



UNION CARBIDE CORPORATION

CHEMICALS AND PLASTICS

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SOUTH CHARLESTON PLANT

July 17, 1974

Mr. David R. Bell
Office of Standards Development
Room 500
Occupational Safety and Health Administration
Department of Labor
1726 M Street N. W.
Washington, D. C. 20210

Draft Environmental Impact Statement-Vinyl Chloride

Dear Mr. Bell:

Attached are detailed comments on the Draft Environmental Impact Statement-Vinyl Chloride to be attached to a general statement sent you earlier by

Mr. J. W. Whittlesey
Union Carbide Corporation
270 Park Avenue
New York, N. Y.

I hope these additional comments will be of value in revising the Draft Statement.

Very truly yours,

R. N. Wheeler, Jr.

Attachment

cc: Mr. J. W. Whittlesly
Dr. A. B. Steele
Dr. N. L. Zutty
Mr. M. E. Eisenhour
Mr. J. L. Carvajal

VVC 000005375

DRAFT ENVIRONMENTAL IMPACT STATEMENT

Proposed Regulation Vinyl Chloride

COMMENTS

Summary Page 2

The second paragraph implies that 13 people in the U. S. died recently of angiosarcoma. The initial death in this series occurred in 1961 and the last two occurred in 1974, a 14 year period.

Summary Page 3

The method of analysis as specified permits a variability in absolute vinyl chloride concentration of 0.3 ppm to 3 ppm. The proposed standard calls for no detectable by this method but the last paragraph states that the proposed standard is to assure that levels do not go above 1 ppm. In addition it states that the employer is required to initiate engineering and work practices designed to bring the level below 1 ppm. This is all very confusing.

Summary Page 4

The last paragraph states that the proposed standard will reduce pollution of the environment external to the immediate work place.

This is a conclusion based on no data. All discussions in regard to control of the work place air have stressed ventilation i.e. remove the vinyl chloride from the work place and blow it into the external air.

Summary Page 5

"The proposal is not without adverse consequences. The standard for the most part will likely cause a slight decrease in productivity and a small increase in costs for products made from vinyl chloride."

VVC 000005376

Summary Page 5 (Cont'd)

This is a conclusion not based on the facts presented in the statement and is contrary to industry statements that the proposed standards will cause withdrawal from the business. The carcinogenic potential of vinyl chloride will not initiate a search for substitutes for polyvinyl chloride products are not hazardous to man; therefore, the only incentive to replace them will be economic. This does not fit with the statement that productivity will decrease slightly and there will be a small increase in costs of PVC resins.

Page 22 IV Occupational Exposure to Vinyl Chloride
Paragraph 2

This paragraph ignores the fact that after the vinyl chloride polymerization step the polymer is exposed to a vinyl chloride stripping or removal step. The final vinyl chloride monomer content of the resin is a function of resin particle size, particle porosity, and the efficiency of the monomer removal operation. The unconverted monomer contained in the resin is a factor in worker exposure only if ventilation at the first processing is poor or if the worker enters a closed vessel containing resin. OSHA is obviously concerned with the migration of VC to the surface of a PVC product since the proposed standard often refers to resin containing detectable quantities of vinyl chloride monomer.

Page 25 (1) Process Descriptions

"Until the late 1950's VC was generally produced from acetylene and hydrogen chloride."

Vinyl chloride was initially produced in the U.S. by caustic hydrolysis of ethylene dichloride. This process was followed by pyrolysis of ethylene dichloride to vinyl chloride and hydrogen chloride. Since hydrogen chloride was a pollution problem, the material was reacted with acetylene to yield vinyl chloride. The statement that vinyl chloride prior to the 1950's was generally produced from acetylene and hydrogen chloride is erroneous.

"Acetylene Route ... The product gases are then purified to vinyl chloride by water and alkaline scrubbing, drying and finally fractional distillation."

The product gases are fractionally condensed. The liquid condensate is then fractionally distilled to recover the pure vinyl chloride. The purified vinyl chloride is often caustic scrubbed after distillation.

VVC 000005377

Acetylene Route (Cont'd)

The oxychlorination process from ethylene to ethylene dichloride to vinyl chloride is replacing the "balanced" or acetylene route because of the high cost of acetylene, not because of greater efficiency.

Page 28 Process Descriptions

The differences noted between PPG and Shell in workers employed per million tons of vinyl chloride capacity is due to failure to secure the same information from both producers. Shell is giving information on all workers involved including maintenance and services whereas PPG has given information on only workers directly involved in production.

Page 33 Process Descriptions

"Four basic processes ... polymerization. The bulk process is a dry process requiring no water, suspending agents, or emulsifiers, the other three processes require water, solvents, or other liquids, but they are similar enough that they can be used in the same equipment."

This statement implies that any given suspension, dispersion or solution polymerization plant can operate on any other process. This implication is erroneous. Each process uses a specialized plant to produce products for a particular market.

Page 33 (1) Process Descriptions

In the United States approximately 78% of PVC resins are produced by suspension polymerization, 13% by emulsion polymerization (not solution as printed), 6% by bulk polymerization and 3% by solution polymerization.

Page 34 Suspension Polymerization

The PVC slurry is then blended in another vessel with other batches to reduce small variations, and dewatered by a continuous solid bowl centrifugal (Superdecanter is a trade name) to yield a polymer cake containing about 20% moisture.

VVC 000005378

Page 34 Emulsion Polymerization

"This process is very similar to the suspension process and is used to produce very fine particles. There are two primary differences: (1) Usually two emulsifying agents are soluble in water and one soluble in the monomer, are used to prevent coalescence of the polymer particles, and (2) The polymer is separated from the water by spray drying."

This is erroneous. The suspension polymerization process uses mechanical mixing to suspend monomer particles in water and thereby produces large spherical particles. The emulsion process uses one or more surfactants and agitation to convert the monomer and water mixture to a stable emulsion containing very fine particles of monomer which polymerize to very fine particles of resin in a stable latex. The polymer is recovered by spray drying because there is no choice but to use this form of drying.

Page 35 Bulk Polymerization

"The output of bulk processing plants is said to be more than twice that of good suspension plants of comparable size."

A resin plant is normally sized by its output; thus this statement is in error. The author may have meant that output per fixed investment dollar is twice that of suspension plants.

Page 36 Solution Polymerization

The author of this section obviously took this information from an ancient patent. The process description is erroneous.

Page 53 V The Proposed Standard

Detailed comments on this Proposed Standard are as follows: