APPENDIX C—MEDICAL SURVEILLANCE GUIDELINES FOR BENZENE

I. ROUTE OF ENTRY

Inhalation; possible skin absorption.

II. TOXICOLOGY

Benzene is primarily an inhalation hazard. Systemic absorption cause depression of the hematopoietic system. Inhalation of high concentrations can affect the central nervous system function. Aspiration of small amounts of liquid benzene immediately causes pulmonary edema and hemorrhage of pulmonary tissue. Skin absorption through intact skin is negligible. However, absorption will be accelerated in the case of injured skin, and benzene may be more readily absorbed if it is present in a mixture or as a contaminate in solvents which are readily absorbed. Defatting action of benzene may produce primary irritation upon repeated or prolonged contact with the skin. High concentrations are irritating to the mucous membranes of the eyes, nose, and respiratory tract.

III. SIGNS AND SYMPTOMS

Benzene is poorly absorbed through the skin, however, direct contact may cause erythema or blistering. Repeated or prolonged contact may result in drying, scaling, dermatitis, or precipitate development of secondary skin infections. Local effects of benzene vapor or liquid on the eye are slight. Only at very high concentrations is there any smarting sensation in the eye. Droplet contamination of the eye by benzene causes a moderate burning sensation, but only slight transient injury of the epithelial cell, with the eye recovering rapidly. Inhalation of high concentrations of benzene may have an initial stimulatory effect on the central nervous system characterized by exhilaration, nervous excitation, and/or giddiness, followed by a period of depression, drowsiness, fatigue, or vertigo. There may be sensation of tightness in the chest accompanied by breathlessness and ultimately the victim may lose consciousness. Convulsions and tremors occur frequently, and death may follow from respiratory paralysis or circulatory collapse in a few minutes to several hours following severe exposures. The insidious and often irreversible effect on the blood-forming system of prolonged exposure to small quantities of benzene vapor is of extreme importance. These effects have been noted to occur at concentrations of benzene which may not cause irritation of mucous membranes, or any unpleasant sensory effects. Early signs and symptoms of benzene morbidity are varied and vague, and not specific for benzene exposure. Subjective complaints of headache, dizziness, and loss of appetite may precede or precede clinical symptomology. Bleeding from the nose, gums, or mucous membranes and the development of purpuric spots may occur as the condition progresses. Rapid pulse and low blood pressure in addition to a physical appearance of anemia may accompany a subjective complaint of shortness of breath. Clinical evidence of leucopenia and anemia are the most common abnormalities reported, however, macrocytosis and thrombocytopenia are also frequently present. Bone marrow may appear normal, aplastic, or hyperplastic and may not in all situations correlate with peripheral blood findings indicating hypo-hyper-activity of blood forming tissues. There are great variations in the susceptibility to benzene morbidity which prohibits the identification of "typical" blood picture. The effects of prolonged benzene exposure may appear after several weeks or years after the actual exposure has ceased. Development of leukemia also results from exposure to benzene.

IV. TREATMENT

Remove from exposure immediately, give oxygen or artificial resuscitation if indicated. Flush eyes and wash contaminated skin. Symptoms of non-specific nervous disturbances may persist following severe exposures. Recovery from mild exposures is usually rapid and complete.

V. SURVEILLANCE AND PREVENTIVE CONSIDERATIONS

A. *Other considerations.* Benzene can cause both acute and chronic effects. It is important that the physician become familiar with the operating conditions in which exposure to benzene occurs. Those with skin disease may not tolerate the wearing of protective clothing and those with chronic respiratory disease may not tolerate the wearing of negative pressure respirators.

B. *Surveillance and screening.* Medical histories and laboratory examinations are required for each employee subject to exposure to benzene. The employer must screen employees for history of certain medical conditions (listed below) which might place the employee at increased risk from exposure.

1. *Liver disease.* The primary site of biotransformation and detoxification of benzene is the liver. Liver dysfunctions likely to inhibit the conjugation reactions will tend to promote the toxic actions of benzene. These precautions should be considered before exposing persons with impaired liver function to benzene vapors.

2. *Renal disease.* Although benzene is not known as a kidney toxin the importance of the organ in the elimination of toxic substances and metabolites justifies special consideration in those with possible impairment of renal function.

3. *Skin disease.* Benzene is a defatting agent and can cause dermatitis on prolonged exposure. Persons with preexisting skin disorders may be more susceptible to the effects of benzene.

4. *Blood dyscrasias.* Benzene is a hematopoietic depressant. Persons with existing blood disorders may be more susceptible to the effects of benzene.

REFERENCES

1. Grant, W. Morton: Toxicology of the Eye, (Second Edition), Charles C. Thomas, Illinois, 1974, page 655.

2. Browning, Ethel: Toxicity and Metabolism of Industrial Solvents, Elsevier Publishing Company, Amsterdam, 1965, pp. 440–447.

3. Patty, F. A.: Industrial Hygiene and Toxicology, Volume II-Toxicology, Interscience Publishers, New York, 1963, pp. 1755–1758.

4. Gerade, H. W.: Toxicology and Biochemistry of Aromatic Hydrocarbons, Elsevier Publishing Company, Amsterdam, 1960, pp. 98–108.

