

PROPOSED STANDARD

1. *Background.* Vinyl chloride (chloroethene) Chemical Abstracts Service Registry No. 75015, is a synthetic chemical made by oxychlorination of ethylene or hydrochlorination of acetylene. It is the parent compound of a series of thermoplastic resin polymers and copolymers which are widely used for containers, wrapping film, electrical insulation, pipe, conduit, and a variety of other products. Vinyl chloride has been made commercially in this country since 1939 and present production is in excess of seven billion pounds per year.

Vinyl chloride (VC) is a gas at ambient temperature and pressure and is a chlorinated hydrocarbon which has moderate liver toxicity. The previous standard set a ceiling value of 500 parts per million (ppm) (29 CFR 100.93, Table G-1).

On January 22, 1974, the Occupational Safety and Health Administration (OSHA) was informed by the National Institute for Occupational Safety and Health (NIOSH) that the B. F. Goodrich Chemical Company reported that deaths of several of its employees from a rare liver cancer (angiosarcoma) may have been occupationally related. As a result of this notification and its consultation with the National Institute for Occupational Safety and Health (NIOSH), and a joint inspection of the plant by OSHA, NIOSH, and the Kentucky Department of Labor, a fact-finding hearing on possible hazards involved with the manufacture and use of VC was announced on January 30, 1974 (39 FR 3874) and held on February 15, 1974.

2. *Carcinogenicity of VC.* Information produced at this hearing demonstrated that exposure of laboratory animals (mostly Sprague-Dawley rats) to VC by inhalation at and below the then current OSHA standard of 500 ppm induced tumors, including angiosarcomas of the liver. Professor Cesare Maltoni, of the Istituto di Oncologia, Bologna, Italy, reported on a series of experiments on the effect of exposure of rats, mice, and guinea pigs to VC at concentrations of 10,000; 6,000; 3,000; 1,500; 750; and 50 ppm for varying periods of time (12-40-60). Some of the experiments have been concluded, and others are still ongoing. The experimental results reported were that tumors have been observed in groups of animals exposed to VC at concentrations as low as 250 ppm. No tumors were observed in the group of animals exposed to VC at a concentration of 50 ppm. It also

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Note:

Underlining denotes words, phrases, sentences or sections of the Proposed Standard for which changes have been suggested.

REASON FOR CHANGES

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appears that the total number of tumors, as well as the numbers of angiosarcomas of the liver, decreased as the concentrations of VC were reduced to 250 ppm. Another experiment by Professor Maltoni was reported underway involving the exposure of 300 animals to VC at concentrations of 50 ppm, in order to assess in a more definitive way whether that level of exposure produces tumors in animals. Data reported by Torkelson, Oyen and Rowe (American Industrial Hygiene Association J 22: 254-261 (1961)) indicate that exposure to VC at concentrations of 25 ppm failed to induce tumors in rats, hamsters, rabbits, and dogs.

The employees of the B.F. Goodrich Chemical Company who died from angiosarcoma of the liver had an average exposure of approximately 19 years to vinyl chloride, at unknown concentrations, and variable exposures to other volatile chemicals. (TR 93). Some employees of Union Carbide, Firestone Tire and Rubber, and Goodyear were also reported in post-hearing comments to have had exposure to vinyl chloride and to have died from angiosarcoma of the liver. Finally, autopsies of four deceased employees revealed their liver angiosarcoma tumors were histologically indistinguishable from the angiosarcoma tumors observed in Professor Maltoni's experimental animals.

3. *The Emergency Temporary Standard.* On the basis of all information available at that time, and the fact that employees were being exposed at levels around the experimentally observed effect level of 250 ppm, an Emergency Temporary Standard (ETS) was promulgated on April 5, 1974 (39 FR 12342) as 29 CFR 140.924. This standard reduced the level from a ceiling of 250 ppm to 50 ppm ceiling. It was expressly recognized that this standard limiting exposures to a 50 ppm level was intended to be a tentative, interim standard, to be in effect no longer than six months, during which time the whole question of possible safe exposure to VC would be reconsidered more fully and in the light of more information, especially results of experiments which were known to be underway at that time.

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4. *Additional information.* On April 15, 1974, information and data were presented to representatives of OSHA, NIOSH and the EPA by the Industrial Bio-Test Laboratories, Northbrook, Illinois, concerning results of animal exposure studies with VC sponsored by the Manufacturing Chemists Association (MCA). Although only preliminary in nature, these results revealed that 2 out of 200 mice exposed to VC concentrations of 50 ppm for 7 hours a day, five days a week, for approximately 7 months, developed angiosarcomas of the liver.

The Industrial Bio-Test Lab data indicate that exposure to VC at 50 ppm may well constitute a serious health hazard to employees. Also, the question of a safe level of exposure for humans cannot be determined at this time, and may continue as a matter for scientific deliberation for many years. We therefore conclude that it is now necessary to propose to change the 50 ppm level established in the FTS to as low a level as can be detected using methodologies outlined in this proposal.

(3) *The proposed permanent standard.* The requirements for a complete standard under section 6(b) of the Occupational Safety and Health Act of 1970 are much more comprehensive than the provisions of the LHS promulgated on April 5. The following proposals are responsive to the additional information on the carcinogenicity of VC, and the requirements of the Act.

A. *Level of exposure.* The proposed standard for VC exposure is set at no detectable level, as determined by a sensitive and reliable method capable of detecting concentrations of 1 ppm with a sensitivity of 1 ppm plus or minus 50 percent. Although more sensitive methods may be available now or in the future, the proposed standard is set at a level which appears to be the lowest level which can be reliably detected by a method which has been recommended by OSHA. To minimize the number of persons at risk, a standard would be established for regulating areas where VC is manufactured, reacted, stored, released, repackaged, or used, including situations with polyvinyl chloride containing detectable levels of vinyl chloride. Access to the areas would be limited to authorized employees.

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A. Level of Exposure

(i) Standard effective October 5, 1974. The 8-hour time-weighted average of vinyl chloride, to which any employee may be exposed, shall not exceed 5 ppm or a ceiling concentration of 40 ppm as determined by the monitoring prescribed in paragraph four (iv).

(ii) Standard effective ^{October 5} ~~April 5~~, 1974. The 8-hour time-weighted average of vinyl chloride, to which any employee is exposed, shall not exceed 5 ppm or a ceiling concentration of 25 ppm as determined by the monitoring prescribed in paragraph four (iv).

(iii) Standard effective October 5, 1974. The 8-hour time-weighted average of vinyl chloride, to which any employee may be exposed, shall not exceed 5 ppm or a ceiling concentration of 10 ppm as determined by the monitoring prescribed in paragraph four (iv).

(iv) The level of exposure shall be determined as accurately as possible by monitoring equipment commercially available.

The accuracy of the present commercially available monitoring equipment is dependent on the level measured; i.e., 25ppm $\pm$ 20%, 10ppm $\pm$ 30%, 1ppm $\pm$ 50%.

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B. Monitoring. A program of monitoring would be required to establish whether there are detectable levels in regulated areas and to permit determination of employee exposures on an individual basis. Provision would also be made for an opportunity to observe monitoring by employees or their designated representatives, as required by section 8 (c) (3) of the Act.

C. Control methods. Where detectable levels of VC are monitored, two programs would be triggered; and engineering and work practice program to reduce levels to as low as feasible; and while this is on-going, a respiratory protection program for employees in the regulated area.

Engineering controls and work practices are favored methods of compliance because they tend to avoid contamination of the ambient air in the workplace. Accordingly, it is proposed to require the institution of engineering controls and of workpractice methods as soon as feasible, and to require the use of respirators pending the institution of such controls, to supplement such controls where they are insufficient to reduce concentrations of vinyl chloride below the detectable level, in specific work situations, and in cases of emergency. The proposal for continuous flow and pressure demand types of respirators is based on the recommendations of NIOSH, which has observed leakage through chemical cartridge respirators at high concentrations of VC.

A requirement would also be established for the provision and use of protective clothing for employees in the regulated areas. The protective clothing would minimize skin contact with VC vapor, and would provide some measure of protection from splash of liquid in the event of a spill or rupture of equipment. Food, beverages, and life products would be prohibited in the regulated area.

Written operational and emergency plans would be required, along with employee training in routine and emergency duties. Specific requirements would be established for emergency actions and for routine maintenance and decontamination operations, including vessel entry, which are known to present particular hazards.

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A program of personnel or area monitoring would be required to establish the levels in regulated areas, as defined in paragraphs A-i, A-ii, and A-iii, and to permit determination of employee exposures on an individual basis.

Where detectable levels of VC are monitored, two programs would be triggered; an engineering and work practice program to reduce levels, as defined in paragraphs A-i, A-ii, and A-iii; and while this is on-going, a respiratory protection program for employees in the regulated area when the ceiling level is exceeded, as defined in paragraph A-i, A-ii, and A-iii.

levels as defined in paragraphs A-i, A-ii, and A-iii,

Canister respirators can be used in work areas when VC levels do not exceed 50 ppm. In VC levels exceeding 50ppm, a continuous flow air respirator or pressure demand air respirator is to be used.

PERFORMANCE SCHEDULE UP TO 100PPM

Delete "Specific"

REASON FOR CHANGES

Proposed abatement schedule recognizes levels of vinyl chloride in the regulated areas.

Recognizes levels of vinyl chloride in regulated areas and requires respiratory protection for employees when levels are above the proposed standard as defined in A-i, A-ii, and A-iii,

To change from detectable to proposed schedule

To provide an interim protection device where our tests demonstrate that a canister respirator can be effective up to 50ppm for 11-hours. This permits employee freedom of movement to either exit the area or procure more suitable protection.

Specific written requirements would not be practical for emergency operations. General guidelines could be provided, but in an emergency the employee handling the emergency would have to take whatever specific action is required by the nature of the emergency situation.

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The purposes of operational and emergency plans and training are to apprise employees of the hazards to which they may be exposed, of the precautions they must take to avoid such hazards, and to rehearse employees in the procedures they must follow in emergencies.

