ILLINOIS POLLUTION CONTROL BOARD
April 14, 1977

STEPAN CHEMICAL COMPANY, Petitioner,	)	
v.	)	PCB 76-161
ENVIRONMENTAL PROTECTION AGENCY, Respondent.	)	

Mr. Harley Hutchins, Attorney, appeared for the Petitioner;
Ms. Kathryn Sheehan Nesburg, Attorney, appeared for the Respondent.

OPINION AND ORDER OF THE BOARD (by Mr. Zeitlin):

This matter is before the Board on a Petition for Variance filed by the Stepan Chemical Company (Stepan) on May 21, 1976. That Petition requested relief from the particulate standards in Rules 203(a) and 203(b), and the carbon monoxide limitations in Rule 206(c) of Chapter 2: Air Pollution, of this Board's Rules and Regulations. Stepan also sought relief from the organic emission limitations in Rule 205(f) and 205(g)(1)(c), also of Chapter 2, or in the alternative a ruling that these limitations do not apply to the subject facility. Pursuant to an objection filed by the Environmental Protection Agency (Agency) on May 27, 1976, the matter was set for hearing.

An Amended Petition was filed by Stepan on September 28, 1976, which extended certain dates contained in the original Petition's compliance schedule by several months, as a result of delays caused by a strike. A further amendment to Stepan's Petition was entered at hearing, (Compl. Ex. 1, R. 8), in which Stepan further extended the period for compliance. A final amendment was made orally at hearing, (R. 5), by which Stepan admitted the applicability of Rule 205(f) to the organic emission from its facility, although it continued to contest the applicability of Rule 205(g)(1)(c), (id.).

The Agency's original Recommendation was filed on September 3, 1976. The Agency's Recommendation was modified slightly at hearing, and a formal Amended Recommendation was filed on March 3, 1977.

A hearing was held in the matter on January 10, 1977, at the Will County Courthouse, in Joliet. Witnesses were presented by both parties, although the Agency's presentation was limited to expert testimony on the definition of "petrochemicals," and the applicability of rules limiting emissions from "petrochemical processes" and "petrochemical manufacturing processes" to Stepan's facility. Although special notice (in addition to the publication and notice normally required) was given to one citizens' group, no members of the public participated at the hearing.

Stepan's Petition concerns emissions from its phthalic anhydride manufacturing process at its Millsdale Plant, located on the Des Plaines River in Will County. Stepan's Millsdale facility is described in a prior Variance case, and that description need not be repeated here. Stepan Chemical Co. v. EPA, PCB 74-425, 17 PCB 105 (May 22, 1975). In fact, a portion of the relief requested here is an extension of the Variance granted in PCB 74-425 with regard to the carbon monoxide limitations of Rule 206(c).

Phthalic anhydride is produced at the Millsdale Plant by the partial oxidation of O-Xylene in the presence of a catalyst. Stepan produced 32,935,000 pounds of phthalic anhydride, utilizing 34,456,000 pounds of O-Xylene, in 1975. Waste gases from the process, exiting at approximately 140°F., with little heat value, are vented to the atmosphere through a 75-foot stack. The composition of the waste gases, and the applicable emission limits, are as follows:

WASTE GAS COMPONENT	EMISSIONS	LIMITATIONS	RELEVANT REGULATION	REQUIRED REDUCTION*
CO	5,000 PPM (860 lb./hr.)*	200 PPM (corrected to 50% excess air)**	206(c)	96%
hydrocarbons	398 lb./hr.* (including 40 lb./hr. as particulate)	8 lb./hr.	205(f)	85% (per 205(f)(1)(A)
hydrocarbons	600 PPM* (equivalent methane)	100 PPM	205(g)(1)(C)	78%
particulate	40 lb./hr.*	29.5 lb./hr.	203(a)	40%

* Per EPA Recommendation, ¶¶ 7-10, apparently using Amended Petition, ¶5. See, R. 50. For 100% operation emissions, see R. 19-20.

