

ILLINOIS POLLUTION CONTROL BOARD  
June 14, 1984

MIDWEST SOLVENTS COMPANY OF ILLINOIS, )  
 )  
 Petitioner, )  
 )  
 v. ) PCB 84-19  
 )  
 ILLINOIS ENVIRONMENTAL PROTECTION )  
 AGENCY, )  
 )  
 Respondent. )

OPINION AND ORDER OF THE BOARD (by W. J. Nega):

This matter comes before the Board on the petition for variance of Midwest Solvents Company of Illinois (MSC) filed on February 15, 1984.\* The Petitioner has requested a three-year variance from the 200 parts per million (ppm) carbon monoxide (CO) emission limit on fuel combustion emission sources delineated in Rule 206(a) of Chapter 2: Air Pollution Control Regulations (now 35 Ill. Adm. Code 216.121) to allow a temporary emission limitation of 700 ppm CO on emissions from the new fluidized bed combustion (FBC) boiler that is being installed in their Pekin plant.

On April 2, 1984, the Illinois Environmental Protection Agency (Agency) filed its Recommendation that variance be granted subject to certain conditions. A hearing was held on May 7, 1984.\*\*

The Petitioner owns and operates an ethyl alcohol production plant in the City of Pekin, Tazewell County, Illinois which occupies an irregularly-shaped parcel of land on the south edge of the city covering about 50 acres near the intersection of South Front Street and Distillery Road. Pekin has a population of 32,315 and the nearest town of significantly greater size is

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\*On February 15, 1984, MSC filed an unnumbered document entitled "Petition for Variance". Upon filing, this document was docketed by the Board as PCB 84-19. However, upon subsequent review, the Board noted that the filing appeared to be an amended variance petition repsonding to the Board's January 26, 1984 more information Order in the case docketed as PCB 84-9, Midwest Solvents Company of Illinois v. IEPA, filed January 23, 1984. To avoid perpetuation of administrative confusion, the Board entered an Order on February 22, 1984 dismissing docket PCB 84-9.

Peoria, Illinois which is located approximately eight miles north of Pekin. The Illinois River borders MSC's facility on the northwest side, the nearest residence is .2 miles east of the plant, and the facility is served by the Conrail Railroad. (Pet. 2-3; Rec. 1-5; Petitioner's Exhibit 1, page V-1).

MSC's facility presently produces ethyl alcohol for beverage and industrial purposes, anhydrous fuel alcohol, distillers feed, and wheat gluten/starch. The Petitioner's plant operates 24 hours per day, 7 days per week and employs about 75 people. (Pet. 1).

MSC's facility has three 80,000 pounds per hour (lbs/hr) natural gas-fired boilers with a total generating capacity of 240,000 lbs/hr of steam. The Petitioner's plant is presently being expanded from an ethyl alcohol production capacity of 20,000 gallons per day to a capacity of 30,000 gallons per day. (Pet. 1).

The company is in the process of installing a fluidized bed combustion boiler which will have a total generating capacity of 120,000 lbs/hr of steam. To generate approximately 3,000 kw of electricity for use by the process facility, the company plans to install a high pressure topping turbine generator. (Pet. 2). The new FBC boiler will use limestone in the fluidized bed to control sulfur dioxide (SO<sub>2</sub>) emissions and will utilize 8,035 lbs/hr of high sulfur Illinois coal.

When MSC purchased the plant from American Distilling Company in June of 1980, the previous coal handling and storage equipment was left intact. MSC plans to restore and then use the crushing equipment, elevator, storage bins, and coal dump which are already in place at the site. (Pet. 2-3). The new FBC boiler "will fire high-sulfur Illinois coal which is locally available within 40 miles of the plant site." (Pet. 3).