D. Medical surveillance. Comprehensive requirements for employee medical examinations are proposed, including necessary tests. Some additional guidance is included for the convenience of physicians. The proposed requirements have been recommended to OSHA by NIOSH as reasonably appropriate to detect liver dysfunction which may be indicative of, or predisposing to, the development of liver angiosarcomas.

E. Records and reports. Records of monitoring, medical examinations, and entry to regulated areas are proposed, with provision of access by appropriate OSHA and NIOSH officials. Specific provisions for employee access to monitoring records are included, as well as the requirement to furnish a copy of a medical record to an employee's physician on the employee's request. Establishments conducting VC operations would be required to identify themselves to OSHA, and to report incidents (accidents) resulting in the release of vinyl chloride.

Accordingly, pursuant to sections 6 (b), 6 (c), and 8 (c) of the Occupational Safety and Health Act of 1970 (84 Stat. 1591, 1595, 1599; 29 U.S.C. 655, 657), Secretary of Labor's Order No. 12-71 (36 F.R. 8754) and 29 CFR Part 1911, it is hereby proposed to amend Part 1910 of Title 29 of the Code of Federal Regulations by revising 1910.93q as set forth below.

Written data, views, and arguments concerning the proposals may be mailed to the Docket Officer, Docket C-511-36, Room 230, 1726 M Street, N.W., Occupational Safety and Health Administration, Washington, D.C. 20210, postmarked not later than June 10, 1974.

Pursuant to 29 CFR 1911.11 (b) and (c), interested persons may file objections to the proposals, requesting an informal hearing with respect thereto, in accordance with the following conditions:

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to report incidents (accidents) resulting in the release of vinyl chloride sufficient to produce acute symptoms among workers exposed or having contact with vinyl chloride.

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Change to follow NIOSH's March 11, 1974 definition of an emergency.

- (1) The objections must include the name and address of the objector;
 - (2) The objections must be postmarked on or before June 10, 1974;
 - (3) The objections must specify the provisions of the proposed rule to which objection is taken, and must state the grounds therefor;
 - (4) Each objection must be separately stated and numbered; and
 - (5) The objections must be accompanied by a summary of the evidence proposed to be adduced at the rehearing.
- As revised, §1910.93q would read as follows:

§1910.93q Vinyl Chloride.

(a) *Scope and application.* (1) This section applies to any area or operation in which vinyl chloride (chloroethene), Chemical Abstracts Service Registry No. 75015, is manufactured, reacted, released, repackaged, stored, or used, including areas and operations involving polyvinyl chloride where detectable levels of vinyl chloride are released.

2(a) Levels of Exposure

- (i) Standard effective October 5, 1974. The 8-hour time-weighted average of vinyl chloride, to which any employee may be exposed, shall not exceed 25 ppm or a ceiling concentration of 40 ppm as determined by the monitoring prescribed in paragraph four (iv).
- (ii) Standard effective April 5, 1974. The 8-hour time-weighted average of vinyl chloride, to which any employee may be exposed, shall not exceed 25 ppm or a ceiling concentration of 25 ppm as determined by monitoring prescribed in paragraph four (iv).
- (iii) Standard effective October 5, 1977. The 8-hour time-weighted average of vinyl chloride, to which any employee may be exposed, shall not exceed 25 ppm or a ceiling concentration of 25 ppm as determined by the monitoring prescribed in paragraph four (iv).
- (iv) The level of exposure shall be determined as accurately as possible by monitoring equipment commercially available.

*
The accuracy of the present commercially available monitoring equipment is dependent on the level measured; i.e. 25ppm $\pm$ 20%, 10ppm $\pm$ 30%, 1ppm $\pm$ 50%.

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(2) This section does not apply to the handling or use of fabricated products made entirely or in part of polyvinyl chloride.

(3) Definition. (1) "Assistant Secretary" means the Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor or his designee.

(2) "Authorized employee" means an employee whose duties require him to be in the regulated area and who has been specifically assigned by the employer; and ~~any employee who enters such an area as a designated~~

~~representative of employees to exercise an opportunity to observe monitoring and measuring of vinyl chloride.~~

(3) "Closed container" means any container which prevents the release of vinyl chloride to the environment.

(4) "Contaminated" means capable of releasing a detectable level of vinyl chloride.

(5) "Decontamination" means reduction of vinyl chloride concentrations to less than detectable levels.

(6) "Detectable level" means an airborne concentration of vinyl chloride measurable by a sampling and analytical method capable of measuring concentrations of 1 ppm, with an accuracy of 1 ppm $\pm$ 50%.

(7) "Director" means the Director, National Institute for Occupational Safety and Health, or any person directed by him or the Secretary of Health, Education, and Welfare to act for the Director.

(8) "Emergency" means an unforeseen circumstance or set of circumstances, resulting in a release of vinyl chloride into areas occupied by employees.

(9) "Exposure" means actual contact with vinyl chloride when unprotected by required personal protective equipment and clothing.

(10) "Fabricated product" means a finished product or part of such product, made of polyvinyl chloride, entirely or in part, including semifinished products such as film, sheet, block, bar, or extrusion stock.

(11) "OSHA Area Director" means the Director for the Occupational Safety and Health Administration Area Office having jurisdiction over the geographic area in which the establishment is located.

(12) "Polyvinyl chloride" means polyvinyl chloride prepolymer or copolymer before such is converted to a fabricated product.

(13) "Protective clothing" means clothing protective against vinyl chloride.

(3)

~~WORKING AREA < THOSE DEFINED IN THE SCOPE~~

means a release of a level of vinyl chloride as described in paragraph (a) section (2).

means reduction of vinyl chloride concentrations to less than levels described in paragraph (a) section (2).

~~delete~~

vinyl chloride with an accuracy as described in paragraph (2) section (2)(iv).

*
means an unforeseen circumstance or set of circumstances, such as a ruptured transfer line, resulting in the release of vinyl chloride sufficient to produce acute symptoms among workers exposed or having contact with the vinyl chloride.

Change to follow NIOSH's March 11, 1974 definition of an emergency.

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- (12) "Vinyl chloride" means vinyl chloride monomer.
- (13) "Waste resin" means any resin or other reaction products removed in the cleaning of equipment, such as sels and piping.
- (14) Reference. College of American Pathologists, 230 Michigan Ave. Chicago, Illinois 60601.
- (15) Regulated area. (1) A regulated area shall be established where (i) vinyl chloride is manufactured, used, released, repackaged, stored, or used; or (ii) polyvinyl chloride capable of releasing detectable levels of vinyl chloride is manufactured, reacted, released, repackaged, stored, or used.
- (16) Access to regulated areas shall be limited to authorized employees. Reasons:
- (17) A daily roster of employees entering regulated areas shall be made and maintained. The rosters, or summaries thereof, shall be kept for at least 20 years.
- (18) Monitoring. (1) Every regulated area shall be monitored for detectable levels of vinyl chloride.
- (2) The monitoring shall assure that any exposure is determined for each authorized employee with a time level of 25%.
- (3) Employees or their designated representatives shall be afforded an opportunity to observe monitoring and measuring required by this paragraph. (i) Where exercise of an opportunity requires entry to an area where use of protective clothing, equipment, facilities, or shelter is required, such clothing, equipment, facilities, and procedures shall be provided to all persons desiring to exercise the opportunity, at no cost to any of them.
- (4) Persons exercising the opportunity shall be instructed regarding: (A) the toxicity and fire hazard of vinyl chloride; and
- (5) the protective steps and measures necessary for protection.
- (6) Observers shall be permitted, without interference to the persons performing the monitoring and measuring, to: (A) observe all steps and procedures related to the collecting, processing, and evaluation of regular monitoring and measurement samples;
- (7) record quantities and results obtained;
- (8) observe condition of monitoring and measuring equipment.

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is manufactured, reacted, released, repackaged, stored or used, and levels of vinyl chloride as described in paragraph (a) section (2), are released to the work area.

Delete

employees are not exposed to vinyl chloride exceeding the levels described in paragraph (a) section (2).

designated employee representatives.

calling MAX = 10 minute TWA sample

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Recognizes allowable levels of vinyl chloride in the work area.

Time cards would be utilized for employees assigned to the regulated area and a roster would be utilized for visitors and employees not assigned to the regulated area.

Recognizes allowable levels and accuracy of monitoring of vinyl chloride in the work areas.

The representative would have to be an employee or an employees representative as recognized in the union contract.

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(2) receive a demonstration of the calibration and operation tests of the monitoring and measuring equipment performed on site; and

(3) examine instructions and documents related to procedures and equipment for monitoring and testing.

(4) Accurate and complete records of all required monitoring shall be made and maintained for not less than 20 years. Such a record shall (i) state the date of monitoring and the levels determined; and

(5) identify the instruments and methods used.

(b) Engineering controls and workpractice methods. Where detectable levels of vinyl chloride are measured, immediate protection shall be provided against exposure to vinyl chloride by the use of engineering controls, work practice methods, and respirators as follows:

(i) Feasible engineering controls and workpractice methods shall immediately be used to reduce airborne concentrations of vinyl chloride below the detectable level.

(ii) Wherever feasible engineering controls and workpractice methods which can be instituted immediately are not sufficient to reduce concentrations of vinyl chloride below the detectable level, they shall nonetheless be used to reduce the concentrations to the lowest practicable level, and shall be supplemented by means of respirators in accordance with paragraph (g) of this section.

(iii) Wherever no feasible engineering control or workpractice method can be instituted immediately, immediate respiratory protection shall be provided in accordance with paragraph (g) of this section; and

(iv) In any case covered by paragraph (i) (1) (ii) or (ii) of this section, the employer shall also undertake as soon as practicable a program to reduce airborne concentrations of vinyl chloride below the detectable level, or to the greatest extent feasible, solely by means of engineering controls and workpractice methods and as soon as feasible.

(c) There shall be tests made for process or equipment leaks and for emission of vinyl chloride which may result from workpractices. The frequency of these tests shall be such as to insure the integrity of equipment and adherence to proper workpractices.

