



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D. C. 20460

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~~JUN 10 1976~~
AIR AND WATER PROGRAMS

SUBJECT: Rulemaking for Vinyl Chloride Emissions Under the
Authority of Section 112 of the Clean Air Act--ACTION
MEMORANDUM

FROM: Assistant Administrator for Air and Waste Management

TO: The Administrator

THRU: AX

General Description of the Rulemaking

On December 24, 1975, we listed vinyl chloride as a hazardous air pollutant and proposed a national emission standard for it under the authority of section 112 of the Clean Air Act. We received 50 public comment letters on the proposed standard. Of these, 24 came from industry; 3 from environmental groups; 15 from Federal, State and local agencies; and 8 from individual citizens. A public hearing was held on the proposed standard on February 3, 1976, in Washington, D. C. Section 112 stipulates that the Administrator may withdraw a pollutant from the list of hazardous air pollutants only if he finds, on the basis of information presented at the public hearing, that the pollutant is clearly not hazardous. We do not feel that sufficient information was presented at the public hearing to remove vinyl chloride from the list of hazardous air pollutants. Only three of the 50 comment letters disagreed with our decision to regulate vinyl chloride under section 112. Most of the other letters agreed with our decision, but commented that we had overstated the problem of community exposure to vinyl chloride. A summary of the comments received on the proposed standard, both in letters and at the public hearing, and our responses to them are contained in the enclosed Standard Support and Environmental Impact Statement, Volume II.

Major Decision Issues

There are no remaining major decision issues which need to be resolved before promulgating the standard. The public comments resulted in relatively minor changes in the standard. These include

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exemption of certain research and development equipment from all or parts of the standard depending on size; provision for emergency manual venting of vinyl chloride to the atmosphere from reactors; correction in the emission limit for reactor opening; and reduced recordkeeping for the continuous monitor.

The commenters recommended several other changes in the proposed standard which have not been made. These include providing for excess emissions during startup, shutdown, and malfunction; increasing the averaging time for several of the emission limits; removing the requirement for double mechanical seals on pumps, compressors, and agitators; making the resin stripping requirements more stringent; and making the resin stripping requirements less stringent.

Two other comments were that vinyl chloride usage should be gradually phased out and that costs should be given more consideration in setting the level of the standard.

Summary of Comments

A preliminary draft of the standard we are recommending for promulgation and Volume II of the Standard Support and Environmental Impact Statement have been reviewed by the Working Group and the Steering Committee. The changes which have been made in the standard since proposal have been discussed in telephone conversations with the Environmental Defense Fund, the Society of Plastics Industry, Inc., and some State agencies.

The Steering Committee did not make any major comments. The Working Group discussed the desirability of adding provisions to the standard for excess emissions during startup, shutdown and malfunction. The Office of General Counsel (OGC) stated that startup, shutdown, and malfunction provisions might be appropriate for some pollutants regulated under section 112. This should be determined based on the degree of hazard that would be presented by the particular pollutant in question if uncontrolled or only partly controlled in upset conditions and/or whether technology is available to avoid or control these emissions.

We investigated this issue and determined that provision for excess emissions during startup, shutdown, and malfunction is not necessary for the vinyl chloride standard. Since polyvinyl chloride production is generally a batch process, startup and shutdown provisions would not be pertinent. Technology exists to avoid excess emissions during startup and shutdown at ethylene dichloride-vinyl chloride plants. During malfunctions we do not believe plants should be allowed to emit excess emissions, and therefore are requiring them to shut down immediately.

Costs and Economic Impact

The proposal of an emission standard for vinyl chloride was considered to be a major action and was therefore subject to the requirements of Executive order 11821. An economic analysis

of the inflationary impact of this action was prepared in accordance with the Agency's guidelines and submitted to the Council on Wage and Price Stability. This analysis was included in Volume I of the Standard Support and Environmental Impact Statement and is summarized in Tab B. Comments on the proposed standard have resulted in only one major change in the economic impact analysis. We estimated that there would be four plant closures as a result of the promulgated standard. Of the four plants identified as possible closure candidates, one has given notice that it no longer produces polyvinyl chloride and the other three have indicated that they do not intend to close as a result of the standard.

Intermedia Effects

Changes in the standard since proposal do not affect the level of control required. Thus, the environmental impact of the promulgated standard is, with one exception, the same as that described in Volume I of the Standard Support and Environmental Impact Statement and is summarized in Tab A. Based on data submitted by the Society of Plastics Industry, Inc. (SPI), the impact on water consumption in the draft environmental impact statement was overstated. We had based our estimates of this impact on worst case conditions. That is, we assumed that those control systems with the greatest water usage would be employed and that there would be no recycling of water. There is no regulation which would require water recycling. According to SPI, the control system using the most water will not be used generally by the industry and economics will cause plants to recycle much of the water. Therefore, the impact of the standard on water consumption will be negligible.

