

ILLINOIS POLLUTION CONTROL BOARD

March 7, 1974

CENTRAL ILLINOIS LIGHT COMPANY )  
PETITIONER )  
)  
)  
v. ) PCB 73-65  
)  
)  
ENVIRONMENTAL PROTECTION AGENCY )  
RESPONDENT )  
)

WILLIAM B. WOMBACHER, ATTORNEY, in behalf of CENTRAL ILLINOIS LIGHT COMPANY  
PRESCOTT E. BLOOM, SPECIAL ASSISTANT ATTORNEY GENERAL, in behalf of the ENVIRONMENTAL PROTECTION AGENCY

OPINION AND ORDER OF THE BOARD (by Mr. Harder)

This action involves a request for variance from Rule 204 (c) (1) (A). Central Illinois Light Co. (CILCO) requests variance for its R. S. Wallace and E. D. Edwards power generating stations. More specifically, relief is requested to exceed the sulphur dioxide emission standards which will become effective on May 30, 1975.

Variance petitions were filed on January 31, 1973. Amendments to said petition were filed on November 5, 1973. The Agency filed its recommendation of March 14, 1973, recommending a denial on both plants. The matter was set for hearing on May 29, 1973. Hearings were held on the following dates: May 29, 30, 31; June 1, 4, 6, 7; July 25, 26; August 21; September 17, 18, 1973. As would be indicated from the many dates of hearings, a large volume of testimony was entered into evidence. This testimony, coupled with lengthy exhibits, serves as an excellent base for the Board. It is particularly noteworthy in this action. The subject of sulphur dioxide abatement technology is still relatively new and a recent update, such as is contained in this action, is vitally needed.

The subject power generation plants are both located in the Peoria major metropolitan area, and hence are regulated to a 1.8 lb/mmBTU sulphur dioxide emission rate. The R.S. Wallace station operates with the following equipment and under the following conditions:

Boiler Desig.	Date on Stream	Fuel	Part. Con- trols	Turbo-Gen. MW
1	1925	Gas only	NA Standby	1 & 2
2	1925	"	NA Standby	1 & 2
3	1925	"	NA Peaking	1 & 2
4	1925	"	NA Peaking	1 & 2
5	1939	"	NA Peaking	
6	1941	"	NA Peaking	
7	1949	Washed coal	95% ESP.	
8	1949	"	95% ESP.	
9	1952	"	95% ESP.	
10	1958	"	95% ESP.	

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This facility utilizes washed Illinois coal and by the Agency's calculations emits 4.89#/MMBTU sulphur dioxide into the atmosphere (Agency recommendation Pg. 3).

The E. D. Edwards station operates with the following equipment and under the following conditions:

Boiler Design	Date on Stream	Fuel	Part. Cont.	MW
1	1960	Washed coal	98.5% ESP.	} 725
2	1968	"	"	
3	1972	"	"	

This facility also uses Illinois washed coal and by the Agency's calculations emits 4.89#/MMBTU sulphur dioxide into the atmosphere. Both stations combined use a total of 2,628,000 tons of coal per year and emit 134,780 tons/yr. of sulphur dioxide.

One major question was woven throughout the entire proceedings. This question dealt with the timeliness of the petition. Petitioner seeks relief from Rule 204 (c) (1) (A) which is not effective until May, 1975, and therefore in granting a variance now the Board would in essence be varying a rule which is not yet in existence. The Board, however, fully realizes Petitioner's plight. It is evident that in order to meet the requirements of 1975 plans must be formulated and acted upon now (although it may already be too late for May 1975 compliance). The above deals only in the case whereby compliance will be brought about by mechanical/chemical desulphurization. In the case of a possible alternate fuel supply compliance could possibly result before the required date. The Board has on many occasions granted variances in advance of the enforceable date although the variance invariably overlaps at least partially into the effective date. In the instant case any variance granted would not extend into the effective date. The Board is restricted by Section 36 (B) of the Environmental Protection Act which states that a variance may be granted up to one year. Therefore a variance from 204 (c) (1) (A) would not give Petitioner the relief sought. What Petitioner seems to be seeking is in

effect a stay of the regulations as they pertain to them. This is an entirely different matter and is not in the scope of the instant case. The Board finds itself with just two options.