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(1) Where detectable levels of vinyl chloride are measured, above the levels described in paragraph (a), section (2), immediate protection shall be provided against exposure to vinyl chloride by the use of engineering controls, work practice methods, and/or respirators as follows:-

levels described in paragraph (a) section (2);

levels described in paragraph (a) section (2),

levels described in paragraph (a) section (2).

Delete

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To recognize proposed TWA and ceilings in abatement schedule.

Eliminates redundancy in the description.

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(g) Respiratory protection. (1) A respiratory protection program in accordance with §1910.134 shall be established and implemented where respirators are required to be used by this section.

(2) Respirators shall be used only in cases of emergency and where required by any other provision of this section. Respirators may not be used in lieu of feasible engineering controls or workpractice methods.

(3) Respirators or combinations of respirators for protection against vinyl chloride shall be selected from among the following: (i) A positive pressure full facepiece self-contained breathing apparatus;

(ii) A pressure-demand full facepiece self-contained breathing apparatus operating in the pressure-demand mode;

(iii) A combination type "C" continuous flow respirator and a pressure-demand full facepiece self-contained breathing apparatus operating in the pressure-demand mode and a pressure-demand self-contained breathing apparatus operating in the pressure-demand mode; or

(iv) A combination type "C" continuous flow respirator and a pressure-demand self-contained breathing apparatus operating in the pressure-demand mode.

(h) Protective clothing. (1) Employees entering regulated areas shall be provided full-body protective clothing, footwear or shoe covers, and gloves, at no cost to them, and be required to wear it while in the regulated area.

(3) Canister respirators shall be worn in levels of vinyl chloride from ceiling levels described in paragraph (a) section (2) to 50ppm levels.

(4) Respirators or combinations of respirators for protection against vinyl chloride in levels exceeding 50ppm shall be selected from among the following: (i) a type "C" supplied air respirator:

(ii) a self-contained breathing apparatus.

(iii) a combination type "C" supplied air respirator and a self-contained breathing apparatus.

Employees entering regulated areas shall be provided full-body protective clothing (smocks, coveralls, or shirts and pants) and be required to wear it while in the regulated area.

To provide an interim protection device where our tests demonstrate that a canister respirator can be effective up to 50 ppm for 11-hours. This permits freedom of movement to either exit the area or procure more suitable protection.

Recognizes air respirators approved for atmospheres not immediately dangerous to life or health.

Smocks to be used for casual visitors. Smocks were included as suitable protective clothing in NIOSH's March 11, 1974 recommendations to OSHA. Foot wear should be standard shoes except for vessel entries where either rubber boots for wet vessels or throwaway shoe covers for dry vessels are to be worn.

Gloves are normally worn by most employees except for some instrument or electrical control maintenance work.

(2) Where polyvinyl chloride powder containing allowable levels of vinyl chloride is handled, employees shall also be: (i) provided and required to wear head-earmuffs;

(ii) required to remove all protective clothing at each exit from the regulated area; and

(iii) required to shower after the last exit of the day.

(3) Clean protective clothing shall be provided whenever contaminated or soiled, but not less frequently than weekly. Contaminated clothing shall be decontaminated before reuse by removal for laundering or disposal.

(4) *Hygiene facilities and practices.* (1) Where employees are required by this section to wear protective clothing and equipment, change rooms shall be provided in accordance with §1910.141(c).

(2) Where employees are required by this section to shower, shower facilities shall be provided in accordance with §1910.141 (d) (3).

(3) Storage or consumption of food or beverages, storage or use of smoking or non-food chewing products, or the storage or application of cosmetics are prohibited in regulated areas.

(4) *Emergency situations.* (1) A written operational plan for emergency situations shall be developed for each regulated area.

(2) In the event of an emergency, appropriate portions of the plan shall be put into operation.

(a) Hazardous conditions created by the emergency shall be eliminated and the affected area shall be decontaminated prior to the resumption of normal operations.

(b) Special medical surveillance by a physician shall be instituted within 24-hours for employees present in the affected area at the time of the emergency.

(iii) Where an employee has a known contact with vinyl chloride such employee shall be required to shower as soon as possible, unless contraindicated by physical injuries.

(iv) An incident report on the emergency shall be reported as required in paragraph (q) (2) of this section.

(3) Each authorized employee shall be trained in a program relating to the hazards of vinyl chloride and the reactions for safe use. (i) The program shall include: A) the nature of the fire hazard, and the necessary protective steps;

vinyl chloride which exceeds the levels as described in paragraph (a) section (2)

the last exit of the day

addition the end of sentence: from the regulated area

Recognizes allowable levels of vinyl chloride in the work areas.

Employees may enter and leave a workplace many times in the course of their regular duties. It would not be feasible for them to change clothes many times during their work day. The change area is not adjacent to the regulated area.

PROPOSED STANDARD

- (B) The nature of the toxic hazard, including local systemic effects, acute and chronic effects including especially the carcinogenic hazard;
- (C) The specific nature of operations which could result in exposure to vinyl chloride, and necessary protective steps;
- (D) The purpose for and application of the medical surveillance program;
- (E) The purpose for and application of decontamination practices;
- (F) The purpose for and significance of emergency actions and procedures;
- (G) The employee's specific role under normal training or emergency conditions;
- (H) Specific information to aid the employee in recognition and evaluation of conditions and situations which may result in the release of vinyl chloride;
- (I) The purpose for and application of specific first aid procedures and practices;
- (J) A review of this standard at the employee's first hiring and indoctrination program and annually thereafter.
- (K) All materials relating to the program shall be made upon request to authorized representatives of Assistant Secretary and the Director.
- (L) Signs and Labels. (1) Entrances to regulated areas shall be posted with signs bearing the legend:

CANCER-SUSPECT AGENT AREA
AUTHORIZED PERSONNEL ONLY

- (2) Areas containing operations covered in paragraph (B) (4) of this section shall be posted with signs bearing the legend:

CANCER-SUSPECT AGENT IN THIS AREA
FULL IMPERVIOUS AIR-SUPPLIED
EQUIPMENT REQUIRED
AUTHORIZED PERSONNEL ONLY

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Delete

Delete

Delete Completely

REASON FOR CHANGES

Specific rule under emergency conditions, specific information for recognition and evaluation, and specific first aid procedures and practices would be very difficult to provide. These would have to be more of a general nature.

Use of an air supplied impervious suit presents a safety hazard to the employee. Use of impervious clothing plus an air supplied respirator permits the employee to be protected in cases where he:

- (1) uses prescription glasses
- (2) is in a vessel and has a safety harness attached to provide for his removal in the event of an accident to him while in the vessel
- (3) permits the normal hard hat protection which is a requirement of many plants
- (4) his removal from a vessel when he is wearing an air supplied suit may be extremely difficult.

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- (3) Containers of waste or other materials contaminated with vinyl chloride shall be labeled:

VINYL CHLORIDE CONTAMINATED MATERIAL

CANCER-SUSPECT AGENT
DISPOSE OF OR DECONTAMINATE USING
AUTHORIZED PROCEDURES

- (4) Containers of polyvinyl chloride containing detectable levels of vinyl chloride shall be labeled:

POLYVINYL CHLORIDE

CONTAINS VINYL CHLORIDE

VINYL CHLORIDE IS A CANCER-SUSPECT
AGENT ABSORBED BY BREATHING AND
THROUGH SKIN

- (5) Containers of vinyl chloride shall be labeled:

VINYL CHLORIDE

ANGER

EXTREMELY FLAMMABLE GAS UNDER
PRESSURE MAY POLYMERIZE WITH
EXPLOSIVE FORCE

POISON

CANCER SUSPECT AGENT AND

ANESTHETIC

ABSORBED BY BREATHING AND
THROUGH SKIN

- (6) No statement shall appear on or near any regulated sign, label or instruction, which contradicts or detracts from the effect of any required warning, information or instruction.

(7) *Marking, storage and decontamination.* (1) Emphasis shall be placed upon immediate clean up of spills, spillage, leakage, prompt repair of equipment and proper handling, storage and disposal of materials. (2) Marking of materials to prevent airborne contamination and accidental skin contact with vinyl chloride. (3) Marking of materials, equipment, and other sources of vinyl chloride in closed containers, may not be placed in areas of excessive temperature or sunlight since build-up of internal pressure may result in rupture of the container, fire or explosion.

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(4)

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(2) Waste resins or other materials contaminated by vinyl chloride shall be placed in closed containers pending disposal or decontamination.

(3) Appropriate procedures shall be developed and implemented for the decontamination or disposal of all such waste material.

(4) In maintenance or repair operations on contaminated systems or equipment, including vessel entry, employees engaged in such operations shall be (i) provided with and required to wear and use a whole-body-air-purified suit impervious to vinyl chloride, and a respirator in accordance with paragraph (g) of this section.

(ii) required to shower after removing protective equipment.

(5) Protective clothing and equipment shall be clean and dry for each use.

(6) When vessels or piping systems are opened local exhaust ventilation shall be provided to remove the escaping vapor from all occupied areas.

(7) (i) Vessels to be entered shall first be ventilated and monitored so that the concentration of vinyl chloride is reduced to a level within the protection factor capability of the protective equipment.

(ii) When vessels are to be entered, all piping to such vessels shall be: (A) Opened, blanked and tagged; or

(B) Where welded piping is in use, not less than 2 valves in series, which isolate the vessel from any other connection to such line, must be closed and secured.

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In cleaning, maintenance and repair, operations inside of contaminated vessels, employees engaged in such operations shall be provided with and required to wear and use a suit impervious to vinyl chloride, a respirator in accordance with paragraph (g) of this section, gloves, and protective footwear.

Delete Completely

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Use of an air supplied impervious suit presents a safety hazard to the employee. Use of impervious clothing plus an air supplied respirator permits the employee to be protected in cases where he:

(1) uses prescription glasses

(2) is in a vessel and has a safety harness attached to provide for his removal in the event of an accident to him while in the vessel

(3) permits the normal hard hat protection which is a requirement of many plants

(4) his removal from a vessel when he is wearing an air supplied suit may be extremely difficult.

