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VC
FINAL

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RECEIVED
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R. N. WHEELER, JR.

Here is the summary section of the very recently issued Foster D. Snell - DRAFT FINAL REPORT - ECONOMIC IMPACT STUDIES OF THE EFFECTS OF PROPOSED OSHA STANDARD FOR VINYL CHLORIDE. This study was contracted by OSHA to rebut the industry presentation that the Proposed Permanent Standard was simply not feasible with present technology.

A response to the Snell report is now due September 25th.

A. B. Steele

ABS:ml
Attachment

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VI. CONCLUSIONS AND RECOMMENDATIONS

This chapter addresses the conclusions and recommendations of the report based on the findings and economic analysis of the previous section.

1. ACHIEVING "NO DETECTABLE" LEVELS OF VCM PRINCIPALLY THROUGH ENGINEERING MEANS IS JUDGED NOT FEASIBLE WITH PRESENT TECHNOLOGY BOTH IN THE VCM AND PVC SECTORS

Based on the industry surveys and Snell's independent assessments of the state-of-the-art of the technology, it is concluded that achieving "no detectable" (0 - 1 ppm) VCM levels in the VCM industry is not feasible principally through engineering means. Reasons include the following:

- technology, including state-of-the-art developments, is not available to eliminate VCM leaks and fugitive losses
- existing plants have not been designed for total VCM containment
- there is no design or operating experience in the industry aimed at maintaining very low VCM levels
- no direct technology transfer opportunities are known to enable development of designs for "no detectable" levels in new plants.

Based on the industry surveys and Snell's independent assessments of the state-of-the-art of the technology, it is concluded that achieving "no detectable" (0 - 1 ppm) VCM levels in the PVC industry is not feasible principally through engineering means. Reasons include the following:

- PVC manufacture is a batch operation
- Technology, including state-of-the-art developments is not available to eliminate VCM leaks and fugitive losses

- existing plants have not been designed for total VCM containment

- there is no design or operating experience in the industry aimed at maintaining very low VCM levels

- no direct technology transfer opportunities are known to enable development of designs for "no detectable" levels in new plants.

. Up to four years of development is estimated to reduce residual VCM levels below 100 ppm in PVC products on the basis of output volume.

. The technology including state-of-the-art developments is not available to reach very low or "no detectable" residual VCM levels on the basis of output volume.

2. THE COSTS OF COMPLIANCE INCREASE RAPIDLY WITH DECREASING VCM TARGET LEVELS AND REPRESENT SIGNIFICANT ENGINEERING UNCERTAINTY OR INFEASABILITY BEYOND 10 PPM CEILING AND 2 - 5 PPM TWA FOR THE VCM INDUSTRY AND 15 - 25 PPM CEILING AND 10 - 15 TWA FOR THE PVC INDUSTRY

. The analysis which follows indicates the cost sensitivity of attempting to reach very low VCM levels in the VCM industry.

VCM Target Level (ppm)	Standard Price (¢/lb.)	Price Index	Percent of VCM Industry Capacity Endangered	Time To Reach Level Via Engineering Controls (years)
Historical Practice	7.41	1.00	Not Applicable	Not Applicable
50 ceiling	7.47	1.01	0%	0.5
25 ceiling	7.59	1.02	0%	2.5
10 ceiling and 2-5 TWA	7.69	1.04	0%	3.0
Extrapolated Attempt to Reach "No Detectable" Levels	12.71	1.72	100% @ "No Detectable" Levels	Not Estimated

Source: Exhibits V-15 and V-13

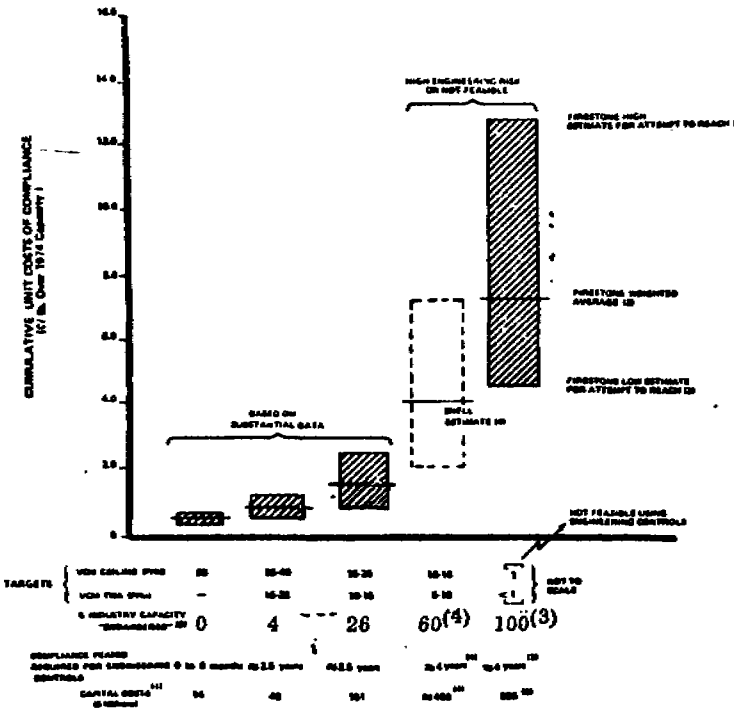
The table indicates the rapid rise in costs associated with attempting to reach the technologically infeasible "no detectable" levels beyond the 10 ppm ceiling and 2 - 5 ppm TWA target level.