Programmatic and Resource Consequences

The manpower requirements which would be needed to enforce the recommended standard are listed in Tab C. During the first year after promulgation of the standard most of the manpower would be spent in reviewing applications for waiver of compliance and setting up compliance schedules. The peak manpower requirement of 5.2 manyears is expected to occur in the second year after promulgation, when the majority of the emission tests would be conducted. Region VI with 18 plants and Region III with 13 plants would have the greatest manpower requirements, but the peak requirement for any regional office would be 1.5 manyears. Regions VII, VIII, and X currently have no plants.

Energy Consequences

The increased energy consumption which would be required by average sized plants attaining the recommended standard is presented in Tab A. Energy consumption would be a significant impact if the standard required combustion of large volume, low concentration gas streams because large quantities of supplemental fuel would be

needed to support combustion. The increased energy consumption which would result at ethylene dichloride-vinyl chloride plants has been minimized by establishing the level of the recommended standard so that only one existing plant, if any at all, will use combustion to control the oxychlorination reactor. Increased energy consumption at polyvinyl chloride plants is expected to be minimal because the large volume, low concentration gas stream from the dryer operation at most, and probably all, plants will be controlled by measures other than incineration.

Recommendation

I recommend that you sign the enclosed notice for publication in the FEDERAL REGISTER.

Enclosures

Tab A - Environmental and Energy Impacts of the Recommended Standard

Tab B - Total Industry Costs to Attain the Recommended Standard

Tab C - Enforcement Manpower Requirements

FEDERAL REGISTER Notice: National Emission Standard for Vinyl Chloride Standard Support and Environmental Impact Statement - Emission Standard for Vinyl Chloride, Volume II.

Prepared by SDB:SWyatt:dbt:rm 730 MU, X371:6-29-76

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TAB A
ALTERNATIVE CONTROL LEVELS

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TABLE A-1. ETHYLENE DICHLORIDE VINYL CHLORIDE PLANT: IMPACTS FOR AVERAGE PLANT
(338 GALLONS PER DAY OR 700 MILLION LBS/YR)
ATTAINING THE SECOND-LEVEL STANDARD AND ALTERNATIVE CONTROL LEVELS.

ALTERNATIVES	PRIMARY EMISSIONS AT THE PLANT		ENERGY CONSUMPTION				COSTS ²		
	VINYL CHLORIDE EMISSIONS KG/HR (LB/HR)	PERCENT REDUCTION IN VINYL CHLORIDE EMISSIONS	PROJECTED MAXIMUM 24 HOUR AVERAGE CONCENTRATION OF VINYL CHLORIDE (PPM)	FUEL MM KCAL/YR (MM BTU/YR)	POWER 1000 KWH/YR	PERCENT INCREASE IN ENERGY CONSUMPTION	CAPITAL \$1000	ANNUAL OPERATING \$1000	PER UNIT OUTPUT IN 1975 OF 1970 CHLORIDE
UNCONTROLLED	176 (392)	-	0.97	-	-	-	-	-	-
LESS STRINGENT STANDARD	19 (42)	90	0.12	Negligible	1272	0.1	889	793	0.9
RECOMMENDED STANDARD	10 (23)	94	0.094	Negligible	1272	0.1	889	793	0.9
FOR STRINGENT STANDARD	5 (12)	97	0.094	74,600 (296,000)	1272	7	1903	1657	2.0

¹The difference between the alternatives presented for ethylene dichloride-vinyl chloride plants represents additional control for only one of several vinyl chloride plants. The emission point represents 3 percent of the total uncontrolled emissions at an average plant.

²The costs presented here are for the recommended standard for vinyl chloride only. Costs due to EPA's Effluent Guidelines and Standards for ethylene dichloride, vinyl chloride, and polyvinyl chloride plants are included in the analysis in the Standard Support and Environmental Impact Statement; Emission Standard for Vinyl Chloride, Volume 1, but are not included in this table. The costs presented in this table include any costs due to the OSMA standard which would overlap with the costs to meet the proposed standard.

TABLE 7.11. POLYVINYL CHLORIDE DISPERSION PLANTS¹ IMPACTS FOR AVERAGE PLANT
(10 MILLION KG/YR OR 30 MILLION LB/YR) AT THE RECOMMENDED STANDARD
AND ALTERNATIVE CONTROL LEVELS

ALTERNATIVE ²	PROPERTY ENVIRONMENTAL IMPACT		ENERGY CONSUMPTION				COSTS ³			
	Vinyl Chloride Emissions KG/YR (LB/YR)	Percent Reduction in Vinyl Chloride Emissions	Projected 24-hour Average Concentration of Vinyl Chloride ppm ⁴	Fuel kg/yr (lb/yr)	Power KW/YR	Percent Increase in Energy Consumption	Capital Costs (\$1000)	Annual Operating Costs (\$1000)	Percent Price Increase in PVC Resins ⁵	Maximum Percent Increase in Price of Commodity Products
Uncontrolled	(1)	-	11	-	-	-	-	-	-	-
Recommended	(1-2)	52	1.7	3,100 (17,400)	400	8	2295	803	7.5	4.3
Controlled	(1)	95	0.29	35,400 (138,400)	1010	81	3319	1363	13.2	6.1
Controlled	(1)	97	0.22	See footnote 6	See footnote 6	See footnote 6	See footnote 6	See footnote 6	See footnote 6	See footnote 6