** The applicability of the "50% Excess Air" correction to this type of facility is presently an issue in a pending Regulatory proceeding, R75-9, R76-8,-12,-13.

In PCB 74-425, the Board found that no technically feasible and economically reasonable method for compliance with the carbon monoxide limitation of Rule 206(c) then existed for Stepan's phthalic anhydride plant. The Board granted a "research and development" Variance, permitting Stepan to continue its investigation and development of a "cold catalytic" compliance technology. Stepan was, at that time, funding a research program at Northwestern University, including bench and later pilot scale study of the new technology. A more complete description of that research program, and an analysis of the inapplicability of incineration as a control measure for Stepan's plant, may be found in the Board's previous Variance Opinion in PCB 74-425, supra, 17 PCB at 106-108.

Subsequent to the entry of our Order in PCB 74-425, while the cold catalytic oxidation study continued, Stepan was approached by the DuPont Company regarding a new control technology which DuPont felt would be applicable to the Millsdale Plant. The DuPont Torvex catalytic reactor utilizes precious metal (platinum) deposited on a ceramic honeycomb to remove both carbon monoxide and hydrocarbons from the exhaust stream, (R. 70). This process is not a "cold" catalytic process; though it will require elevation of the exhaust gases above their 140°F. exit temperature, it will not require the excessive amounts of fuel for incineration, as discussed in PCB 74-425. Instead, the DuPont process (called a "combustor") utilizes waste heat and steam from the phthalic anhydride process itself, along with heat exchange, to achieve operating temperatures of approximately 500° to 525°F., (e.g., R. 42). Except for startup, no additional fuel is required.

An additional significant advantage of the combustor is that it will treat the entire emission problem at Stepan's Millsdale Plant, rather than only the carbon monoxide emissions, or only the organic emissions, (R. 41). The combustor will remove carbon monoxide with an efficiency of 95 per cent or more, approaching 100 per cent, (R. 72). The efficiency with regard to organics is stated to be "above 85 per cent," (id.). Because of the operating temperatures involved, all organics are expected to be in the vapor phase, with the result that there will be no particulate emissions, (R. 79). In fact, a principal use of the Torvex unit has been hydrocarbon emission control.

A final advantage of the combustor is catalyst life. Unlike the cold catalytic system researched at Northwestern University, the catalyst is guaranteed by DuPont for a one-year period, yet the parties expect catalyst life of five years or better, (R. 81-83).

As amended, Stepan's timetable for compliance called for a decision by February 1, 1977, as to whether the combustor or some other control technology will be used at the Millsdale Plant, (Pet. Ex. 6). Petitioner's post-hearing Brief indicates that the combustor was chosen. Petitioner's timetable then calls for the following:

April 1, 1977	Complete System Final Design and Approval Drawings.
April 1, 1978	Equipment Delivery.
July 1, 1978	System Installation.
August 15, 1978	System Start-Up and Debugging.

The effect of Stepan's present emissions of CO were detailed in the previous Variance Opinion, PCB 74-425, supra, and need not be repeated. The Agency's Recommendation in this matter noted that the nearest monitors for particulates, more than five miles from the Millsdale Plant, (Rec., ¶18), showed the following annual geometric mean concentrations for 1975: Rockdale, 97; Wilmington, 69. The only Will County monitor for ozone, located in Joliet, indicated 77 violations of the 0.08 ppm maximum.

As the Board found in the previous Variance case, supra, 17 PCB at 108:

> To deny the variance in the instant action would require utilization of existing control technology which not only would be expensive, but would have an adverse impact upon energy demand and the environment. Such a ruling would impose an arbitrary and unreasonable hardship upon Stepan while actually injuring the public and environment.

Throughout this proceeding, as in the previous case, the Agency has recommended that the requested Variance be granted. We agree. Stepan has demonstrated a continuing effort to achieve compliance with the carbon monoxide Regulations, to the point of developing new technology. It has extended that effort to the other emissions in issue here, despite the fact that the applicability of the relevant Regulations is honestly debatable. Stepan has now developed technology which will allow compliance within a reasonable period of time, and is proceeding expeditiously to implement a suitable program.