Exhibit VI-1, on the following page, presents a similar discussion for the PVC industry.

EXHIBIT VI-1

USDOL / OSHA

PVC INDUSTRY CLAIMED ANNUAL COSTS TO ACHIEVE VCM TARGET LEVELS AND SUSTAIN 1974 CAPACITY (1)



ECONOMIC IMPACT CRITERIA

PLANTS LIKELY TO BE MOST "ENDANGERED"(2)

- Highest compliance costs
- Plant located in cold climate
- Old plant
- Small plant
- Small reactors
- Copolymer, emulsion or latex resin production (High free monomer)
- Small company
- Merchant sales
- Slackening demand

PLANTS LIKELY TO BE LEAST "ENDANGERED"(2)

- Lowest compliance costs
- Plant located in warm climate
- Modern plant with automation
- Large reactors
- Bulk or suspension resin production
- Large company
- Large plant
- Captive use of PVC
- Highly disciplined plant personnel

NOTES:

(1) ESTIMATES INCLUDE COSTS OF ENGINEERING CONTROLS, PERSONAL PROTECTIVE AND MONITORING EQUIPMENT AS WELL AS COSTS DUE TO PRODUCTIVITY LOSSES

(2) ENDANGERED—MANAGEMENT WILL SERIOUSLY CONSIDER A PLANT SHUTDOWN

(3) FIRESTONE PROVIDED COST ESTIMATES RELATED TO "NO DETECTABLE" VCM LEVEL FOR AN ATTEMPT PRIMARILY BASED ON ENGINEERING CONTROLS, CONCLUDING INFEASIBILITY AND INDICATING THAT FIRESTONE PLANTS WOULD BE ALSO "ENDANGERED"

(4) SMELL ESTIMATE BASED ON INTERPOLATION OF INDUSTRY DATA AND JUDGEMENTAL ASSESSMENT OF THE ECONOMIC IMPACT CRITERIA ABOVE

(5) SMELL ORDER OF MAGNITUDE PROJECTION FOR THE INDUSTRY BASED ON FIRESTONE DATA WITH ITS LIMITATIONS

SOURCE: INDUSTRY INTERVIEWS, HEARING RECORDS AND SMELL ESTIMATES IN CHAPTER FIVE

- For the VCM industry, the engineering control steps for OSHA compliance are significantly the same as those potentially used for air pollution control. Therefore, appreciable air pollution control costs are automatically accounted for by OSHA compliance.

- For the PVC industry, engineering control steps from the 50 ppm VCM ceiling level to the 15 - 25 ppm ceiling with 10 - 15 ppm TWA primarily address OSHA compliance, but significant air pollution control benefits are gained, especially at lower levels.

3. AREA MONITORING, PARTICULARLY IN PVC PLANTS IS RECOMMENDED TO OSHA AS A COMPLIANCE REQUIREMENT REGARDLESS OF THE TARGET LEVEL SELECTED BY OSHA

- Automatic Sequential Monitoring Systems (ASMS) can serve as a long term data collection system for an entire plant.

  - The ASMS can analyze an air sample from a particular point in the plant in 1 to 3 minutes with potential for at least 10 point monitoring.

  - The ASMS can be used to provide correlation with personnel monitoring data of actual worker exposure. In addition, it can be used to provide a permanent record of VCM levels, provide alarms in case of exceeding ceiling values, serve as a means to initially identify the general sources of VCM releases, and to monitor progress in complying with OSHA requirements.

  - A system installed in the polymerization building can provide warning to work personnel in that area if VCM levels have gone above ceiling levels.

  - Response to alarm can be standardized. These steps could include donning of personal protective equipment, investigation using leak detectors, isolating the point of VCM release and corrective maintenance.

4. IT IS RECOMMENDED THAT OSHA ESTABLISH PHASED REQUIREMENTS FOR REACHING VCM TARGET LEVELS TO ALLOW THE COLLECTION OF ADDITIONAL VCM MONITORING DATA TO FULLY ASSESS THE EFFICIENCY OF THE CORRECTIVE STEPS, SUBJECT TO REVIEW IN LIGHT OF CURRENT MEDICAL FINDINGS, AND AS THEY BECOME AVAILABLE

- The currently available data base particularly for VCM monitoring, is relatively small. In addition, the technology required for compliance with the lower VCM levels is not yet proven. Consequently, considerable risks exist as to the efficacy of engineering controls even for levels other than "no detectable", which is not technologically feasible.

- A phased compliance plan would allow for the assessment of the efficiency of corrective steps already taken by industry. In any event, significant lead times exist for hardware required for engineering controls.

- The phased compliance plan should be reviewed in light of current and emerging medical findings.

- A possible result of a phased compliance plan would be to spread the costs of compliance over periods of time. This may be desirable considering that the VCM and PVC price impacts may be of the same order of magnitude as the price results of the "energy crisis".

- Developmental efforts should be encouraged to improve techniques in personal protective devices, monitoring systems, and residual monomer reductions.

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The Appendices supporting the report follow in a separate volume.