

ILLINOIS POLLUTION CONTROL BOARD
November 8, 1972

ENVIRONMENTAL PROTECTION AGENCY)
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 v.) #72-83
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 CENTRAL ILLINOIS LIGHT CO.)

Prescott E. Bloom, Assistant Attorney General, for the
Environmental Protection Agency

William B. Wombacher, for Central Illinois Light Co.

Opinion of the Board (by Mr. Currie):

This case involves particulate emissions from power plant boilers 7, 8, 9 and 10 at the Central Illinois Light Company (CILCO) Wallace Station in Peoria. The boilers have dry-bottom stokers fed with pulverized coal. The exhaust gases from boilers 7 and 8 are cleaned by electrostatic precipitators and then exit jointly through a 195 ft. stack (stack number 4). The exhaust gases from boilers 9 and 10 are cleaned by electrostatic precipitators and then exit jointly through another 195 ft. stack (stack number 5).

The EPA alleges that the plant operates in violation of Section 9(a) of the Environmental Protection Act, which prohibits emissions or discharges of contaminants into the environment "so as to cause or tend to cause air pollution in Illinois," and in violation of Rule 3-3.112 of the Rules and Regulations Governing the Control of Air Pollution, which limits particulate emissions from indirect heating combustion sources.

CILCO denied the allegations, saying that at average actual operating conditions it is in compliance with the regulations as it construes them. We find a violation and impose a remedial order for reasons given below.

I. Violations

Testimony showed that two sets of stack sampling tests were performed on the boilers and precipitators in question and that the Respondent accepts the tests as "being made under proper and rigorous engineering practice." (R. 154).

The tests (Commercial Testing and Engineering Co. (CTE) performed January 1972 (EPA Ex. 2, 3, 4, 5), and Southern Research Institute (SRI), performed separately March, April, and July 1972 (EPA, Ex. 6)) show emissions from the stacks exceeding, in some cases, the maximum allowable particulate emissions of $0.6 \text{ lb}/10^6 \text{ BTU}$ stated in Rule 3-3.112. The results from the CTE tests show average particulate emissions of $0.66 \text{ lb}/10^6 \text{ BTU}$ for stack 4 and $0.93 \text{ lb}/10^6 \text{ BTU}$ for stack 5. The average emissions resulting from the SRI tests are 0.37 to $1.05 \text{ lb}/10^6 \text{ BTU}$ for stack 4 and $0.90 \text{ lb}/10^6 \text{ BTU}$ for stack 5. The emissions measured still more frequently exceed the allowable limit calculated according to ASME APS-1, incorporated into Rule 3-3.112, which for this particular plant can be as low as $0.22 \text{ lb}/10^6 \text{ BTU}$ on the basis of rated plant capacity and which CILCO itself argues is $0.33 \text{ lb}/10^6 \text{ BTU}$ at actual operating loads (Respondent's Brief, Ex. B, p. 2).

CILCO's defense is that the test results were obtained with boiler loadings higher than those that occur on the average. The company presents a reduced boiler loading schedule (Resp. Ex. 4) that it says will enable the plant to comply with the emission limitations. In addition CILCO in Exhibit B of Respondent's Brief presents calculations purporting to show the plant in compliance for the average boiler operating loads for the period of January, 1971 to May, 1972.

CILCO's position that it is sufficient to meet the emission standard on the basis of a seventeen-month average is quite insupportable. The purpose of Rule 3-3.112 is to protect against air pollution, and the rule cannot be read to say that one day or one month of clean air justifies one of polluted air. This is made clear by Figure 2 of the Regulations, which indicates that the goal of the regulation is to achieve stated ambient concentrations of particulate matter for periods as short as three to fifteen minutes.

Rejecting the impermissible view that long-term averages determine compliance with the regulation, we find that CILCO has plainly violated the standard even if all other issues are resolved in its favor. CILCO's own data for monthly average operating loads (Resp. Ex. 1), CILCO's method for estimating reduced-load emissions from the test results (EPA Ex. 6), and CILCO's method for calculating allowable emissions (Resp. Ex. 4), taken together, show that the plant was clearly in violation of Rule 3-3.112, even on a monthly average basis, during February and March of 1971 and January of 1972 (actual emissions = 0.35 to $0.37 \text{ lb}/10^6 \text{ BTU}$;

allowable emissions = $0.30 \text{ lb}/10^6 \text{ BTU}$). On the basis of its own evidence and its own method of calculating allowable emissions, therefore, CILCO's emissions have exceeded the standard.