(Secs 4, 6, 8, 84 Stat. 1593, 1599 (29 U.S.C. 653, 655, 657); Secretary of Labor's Order 8–76 (41 FR 25059); 29 CFR Part 1911.)

[FR Doc.77–14959 Filed 5–26–77;8:45 am]

EPA PROPOSED REGULATIONS SETTING NATIONAL EMISSION STANDARDS FOR VINYL CHLORIDE AS A HAZARDOUS AIR POLLUTANT

42 FR 28154, June 2, 1977

ENVIRONMENTAL PROTECTION AGENCY

[40 CFR Part 61]

[FRL 728–5]

VINYL CHLORIDE

National Emission Standards for Hazardous Air Pollutants

AGENCY: Environmental Protection Agency.

ACTION: Proposed rule.

SUMMARY: The proposed amendments are being made to the vinyl chloride standard which has promulgated October 21, 1976, and would apply to new and existing ethylene dichloride, vinyl chloride, and polyvinyl chloride plants. The standard and the proposed amendments implement the Clean Air Act and are based on the Administrator's determination that vinyl chloride is a hazardous air pollutant. The intended effect of the proposed amendments is to require improved effectiveness of control technology at existing plants, impose more stringent emission limits on new sources, and prohibit an emission increase within the vicinity of an existing source due to the construction of a new source.

DATES: Comments must be received on or before August 1, 1977.

ADDRESSES: Comments should be submitted (preferably in triplicate) to the Emission Standards and Engineering Division, Environmental Protection Agency, Research Triangle Park, North Carolina, Attention: Mr. Don R. Goodwin.

All public comments received may be inspected and copied at the Public Information Reference Unit (EPA Library), Room 2922, 401 M Street, SW., Washington, D.C.

FOR FURTHER INFORMATION CONTACT:

Don R. Goodwin, Emission Standards and Engineering Division, Environmental Protection Agency, Research Triangle Park, North Carolina 27711. Telephone No. 919–688–8146, ext. 271.

SUPPLEMENTARY INFORMATION:

BACKGROUND

On October 21, 1976, EPA promulgated a standard for vinyl chloride under the authority of section 112(b)(1)(B) of the Clean Air Act, as amended (41 FR 46561). The standard applies to ethylene dichloride, vinyl chloride, and polyvinyl chloride plants.

On November 19, 1976, the Environmental Defense Fund (EDF) petitioned the United States Court of Appeals for the District of Columbia Circuit to review

the standard. Motions to intervene were subsequently filed on behalf of the Society of the Plastics Industry, Inc., the Goodyear Tire and Rubber Company and Air Products and Chemicals, Inc., and were granted by order of the Court on January 18, 1977. On March 24, 1977, EDF and EPA moved to dismiss the proceedings in view of a settlement agreement requiring EPA to take certain additional actions. These include a restatement of EPA's policy for regulating carcinogens under section 112 of the Clean Air Act; the proposal of amendments which would require increased efficiency of existing control equipment, require more stringent control at new sources, and prohibit increases in emissions within the vicinity of an existing source due to new construction; and the initiation of a review of the vinyl chloride standard three years after the promulgation of the amendments.

Zero Emission Goal

The vinyl chloride standard has been criticized for allegedly placing unwarranted emphasis on technological rather than health considerations. Although EPA disagrees with this criticism, it seems appropriate to restate EPA's approach to the regulation of carcinogens in general and under Section 112 of the Clean Air Act, and to explain how the vinyl chloride standard and the proposed amendments are consistent with this approach and with the protection of public health.

On May 25, 1976, EPA published interim procedures and guidelines for health risk and economic impact assessments of suspected carcinogens (41 FR 21402), which define EPA's approach to regulatory action for suspect carcinogens. As indicated in that publication, there are two steps involved in the decision-making process with regard to the regulation of a potential carcinogen. Although different EPA statutory authorities impose different requirements, in general two decisions must be made with regard to each potential carcinogen. The first decision is whether a particular substance constitutes a cancer risk. The second decision is what regulatory action, if any, should be taken to reduce that risk.

In deciding whether a cancer risk exists, EPA will consider a substance a presumptive cancer risk when it causes a statistically significant excess incidence of benign or malignant tumors in humans or animals. In the case of vinyl chloride, EPA evaluated all available data and concluded that a cancer risk exists. In deciding how and whether to regulate, EPA examined section 112 of the Clean Air Act. Section 112 of the Act requires that emission standards be set "at the level which in the judgment of the Administrator provides an ample margin of safety to protect the public health from such hazardous air pollutants." This requirement appears to assume that each pollutant regulated will have a threshold level of effects below which no health effects will occur. As explained in the documentation for the current standard (40 FR 59532, December 24, 1975; 41 FR 46560, October 21, 1976), it has not been possible to determine if there is a threshold level of effects for vinyl chloride and it is not certain that such a threshold may be determined in the near future. In the absence of strong evidence to the contrary, then, the only level of vinyl chloride which would appear to be absolutely protective of health is zero, which may be achievable only by banning vinyl chloride emissions completely. That, in turn, would require closing the entire industry. As explained in the earlier rulemaking it is not clear that Congress would have intended this result, so instead EPA required the lowest level achievable using technological means. (See 40 FR 59534 and 41 FR 46562).