The company has indicated that that this coal "will be trucked from the Midland or the Peabody mines to the plant site". (Pet.3). The three natural gas-fired boilers "will be retained

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\*\*On March 16, 1984, the Board received a letter of inquiry from Mrs. William Skarnikat of Pekin, Illinois in reference to MSC's variance request. The Assistant Clerk of the Board notified Mrs. Skarnikat by telephone on May 3, 1984 that the hearing was scheduled for May 7, 1984 and gave her information as to the time and place of the public hearing. Mrs. Skarnikat apparently did not attend this hearing. At the hearing, it was indicated that initially only the parties and the media were present. (R.2). However, at the end of the hearing, an unidentified member of the public walked in and was asked by counsel for the Agency if they had any questions to ask. This unidentified member of the public responded "no" and the hearing was subsequently terminated. (R. 21).

for standby and emergency service only". (Pet. 2). The company has decided to switch from natural gas to Illinois coal because of rising natural gas prices and because it already has existing coal handling equipment in place. (Pet. 2-3). The new FBC boiler: (1) is designed to produce 120,000 pounds per hour of steam at 685 psig and 750 degrees Fahrenheit; (2) has high combustion efficiency; and (3) meets all current environmental requirements pertaining to sulfur dioxide and nitrogen oxide emissions. (Rec. 2). The Petitioner has indicated that particulate levels will be controlled by a fabric filter baghouse to 0.03 lb/MMBtu. Similarly, sulfur dioxide emission levels will be controlled by a limestone bed in the boiler to 1.2 lb/MMBtu, while nitrogen oxide levels will be controlled to .6 lb/MMBtu or less. (Rec. 2).

However, given the present state of technology in this area, the company's engineering consultants have ascertained that it is not technically possible to efficiently operate this new FBC boiler and meet the carbon monoxide emission limit set by 35 Ill. Adm. Code 216.121 while at the same time maintaining low levels of sulfur dioxide emissions, nitrogen oxide emissions and high boiler efficiency. (R. 7-16; Rec. 2-3). Thus, it is anticipated that the carbon monoxide emissions from the new FBC boiler will probably range between 620 ppm to 630 ppm CO once the boiler comes into operation.

The Petitioner has carefully considered various methods to reduce the level of carbon monoxide emissions. The company has indicated that the freeboard area size could be increased in order to reduce carbon monoxide emissions, since larger freeboard allows greater retention time of flue gas (enabling carbon monoxide to be converted to carbon dioxide). However, since MSC is using an existing building to house the new FBC boiler and the FBC boiler is the largest physical size which can be accommodated, a changeover would require a much larger boiler and a new building to house the boiler, thereby adding at least \$1,000,000 extra to the cost of the project in order to achieve a moderate reduction in CO levels. (Rec. 3).

Another alternative that the company has considered is increasing the excess air rate from 20% to 40%. Although this method would result in a greater reduction in carbon monoxide emissions, it would also reduce boiler efficiency by about 1.5%. According to engineering estimates by the firm's environmental consultants, it would require about 2.5 MMBtu/hr of fuel to save less than .5 MMBtu/hr. of potential energy from the combustion CO. (Rec. 3-4). Additionally, extra coal and limestone would be utilized, additional energy would be required to power both the forced draft fans and induced fans, and larger quantities of residue would be produced which would require disposal. (Rec. 4).

The Petitioner's facility is located in an area that has been classified as an attainment area for carbon monoxide. Accordingly, MSC's plan is subject to review under the Prevention of Significant Deterioration (PSD) program. The air quality

analysis which was conducted by the Petitioner has already been received and examined by the Agency. The Agency has issued a PSD permit to the company which authorizes the construction of the FBC boiler. (Rec. 4)

The Agency has indicated that this new FBC boiler will not be a significant source of carbon monoxide emissions since the highest predicted one-hour impact in the air quality analysis was 50.62 ug/M and the significance level for carbon monoxide impacts is 2,000 ug/M. (Rec. 4) Thus, the Agency believes that granting the variance will not interfere with the maintenance of the requisite National Ambient Air Quality Standard (NAAQS) for carbon monoxide. (Rec. 4) Concomitantly, the Petitioner has asserted that no adverse impact on community health and no adverse environmental impact on animal or plant life in the area will occur since the projected emissions of its FBC boiler will meet the requirements imposed by the NAAQS. (Rec. 4)