Moreover, CILCO's method for computing allowable emissions is incorrect. CILCO argues that the allowable rate of emission in pounds per million BTU depends upon actual heat input from time to time rather than upon rated boiler capacity as advocated by the Agency. In its goal of achieving a stated effect on air quality, the regulation is to a certain degree more stringent as the size of the emission source increases; to make actual operating loads determinative, as CILCO asks, would mean the applicable standard becomes more lenient as the actual load decreases.

In policy terms there is something to be said for either approach. On the one hand, since a smaller volume of emission at a higher rate would achieve the stated air-quality goal of the regulation, it can be argued that actual heat input should be used. This method also protects against adverse effects on air quality by tightening the standard if a boiler is operated in excess of its rated capacity. On the other hand, since it is necessary to install control equipment to meet the standard during peak operating conditions, it does not seem unreasonable to require such equipment to be used, presumably with at least as good results, when the boiler is operated at a lower load. Moreover, as the present case shows, ease of enforcement clearly favors allowing proof of a violation on the basis of rated capacity. On the other side, again, reliance on rated capacity penalizes the operator who installs a larger boiler than he presently needs and whose actual emissions never exceed those from a smaller boiler in compliance.

Our new regulations, applicable in the future, explicitly make allowable emissions dependent upon actual heat input as it fluctuates over time. PCB Regs., Ch. 2, Rule 203(g)(1). But the regulation under which this case was brought, Rule 3-3.112 of the APCB rules, does not. The text of the rule is silent on the subject. The accompanying graph, incorporated in the regulation, flatly speaks of "Total Equipment Capacity Rating, Million BTU Per Hour Input." ASME APS-1 equation 15, also incorporated in the regulation; utilizes "total equipment capacity rating, heat input, BTU/hr." "Total heat input" ASME then defines in the following terms: "The total heat input to all indirect heat exchangers at a plant from which plumes merge close to the plant shall be used for determining the total equipment capacity

rating. . . ." The only argument that can be made against giving "capacity rating" its plain meaning in this context is that the definition of "heat input" in some way suggests that "actual" heat input is to be used in place of capacity. This is to say the least a strained construction. The definition clearly focuses not upon the distinction between actual and rated inputs but upon the propriety of aggregating several emission sources. There is no suggestion that "heat input" means anything in this sentence but rated heat input, as is the overwhelming inference from the use of heat input in BTU/hr as the term in which capacity rating is to be expressed. Finally, use of capacity rating in computing the allowable emission is confirmed by Technical Release No. 1-1 of the Air Pollution Control Board (EPA Ex. 19), which expresses the contemporary understanding of the agency that adopted the regulation. Cf. Application of Commonwealth Edison Co. (Dresden #3), #70-21, 1 PCB ____ (March 3, 1971). We conclude that rated capacity is the basis for calculating allowable emissions under Rule 3-3.112.

There is a further legal dispute over the correct allowance for the existence of two stacks in determining allowable emissions. We discuss this issue in connection with the question of remedy, but it need not detain us here. Whichever of the suggested multiple-stack correction methods is employed, the company's own average operating data for the months of February, March, April, and May of 1972, as well as of those indicated above and others in 1971, show emissions exceeding the allowable as determined on the correct basis of rated capacity. The plant emissions for these months in 1972 range from approximately $0.33 \text{ lb}/10^6$ BTU in February to $0.27 \text{ lb}/10^6$ BTU in May; whereas the allowable emission using the CILCO multiple-stack correction is $0.24 \text{ lb}/10^6$ BTU.

Moreover, apart from violations shown by CILCO's actual operating data, we cannot accept the company's argument that a stack test proves nothing unless the Agency establishes the precise times at which the boilers were operated at loads high enough to cause violations of the standard. We believe the introduction of the results of a properly conducted stack test showing a violation under load conditions within the normal capacity of the boilers shifts the burden to the Respondent to show that the conditions under which the test was taken were not representative and that the boilers are in fact not operated at such levels as to cause violations. Not to accept the representative nature of test conditions in the absence of contrary proof

would place insurmountable obstacles in the way of enforcement by requiring the Agency to conduct daily stack tests in order to prove a continuing violation. We cannot believe the regulation intended any such result. If actual operating conditions differ significantly from those under which the test is run, the operator is in the best position to present the facts on the basis of its own records, and it must bear the burden of proof. This conclusion is foreshadowed, if not compelled, by our long-standing holding that a violation may be shown, without stack testing, on the basis of standard emission factors derived from stack tests of equipment similar to that in question, subject to proof by the Respondent that its actual emissions differ from those elsewhere tested. EPA v. Lindgren Foundry Co., #70-1, 1 PCB 11 (Sept. 25, 1970); EPA v. Norfolk & Western Ry., #70-41, 1 PCB ___ (May 26, 1971). In the case of stack tests as well as of emission factors, reliance upon representative information is proper in the absence of rebuttal.