In order to insure that the standard continues to approach the only level of emissions which is known to be absolutely protective of health, namely zero emissions, EPA is proposing amendments which require more efficient use of existing control technology at existing plants and more effective controls at new plants, and which encourage technology to reach this goal without banning vinyl chloride.

More Stringent Standards for Existing Sources

EPA is proposing amendments which would require sources presently subject to a 10 ppm emission limit to reduce emissions to 5 ppm within three years of promulgation of the amendments. The affected sources include ethylene dichloride purification; vinyl chloride formation and purification; reactors, strippers; mixing, weighing, and holding containers; monomer recovery systems; and fugitive emissions which have been captured in accordance with the existing regulation.* If the owner or operator of a source believed that a control system would not be capable of meeting the 5 ppm limit, he would be able to request that the Administrator approve an interim emission limit for that source. Such requests would have to be made one year before the compliance date. In requesting an interim emission limit, the owner or operator would have to submit supportive data and meet with EPA to discuss his particular problems in attaining compliance. The meeting would be announced in the Federal Register and any interested party would be allowed to attend and submit written or oral comments. If an interim emission limit were granted to the source, the required emission level would be specified in a written notification from EPA and in the Federal Register. Each source granted an interim emission limit would be reviewed every three years to determine whether emissions could be reduced to 5 ppm, or at least to a lower interim emission limit.

In proposing the reduction from 10 to 5 ppm, it is not EPA's intent that a control system which has been installed to meet the 10 ppm emission limit be removed and replaced with another more efficient control system or that a second control system be added behind the first control system. The purpose of the proposed amendment is to force owners and operators to maximize the effectiveness of existing control systems.

More Stringent Standards for New Sources

The proposed amendments would also require more stringent controls for new sources; i.e., sources for which construction is commenced after the date of proposal of these amendments. According to § 61.02 of the General Provisions, "commenced" means that an owner or operator has undertaken a continuous program of construction or modification or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of construction or modification.

New sources of types which would be subject to the 10 ppm emission limit under the current standard would be required under the amendments to meet a 5 ppm emission limit at the time of startup. With new sources there would be no provision allowing requests for EPA approval of an interim emission limit. New sources would be required to meet the more stringent emission limit at the time of startup, because they have an opportunity to design their equipment to meet the 5 ppm emission limit at the time construction is commenced. Existing sources, on the other hand, require time to maximize the effectiveness of their control systems.

The proposed amendment would also require ethylene dichloride-vinyl chloride plants to control emissions from new oxychlorination reactors to 5 ppm. This requirement is based on installation of a recycling and oxygen feed system with an incinerator or equivalent control device. The current standard limits emissions from the oxychlorination reactor to 0.2 g/kg (0.0002 lb/lb) of the 100 percent ethylene dichloride product from the oxychlorination reactor. This emission limit can be met by changing process parameters, rather than installing a control device. During the development of the current standard EPA considered requiring existing sources to control emissions with an incinerator or equivalent technology, but rejected this approach because a large quantity of fuel would be required to reduce emissions from a relatively small source. An existing oxychlorination reactor typically has a large volume, low hydrocarbon effluent gas stream, and large quantities of supplemental fuels would be required for combustion of its emissions.

A new plant can reduce the volume of its effluent gas stream and make it more concentrated by recycling the gas stream and using oxygen instead of air to feed

*As an explanatory note, paragraph (b) of § 61.65 contains nine fugitive emission regulations. For several of these, the fugitive emissions are required to be captured and ducted to a control device meeting 10 ppm. According to the proposed amendments, the emissions from this control device would have to be reduced to 5 ppm in the same way any other source currently required to meet 10 ppm would have to do. Rather than incorporating both the 5 and 10 ppm emission limits in each paragraph in § 61.65(b), a separate paragraph (c) containing these emission limits is being added to § 61.65. All the other paragraphs in (b) are cross-referenced in paragraph (c).

into the process. (3, 4) the current standard was not based on this technology because it was not considered feasible to retrofit existing plants so that they could use oxygen instead of air. The recycling and oxygen feed methodology is considered feasible for new oxychlorination reactors because it can be incorporated at the time of construction. Since the use of this technology would eliminate the supplemental fuel problem referred to above, it is EPA's judgment that new oxychlorination reactors should be controlled to the same extent that is proposed for other emission sources.

The proposed amendment also includes a more stringent emission limit for new polyvinyl chloride resins being processed in equipment following the stripping operation. That is, the amendment would apply to resins for which production for the purpose of marketing was commenced after the proposal of the amendment. The amendment would require all new resins except new dispersion resins to be stripped to 100 ppm and new dispersion resins to be stripped to 500 ppm. These limits for new products would be one-fourth of the limits contained in the standard for existing products. Consistent with the current standard, the amendment would permit the use of control devices rather than stripping technology to meet the emission limit. In this case equipment being used to process all new resins except new dispersion resins would have to be controlled to 0.01 kg/kg product and the equipment used for new dispersion resins would have to be controlled to 0.05 kg/kg product.