Since the employee has been protected against exposure to vinyl chloride, a shower every time he removes the impervious clothing is not necessary. He will be showering at the end of his work day or if he has had known contact with liquid vinyl chloride he will shower immediately.

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(iii) No employee shall enter a vessel, except when another employee properly trained and equipped for entry is present and is observing the employee in the vessel,

The observer shall have means for signalling for help in the event the employee experiences problems. Under such conditions, the observer shall signal for help, and shall not enter to assist the employee until another person is present to observe.

(in) *Transportation loading and unloading.* (1) Facilities for the loading and unloading of vinyl chloride to and from containers shall have each transfer line and vapor-equalizing line equipped with vent-connections, and shall have an inert gas purging system. Vent and purge effluent shall be returned to a process stream or flared in a safe location.

(2) Procedures shall be developed and implemented for the transfer of vinyl chloride. Written copies of such procedures shall be provided employees engaged in such operations, and such employees shall be fully trained and rehearsed in all procedures.

(3) Employees engaged in transfer operations shall be provided with and required to wear respirators in accordance with paragraph (g) of this section.

(in) *Polymer handling operations.* (1) Containers of polyvinyl chloride releasing detectable levels of vinyl chloride shall be opened and transferred only under local exhaust ventilation which reduces the concentration of vinyl chloride below the detectable level.

(2) Hot operations, such as but not limited to milling, compounding and extruding, which release detectable levels of vinyl chloride, shall be carried on only under local exhaust ventilation which reduces the concentration of vinyl chloride below the detectable level.

or a mechanical standby is provided which requires acknowledgement from the man inside the vessel on a 2-1/2 minute time cycle and another man (observer) is in the area to assist the man if he does not respond.

Delete

Delete - but add: levels as described in paragraph B, items 1, 2, and 3.

Delete - but add: levels as described in paragraph B, items 1, 2, and 3.

We feel a mechanical standby is more reliable for routine vessel entries. A physical standby to get bored and may not be as reliable. It has demonstrated in the past that our mechanical standby at one of our plants was responsible for saving lives where an employee standby disregarded rule and entered a vessel to remove a fellow employee had been overcome. The standby also was overpowered and both employees would have died if the mechanical standby had not alerted others who successfully removed both employees without loss of life.

It is not always practical nor available to have inert gas at loading or unloading stations. Purging back to the process is feasible and practical.

PROPOSED STANDARD

(1) *Medical surveillance.* Not later than 1974, a program of medical surveillance shall be instituted, and shall provide each authorized employee with an opportunity for examinations in accordance with this paragraph. All medical examinations and procedures shall be performed by or under the supervision of a Licensed Doctor of Medicine (MD) or Doctor of Osteopathy (DO). All medical examinations and tests shall be provided without cost to the employee. (1) At the time of initial employment, or upon institution of screening, a physical examination shall be performed with specific attention to detecting enlargement of liver or spleen by abdominal palpation.

(2) At the time of initial employment or upon institution of screening, and annually thereafter, a medical history checklist shall be completed by the employee. This list shall include questions concerning: (i) alcohol intake;

(ii) past history of hepatitis;

(iii) past exposure to potential hepatotoxic agents, including drugs and chemicals;

(iv) past history of blood transfusions; and

(v) past history of hospitalizations.

(3) At the time of initial employment, or upon institution of screening, a serum specimen shall be obtained for screening with respect to the following bio-chemical determinations of liver function: (i) total bilirubin;

(ii) alkaline phosphatase;

CHANGES

REASON FOR CHANGES

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PROPOSED STANDARD

(iii) serum glutamic oxalacetic transaminase (SGOT);

(iv) serum glutamic pyruvic transaminase (SGPT); and

(v) gamma glutamyl transpeptidase (GGTP).

(12) Additional tests that may optionally be considered for use in screening include: (i) lactic dehydrogenase;

(ii) serum protein determinations;

(iii) serum protein electrophoresis; and

(iv) platelet count.

(13) Laboratory analyses for all biological specimens included in medical examinations shall be performed in laboratories accredited by the College of American Pathologists or licensed under 42 CFR Part 74.

(14) If the results of screening required in paragraph (c) (3) of this section are normal, screening shall be repeated: (i) every six months for employees who have been employed in vinyl chloride related operations for 10 years or more; and

(ii) annually for all other employees entering regulated areas.

(15) If one or more liver function tests performed are abnormal, serum testing shall be repeated as soon as possible, preferably within two to four weeks. If no abnormalities are present upon rescreening, serum testing shall be repeated in three months.

(16) If abnormalities persist upon rescreening, the employee shall be withdrawn from areas where contact with vinyl chloride is possible, and an individualized medical workup shall be instituted. Suggested as initial steps are a complete physical examination and various special procedures such as hepatitis B antigen determination and liver scanning. If liver function abnormalities are determined to be unrelated to liver disease, the employee may be permitted to return to vinyl chloride-related employment, subject to individual medical evaluation.

(17) A complete and accurate record of the results of medical examinations shall be made and maintained for the duration of employment plus five years, or for 20 years, whichever is longer.

(18) *Records.* (1) Records of monitoring and measuring, medical records, and regulated area entry rosters and summaries, shall be made available for examination and copying upon request to authorized representatives of the Assistant Secretary and the Director.

CHANGES

REASON FOR CHANGES

Para. 18

(2) In the event that the employer ceases to do business and there is no successor to receive and retain its records for the prescribed period, these records shall be transferred by registered mail to the Director, and each employee individually notified in writing of this transfer.

(3) Employees and their designated representatives shall be provided access to examine and copy records of monitoring and measuring.

(4) Former employees shall be provided access to examine and copy records reflecting their own exposures.

(5) Upon written request of any employee, a copy of the medical record of such employee shall be furnished to a physician designated by the employee in such request.

(q) Report. (1) Not later than the following information shall be reported to the OSHA Area Director. Any change in such information shall be reported to the OSHA Area Director within 15 days of such change. (i) The address and location of each establishment which is one or more regulated areas; and

(ii) The number of employees in each regulated area during normal operations, including maintenance.

(2) Incidents which result in the release of vinyl chloride into any area where employees may be exposed shall be reported in accordance with this paragraph. (3) A report of the occurrence of the incident and the facts observed at the time shall be made a report on any medical treatment of affected employees shall be made within 24 hours to the OSHA Area Director.

(4) A written report shall be filed with the OSHA Area Director within 15 calendar days thereafter and shall include (A) A specification of the amount of material released.

(B) A description of the area involved and the extent of known and potential employee exposure and area affected.

(C) A report on any medical treatment of affected employees and any medical surveillance program implemented; and

designated employee representatives.

The representative would have to be an employee or an employees representative as recognized in the union contract.

Incidents which result in an emergency as defined in paragraph (a) section (8) shall be reported in accordance with this paragraph. (1)

Change to follow NIOSH's March 11, 1974 definition of an emergency.

PROPOSED STANDARD

Page 19

(d) An analysis of the circumstances of the incident, and measures taken or to be taken, with specific completion dates, to avoid further similar releases.

(5) Upon completion of any monitoring and measuring which discloses that any employee has actually been exposed to detectable levels of vinyl chloride, each such employee shall be individually notified in writing. The notice shall (i) be delivered not later than 10 working days after completion of the monitoring and measuring;

(ii) state the actual exposure in terms of concentration and time; and

(iii) state the steps which have been taken, are being taken, and will be taken, with specific completion dates, to terminate the exposure and prevent a recurrence.

(Sec. 6 (b), 6 (c), and 8 (c), 84 Stat. 1593, 1596, 1599 (29 U.S.C. 655, 657); Secretary of Labor's Order No. 12-71 (35 FR 8754))

Signed at Washington, D.C. this 6th day of May, 1974.

/s/John Stender
Assistant Secretary of Labor

CHANGES

Employee notification. Any employee found to have been exposed at any time to airborne concentrations of vinyl chloride in excess of the limits prescribed in paragraph B of this section shall be notified of the exposure as soon as practicable, but not later than five (5) days after the finding. The employee shall also be timely notified of the corrective action being taken.

A New Section Needs to be Added

Recognizes the ceiling level as proposed and also provides for a more rapid notification of the employee.

A complete new section needs to be added which covers laboratory activities. The carcinogens covered in 1910.93c through 1910.93p makes this provision for those 14 chemicals.

RSV 0011059

I
Proposed Standard
 (Objections Underlined)

II
Recommended Changes 1/

III
Comments

§ 1910.934 Vinyl Chloride.

(a) Scope and application. (1) This section applies to any area or operation in which vinyl chloride (chloroethene), Chemical Abstracts Service Registry No. 75015, is manufactured, reacted, released, repackaged, stored, or used, including areas and operations involving polyvinyl chloride where detectable levels of vinyl chloride are released.

(2) This section does not apply to the handling or use of fabricated products made entirely or in part of polyvinyl chloride. (add)

(a) (1)...which contains 0.1% or more of residual vinyl chloride on and after Oct. 5, 1974, and which contains 0.01% or more of residual vinyl chloride on and after Oct. 5, 1977.

(a) (2)...nor to the handling or use of polyvinyl chloride that complies with the residual vinyl chloride limitations set forth in paragraph (a) (1).

Add a new paragraph (b) to read as follows and reletter all succeeding paragraphs accordingly:

* * *

(b) Permissible exposure to vinyl chloride.

(b) (1) For polyvinyl chloride production facilities.

(1) Standard effective Oct. 5, 1974. The maximum concentration of vinyl chloride to which any employee may be exposed shall not exceed 40 ppm nor shall the time-weighted average concentration exceed 25 ppm.

This will set forth the exposure limitations recommended by the various witnesses. It also reflects the recommendations of different standards for different manufacturing operations to set work place levels as low as feasible.

1/ The recommended changes are submitted as substituted language for that underlined in Column I unless it is indicated in Column I that language from Column II is submitted to be added to the proposed section as in the case of Section (a) (2).