The Agency has determined that the facts as stated by the company are accurate. However, the Agency has reserved its judgment "on whether or not the design and performance characteristics" of the new boiler "represents the best available control technology for a bubbling-bed FBC boiler... this determination can best be made after the boiler has been operated and CO emissions have been evaluated based on actual performance." (Rec. 5) The Agency points out that "the FBC boiler technology was unknown when the Board adopted the carbon monoxide standards in 1972... no proven, practical CO control technology exists for circulating fluidized bed combustion boilers to achieve an emission rate of 200 ppm." (Rec. 9)

As it is presently envisioned, the new FBC boiler will have four continuous emission monitors and nitrogen oxide, sulfur dioxide, and carbon monoxide will be measured in the stack. MSC is considering ducting the exhaust gas from the boiler stack to a feed dryer. (Rec. 7) There are two air quality reporting stations in Pekin, Illinois (one monitors suspended particulates, the other monitors sulfur dioxide). The nearest carbon monoxide reporting station is in Peoria, Illinois and is fourteen miles north of the Petitioner's plant. (Rec. 6) However, modeling studies performed by Bibbs and Associates, Inc., the Petitioner's environmental consultants, have demonstrated that emissions of 700 ppm CO instead of the current limit of 200 ppm will not interfere with the maintenance of the NAAQS in Illinois and the concentration values indicated by MSC's petition and the engineer's modeling study are very small. (Rec. 9) The Agency has no record of any citizen's complaints against the Petitioner and it is likely that any unacceptable excursions that might possibly occur once the FBC is in operation would be immediately detected and corrected. (Rec. 6)

The Agency has recommended that, under the facts and circumstances, MSC's plan is subject to review under the Prevention of Significant Deterioration (PSD) program. The air quality

stances of this case, a variance is appropriate given the current limitations of present technology and the likelihood of no adverse effect on air quality.

Since the "bubbling-bed" FBC boiler technology was unknown when the Board adopted the carbon monoxide standards in 1972, it is conceivable that a variance from the 200 ppm CO standard might not be necessary in the instant case. However, to protect the Petitioner from a possible enforcement action based on a violation of 35 Ill. Adm. Code 216.121, the Board deems it appropriate to grant the requested variance.

Accordingly, the Board finds that denial of variance would impose an arbitrary or unreasonable hardship upon the Petitioner and will grant the requested relief, subject to the conditions delineated in the Order.

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

#### ORDER

The Petitioner, Midwest Solvents Company of Illinois, is hereby granted a variance from 35 Ill. Adm. Code 216.121 to allow a temporary emission limitation of 700 parts per million of carbon monoxide on emissions from the new fluidized bed combustion boiler that is being installed in its Pekin, Illinois plant, subject to the following conditions:

1. This variance shall expire on June 14, 1987.
2. The Petitioner shall develop and implement a program to study and evaluate any technical advances in the control of carbon monoxide in fluidized bed combustion boilers.
3. The Petitioner shall develop a program to evaluate the operating characteristics of its FBC boiler. This program shall include the periodic testing of the FBC boiler for carbon monoxide emissions so that the operation of the boiler can be optimized to minimize the emissions of carbon monoxide while maintaining the design efficiency.
4. The Petitioner shall submit to the Agency every six months a written report describing the progress of the aforementioned programs delineated in items #2 and #3.
5. Within 45 days of the date of this Order, the Petitioner shall execute and forward to the Illinois Environmental Protection Agency, Division of Air Pollution Control, 2200 Churchill Road, Springfield, Illinois 62706, a Certificate of Acceptance and Agreement to be bound to all the terms and conditions of this

variance. This 45-day period shall be held in abeyance for any period this matter is being appealed. The form of the certificate will be as follows:

CERTIFICATE

I, (We), \_\_\_\_\_, having read the Order of the Illinois Pollution Control Board in PCB 84-19 dated June 14, 1984, understand and accept the said Order, realizing that such acceptance renders all terms and conditions thereto binding and enforceable.

\_\_\_\_\_  
Midwest Solvents Company of Illinois

\_\_\_\_\_  
By: Authorized Agent

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

IT IS SO ORDERED.

Chairman Dumelle concurred.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above Opinion and Order was adopted on the 14<sup>th</sup> day of June, 1984 by a vote of 6-0.

Dorothy M. Gunn  
Dorothy M. Gunn, Clerk  
Illinois Pollution Control Board