A "new source" is defined in 40 CFR 61.02 as a stationary source, the construction or modification of which is commenced after proposal of a standard. There was some question based on this definition as to whether the amendment to the stripping standard for new sources should apply to new polyvinyl chloride resins or the installation of new equipment following the stripper. If the applicability of the amendment for new sources were based on the installation of new equipment following the stripper, it would be difficult to determine what constitutes a new source at an existing plant. This is based on the reasoning that the stripping standard requires that all equipment following the stripper in the process be controlled as a unit. The series of equipment following the stripper includes pumps and conveying equipment which might be expected to be replaced on a frequent and routine basis. Replacing one of these pieces of equipment would in effect cause the whole series of equipment following the stripper to have to meet the standard for new sources. In other words, all resins processed in the series of the equipment would have to meet the lower standard even though only a minor part of the equipment had been replaced.

EPA decided that a more reasonable and direct approach was to make the proposed amendment apply to the production of new polyvinyl chloride resins. This is based on the reasoning that emissions from the equipment following the stripper are a function of the amount of vinyl chloride left in the resin after the stripping operation is completed; i.e., the resin is the source of the emissions rather than the equipment. The same equipment can be used to process different resin grades. Variations in the emissions from the equipment are a function of the resin being processed rather than the characteristics of the equipment. The control technology which is used for the equipment following the stripper is likewise more directly linked to the resin than the equipment. Stripping is used to control the emissions due to the vinyl chloride in the resin before the resin is processed in the equipment.

Before the hazards of vinyl chloride became known, stripping technology was employed by polyvinyl chloride manufacturers to recover raw materials for economic purposes. As a result of a standard promulgated by the Occupational Safety and Health Administration (39 FR 35890), some companies investigated improvements in stripping methodology for emission control purposes. (1)

Optimum stripping consists of a set of operating conditions which must be developed experimentally on an individual basis for the many resins. In developing the current standard, EPA recognized that stripping technology for dispersion resins had not been refined to the same extent as it had been for other resins and that there was more difficulty in stripping dispersion resins than other resins. For this reason a less stringent emission limit was established for dispersion resins. Dispersion resins are permitted a higher emission limit under the proposed amendment for the same reason.

EPA believes that for some resins, companies have already developed stripping technology which would meet the proposed amendment. (2) For other resins, the proposed standard would require additional improvement in stripping technology. If stripping technology has not been developed to the extent necessary to meet the proposed amendment for a particular resin, the manufacturer would have the option of developing the technology or not producing the resin.

The current standard, unlike the proposed amendment, was not based on the premise that an owner or operator would have the option of not producing a particular resin. It is EPA's judgment that the owner or operator making a new product has more freedom of choice than the owner or operator already making a particular product in selecting those resins which are to be produced. EPA's standard would be included in the variables under consideration when decisions are being made as to which resins are to be produced.

The proposed amendment would apply to any new source, whether it constituted replacement of an existing source in an existing plant, the expansion of an existing plant, or part of an entirely new plant. That is, if a new oxychlorination reactor or a new polyvinyl chloride reactor were installed at an existing plant, it would be subject to the emission limits for new sources. This means that as existing sources are gradually replaced with new sources in an existing plant, the overall emission level from that existing plant would be reduced.

Emission Offset

Because the present vinyl chloride standard focuses on reducing emissions rather than attaining a particular ambient air quality concentration, there is no provision for limiting the size of plants or the clustering of plants in a geographical area. The doubling of the size of an existing plant or the construction of a new plant beside an existing plant would considerably increase the ambient air concentrations of vinyl chloride in the vicinity of the plant(s) even if the vinyl chloride standard was met. EPA determined at the time of promulgation of the current standard that the costs of prohibiting the production of vinyl chloride and polyvinyl chloride were too high and the continued operation of existing plants should be allowed. EPA believes, however, that the standard should include a mechanism for prohibiting an increase in ambient concentrations of vinyl chloride due to new construction in areas where existing sources are already located.

Accordingly, EPA is proposing an amendment which would prohibit an increase in emissions within 8 kilometers (km) (approximately five miles) of an existing source due to the construction of a new emission source. This means that if a new source were added to an existing plant, the increase in emissions due to that new source would have to be offset by a reduction in emissions from other existing sources within that plant or at other plants within 8 km of the construction site of the new source. Similarly, a new plant could not be constructed within 8 km of an existing plant(s) unless the emission increase due to the new plant were offset by an emission reduction at the existing plant or plants. This provision may result in few existing plants being expanded and few new plants being constructed in the vicinity of existing plants. However, the proposed amendment does not preclude this possibility.

The offset provision would apply only to new construction which results in an increase in production rate. Replacing or adding equipment such as pumps, compressors, agitators, sampling equipment and unloading hoses is a routine practice at existing plants. Additions of equipment of this nature would, in and of itself, be expected to result in little, if any, increase in emissions. In EPA's judgment, a plant should not be required to prove this fact each time one of these pieces of equipment is added. The addition of this type of equipment in conjunction with major process equipment, however, is likely to result in both an increase in emissions as well as an increase in production rate, and is therefore covered by the offset provision.

If the offset provision were adopted, the reduction in emissions could be achieved in the production rate of an existing source or sources. The baseline emission rate would be determined based on the maximum production rate which

had been attained by each existing source. The allowable emission rate for each source would be based on the maximum production rate at which that source would be operated in the future.

Also, if the emissions from an existing source were already below the emission limit applicable to it, the proposed amendment would give the source credit for the difference between the emission limit and the actual emission level. That is the baseline emission rate would be based on the standard rather than on an emission test. It is EPA's judgment that this is a more equitable approach than penalizing a source which has already taken measures to reduce emissions below the standard. Such a source would have less room for further reducing emissions.