With regard to the application of Rule 205(g)(1)(c) to Stepan's facility, we note that Stepan is a party to a pending Regulatory proceeding which could resolve this issue. In R75-9, R76-8,-12,-13, Carbon Monoxide, the Board has been requested to separately define "organic chemical partial oxidation" processes. Since the existence of such a definition may resolve finally the application of Rule 205(g)(1)(c) to Stepan's facility, we decline to review our decision in Sherwin-Williams Co. v. EPA (Dec. 18, 1975). Under the circumstances, we need not decide the narrow legal issue of the Rule's applicability under the tests set out in Sherwin-Williams. Id., Opinion at 3. We shall grant the variance, pending decision in the Regulatory matter.

Finally, we note that Stepan plans to expand phthalic anhydride production capacity at the Millsdale Plant, (R. 26). Inasmuch as the parties agree that the control system to be constructed using the DuPont combustor technique will be adequate to control the emissions from such expanded operations, (R. 51), we find that this planned expansion does not affect our judgement concerning this Variance.

We shall grant the requested Variance, conditioned upon the compliance schedule indicated in Petitioner's Exhibit 6. We shall continue in effect the $25,000 performance bond required in the previous Variance, although it shall now cover construction under the new compliance plan. We shall also enter standard reporting and certification requirements. In addition, we shall release Stepan from the research requirements contained in the prior Variance.

This Opinion constitutes the findings of fact and conclusions of law of the Board in this matter.

ORDER

IT IS THE ORDER OF THE POLLUTION CONTROL BOARD that:

1. Petitioner Stepan Chemical Company be granted a Variance from Rules 203(a), 205(f), 205(g)(1)(C), and 206(c) of Chapter 2: Air Pollution, from May 22, 1976 until August 15, 1978, subject to the following conditions:

   a. Petitioner shall comply with the construction schedule for its catalytic reactor system as set forth in the accompanying Opinion and shall apply to the Environmental Protection Agency for all necessary construction and operating permits.

b. Petitioner shall, on or about the 15th day of each month subsequent to the entry of this Order, submit to the Environmental Protection Agency a written report detailing all progress towards compliance, such report to be submitted to:

Environmental Protection Agency
Control Program Coordinator
2200 Churchill Road
Springfield, Illinois 62706

c. Petitioner shall, within twenty-eight (28) days of the date of this Order, continue in effect its performance bond in the amount of Twenty-Five Thousand Dollars ($25,000.00), in a form satisfactory to the Environmental Protection Agency, to insure compliance with the control program detailed in the accompanying Opinion. Such bond shall be submitted to the Environmental Protection Agency at the address given in subparagraph (b) above.

d. The Variance granted herein from Rule 205(g)(1)(c) shall terminate upon final Board action in the pending Regulatory proceeding R75-9, R76-8,-12,-13, if a new or amended definition is adopted affecting Petitioner's manufacturing process, in conformity with the Board's Opinion in this matter, supra.

e. Petitioner shall, within twenty-eight (28) days of the date of this Order, execute and forward to the Environmental Protection Agency, at the address shown in subparagraph (b) above, a Certificate of Acceptance in the following form:

CERTIFICATE OF ACCEPTANCE

I, (We), _____ having read the Order of the Illinois Pollution Control Board in case No. PCB 76-161, understand and accept said Order, realizing that such acceptance renders all terms and conditions thereto binding and enforceable.

_____
SIGNED

_____
TITLE

_____
DATE

2. Petitioner Stepan Chemical Company be released from the research and development program required by our Order in Stepan Chemical Company v. EPA, PCB 74-425, regarding cold catalytic oxidation.

Mr. Jacob D. Dumelle dissents.

Mr. Irvin G. Goodman concurs.

I, Christan L. Moffett, Clerk of the Illinois Pollution Control Board, hereby certify the above Opinion and Order were adopted on the 14th day of April, 1977, by a vote of 4-1.

Christan L. Moffett, Clerk
Illinois Pollution Control Board