- The dispersion process is only one of several processes for producing polyvinyl chloride resins. It represents about 13 percent of the total U. S. polyvinyl chloride production. The production rates of the other types of resins at individual plants are generally higher than the production rate indicated here for an average-sized dispersion plant. Therefore, the mass emissions from an average-sized plant making other resin types are generally larger than the ones indicated here for the average-sized dispersion resin plant.
- The difference between the alternatives presented for polyvinyl chloride plants represents additional control for only one of several emission points. The emission point represents 66 percent of the total uncontrolled emissions at an average plant.
- The costs presented here are for the recommended standard for vinyl chloride only. Costs due to EPA's Effluent Guidelines and Standards for ethylene dichloride and polyvinyl chloride plants are included in the analysis in the Standard Support and Environmental Impact Statement. Costs for Standard for ethylene dichloride but are not included in this table. The costs in this table include any costs due to the OSHA standard which would overlap with the recommended standard.
- The ambient concentrations presented here are based on emissions from a combination suspension-dispersion plant; dispersion resins are typically produced at a plant that produces other types of resins. The production rate of the combination plant is 54 million lb/yr or 120 million kg/yr.
- The price increases listed here are for dispersion polyvinyl chloride plants only. Therefore, these figures differ from the ones in the text which are for the polyvinyl chloride industry in general.
- Data are unavailable because this level of control has not been commercially demonstrated.

TAB B

Total Industry Costs to Attain the Recommended Standard

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Table B-1: Total Industry Costs to Attain the Recommended Standard

INDUSTRY	CAPITAL	ANNUALIZED COSTS ¹ FOR CONTROL EQUIPMENT		AMOUNT REQUIRED TO MAINTAIN ESTIMATED PRE-CONTROL PROFITABILITY		TOTAL ANNUALIZED COSTS PLUS PROFIT	
		\$	¢/LB.	\$	¢/LB.	\$	¢/LB.
ETHYLENE DICHLORIDE/ VINYL CHLORIDE	\$15,376,000	12,293,000	0.18	2,307,000	0.03	14,600,000	0.21
POLYVINYL CHLORIDE	\$183,022,000	58,163,000	1.01	36,605,000	0.64	94,768,000	1.65

¹ Includes operating and maintenance costs, depreciation, interest, and overhead charges.

Table B-2. Total Industry Costs to Attain the Recommended Standards and EPA Water Effluent Guideline Regulations

INDUSTRY	CAPITAL COSTS	ANNUALIZED COSTS ¹ FOR CONTROL EQUIPMENT		AMOUNT REQUIRED TO MAINTAIN ES PRE-CONT PROFITABILITY		ED TO MATED L ITY	TOTAL ANNUALIZED COSTS PLUS PROFIT	
		\$	¢/LB.	\$	¢/LB.		\$	¢/LB.
ETHYLENE DICHLORIDE/ VINYL CHLORIDE	\$ 50,332,000	19,280,000	0.28	7,550,000	0.11		26,830,000	0.39
POLYVINYL CHLORIDE	\$231,364,000	68,522,000	1.19	46,273,000	1.80		114,795,000	1.00

¹ Includes operating and maintenance costs, depreciation, interest, and overhead charges.

TAB C

Enforcement Manpower Requirements

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TABLE C-1
ENFORCEMENT MANPOWER REQUIREMENTS
(MAN-YEARS)

FISCAL YEAR	1977 ⁽¹⁾	1978	1979
REVIEW REPORTING FORMS	0.4	-	-
INSPECT 50 SOURCES WITH DUBIOUS COMPLIANCE STATUS	0.8	-	-
TEST, OBSERVE AND EVALUATE 10 SOURCES	0.8	-	-
SET SCHEDULES FOR 30 SOURCES	2.4	-	-
COMPLIANCE MONITORING			
A) OF SCHEDULES	-	0.4	0.2
B) OF IN COMPLIANCE SOURCES	-	0.6	0.6
C) LITIGATION	-	1.0	2.0 ⁽²⁾
D) END OF SCHEDULE TESTS	-	-	2.4
TOTAL	<u>4.4</u>	<u>2.0</u>	<u>5.2</u>

(1) ASSUMES STANDARDS PROMULGATED BY 10/76, 30 SOURCES IN VIOLATION.

(2) ASSUMES 2 SOURCES FAIL TO COMPLY.

TABLE C-2

MANPOWER REQUIREMENTS BY REGION
(MAN-YEARS)

REGION	NO. OF PLANTS	MANPOWER		
		FY '77	FY '78	FY '79
I	6	0.4	0.2	0.5
II	4	0.3	0.1	0.4
III	13	0.9	0.4	1.1
IV	7	0.5	0.2	0.6
V	10	0.7	0.3	0.8
VI	18	1.3	0.6	1.5
VII	0	0	0	0
VIII	0	0	0	0
IX	5	0.3	0.1	0.4
X	0	0	0	0
TOTAL	63	4.4	2.0	5.2

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