I

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(ii) Standard effective Oct. 5, 1975.
The maximum concentration of vinyl chloride to which any employee may be exposed shall not exceed 25 ppm.

(iii) Standard effective Oct. 5, 1976.
The maximum concentration of vinyl chloride to which any employee may be exposed shall not exceed 25 ppm nor shall the time-weighted average concentration exceed 10 ppm.

(b) (2) For vinyl chloride production facilities.

(i) Standard effective Oct. 5, 1974.
The maximum concentration of vinyl chloride to which any employee may be exposed shall not exceed 25 ppm nor shall the time-weighted average concentration exceed 10 ppm.

(ii) Standard effective Oct. 5, 1977.
The maximum concentration of vinyl chloride to which any employee may be exposed shall not exceed 10 ppm nor shall the time-weighted average concentration exceed 5 ppm.

(b) (3) For polyvinyl-chloride-fabricating facilities. ~~No workplace concentrations of vinyl chloride in excess of 1 ppm in facilities falling within the scope of this standard.~~

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I

II

III

(b) Definitions. (1) "Assistant Secretary" means the Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor or his designee.

(2) "Authorized employee" means an employee whose duties require him to be in the regulated area and who has been specifically assigned by the employer; and any employee who enters such an area to exercise an opportunity to charge, monitor, and measuring of vinyl chloride.

(3) "Closed container" means any container which prevents the release of vinyl chloride to the environment.

(4) "Contaminated" means capable of releasing a detectable level of vinyl chloride.

(5) "Decontamination" means reduction of vinyl chloride concentrations to less than detectable levels.

(6) "Detectable level" means an airborne concentration of vinyl chloride which can be detected by analytical methods with an accuracy of 1.0 percent.

(7) "Director" means the Director, National Institute for Occupational Safety and Health, or any person directed by him or the Secretary of Health, Education, and Welfare to act for the Director.

(8) "Emergency" means an unforeseen circumstance or act of circumstances, resulting in the release of vinyl chloride.

(9) "Exposure" means actual contact with vinyl chloride when unprotected by required personal protective equipment and clothing.

(10) "Fabricated product" means a finished product or part of such product, made of polyvinyl chloride, entirely or in part, including semifinished products such as film, sheet, block, bar, or extrusion stock.

(c) (2) "Authorized personnel"...; and other personnel such as truck drivers, contractors, service personnel and others whose legitimate duties require their occasional presence in operating areas.

(c) (4)... means, a level of vinyl chloride in the workplace or materials that produce a level of vinyl chloride in the workplace in excess of the limitations set forth in paragraph (b).

(c) (5)... the levels set forth in paragraph (b).

(c) (6)... [Omit]

(c) (8)... such as a ruptured transfer line, resulting in the release of vinyl chloride sufficient to produce acute symptoms among workers exposed to or having contact with the vinyl chloride.

(c) (9)... liquid vinyl chloride or inhalation of vinyl chloride gas in excess of permissible levels set forth in paragraph (b).

(c) (10)... extruded stock, or diced or pelletized product made from the foregoing.

This entire subparagraph will not be required if the proposed limitations (paragraph(b)) are adopted.

This reflects the NIOSH March 11, 1974 definition of an emergency.

Personnel using protective equipment are not exposed to the vinyl chloride.

This corresponds to commercial practice and nomenclature.

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I

(c) Reference. College of American Pathologists, 230 N. Michigan Ave., Chicago, Illinois 60601.

2/18 Regulated areas. (1) A regulated area shall be established where (i) vinyl chloride is manufactured, reacted, released, repackaged, stored, or used; or (ii) polyvinyl chloride capable of releasing detectable levels of vinyl chloride is manufactured, reacted, released, repackaged, stored, or used.

(2) Access to regulated areas shall be limited to authorized employees.

(3) A daily roster of employees entering regulated areas shall be made and maintained. The rosters, or summaries thereof, shall be kept for at least 20 years.

(c) Monitoring. (1) Every regulated area shall be monitored for detectable levels of vinyl chloride.

(2) The monitoring shall assure that any exposure may be determined for each authorized employee with a confidence level of 95 percent.

II

2/

(e) (1) (ii) ...containing levels of residual vinyl chloride in excess of the limits set forth in paragraph (a) (1) ...

(e) (2) ...personnel.

(3) (3) ...personnel whose duties regularly require their entry into regulated areas shall be made and maintained... 30...

(f) (1) ...constantly sequentially monitored for levels of vinyl chloride at intervals not exceeding 10 minutes.

equivalent of 10 min integrated sample interval measurement

(f) (2) Delete, and add the following:

(f) (2) (i) Probes shall be so located in every regulated area as to provide a statistically valid sample of the workplace atmosphere. Analysis shall be conducted on samples obtained from each probe in a sequential manner so that the atmosphere at each site is analyzed.

(f) (2) (ii) The analytical instruments shall be periodically checked and re-calibrated to assure proper functioning in accordance with good analytical practices.

(f) (2) (iii) The monitoring equipment shall produce an audible and visible alarm in any plant area when the concentration of vinyl chloride in that area exceeds the limit set forth in paragraph (b).

III

2/ This paragraph in the proposed standard should be lettered "(d)"; it is shown as "(e)" in the "Recommended changes" because of the recommended inclusion of a new paragraph (b).

I

(3) Employees or their designated representatives shall be afforded an opportunity to observe monitoring and measuring required by this paragraph.

(i) Where exercise of an opportunity requires entry to an area where the use

of protective clothing, equipment, facilities, or procedures is required, such clothing, equipment, facilities, and procedures shall be provided to all persons entitled to exercise the opportunity, at no cost to any of them.

(ii) Persons exercising the opportunity shall be instructed regarding:

(A) The toxicity and fire hazard of vinyl chloride; and

(B) The protective steps and measures necessary for their protection.

(iii) Observers shall be permitted, without interference to the persons performing the monitoring and measuring, to:

(A) Observe all steps and procedures related to the collecting, processing, and evaluation of particular monitoring and measurement samples;

(B) Record quantities and results obtained;

(C) Observe the condition of monitoring and measuring equipment;

(D) Receive a demonstration of the calibration and function tests of the monitoring and measuring equipment performed on site; and

(E) Examine instructions and documents related to the procedures and equipment for monitoring and measuring.

(4) Accurate and complete records of all required monitoring shall be made and maintained for not less than 20 years. Such a record shall (i) state the date of such monitoring and the levels determined; and (ii) identify the instruments and methods used.

II

(f) (2) (iv) The monitoring equipment shall produce an audible and visible alarm, readily distinguishable from that required by (f) (2) (iii), in any plant area when the concentration of vinyl chloride in that area exceeds 100 ppm.

(f) (3) ...elected...a reasonable opportunity...

(f) (3) (i) through (f) (3) (iii) - [Delete]
Replace by:

(f) (3) (i) Summaries of monitoring results including the daily maximum and average for each probe location shall be promptly and conspicuously posted. Employees or their elected representatives shall have reasonable opportunities to inspect the raw data from which the summaries have been prepared.

(f) (4) ...30...

III

It is anticipated that the constant sequential monitoring envisioned here will result in instrument charts and/or computer print-outs. The only meaningful information generated would be the summaries referred to in the "recommended change". Since the probes will be in fixed locations, "observation" here would have no practical significance and the details set forth in the proposed standard have no applicability.

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III

6⁰
1

(f) Engineering controls and work-practice methods. (1) Where detectable levels of vinyl chloride are measured, immediate protection shall be provided against exposure to vinyl chloride by the use of engineering controls, workpractice methods, and respirators as follows:

(i) Feasible engineering controls and workpractice methods shall immediately be used to reduce airborne concentrations of vinyl chloride below the detectable level:

(ii) Wherever feasible engineering controls and workpractice methods which can be instituted immediately are not sufficient to reduce concentrations of vinyl chloride below the detectable level, they shall nonetheless be used to reduce the concentrations to the lowest practicable level, and shall be supplemented by means of respirators in accordance with paragraph (e) of this section;

(iii) Wherever no feasible engineering control or workpractice method can be instituted immediately, immediate respiratory protection shall be provided in accordance with paragraph (g) of this section; and

(iv) In any case covered by paragraph (i), (ii) or (iii) of this section, the employer shall also undertake as soon as practicable a program to reduce airborne concentrations of vinyl chloride below the detectable level, or to the greatest extent feasible, solely by means of engineering controls and workpractice methods and as soon as feasible.

(g) (1) ...levels of vinyl chloride in excess of the limits set forth in paragraph (b),...

(g) (1) (i) ...[Same as (g) (1)]

(g) (1) (ii) ...[Same as (g) (1)]...h...

(g) (1) (iv) ...the limits set forth in paragraph (b),...

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I

(g) Respiratory protection. (1) A respiratory protection program in accordance with 1910.134 shall be established and implemented where respirators are required to be used by this section.

(2) Respirators shall be used only in cases of emergency and where required by any other provision of this section. Respirators may not be used in lieu of feasible engineering controls or work-practice methods.

(3) Respirators or combinations of respirators for protection against vinyl chloride shall be selected from among the following:

(i) A positive pressure full facepiece self-contained breathing apparatus;

(ii) A pressure-demand full facepiece self-contained breathing apparatus operating in the pressure-demand mode;

(iii) A combination type "C" pressure-demand full facepiece respirator operating in the pressure-demand mode and a pressure-demand self-contained breathing apparatus operating in the pressure-demand mode; or

(iv) A combination type "C" continuous flow respirator and a pressure-demand self-contained breathing apparatus operating in the pressure-demand mode. *[Add]*

II

III

Add the following new paragraph:

(h) (3) (v) A half-face, canister-type mask when the concentration of vinyl chloride is above the limit set forth in paragraph (b) but below 100 ppm.

Until a suitable indicator system has been developed to show when the canister is no longer effective, each regulated area shall develop a work-practice rule that provides for the replacement of used canisters when such canisters have consumed 50% of specified capacity, but no less than daily replacement when such canisters have been used at all.