This burden of rebuttal CILCO failed to meet. Even allowing for its own erroneous interpretation with respect to actual heat input in determining the allowable emission, CILCO proved at best only that it was sometimes in compliance on a monthly or longer average. This by no means demonstrates that the boilers were never operated at a rate high enough to cause violations during those months even on the company's interpretation; indeed the natural inference, even without considering the variability of demand for electricity, is that the long-term average is derived from individual short-term values some of which are substantially higher. The stack tests therefore stand as unrebutted proof of a continuing violation.

II. Future Compliance

Having determined that CILCO's emissions have been proved in violation of the applicable standard, we turn next to the question of remedy. Most important is to assure that CILCO will meet the standard in the future.

The company assures us that it can do so by operating at less than capacity loads at all times and that precipitator improvements are unnecessary. To whatever extent this assurance is based upon long-term averaging of emissions or upon an allowable emission fluctuating with actual load, both of which we have held impermissible, CILCO must re-examine its conclusions. Moreover, while annual operating data for 1971 (EPA Ex. 11) and boiler ratings (gas-fired and coal-fired) (EPA Ex. 1) seem to indicate that a reduction in coal-fired loading might to a great extent be made up for by

greater use of gas, we do not have adequate information to convince us, in light of varying demands by electrical customers and of overall gas availability, that coal firing can be kept low enough to avoid violations. We cannot help wondering why such large boilers were built if they were not meant to be used.

In reexamining the measures needed to assure future compliance CILCO must make proper allowance for the fact that emissions from the Wallace station come from two stacks of equal height and unequal loading, an issue on which the parties disagree. The basic equation of ASME APS-1, which is the heart of the regulation, applies to emissions from a single stack. The regulation, following ASME's advice, states that "for a plant with multiple stacks the appropriate correction factor shall be applied."

For multiple stacks of equal height and equally heated, Appendix B of ASME APS-1 adds a correction factor $n^{.25}$ to the heat rise portion of the emission equation; where n is the number of stacks. The Agency argued that this factor was the "appropriate" one here and thus asserted that $n = 2$. But since the two stacks (4 and 5) are not equally heated (R. 114, 115), ASME APS-1 Appendix B is not applicable since it states

"The consideration in the foregoing paragraphs apply when the emission is split evenly among n stacks of equal height. Complexity increases where heights or emissions are not similar."

ASME APS-1 does not specifically discuss equal height stacks unequally heated. CILCO therefore attempted to weigh the multiple stack term, n , of Appendix B by the unequal heat inputs to the two stacks and determined that $n = 1.60$ to 1.67. This is also not correct for the following reason.

The ground level concentration of particulates resulting from multiple stack emissions is just the superposition of the concentrations resulting from each stack taken individually. This is true independent of the stack heights or the distribution of heat between the stacks. In order to obtain the multiple stack equation for the ground level concentration maximized with respect to both distance and windspeed (equation (15) of Appendix A for a single stack), a mathematical derivation using calculus is employed. For the special multiple stack case of equal stack heights and equal stack heat inputs, this derivation results in equation (2) of Appendix B, which is the same as equation (15) but modified by the multiple stack factor $n^{.25}$. Thus the use of equation

(2) assures that the conditions of equal stack heights and equal heat inputs, used in its derivation, are valid. Since these conditions are not valid in the case of CILCO, the use or adjustment of equation (2) as attempted by CILCO is not appropriate.

The method therefore that should be used in this case for calculating allowable plant emissions is to superimpose the emissions from the two stacks and determine the allowable emissions such that a ground level particulate concentration of 50 ugm/m^3 , maximized with respect to distance and windspeed, is not exceeded.

On the basis of today's decision it will be incumbent upon CILCO to reassess its program to determine whether or not merely reducing the load on the coal-fired boilers will enable it to comply. We will require an updated report on the company's plan for compliance to be filed with us and with the Agency within 35 days. We note that an operating permit application (PCB Regs., Rule 103) containing a program for compliance (Rule 104) by May 30, 1975 with the new $0.1 \text{ lb}/10^6 \text{ BTU}$ standard (Rule 203(g)) will be due from CILCO January 1, 1973; if precipitator improvements are needed to meet the old standard, CILCO may wish to make a single improvement to meet the new standard as well. We shall also order CILCO, effective immediately, to effect such emission reductions as are feasible by decreasing the load on the offending boilers. We shall expect the Agency's response within 20 days after receipt of the company's report and shall thereupon take such further action as may appear appropriate with respect to future compliance.