The emission limits applicable to both the existing and new sources involved in the offset arrangement would be contained in the approval of new construction granted by the Administrator under 40 CFR 61.08.

EPA believes that a policy of no net increase in emissions due to new construction is justified because of the hazardous nature of vinyl chloride. However, EPA recognizes the potential difficulties in implementing such a policy and interested persons are urged to submit comments and factual information relating to this policy.

Review of Standard

EPA plans to undertake a full-scale review of Subpart F of 40 CFR Part 61 beginning three years from the promulgation of any amendments. In the study EPA will review information concerning technological advances in the control of vinyl chloride emissions to determine what further changes might then be appropriate to move toward the goal of zero vinyl chloride emissions. EPA will also consider recent health data to determine whether the approach for regulating vinyl chloride should be altered.

Environmental Impact

The proposed amendment, in contrast to the current standard, would encourage the development of new technology and improvements in existing technology and would have the following three positive environmental impacts: (1) further reduction of emissions at existing plants, (2) no increase in emissions within 8 km of an existing source, and (3) lower emissions from new sources than would be accomplished through the current standard regardless of the construction site. These environmental impacts would provide progress toward the ultimate goal of zero emissions without banning vinyl chloride, and in the process would provide additional protection of public health by further minimizing the health risks to the people living in the vicinity of existing plants and to any additional people who are exposed as a result of new construction.

Specifically, for those existing sources which are currently subject to a 10 ppm emission limit, emissions would be reduced by half within three years after the promulgation date of these amendments. At both an existing average-sized ethylene dichloride-vinyl chloride plant and an existing average-sized polyvinyl chloride plant, which contain other sources than the ones required to meet a 5 ppm emission limit, it is estimated this will have the effect of reducing total emissions by less than one percent. Emissions at existing plants would be further reduced as existing oxychlorination reactors are replaced with new oxychlorination reactors and as new polyvinyl chloride resins are produced to replace existing ones.

Under the proposed amendment, emissions from new plants would be considerably lower than they would be under the current standard. For a typical new average-sized ethylene dichloride-vinyl chloride plant (318×10^6 kg/yr or 700×10^6 lb/yr produced), the hourly emissions would be 5.1 kg (11.5 lb) instead of 10.3 kg (23.1 lb). For a typical new average-sized dispersion polyvinyl chloride plant (46×10^6 kg/yr or 100×10^6 lb/yr production), the emissions would be about 9 kg/hr (20 lb/hr) instead of 17.5 kg/hr (39 lb/hr) and for a typical new average-sized suspension polyvinyl chloride (68×10^6 kg/yr or 150×10^6 lb/yr production) the emissions would be 13.5 kg/hr) (30 lb/hr) instead of 16 kg/hr (36 lb/hr). These emissions are calculated based on the emission factors published in the documentation for the existing standard. (1) Ambient air concentrations are expected to be reduced proportionately.

The only negative environmental impact would be an increase in hydrogen chloride emissions at ethylene dichloride-vinyl chloride plants if incineration were used to control emissions from new oxychlorination reactors. However, due to the corrosion problems which would otherwise occur on plant property and in the community, plants are expected to use scrubbers to control the hydrogen chloride emissions. The proposed amendment is not expected to have a significant impact on energy consumption.

Economic Impact

The potential economic impacts of the proposed standard are:

(1) Costs for research and development of improved methodology for operation of existing control technology so that it can be used to meet the 5 ppm emission limit.

(2) Costs for research and development of improved stripping techniques to meet the standard for new polyvinyl chloride resins.

(3) Cost of research and development or licensing for converting over to the oxygen system for a new oxychlorination reactor.

(4) Possibly increased transportation costs of raw materials in the case that the offset policy results in the construction of a new plant farther from an existing plant than it otherwise would have been.

(5) Costs of building a new plant more than 8 km from an existing plant in the event that the offset requirement precluded the expansion of an existing plant.

(6) Delay in the production of a particular resin due to time spent developing stripping technology for that resin.

(7) No growth in the production of a particular resin due to the inability to strip that resin to required levels.

The types of costs which have been named would be difficult to quantify. The costs would be expected to vary considerably from one plant to another depending on the amount of research and development than had already been done, the extent to which technology could be transferred from other plants and processes, and the plans for new construction.

One area in which cost estimates can be generated is the use of an oxygen-recycle oxychlorination process as opposed to an air-based system. The proposed amendment does not require the use of the oxygen-recycle system, but many plants would be expected to employ this system to avoid the high costs of incinerating the high volume gas stream from a typical air-based system. The primary cost of using the oxygen-recycle system is the cost of the oxygen itself. The cost of the oxygen for a particular plant would depend on whether the plant was located where there is a considerable demand for both the oxygen and nitrogen products of air separation. According to one recent article, if it is assumed that such a demand exists, the cost of the oxygen ($14.34/ton) would be approximately equivalent to the cost of compressing air for use in the air-based system. (1) Another report in which this assumption was not made and the economics of the air and oxygen systems were being compared, it was concluded that overall production economics "favor the oxygen process even if vent gas incineration would not be required for an air-based plant since the sum of all remaining advantages offered by oxygen-based plant operation more than outweighs the incremental cost for the oxygen feed." (2)

Miscellaneous: The Administrator invites comments on all aspects of the proposed amendments.

