

ILLINOIS POLLUTION CONTROL BOARD

October 31, 1974

ENVIRONMENTAL PROTECTION AGENCY,)
)
 Complainant,)
)
 vs.) PCB 72-81
)
TEE-PAK, INC.,)
)
 Respondent.)

Thomas J. Immel, Assistant Attorney General for the EPA
John B. Jenkins, Attorney for Respondent

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

The Environmental Protection Agency filed its Complaint against Respondent Tee-Pak, Inc. alleging that the company had allowed the discharge of hydrogen sulfide and foul and obnoxious odors into the environment in violation of Section 9(a) of the Environmental Protection Act. The Agency and Respondent entered into an interim settlement which was approved by this Board on November 8, 1972. The Interim Order provided that the parties would conduct stack tests, ground level measurements and odor evaluations in order to determine whether odorous emissions from the Tee-Pak plant are causing a nuisance in the community. The studies were to determine the effectiveness of Tee-Pak's emission control program and hopefully, were to form a basis for final conclusion of this litigation.

The Agency and Tee-Pak have now submitted a Proposal for Final Settlement. This Opinion and Order will deal with the matters in that voluminous document.

Tee-Pak is a manufacturer of cellulose casings which are used in the meat packing business. A major part of its product is from its Danville, Illinois plant which employs 800 persons and has operated since 1957. During the manufacturing process hydrogen sulfide gas (H₂S) is released. The odor caused by the hydrogen sulfide emission has in the past resulted in a number of citizen complaints. The parties have previously agreed that hydrogen sulfide is the principal cause of the odor and have concentrated on methods for abatement of this type of emission.

As we have previously noted, no standard has been set for hydrogen sulfide emissions in the State of Illinois. The EPA Complaint was based on the theory that a quantity of hydrogen sulfide was being emitted from Respondent's plant to cause a nuisance in the community. Therefore, citizen reaction to the emissions and the Tee-Pak control program was of principal concern.

We will not detail all of the background of this litigation since it is set out in our Opinion of November 8, 1972. However, it should be noted that prior to the commencement of the testing program Tee-Pak had completed installation of five scrubbers in a period of approximately 3 years, and it was claimed that this would bring a total H₂S emission reduction of approximately 55%.

We believe it is important at this point to review some of the more important findings of the studies which were conducted under the Interim Settlement. Stack testing showed that Tee-Pak was emitting an average of 31.9 to 35.5 lbs. of hydrogen sulfide per hour during the test period. These averages are reportedly subject to a statistical variability of ± 6.6 lbs./hr. at a 95% confidence level. The emissions as measured were found to be within 9% of the emissions which were theoretically calculated. This is, therefore, an acceptable measurement.

A surging emission source was located during the study. This source is a machine which is used to produce large diameter re-generated cellulose casing. It was discovered to be emitting nonsteady (surging) emissions, and, since the emissions from this source are presently not treated, it is believed to be responsible for the odor which was observed by an odor panel.

The two parties used different procedures in analyzing ground level measurements, with the result that there were certain differences of opinion. Therefore, they submitted separate discussions, analyses, supporting exhibits and conclusions on this aspect of the testing program. In spite of their differing opinions, the parties did agree that the data did not support a conclusion that an odor nuisance exists in the communities surrounding Tee-Pak's facility.

A community survey was conducted by Professor Gerald R. Salancik, of the University of Illinois, consisting of 500 interviews of residents living within two miles of the Tee-Pak plant. Forty-four per cent of the people who were sampled said air pollution is the most severe environmental problem affecting the residential area. (However, a surprising 38% felt that noise pollution was the most severe problem.) Of the total sample 22% are bothered by industrial odors which they assumed to be emitted by Tee-Pak. Because there are several factories and plants in the area it is possible for the residents to be unsure as to which firm is truly responsible for

industrial odors. About 2% of the total sample said they were annoyed daily by Tee-Pak odors and 9% of the sample feel odors emitted by Tee-Pak do interfere with their lives in some manner. Of this 9% over one-third responded illogically to one or more questions (i.e., type of odor, wind direction), and this caused those responses to be deemed nonplausible. Therefore 6% of the total interviewed plausibly claimed that Tee-Pak odors constituted a nuisance. These people were located within 1 1/2 miles of Tee-Pak. Market Facts, Inc. of Chicago was employed to process and analyze the data from Professor Salancik's study.

Another set of tests involved the use of odor panels--groups of people who were asked to record their observations under expert guidance. Thirty-eight panels were used in this phase of the testing program. Only 1% of the panel members recorded objectionable findings of odor. Not one of the total of thirty-eight panels had a majority opinion that there was an objectionable sulfide odor. On three panels one panel member detected objectionable odor. On a fourth panel there were two panel members detecting objectionable odor. All of the detections of objectionable odor were found at locations downwind from the Tee-Pak facilities. Twenty-three of the panel tests were conducted downwind from Tee-Pak.

One of the conclusions from the odor panel sampling was that the plume is apparently very narrow and it appears to fall out between 1/2 and 1 1/2 miles downwind from Tee-Pak's facility. At the request of the EPA Dr. Howard Hesketh of Southern Illinois University examined the data accumulated from the field odor panels. Dr. Hesketh concluded that it was difficult to locate suitable positions to smell the odor. There were times when panel members on one side of a test site could smell the Tee-Pak emissions and members 40 feet away could not. He said "the detectable width of the odorous plume downwind on the ground is about 100 feet. The maximum concentration of the plume varies with wind speed but occurred 0.75-1.2 miles downwind at winds ranging from 5-10 miles per hour." Dr. Hesketh concluded that "it would not be possible to correlate the field odor results with the EPA air sampling data because the odorous plume moves back and forth from place to place too rapidly".