Addition: utilization of AIR LINE MASK

I

II

III

(h) Protective clothing. (1) Employees entering regulated areas shall be provided full-body protective clothing, footgear or shoe covers, and gloves, at no cost to them, and required to wear it while in the regulated area.

(2) Where polyvinyl chloride powder containing detectable levels of vinyl chloride is handled, employees shall wear:

(i) Provided and required to wear headcoverings;

(ii) Required to remove all protective clothing at each exit from the regulated area; and

(iii) Required to shower after the last exit of the day.

(3) Clean protective clothing shall be provided whenever contaminated or soiled, but not less frequently than weekly. Contaminated clothing shall be decontaminated before reuse by removal for laundering or disposal.

(4) Hygiene facilities and practices. (1) Where employees are required by this section to wear protective clothing and equipment, change rooms shall be provided in accordance with [1910.141(c)].

(2) Where employees are required by this section to shower, shower facilities shall be provided in accordance with [1910.141(d)(3)].

(3) Storage or consumption of food or beverages, storage or use of smoking or tobacco products, and the storage or application of cosmetics are prohibited in regulated areas.

(i) (1) This item should be deleted.

(1) (2) ...levels of vinyl chloride in excess of the limit set forth in paragraph (a)...[delete "also"]

(i) (2) (ii) ...^{any excess}adhering polyvinyl chloride powder from clothing...by vacuum or brushing

(1) (2) (iii) [Delete]

(i) (3) ...headcoverings...

...headcoverings...

(j) (3) Storage or consumption of smoking products are prohibited in regulated areas.

Under general working circumstances special protective clothing is neither available nor necessary.

We see no useful purpose being served by this requirement.

We see no reason why chewing gum or the use of cosmetics should be barred.

I

(j) Emergency situations. (1) A written operational plan for emergency situations shall be developed for each regulated area.

(2) In the event of an emergency, appropriate portions of the plan shall be put into operation.

(i) Hazardous conditions created by the emergency shall be eliminated and the affected area shall be decontaminated prior to the resumption of normal operations.

(ii) Special medical surveillance by a physician shall be instituted within 24 hours for employees present in the affected area at the time of the emergency.

(iii) Where an employee has a known contact with vinyl chloride, such employee shall be required to shower as soon as possible, unless contraindicated by physical injuries.

(iv) An incident report on the emergency shall be reported as required in paragraph (i)(2) of this section.

(k) Each authorized employee shall be trained in a program relating to the hazards of vinyl chloride and the precautions for safe use.

(i) The program shall include:

(A) The nature of the fire hazard, and the necessary protective steps;

(B) The nature of the toxic hazard including local and systemic effects, acute and chronic effects, including specifically the carcinogenic hazard;

(C) The specific nature of operation which could result in exposure to vinyl chloride, and necessary protective steps;

(D) The purpose for and application of the medical surveillance program;

(E) The purpose for and application of decontamination practices;

(F) The purpose for and significance of recognition and situations which result in the release of vinyl chloride;

(G) The purpose for and application of specific first aid procedures and practices.

(j) A review of this standard as the employee's first training and indoctrination program and annually thereafter.

(ii) All materials relating to the program shall be provided upon request to authorized representatives of the Assistant Secretary and the Director.

II

(k) (2) (iii)...an amount sufficient to create an emergency...

(k) (3) [This paragraph relates to a desirable general training program, not to emergencies. We recommend that it be placed in a separate lettered paragraph.]

I

II

III

(L) (1) . . . :

(k) Signs and labels. (1) Entrances to regulated areas shall be posted with signs bearing the legend:

~~CANCER SUSPECT AGENT AREA~~
~~RESTRICTED PERSONNEL ONLY~~

2/ Areas containing operations covered in paragraph (k) (1) (4) of this section shall be posted with signs bearing the legend:

~~CANCER SUSPECT AGENT IN THIS AREA~~
~~RESTRICTED PERSONNEL ONLY~~

~~AUTHORIZED PERSONNEL ONLY~~

(3) Containers of waste or other materials contaminated with vinyl chloride shall be labeled:

~~VINYL CHLORIDE CONTAMINATED~~
~~MATERIAL~~

~~CANCER SUSPECT AGENT~~

~~DISPOSE OR DECONTAMINATE USING~~
~~AUTHORIZED PERSONNEL~~

(L) (2) . . . :

VINYL CHLORIDE VAPOR HAZARD

~~CARRY RESPIRATOR AND WEAR ASSIGNED PROTECTIVE EQUIPMENT~~

WHEN ALARM SIGNAL IS ACTIVATED

WHEN SIGNAL IS ACTIVATED, DO NOT REMAIN IN ALARM AREA

UNLESS YOUR WORK REQUIRES IT

BREATHING EXCESSIVE QUANTITIES OF VINYL CHLORIDE VAPOR

MAY BE HAZARDOUS TO YOUR HEALTH

AUTHORIZED PERSONNEL ONLY

VINYL CHLORIDE VAPOR IN THIS AREA

IMPERVIOUS PROTECTIVE CLOTHING AND

RESPIRATORS REQUIRED

AUTHORIZED PERSONNEL ONLY

(L) (3) . . . :

VINYL CHLORIDE CONTAMINATED MATERIAL

MAY BE HAZARDOUS TO YOUR HEALTH

DECONTAMINATE OR DISPOSE OF USING ADEQUATE

VENTILATION OR PROTECTIVE EQUIPMENT

3/ It is assumed that the paragraph (k) (1) (4) to which reference is made in this paragraph should read paragraph (L) (4).

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I

II

III

(L) (4) ...levels of vinyl chloride in excess of the limits set forth in paragraph (a)....:

(4) Containers of polyvinyl chloride containing detectable levels of vinyl chloride shall be labeled:

POLYVINYL CHLORIDE
CONTAINS VINYL CHLORIDE
VINYL CHLORIDE IS A
KNOWN CARCINOGEN
ABSORBED BY BREATHING AND
THROUGH SKIN

(5) Containers of vinyl chloride shall be labeled:

VINYL CHLORIDE
DANGER
EXTREMELY FLAMMABLE GAS
UNDER PRESSURE
MAY POLYMERIZE WITH
EXPLOSIVE FORCE
POISON
CANCER SUSPECT AGENT AND
MAY BE FERTILIZING
ABSORBED BY BREATHING
AND THROUGH SKIN

(6) No statement shall appear on or near any required sign, label or instruction, which contradicts or detracts from the effect of any required warning, information or instruction.

CAUTION-
POLYVINYL CHLORIDE
CONTAINS VINYL CHLORIDE
AVOID BREATHING VAPOR OR DUST
CLOSED CONTAINERS OF POLYVINYL CHLORIDE MAY CONTAIN
VAPOR LEVELS OF VINYL CHLORIDE WHICH MAY
BE HAZARDOUS TO YOUR HEALTH
OPEN ONLY IN WELL-VENTILATED AREAS OR WEAR RESPIRATORY
PROTECTION

(L) (5):

VINYL CHLORIDE
DANGER
EXTREMELY FLAMMABLE GAS UNDER PRESSURE
MAY POLYMERIZE WITH EXPLOSIVE FORCE
POISON-
AVOID CONTACT WITH LIQUID OR VAPOR UNLESS FULLY
PROTECTED BY AUTHORIZED EQUIPMENT
IN THE EVENT OF ACUTE EXPOSURE SEEK MEDICAL
ASSISTANCE IMMEDIATELY

I

(1) Maintenance and decontamination. (1) Emphasis shall be placed upon immediate clean up of spills, periodic inspection, prompt repair of equipment and leaks, and proper handling, storage and disposal or decontamination of materials to prevent airborne contamination and accidental skin contact with vinyl chloride. Waste materials, equipment, and other sources of vinyl chloride in closed containers, may not be placed in areas of excessive temperature or sunlight since build-up of internal pressure may result in rupture of the container, fire or explosion.

(2) Waste resins or other materials contaminated with vinyl chloride shall be placed in closed containers pending disposal or decontamination.

(3) Appropriate procedures shall be developed and implemented for the decontamination or disposal of all such waste material.

(4) In maintenance or repair operations on contaminated systems or equipment, including vessel entry, employees engaged in such operations shall be (i) provided with and required to wear and use a whole-body air-supplied suit impervious to vinyl chloride, and a respirator in accordance with paragraph (m) (4) (i) of this section, and (ii) required to shower after removing protective equipment.

II

Protective clothing
(m) (4) (i) ... a suit impervious to vinyl chloride, a respirator in accordance with paragraph (h) of this section, gloves, and protective footwear.

(m) (4) (ii) [Delete]

III

Use of an air-supplied whole body impervious suit constitutes a major health and safety hazard. The recommended change permits an employee to be protected where he:

- (1) uses prescription glasses,
- (2) is in a vessel with a safety harness to permit his removal in case of accident,
- (3) needs to wear a hard hat.

Since no contact with vinyl chloride will occur, this provision is unnecessary.

I

(5) Protective clothing and equipment shall be clean and dry for each use.

(6) When vessels or piping systems are opened local exhaust ventilation shall be provided to remove the escaping vapor from all occupied areas.

(7) (i) Vessels to be entered shall first be ventilated and monitored so that the concentration of vinyl chloride is reduced to a level within the protection factor capability of the protective equipment.

(ii) When vessels are to be entered, all piping to such vessel shall be:

(A) Opened, blanked and tagged; or

(B) ~~When a valve is in use, not less than 2 valves in series, which isolate the vessel from any other connection to such line, must be closed and secured.~~

(iii) No employee shall enter a vessel, except when another employee properly trained and equipped for entry is present and is observing the employee in the vessel. The observer shall have means for signaling for help in the event the employee experiences problems. Under such conditions, the observer shall signal for help, and shall not enter to assist the employee until another person is present to observe.

(m) ~~Transportation loading and unloading.~~ (i) Facilities for the loading and unloading of vinyl chloride to and from containers shall have each transfer line and vapor-equalizing line equipped with vent connectors, and shall have an inert gas purging system. Vent and purge effluent shall be returned to a process stream or flared in a safe location.