III. Penalties

The final issue is that of money penalties. CILCO's program for achieving compliance with Rule 3-3.112 (ACERP), approved by the Air Pollution Control Board (R. 122), and completed in the Fall of 1971 (R. 119), included rebuilding the precipitators on the boilers here in question (EPA Ex. 1). Upon completion of the program, stack tests promptly performed revealed precipitator efficiencies considerably below those contemplated by the design. So far as the record shows, the company was not aware before the CTE test report of January 1972 that its program of improvements carried out in good faith and agreed to by the APCB would not be adequate.

Under Rule 2-2.41, good faith pursuit of an approved ACERP constitutes a defense to enforcement charges for

emissions during the program. Although we have held that an ACERP was in essence a varaince and thus required renewal after one year, EPA v. Commonwealth Edison Co., #70-4, 1 PCB 207 (Feb. 17, 1971), we have abstained from imposing money penalties on those who continue to carry out approved programs in good faith after the expiration of a year. E.g., EPA v. Hyman Michaels Co., #71-24, 2 PCB 141 (July 22, 1971). There is no suggestion that CILCO failed to pursue its ACERP with diligence and good faith, and therefore no cause for penalties for emissions before the program was completed.

The more serious question arises as to CILCO's emissions since the ACERP improvements were completed. Emission tests were taken without undue delays, and no purpose would be served by penalizing the company for emissions before the tests since on the record there was no reason to suspect violations until the test results were received. After the January tests, however, it may be argued that CILCO should have taken more effective action than it did to eliminate the problem. CILCO in fact attempted to reduce coal-fired boiler loadings in order to meet the standard according to its own interpretation of the rules, with some success: The monthly average figures for March, April, and May, the latest in the record, do not reveal violations if all of CILCO's legal assumptions are accepted. Thus it can be argued that CILCO should not be penalized because it acted in good faith on the basis of its interpretation of the laws.

That good-faith reliance on a reasonable but erroneous interpretation of the law can be a mitigating factor in determining money penalties we recognized in such cases as EPA v. Hyman-Michaels Co., discussed above, which dealt with a company that did not believe its ACERP required annual renewal. There, however, the regulation itself said nothing about renewal, and the State had granted approval of a program lasting more than a year. Reliance on such affirmative state action we thought to be entirely reasonable. Such is not the case here, even if we give CILCO the benefit of the doubt with regard to its assumption that actual heat input was determinative of allowable emissions. That we should do so is not clear, since the not unreasonable assumption that emissions equal to those from a complying smaller boiler would be permissible is refuted by the not very ambiguous language of the chart incorporated in the regulations. In any event, we do not think CILCO or anyone else reading the regulation could reasonably have believed it could meet its obligations by complying on a long-term average basis. A violator may not with impunity postpone

compliance by concocting an improbable misinterpretation of the rules.

We find that the stack tests demonstrate a continuing violation of Rule 3-3.112; that CILCO's proof of compliance on a monthly average basis, even on its own erroneous actual-input basis for computing allowable emissions, does not rebut this showing; that CILCO knew of such violations as early as January, 1972 and was required to take prompt corrective action; that the action taken, designed as it was to achieve compliance only on a long-term average basis, has not been shown to be adequate even on the assumption that actual heat input determines allowable emissions; that CILCO should have known that long-term averages cannot satisfy the regulation; and therefore that CILCO did not act with proper diligence to abate a known emission problem. A penalty is thus in order.

In this respect the case is not unlike EPA v. CPC International, #71-338, 5 PCB ___ (Oct. 3, 1972), in which we imposed a \$15,000 penalty for several months' use of high-ash coal in light of proof that the company knew this would result in emissions in excess of the particulate regulations. The penalty will be the same in this case, for violations down to the date of this order.

The short of the case is that CILCO tried to get by by meeting the standards part of the time. This is not enough, and it cannot be excused.

ORDER

1. Within 35 days after receipt of this order, CILCO shall file with the Board a progress report and statement of intent with respect to upgrading the plant to meet Rule 3-3.112 of the Rules and Regulations Governing the Control of Air Pollution. The Agency shall file a response within 20 days after receipt of the CILCO report.
2. Effective immediately upon receipt of this order, the plant shall be operated in such a manner as to minimize particulate emissions. To this end maximum use shall be made of gas-fired boilers 1 through 6 consistent with safe operating procedures, the demand for electricity, and gas availability.
3. Within 35 days after receipt of this order, CILCO shall pay as a penalty for the violations found in the Board's

opinion the sum of \$15,000 to the State of Illinois, Fiscal Services Division, Illinois Environmental Protection Agency, 2200 Churchill Road, Springfield, Illinois 62706.

4. This case remains open for such further proceedings as the Board may direct.

I, Christan Moffett, Clerk of the Pollution Control Board, certify that the Board adopted the above Opinion this 8th day of November, 1972, by a vote of 5-0.
