respirators shall be stored to protect them against dust, sunlight, heat, extreme cold, excessive moisture or damaging chemicals.
- B. Routinely used respirators, such as the maintenance-free organic vapor respirators used for spray painting operations, may be placed in plastic respirator storage bags that are available through the Personal Protective Equipment Catalog. Respirators shall not be stored in such places as lockers or tool boxes unless they are in carrying cases or cartons.
- C. Respirators placed at stations and work areas for emergency use shall be accessible at all times and shall be stored in compartments or cases built for that purpose. The compartments shall be clearly marked.
- D. Respirators shall be packed or stored so that the face piece or exhalation valve shall rest in a normal position and function shall not be impaired by the elastomer sitting in an abnormal position.
- E. Instructions for proper storage of emergency respirators, such as gas masks, 5-minute escape masks and self contained breathing apparatus (SCBA), are found in "use" and "care" instructions usually mounted inside the carrying case lid or attached directly to the respiratory device itself.

VII. RESPIRATOR INSPECTION AND MAINTENANCE

- A. Respirators used routinely shall be inspected before and after each use and during necessary cleaning. The entire cartridge type maintenance-free respirator shall be disposed of once its useful cartridge life has expired. Infrequently used respirators as described in VI.B. shall have worn or deteriorated parts replaced as is necessary.
- B. Emergency self contained breathing apparatus (SCBA) used for fire protection shall be checked visually on a daily basis, when in daily use. Monthly, the masks are physically inspected, donned and then cleaned and disinfected if

		PROCEDURE NO: 20
SUBJECT: RESPIRATORY PROTECTION	DATE ISSUED: 11/1/88	PAGE 11 OF 12

necessary before being stored. Cylinders are fully charged according to the manufacturer's instructions. The regulators and warning devices are checked for proper operating function.

- C. Emergency self contained breathing apparatus (SCBA) stored in maintenance areas at Plants 1 and 5 shall be inspected by Fire Protection personnel using an appropriate operation instruction and checklist guide. However, instead of daily visual checks, the equipment shall be checked on a weekly basis with a monthly operational check. Gas masks maintained throughout the facilities shall be inspected on a regular basis by the using department.
- D. Respirator inspection shall include a check of the tightness of connections and the condition of the face piece, headbands or straps, connecting tubes and cartridges, canisters or tanks as applicable. Rubber, silicone or elastomer parts shall be inspected for pliability and signs of deterioration. Stretching and manipulating rubber or elastomer parts with a massaging action will keep them pliable and flexible and prevent them from setting permanently during storage.
- E. A record shall be kept of inspection dates and findings for respirators maintained for emergency use.
- F. Replacement of parts or repairs shall be done only by experienced persons with parts designed for the respirator. No attempt shall be made to replace components or to make adjustment or repairs beyond the manufacturer's recommendations. Reducing or admission valves or regulators shall be returned to the manufacturer to a trained technician for adjustment or repair.
- G. After inspection, the respirator shall be properly stored.

VII. WORK AREA SURVEILLANCE

- A. Appropriate surveillance of work area conditions and degree of employee exposure or stress shall be maintained.
- B. Work area surveillance shall include identification of the contaminant(s), nature of the hazard, concentration at the breathing zone and, if appropriate, biological monitoring to be performed by Medical Services. The Industrial Hygienist shall carefully and fully document all necessary hazards.

		PROCEDURE NO: 20
SUBJECT: RESPIRATORY PROTECTION	DATE ISSUED: 11/1/88	PAGE 12 OF 12

IX. INSPECTION AND EVALUATION OF THE PROGRAM

- A. Regular inspections by the Industrial Hygienist of the various requirements of the program shall be performed and evaluated to determine the continued effectiveness of the program.
- B. Numerous factors affecting employee acceptance of respirators must be evaluated. These factors include, but are not limited to, comfort, ability to breathe without objectionable effort, adequate visibility under all conditions, provisions for wearing prescription glasses, if necessary, the ability to communicate, ability to perform all tasks without undue interference and confidence with the face piece fit. To this end, employees shall be observed while wearing respirators during normal activities. Employee comments are to be solicited where deemed appropriate.
- C. Regular inspections by the Industrial Hygienist shall be performed to ensure that respirators are properly selected, used, cleaned and maintained. On an annual basis, an evaluation of new respiratory devices shall be made, so as to consider and approve on a continuing basis, the latest development in employee respiratory protection.

X. MEDICAL EXAMINATIONS

- A. Persons shall not be assigned to tasks requiring use of respirators unless it has been determined that they are physically able to perform the work and use the equipment. The Manager of Medical Services, a physician, shall determine what health conditions are pertinent. The respirator user's medical status shall be reviewed periodically and at least on an annual basis, by the physician if applicable.
- B. More specific medical surveillance programs are found in Title 29, C.F.R. 1910, Subpart Z, under specific air contaminant sections, such as 1910.1001, Asbestos.
- C. Medical examinations, which include a medical questionnaire and/or physical exam, may necessitate pulmonary lung function testing and X-rays as determined by the Manager of Medical Services or as specified in a specific standard in OSHA Subpart Z.