(2) Procedures shall be developed and implemented for the transfer of vinyl chloride. Written copies of such procedures shall be provided employees engaged in such operations, and such employees shall be fully trained and rehearsed in all procedures.

(3) Employees engaged in transfer operations shall be provided with and required to wear respirators in accordance with paragraph (g) of this section.

(n) ~~Polymer handling operations.~~ (1) Containers of polyvinyl chloride releasing detectable levels of vinyl chloride shall be opened and transferred only under local exhaust ventilation which reduces the concentration of vinyl chloride below the detectable level.

(2) ~~Hot operations, such as but not limited to milling, calendaring and extruding, which release detectable levels of vinyl chloride, shall be carried on only~~

II

(m) (7) (ii) (B) [Delete]

(m) (7) (iii) Insert the following:

..., or a mechanical standby is provided which requires acknowledgment from the man inside the vessel on a 2 1/2 minute time cycle and another man (observer) is in the area to assist the man in the vessel if he does not respond.

(n) (1) [Delete]

(o) (1) ...levels of vinyl chloride above the limits set forth in paragraph (a) ...the limits set forth in paragraph (b) (3).

(o) (2) ...levels of vinyl chloride above the limits set forth in paragraph (b) (3) ...the limits set forth in paragraph (b) (3).

Alternate B should be permitted for all piping.

An inert gas purge is neither necessary nor always practicable. Purging back to the process is feasible and provides equivalent protection.

RSV 0011072

I

(a) Medical surveillance. Not later than ~~January 1, 1974~~, a program of medical surveillance shall be instituted, and shall provide each authorized employee with an opportunity for examinations in accordance with this paragraph. All medical examinations and procedures shall be performed by or under the supervision of a licensed Doctor of Medicine (MD) or Doctor of Osteopathy (DO). All medical examinations and tests shall be provided without cost to the employee.

(1) At the time of initial employment, or upon institution of screening, a physical examination shall be performed with specific attention to detecting enlargement of liver or spleen by abdominal palpation.

(2) At the time of initial employment or upon institution of screening, and annually thereafter, a medical history checklist shall be completed by the employee. This list shall include questions concerning:

- (i) Alcohol intake;
- (ii) History of hepatitis;
- (iii) Any exposure to potential hepatotoxic agents, including drugs and chemicals;
- (iv) Transfusion history of blood transfusions;
- (v) History of hospitalizations;
- (3) At the time of initial employment, or upon institution of screening, a serum sample shall be obtained for screening concerned to the presence of biochemical abnormalities of liver function:
 - (i) Total bilirubin;
 - (ii) Alkaline phosphatase;
 - (iii) Serum glutamic oxalacetic transaminase (SGOT);
 - (iv) Serum glutamic pyruvic transaminase (SGPT); and
 - (v) Gamma glutamyl transpeptidase (GGT).
- (4) Additional tests that may optionally be considered for use in screening include:
 - (i) Lactic dehydrogenase;
 - (ii) Serum protein determinations;
 - (iii) Serum protein electrophoresis; and
 - (iv) Platelet count.

II

(p) (1) [Delete]

(p) (2) [Delete]

(p) (3) ...suitable samples shall be taken to permit the performance of all tests deemed necessary by the examining physician.

(p) (4) [Delete]

III

It is the consensus of medical opinion that there are no diagnostic or screening procedures that will detect sensitivity or predisposition to angiosarcoma of the liver. Consequently a standard should not specify what tests should be performed, but should leave medical examinations to the discretion and professional competence of the examining physician.

III

maries, shall be made available for examination and copying upon request to authorized representatives of the Assistant Secretary and the Director.

(p) (B) [Delete]

15-

RSV 0011074

(2) In the event that the employer ceases to do business and there is no successor to receive and retain his records for the prescribed period, these records shall be transmitted by registered mail to the Director, and each employee individually notified in writing of this transfer.

(3) Employees and their designated representatives shall be provided access to examine and copy records of monitoring and measuring.

(4) Former employees shall be provided access to examine and copy records reflecting their own exposures.

(5) Upon written request of any employee, a copy of the medical record of such employee shall be furnished to a physician designated by the employee in such request.

(6) Former (a) Not later than the following information shall be reported to the OSHA Area Director. Any change in such information shall be reported to the OSHA Area Director within 15 days of such change.

(i) The address and location of each establishment which has one or more regulated areas; and

(ii) The number of employees in each regulated area during normal operations, including maintenance.

(7) Incidents which result in the release of any level of toxic air pollutant shall be reported to the OSHA Area Director within 24 hours of the occurrence of the incident.

(8) A report of the occurrence of the incident and the facts obtainable at that time including a report on any medical treatment of affected employees shall be made within 24 hours to the OSHA Area Director.

(9) A written report shall be filed with the OSHA Area Director within 15 calendar days thereafter and shall include:

(a) A specification of the amount of material released;

(b) A description of the area involved and the extent of known and potential employee exposure and area affected;

(c) A report on any medical treatment of affected employees and any medical surveillance program implemented; and

(d) An analysis of the circumstances of the incident and measures taken or to be taken to prevent further releases.

(q) (3) ...reasonable access...

(q) (4) ...reasonable access...

(r) (2) (1) ...emergency...

(r) (2) (1) (D) ...emergency...

(3) Upon completion of any monitoring and measuring which discloses that any employee has actually been exposed to ~~detectable levels of vinyl chloride~~, each such employee shall be individually notified in writing. The notice shall:

- (i) Be delivered not later than 10 working days after completion of the monitoring and measuring;
- (ii) State the actual exposure in terms of concentration and time; and
- (iii) State the steps which have been taken, are being taken, and will be taken, with specific completion dates, to terminate the exposure and prevent a recurrence.

(Secs. 6(b), 6(c), and 8(c), 84 Stat. 1593, 1596, 1599 (29 U.S.C. 653, 657); Secretary of Labor's Order No. 12-71 (36 FR 8154))

Signed at Washington, D.C. this 6th day of May, 1974.

JOHN STENGER,
Assistant Secretary of Labor.
[FR Doc. 74-10746 Filed 5-9-74; 8:45 am]

(r) (3) ...levels of vinyl chloride in excess of the limits set forth in paragraph (b) ... The employee shall:

(r) (3) (i) [Delete, and replace by the following]:

Be notified of the exposure as soon as practicable, but not later than five working days after the finding; and,

(r) (3) (ii) Be informed of...

(r) (3) (iii) [Delete, and replace by the following]:

Be notified in a timely fashion of the corrective action being taken.

Monsanto

FROM (NAME & LOCATION): P.L. Wright - A2SC

DATE: March 4, 1975

CC: G.J..Levinskas - A2SC

SUBJECT: Dow Report on Vinyl Chloride -
Teratology Study

REFERENCE:

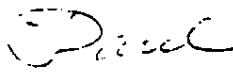
TO:

G. Roush
A2SA

We have reviewed the report of the teratology study on vinyl chloride, sponsored by MCA and conducted in the Dow Laboratories. We would agree with the conclusion that vinyl chloride was not demonstrated to be teratogenic in any animal studied.

Regarding the potentiation of maternal toxicity, it is also clear that ethanol increases the toxicity of vinyl chloride in all 3 species. Further, no evidence of teratogenic effects was found in rats or rabbits exposed to vinyl chloride plus ethanol. The evidence for a teratogenic response in mice exposed to both vinyl chloride and ethanol is, at most, only suggestive. As a result of the small number of litters and affected fetuses, the following is suggested to replace the last sentence in the conclusion section on page 9.

"No teratogenic response to the combination of vinyl chloride and ethanol was observed in either rats or rabbits. The small number of litters and fetuses involved prevent a conclusive assessment of the teratogenic effect of the combination of vinyl chloride and ethanol in mice."



Paul L. Wright

/bkp

RSV 0011077

PROPOSED STANDARD

CHANGES

REASON FOR CHANGES

DRAFT #3
5-23-76

Note:

Underlining denotes words, phrases, sentences or sections of the Proposed Standard for which changes have been suggested.

1. *Background.* Vinyl chloride (chloroethene) is a chemical Abstracts Service Registry No. 75015, is a synthetic chemical made by oxychlorination of ethylene or hydrochlorination of acetylene. It is the parent compound of a series of thermoplastic resins, polymers and polymers which are widely used for containers, wrapping films, electrical insulation, pipe, conduit, and a variety of other products. Vinyl chloride has been made commercially in this country since 1919 and present production is in excess of seven billion pounds per year. Vinyl chloride (VC) is a gas at ambient temperature and pressure and is a chlorinated hydrocarbon which has moderate fire toxicity. The previous standard set a ceiling value of 500 parts per million (ppm) (29 CFR 1093, Table G-1).

On January 22, 1974, the Occupational Safety and Health Administration (OSHA) was informed by the National Institute for Occupational Safety and Health (NIOSH) that the B. F. Goodrich Chemical Company reported that deaths of several of its employees from a rare liver cancer (angiosarcoma) may have been occupationally related. As a result of this notification and consultation with the National Institute for Occupational Safety and Health (NIOSH), and a joint inspection of the plant by OSHA, NIOSH, and the Kentucky Department of Labor, a fact-finding hearing on possible hazards involved with the manufacture and use of VC was announced on January 30, 1974 (39 FR 3874) and held on February 13, 1974.