The parties agree that no relationship has been established between odor nuisance and the ground level concentrations of hydrogen sulfide as measured by instruments. The results of the odor panel tests do not provide a basis for determination of an ambient atmospheric concentration standard and do not alone show the existence of an odor nuisance.

However, the total evidence apparently indicated to the parties that additional controls are needed. As part of the settlement package, Tee-Pak will install a sixth hydrogen sulfide scrubbing unit which will be used to treat emissions from the surging source and other smaller sources. When this scrubber is completed and

placed into operation in conjunction with present scrubbers it is expected that Tee-Pak's average hydrogen sulfide emission rate will be reduced to 25 lbs. per hour. The parties agree that this level of hydrogen sulfide will preclude the existence of any odor nuisance in the community. Capital costs for the sixth unit are expected to be \$115,000 and annual operating costs about \$24,000.

Although they expect the emission rate to be 25 lbs./hr., the parties recommend that Tee-Pak be allowed a maximum emission rate of 36 lbs./hr. to be determined by averaging over two hour periods. This additional allowance is said to be necessary because of the uniqueness of Tee-Pak's operation. The Tee-Pak process for production of regenerated cellulose casings is a continuous one in which the initial phase of the process involves a chemical reaction which has a finite degradation rate. A characteristic of this process is that once the sodium salt xanthic acid has been formed, it becomes suitable for the regenerative reaction only between 40 and 45 hours later. If the raw material cannot be used during that time it must be dumped. Simple voltage drops in the electrical system have in the past caused failures in the regenerative step and have resulted in losses as high as \$45,000 for a single event.

To require that Tee-Pak shut down the regenerative process upon failure of one or more scrubbers might create significant problems depending upon the stage of chemical reaction at the time of shutdown. Halting the regenerative process before a reactor reached the fortieth hour of the reaction would require the dumping of the reactants. This is necessary in order to keep the reactants from gelling in the reactor and thereby causing cleaning and maintenance difficulties.

If the reactants were in the 40 to 45 hour time period and were already in the piping system to the regenerative process equipment, a forced shutdown would allow the reactant to gel in the piping and equipment. It would then be necessary to remove and clean all such piping and equipment prior to commencement of operations. Such costs are described as "fantastically high".

Another serious problem which would be caused from a shutdown at this facility involves the discharge to the Danville Sanitary District. When the sixth scrubber goes on line, effluent from Tee-Pak will be near the BOD concentration limits imposed on Tee-Pak by the Danville Sanitary District. The dumping of a 3,000 gallon reactor which contains highly alkaline reactants would cause an additional 12,000 population equivalence of BOD to enter the sewer system and would result in a Tee-Pak violation of the District's limitations. About \$1 million in capital funds would

be required for planning and installation of facilities to treat the liquid effluent if Tee-Pak were forced to cope with the higher BOD discharges.

In the event of a scrubber failure it is theoretically possible that hydrogen sulfide emissions could rapidly escalate to an average of 36 lbs./hr. This represents a maximum emission rate of as much as 42.6 lbs./hr. because of the 6.6 lbs./hr. statistical deviation.

Maintenance experience with the five scrubbers now in operation leads Tee-Pak to believe that the probability of a sudden and total failure of a scrubber is minute. If such failure did occur the studies indicate that the expected level of hydrogen sulfide in the stack discharge would cause some minimal interference with the lives and activities of citizens in Danville while repairs are being made to correct the malfunction.

Although we reject the settlement, there is much in this proposal which we could approve. Based upon its past conduct we believe Tee-Pak will perform the degree of maintenance required on the scrubbers to keep the hydrogen sulfide emissions at a level sufficiently low to preclude any odor nuisance. The two tiered emission rate is reasonable, especially in view of the economic or environmental problems which would be caused by the dumping of a reactor. We could accept the recommendation of the parties that no monetary penalty be imposed upon Tee-Pak. The record shows Tee-Pak's good faith and cooperative efforts in performing its commitments. Tee-Pak has agreed to install an additional scrubber at considerable capital and operating expense and spent over \$113,000 for the testing program which was ordered in November 1972. There is no need to add monetary penalty to the already large expense.

The settlement is rejected because it appears to give Tee-Pak a permanent defense to Section 9(a) prosecutions. Under the terms of the settlement Tee-Pak might claim that its compliance with this Board Order constitutes a prima facie defense to any prosecution resulting from future odorous emissions. We are willing to provide a limited period of freedom from prosecution. However, we do not have such absolute faith in the figures presented to us that we should proclaim for all time to come that compliance with these emission limitations is prima facie compliance with Section 9(a).

We believe it was reasonable to attempt to correlate human reactions in the community with actual scientific measurement of emissions and air quality. The record is not sufficient, however, for us to accept the test results as a Section 9(a) "standard".

Because we believe there is much merit in the settlement we suggest the parties renegotiate this phase of the agreement. If the parties inform us that they cannot agree on new language which conforms to this Opinion, then we will assign the matter to a hearing officer.

ORDER

The proposal for final settlement is rejected. The parties shall report to the Board in 30 days regarding the possibility of disposing of this matter through negotiation or the need for a hearing on the merits.

I, Christan L. Moffett, Clerk of the Illinois Pollution Control Board, hereby certify the above Opinion and Order was adopted this 31st day of October, 1974 by a vote of 5 to 0.