(Section 112 of the Clean Air Act, sec. 4(a) of Pub. L. 91-604, 84 Stat. 1685 (42 U.S.C. 1857c-7) and section 301(a) of the Clean Air Act, sec. 2 of Pub. L. No. 90-148, 84 Stat. 504 as amended by sec. (15)(c)(2) of Pub. L. 91-604, 84 Stat. 1713 (42 U.S.C. 1857 g(a)). Secs. 61.67 and 61.68 also proposed under the authority of section 114 of the Clean Air Act, as added by sec. 4(a) of Pub. L. 91-604, 84 Stat. 1687 and amended by Pub. L. 93-319, sec. 6(a)(4), 88 Stat. 259 (42 U.S.C. 1857c-9).)

Note.—The Environmental Protection Agency has determined that this document does not contain a major proposal requiring preparation of an Economic Impact Analysis under Executive Orders 11821 and 11949 and OMB Circular A-107.

Dated: May 27, 1977.

Douglas M. Costle,
Administrator.

References

(1) *Standard Support and Environmental Impact Statement: Emission Standard for Vinyl Chloride*, EPA-450 12-76-009, October, 1976.

(2) "Goodrich Reports Impressive Progress in Solving Vinyl Chloride Problem," *American Paint and Coatings Journal*, Vol. 60, No. 31, January 12, 1976, p. 24.

(3) E. W. Wilmer and R. E. Feathers, "Oxygen Gives Low Cost VCM," *Hydrocarbon Processing*, March 1976, pp. 81-84.

(4) Peter Reich, "Air or Oxygen For VCM?," *Hydrocarbon Processing*, March, 1976, pp. 85-89.

It is proposed that Subpart F of 40 CFR Part 61 be amended as follows:

1. In § 61.08, paragraph (b) is revised to read as follows:

§ 61.08 Approval by the Administrator.

* * * * *

(b) If the Administrator determines that a stationary source for which an application pursuant to § 61.07 was submitted will not, if properly operated, cause emissions in violation of the standard or violation of § 61.73, he will approve the construction or modification of such source.

* * * * *

2. Section 61.62 is revised to read as follows:

§ 61.62 Emission standard for ethylene dichloride plants.

An owner or operator of an ethylene dichloride plant shall comply with the requirements of this section and § 61.65.

(a) Ethylene dichloride purification: Except as provided in § 61.65(a), the concentration of vinyl chloride in all exhaust gases discharged to the atmosphere from any equipment used in ethylene dichloride purification is not to exceed the appropriate emission limit as follows:

(1) Each source for which construction had commenced on or before (date of proposal of these amendments), 10 ppm until (date three years after promulgation of these amendments) and 5 ppm after (date three years after the promulgation of these amendments).

(2) Each source for which construction commenced after June 2, 1977, 5 ppm.

(b) Oxychlorination reactor: Except as provided in § 61.65(a), emissions of vinyl chloride to the atmosphere are not to exceed the appropriate emission limit as follows:

(1) Each source for which construction had commenced on or before (date of proposal of these amendments), 0.2 g/kg (0.0002 lb/lb of the 100 percent ethylene dichloride product from the oxychlorination reactor.

(2) Each source for which construction commenced after June 2, 1977, 5 ppm.

(c) The requirements of this section do not apply to equipment that has been opened, is out of operation and met the requirement in § 61.65(b)(6)(i) before being opened.

3. Section 61.63 is revised to read as follows:

§ 61.63 Emission standard for vinyl chloride plants.

An owner or operator of a vinyl chloride plant shall comply with the requirements of this section and § 61.65.

(a) Vinyl chloride formation and purification: Except as provided in § 61.65(a), the concentration of vinyl chloride in all exhaust gases discharged to the atmosphere from any equipment used in vinyl chloride formation and/or purification is not to exceed the appropriate emission limit as follows:

(1) Each source, for which construction had commenced on or before June 2, 1977, 10 ppm until (date three years after promulgation of these amendments) and 5 ppm after (date three years after promulgation of these amendments).

(2) Each source for which construction commenced after June 2, 1977, 5 ppm.

(b) The requirements of this section do not apply to equipment that has been opened, is out of operation, and met the requirement in § 61.65(b)(6)(i) before being opened.

4. Section 61.64 is amended by revising paragraphs (a)(1), (b), (c), (d) and (e) and by adding paragraph (f) as follows:

§ 61.64 Emission standard for polyvinyl chloride plants.

An owner or operator of a polyvinyl chloride plant shall comply with the requirements of this section and § 61.65.

(a) Reactor: The following requirements apply to reactors:

(1) Except as provided in paragraph (a)(2) of this section and § 61.65(a), the concentration of vinyl chloride in all exhaust gases discharged to the atmosphere from each reactor is not to exceed the appropriate emission limit as follows:

(i) Each source for which construction had commenced on or before June 2, 1977 10 ppm until (date three years after promulgation of these amendments) and 5 ppm after (date three years after promulgation of these amendments).

(ii) Each source for which construction commenced after June 2, 1977, 5 ppm.

* * * * *

(b) Stripper: Except as provided in § 61.65(a), the concentration of vinyl chloride in all exhaust gases discharged to the atmosphere from each stripper is not to exceed the appropriate emission limit as follows:

(1) Each source for which construction had commenced on or before June 2, 1977 10 ppm until (date three years after promulgation of these amendments) and 5 ppm after (date three years after final promulgation of these amendments).