2. *Carcinogenicity of VC.* Information produced at this hearing demonstrated that exposure of laboratory animals (mostly Sprague-Dawley rats) to VC by inhalation at and below the then current OSHA standard of 500 ppm induced tumors, including angiosarcomas of the liver. Professor Cesare Maltoni, of the Istituto di Oncologia, Bologna, Italy, reported on a series of experiments on the effect of exposure of rats, mice, and guinea pigs to VC at concentrations of 10,000; 6,000; 3,000; 250; and 50 ppm for varying periods of time (12, 43, 63). Some of the experiments have been concluded, and others are still ongoing. The experimental results indicated that tumors have been observed in groups of animals exposed to VC at concentrations as low as 250 ppm. No tumors were observed in the group of animals exposed to VC at a concentration of 50 ppm. It also

appears that the total number of tumors, as well as the numbers of angiosarcomas of the liver, decreased as the concentrations of VC were reduced to 250 ppm. Another experiment by Professor Maltoni was reported underway involving the exposure of 300 animals to VC at concentrations of 50 ppm, in order to assess in a more definitive way whether that level of exposure produces tumors in animals. Data reported by Turkelson, Oyen and Rowe (American Industrial Hygiene Association J 22: 254-261 (1961)) indicate that exposure to VC at concentrations of 50 ppm failed to induce tumors in rats, hamsters, rabbits, and dogs.

The employees of the B.F. Goodrich Chemical Company who died from angiosarcoma of the liver had an average exposure of approximately 19 years to vinyl chloride, at unknown concentrations, and variable exposures to other volatile chemicals. (TR 93). Some employees of Union Carbide, Firestone Tire and Rubber, and Goodyear were also reported in post-hearing comments to have had exposure to vinyl chloride and to have died from angiosarcoma of the liver. Finally, autopsies of four deceased employees revealed their liver angiosarcoma tumors were histologically indistinguishable from the angiosarcoma tumors observed in Professor Maltoni's experimental animals.

3. *The Emergency Temporary Standard.* On the basis of all information available at that time, and the fact that employees were being exposed at levels around the experimentally observed effect level of 250 ppm, an Emergency Temporary Standard (ETS) was promulgated on April 5, 1974 (39 FR 12342) as 29 CFR 1910.93j. This standard reduced the level from a ceiling of 500 ppm to 50 ppm ceiling. It was expressly recognized that this standard limiting exposures to a 50 ppm level was intended to be a tentative, interim standard, to be in effect no longer than six months, during which time the question of possible safe exposure to VC would be considered more fully and in the light of more information, especially results of experiments which were known to be underway at that time.

PROPOSED STANDARD

4. *Additional information.* On April 15, 1974, information and data were presented to representatives of OSHA, NIOSH and the EPA by the Industrial Bio-Test Laboratories, Northbrook, Illinois, concerning results of animal exposure studies with VC, sponsored by the Manufacturing Chemists Association (MCA). Although only preliminary in nature, these results revealed that 2 out of 200 mice exposed to VC concentrations of 50 ppm for 7 hours a day, five days a week, for approximately 7 months, developed angiosarcomas of the liver.

The Industrial Bio-Test Lab data indicate that exposure to VC at 50 ppm may well constitute a serious health hazard to employees. Also, the question of a safe level of exposure for humans cannot be determined at this time, and may continue as a matter for scientific deliberation for many years. We therefore conclude that it is now necessary to propose to change the 50 ppm level established in the ETS to as low a level as can be detected using methodologies outlined in this proposal.

(5) *The proposed permanent standard.* The requirements for a complete standard under section 6(b) of the Occupational Safety and Health Act of 1970 are much more comprehensive than the provisions of the ETS promulgated on April 5. The following proposals are responsive to the additional information on the carcinogenicity of VC, and the requirements of the Act.

A. *Level of exposure.* The proposed standard for employee exposure is set at no detectable level, as determined by a sensitive and analytical method capable of detecting a level of concentration of 1 ppm with an accuracy of 1 ppm plus or minus 50 percent. Although more sensitive methods may be available now or in the future, the method of sensitivity proposed appears to be the most feasible and generally available. A method of analysis has been recommended to OSHA by NIOSH. To minimize the number of persons at risk, a requirement would be established for regulating areas where vinyl chloride is manufactured, reacted, stored, handled, released, repackaged, or used, including operations with polyvinyl chloride containing detectable levels of vinyl chloride. Access to the areas would be limited to authorized employees.

CHANGES

A. Level of Exposure

(i) Standard effective October 5, 1974. The 8-hour time-weighted average of vinyl chloride, to which any employee may be exposed, shall not exceed ¹⁵ ppm or a ceiling concentration of ⁴⁰ ppm as determined by the monitoring prescribed in paragraph four (iv).

(ii) Standard effective ^{October 5, 1978} April 5, 1978. The 8-hour time-weighted average of vinyl chloride, to which any employee is exposed, shall not exceed ¹⁵ ppm or a ceiling concentration of ²⁵ ppm as determined by the monitoring prescribed in paragraph four (iv).

(iii) Standard effective October 5, 1977. The 8-hour time-weighted average of vinyl chloride, to which any employee may be exposed, shall not exceed ¹⁵ ppm or a ceiling concentration of ¹⁰ ppm as determined by the monitoring prescribed in paragraph four (iv).

(iv) The level of exposure shall be determined as accurately as possible by monitoring equipment commercially available.

REASON FOR CHANGES

The accuracy of the present commercially available monitoring equipment is dependent on the level measured; i.e., 25ppm $\pm$ 20%, 10ppm $\pm$ 30%, 1ppm $\pm$ 50%.

PROPOSED STANDARD

B. Monitoring. A program of monitoring would be required to establish whether there are detectable levels in regulated areas and to permit determination of employee exposures on an individual basis. Provision would also be made for an opportunity to observe monitoring by employees or their designated representatives, as required by section 8 (c) (3) of the Act.

C. Control methods. Where detectable levels of VC are monitored, two programs would be triggered; and an engineering and work practice program to reduce levels to as low as feasible; and while this is on-going, a respiratory protection program for employees in the regulated area.

Engineering controls and work practices are favored methods of compliance because they tend to avoid contamination of the ambient air in the workplace. Accordingly, it is proposed to require the institution of engineering controls and of workpractice methods as soon as feasible, and to require the use of respirators pending the institution of such controls, to supplement such controls where they are insufficient to reduce concentrations of vinyl chloride below the detectable level, in specified work situations, and in cases of emergency. The standard for continuous flow and pressure demand types of respirators is based on the recommendations of NIOSH, which has observed leakage through chemical canister respirators at high concentrations of VC.

A requirement would also be established for the provision and use of protective clothing for employees in the regulated areas. The protective clothing would minimize skin contact with VC vapor, and would provide some measure of protection from splash of liquid in the event of a spill or rupture of equipment. Food, beverages, and life products would be prohibited in the regulated area.

Written operational and emergency plans would be required, along with employee training in routine and emergency duties. Specific requirements would be established for emergency actions and for routine maintenance and decontamination operations, including vessel entry, which are known to present particular hazards.

CHANGES

A program of personnel or area monitoring would be required to establish the levels in regulated areas, as defined in paragraphs A-i, A-ii, and A-iii, and to permit determination of employee exposures on an individual basis.

Where detectable levels of VC are monitored, two programs would be triggered; an engineering and work practice program to reduce levels, as defined in paragraphs A-i, A-ii, and A-iii; and while this is on-going, a respiratory protection program for employees in the regulated area when the ceiling level is exceeded, as defined in paragraph A-i, A-ii, and A-iii.

levels as defined in paragraphs A-i, A-ii, and A-iii,

Canister respirators can be used in work areas when VC levels do not exceed 50 ppm. In VC levels exceeding 50 ppm, a continuous flow air respirator or pressure demand air respirator is to be used.

PERFORMANCE SCHEDULE, UP TO 100PPM

Delete "Specific"

Proposed abatement schedule recognizes levels of vinyl chloride in the regulated areas.

Recognizes levels of vinyl chloride in regulated areas and requires respiratory protection for employees when levels are above the proposed standard as defined in A-i, A-ii, and A-iii.

To change from detectable to proposed schedule

To provide an interim protection device where our tests demonstrate that a canister respirator can be effective up to 50ppm for 11-hours. This permits employee freedom of movement to either exit the area or procure more suitable protection.

Specific written requirements would not be practical for emergency operations. General guidelines could be provided, but in an emergency the employee handling the emergency would have to take whatever specific action is required by the nature of the emergency situation.

PROPOSED STANDARD

The purposes of operational and emergency plans and training are to apprise employees of the hazards to which they may be exposed, of the precautions they must take to avoid such hazards, and to rehearse employees in the procedures they must follow in emergencies.

D. Medical surveillance. Comprehensive requirements for employee medical examinations are proposed, including necessary tests. Some additional guidance is included for the convenience of physicians. The proposed requirements have been recommended to OSHA by NIOSH as reasonably appropriate to detect liver dysfunction which may be indicative of, or predisposing to, the development of liver angiosarcomas.

E. Records and reports. Records of monitoring, medical examinations, and entry to regulated areas are proposed, with provision of access by appropriate OSHA and NIOSH officials. Specific provisions for employee access to monitoring records are included, as well as the requirement to furnish a copy of a medical record to an employee's physician on the employee's request. Establishments conducting VC operations would be required to identify themselves to OSHA, and to report incidents (accidents) resulting in the release of vinyl chloride.

Accordingly, pursuant to sections 6 (b), 6 (c), and 8 (c) of the Occupational Safety and Health Act of 1970 (84 Stat. 1591, 1596, 1599; 29 U.S.C. 655, 657), Secretary of Labor's Order No. 12-71 (36 F.R. 8754) and 29 CFR Part 1911, it is hereby proposed to amend Part 1910 of Title 29 of the Code of Federal Regulations by revising §1910.93q as set forth below.

Written data, views, and arguments concerning the proposals may be mailed to the Docket Officer, Docket O-511-26, Room 230, 1726 M Street, N.W., Occupational Safety and Health Administration, Washington, D.C. 20210, postmarked not later than June 10, 1974.

Pursuant to 29 CFR 1911.11 (b) and (c), interested persons may file objections to the proposals, requesting an informal hearing with respect thereto, in accordance with the following conditions:

CHANGES

to report incidents (accidents) resulting in the release of vinyl chloride sufficient to produce acute symptoms among workers exposed or having contact with vinyl chloride.

REASON FOR CHANGES

Change to follow NIOSH's March 11, 1974 definition of an emergency.