(2) Each source for which construction commenced after June 2, 1977, 5 ppm.

(c) Mixing, weighting, and holding containers: Except as provided in § 61.65(a), the concentration of vinyl chloride in all exhaust gases discharged to the atmosphere from each mixing, weighing, or holding container in vinyl chloride service which precedes the stripper (or the reactor if the plant has no stripper) in the plant process flow is not to exceed the appropriate emission limit as follows:

(1) Each source, for which construction had commenced on or before (date of proposal of these amendments), 10 ppm until (date three years after promulgation of these amendments) and 5 ppm after (date three years after promulgation of these amendments).

(2) Each source for which construction commenced after June 2, 1977, 5 ppm.

(d) Monomer recovery system. Except as provided in § 61.65(a), the concentration of vinyl chloride in all exhaust gases discharged to the atmosphere from each monomer recovery system is not to exceed the appropriate concentration as follows:

(1) Each source for which construction had commenced on or before (date of proposal of these amendments), 10 ppm until (date three years after promulgation of these amendments) and 5 ppm after (date three years after promulgation of these amendments).

(2) Each source for which construction commenced after June 2, 1977, 5 ppm.

(e) Sources following the stripper(s): The following requirements apply to emissions of vinyl chloride to the atmosphere from the combination of all sources following the stripper(s) [or the reactor(s) if the plant has no stripper] in the plant process flow including, but not limited, to centrifuges, concentrators, blend tanks, filters, dryers, conveyor air discharges, baggers, storage containers, and inprocess wastewater.

(1) In polyvinyl chloride plants using stripping technology to control vinyl chloride emissions:

(i) For a grade or grades of polyvinyl chloride resin which have been produced by the plant on or before June 2, 1977, the weighted average residual vinyl chloride concentration in all the grades processed through the stripping operation on each calendar day, measured immediately after the stripping operation is completed, may not exceed the appropriate emission limit as follows:

(A) 2,000 ppm for polyvinyl chloride dispersion resins, excluding latex resins;

(B) 400 ppm for all other polyvinyl chloride resins, including latex resins, averaged separately for each type of resin;

(ii) For a grade or grades of polyvinyl chloride resin which have not been produced by the plant on or before June 2, 1977, the weighted average residual vinyl chloride concentration in all the grades processed through the stripping operation on each calendar day, measured immediately after the stripping operation is completed, may not exceed the appropriate emission limit as follows:

(A) 500 ppm for polyvinyl chloride dispersion resins, excluding latex resins;

(B) 100 ppm for all other polyvinyl chloride resins, including latex resins, averaged separately for each type of resin; or

(2) In polyvinyl chloride plants controlling vinyl chloride emissions with technology other than stripping or in addition to stripping:

(i) For sources being used to process a grade or grades of polyvinyl chloride

resin all of which had been produced by the plant on or before June 2, 1977:

(A) 2 g/kg (0.003 lb/lb) product from the stripper(s) [or reactor(s) if the plant has no stripper(s)] for dispersion polyvinyl chloride resins, excluding latex resins, with the product determined on a dry solids basis;

(B) 0.4 g/kg (0.004 lb/lb) product from the stripper(s) (or reactor(s) if the plant has no stripper(s)) for all other polyvinyl chloride resins, including latex resins, with the product determined on a dry solids basis.

(ii) For sources being used to process any grade of polyvinyl chloride resin not produced by the plant on or before June 2, 1977:

(A) 0.5 g/kg (0.0005 lb/lb) product from the stripper(s) (or reactor(s) if the plant has no stripper(s)) for dispersion polyvinyl chloride resins, excluding latex resins, with the product determined on a dry solids basis;

(B) 0.1 g/kg. (0.0001 lb/lb) product from the strippers (or reactor(s) if the plant has no stripper(s)) for all other polyvinyl chloride resins, including latex resins, with the product determined on a dry solids basis.

(f) The requirements of paragraphs (b), (c), and (d) of this section do not apply to equipment that has been opened, is out of operation, and met the requirement in § 61.65(b)(6)(i) before being opened.

5. Section 61.65 is amended as follows:

A. By replacing the phrase "10 ppm" with the phrase "the appropriate emission limit specified in § 61.65(c)" in paragraphs (b)(1)(ii), (b)(2), (b)(3)(i), (b)(3)(ii), (b)(3)(iii), (b)(3)(iv), (b)(3)(v), (b)(5), (b)(6)(ii), and (b)(9)(ii);

B. By revising paragraph (c) and adding paragraph (d) as set forth below.

§ 61.65 Emission standard for ethylene dichloride, vinyl chloride, and polyvinyl chloride plants.

* * * * *

(c) The emission limit which is not to be exceeded is as follows: (1) Each source, for which construction had commenced on or before June 2, 1977, 10 ppm until (date three years after promulgation of these amendments) and 5 ppm after (date three years after promulgation of these amendments).

(2) Each source for which construction commenced after June 2, 1977, 5 ppm.

(d) The requirements in paragraphs (b)(1), (b)(2), (b)(5), (b)(6), (b)(7) and (b)(8) of this section are to be incorporated into a standard operating procedure, and made available upon request for inspection by the Administrator. The standard operating procedure is to include provisions for measuring the vinyl chloride in equipment ≥4.75 m^3 (1250 gal) in volume for which an emission limit is prescribed in § 61.65(b)(6)(i) prior to opening the equipment and using Test Method 106, a portable hydrocarbon detector, or an equivalent or alternative method. The method of measurement is to meet the requirements in § 61.67(g)(5)(i)(A) or (g)(5)(i)(B).

6. In § 61.67, paragraph (a) is revised to read as follows:

§ 61.67 Emission tests.

(a) Unless a waiver of emission testing is obtained under § 61.13, the owner or operator of a source to which this subpart applies shall test emissions from the source as follows:

(1) For an existing source or a new source which has an initial startup date preceding October 21, 1976:

(i) Within 90 days following October 21, 1976, and

(ii) For those sources subject to §§ 61.62(a); 61.63(a); 61.64 (a)(1), (b), (c), and (d); and/or 61.65(b)(1), (b)(2), (b)(3), (b)(5), (b)(6), and/or (b)(9), within 90 days following (date three years after the promulgation date of these amendments).

(2) For a new source for which initial startup occurs after October 21, 1976, within 90 days of startup.

* * * * *

7. In § 61.68, paragraph (c) is revised to read as follows:

§ 61.68 Emission monitoring.

* * * * *

(c) A daily span check is to be conducted for each vinyl chloride monitoring system used. For all of the sources listed in paragraph (a) of this section, except for the one for which an emission limit is prescribed in § 61.62(b)(1), the daily span check is to be conducted with a concentration of vinyl chloride equal to the concentration emission limit applicable to it. For a source subject to the emission limit prescribed in § 61.62(b)(1), the daily span check is to be conducted with a concentration of vinyl chloride which is determined to be equivalent to the emission limit for that source based on the emission test required by § 61.67. The calibration is to be done with either:

* * * * *

8. A new § 61.72 is added to read as follows:

§ 61.72 Request for interim emission limit.

(a) If in the opinion of the owner or operator of an existing source, that source will be unable to comply with the 5 ppm emission limit in §§ 61.62(a)(1); 61.63(a)(1); 61.64 (a)(1)(i), (b)(1), (c)(1), (d)(1); and/or 61.65(c)(1) on or before (date three years after promulgation of these amendments), the owner or operator of that source may request that the Adminstrator approve an interim emission limit for that source. The request is to be in writing and is to be submitted to the Administrator within six months prior to (date two years after promulgation of these amendments). The request is to include:

(1) The reasons the source is incapable of being in compliance with the 5 ppm emission limit and data to support those reasons, and

(2) A suggested interim emission limit and description of the methodology for attaining that limit.

(b) Any owner or operator of a source who has submitted to the Administrator a written request for an interim emission limit in accordance with § 61.72(a), shall within 60 days of the date of the written request meet with the Administrator concerning the information contained in the request. The meeting is to be open to interested persons, who are to be allowed to submit oral or written testimony relevant to compliance of the source.

(c) The Administrator will within 120 days of receipt of the written request required by paragraph (a) of this section, notify the owner or operator in writing of approval or denial of approval of an interim emission limit.

(d) If an interim emission limit is approved the notification is to include the level of the interim emission limit, which may be the level requested or a more stringent one.

(e) A determination to deny approval of an interim emission limit is to set forth the specific grounds on which such denial is based.

(f) Approval for any interim emission limit granted for any source under § 61.72(c) shall expire three years from the date of issuance. The owner or operator may request an extension of approval for an interim emission limit or a lower interim emission limit. The request is to be in writing, is to be submitted within six months prior to a year before the expiration date and is to include the information listed in § 61.72 (b), (c), (d), and (e) are to apply.

9. A new § 61.73 is added to read as follows:

§ 61.73 Offset of emissions due to new construction.

(a) No owner or operator is to construct a new source which alone or in combination with other sources being constructed at the same time results in an increased production rate unless he demonstrates to the Administrator's satisfaction that such construction will not cause an increase in vinyl chloride emissions within 8 km of any other source which is subject to this subpart.

(b) Reduction in production rate is an allowable mechanism for attaining an offset in emissions.

(c) The baseline emission rate is to be determined based on the level of emissions allowable by the standard.

(d) Reducing emissions from an interim emission limit to the standard for a source is not an acceptable means of achieving an emission offset.

(e) In the application for approval of construction required by § 61.07, owners or operators of sources subject to this subpart shall include, in addition to the information required by § 61.07, the following information:

(1) The name, address, and location of any plant subject to this subpart which is located within 8 km of the proposed location of the source to be constructed.

(f) The emission limits applicable to both the new source(s) and the source(s) at which emissions are being reduced to balance the increase in emissions due to the new construction are to be established by the Administrator in the approval for construction required by § 61.08.

(Secs. 112 and 301(a) of the Clean Air Act, sec. 4(a) of Pub. L. No. 91-604, 84 Stat. 1683; sec. 2 of Pub. L. No. 90-148, 81 Stat. 504 (42 U.S.C. 1855c-7, 1857g(a)). Secs. 61.67 and 61.68 also issued under sec. 114 of the Clean Air Act, sec 4(a) of Pub. L. No. 91-604, 84 Stat. 1687 (42 U.S.C. 1857c-9).)

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