The first option would be to deny the variance on the facts elicited. It is the Board's decision that this would serve no useful purpose. As mentioned, a great deal of valuable information has been generated during this procedure, and this information could and should be used in a more timely variance petition. The second option open to the Board is to dismiss the petition as premature without prejudice. This option seems much more logical and will be the final result of said action.

In dismissing this action the Board makes a number of points:

I. The following review of testimony entered will be made to facilitate any future actions of this type. The Board suggests that the proceedings in this action can be incorporated into any future action as a case in chief. Any party to a future action can, of course, add to or update the original testimony, but it is expected that expensive testing (e.g., Modeling of Air Quality) can be reused.

II. The Board anticipates that it will shortly hold hearings on the entire sulphur regulations. What the outcome of such proceedings will be at this point is not known (at the date of this writing an Agency recommendation has not been received.). But it is evident that whatever the outcome, Petitioner, along with all other sulphur dioxide emitters, will be affected. It is hoped that some of the information generated during the instant proceedings will be introduced as evidence during the upcoming sulphur dioxide proceedings.

Petitioner has stated that the only methods available to achieve compliance are: 1) use of natural gas, 2) use of low sulphur oil, 3) use of low sulphur coal, 4) use of desulphurization techniques. Testimony was elicited in regard to all of the above possibilities.

I. Use of Natural Gas: Mr. Charles E. Gagnier, an employee of CILCO, entered the main testimony as to availability of natural gas as a possible fuel supply (R. 50-123). He testified that procurement of natural gas has been under his direction since 1965 (R. 50). Problems with CILCO'S two main suppliers' (mainly Panhandle) ability to deliver gas has been apparent since 1971. Panhandle's curtailment during 1972 amounted to 8.5% and projections (by Panhandle Gas) for the 1973-74 heating season anticipate a maximum curtailment of 300,000 M.C.F. per day (R. 59). Witness testified that the prospects for any increase in gas supplies are extremely dim (R. 62). Witness further commented that CILCO, like every other major gas distributing company, is under restrictive selling orders from the Illinois Commerce Commission (R. 66), and stated that in his opinion, "It (gas) is simply not available as a viable alternate to meeting fuel requirements of those units." (R. 67) There was no Agency rebut to the above testimony, and from the rapidly growing number of cases before the Board using a similar argument (e.g., Koppers, PCB 73-365, J.R. Short, 73-251, Crest Container, 73-348), the Board feels that gas is not at this time a viable alter-

nate.

II. Use of Low Sulphur Fuel Oil: Again the main testimony was elicited from Mr. Gagnier. Mr. Gagnier testified that at this time #2 low sulphur oil is not available to CILCO (R. 74), and that at this time CILCO does not use oil to fire any of its units, but does use 345,000 gal. of oil for ignition purposes (R. 76). Witness stated that in light of discussion held with vendors as to the possibility of securing additional #2 fuel oil, he feels that oil is not a viable alternate (R. 76). Under cross-examination the witness testified that CILCO had not explored the possibility of importing low-sulphur oil (R. 99).

Mr. J. C. Gruber (consultant for CILCO) testified that he has had experience in converting power plants from coal to oil firing (R. 140), and that one of the problems of converting to oil would be land area at Wallace (for oil storage facilities). His "ball park" estimate for conversion to oil at the Wallace Station would be "nine to ten million dollars and at Edwards not quite twice that much." (R. 146) As in the case of natural gas the shortages of low sulphur fuel oil are becoming increasingly clear. Recent federal guidelines regarding fuel allocations will even further restrict utilities from utilizing the fuel to generate power.

III. Use of Low Sulphur Coal: The subject of low sulphur coal was discussed in some detail. Mr. Gagnier testified as to CILCO's investigation into low sulphur coal. Pet. Exhibit #1 was introduced which is a summary of costs per million BTU for various coals. The exhibit alleges that the cost of freight would be two times the cost of the coal upon shipment from Wyoming. Witness further pointed out that the availability of railroad cars may be a problem (R. 87), and that based on economics low sulphur coal is not a viable alternate to Illinois coal (R. 90). Under cross-examination the validity of Pet. Exhibit #1 was attacked. It was pointed out that freight rates are based on single car loads (R. 95), and that it is more economical to ship multi-car loads (R. 97).

Mr. Gruber testified as to various technical problems which would be encountered upon conversion to low sulphur coal. Testimony was elicited as to the problem with fly ash removal using low sulphur coal (R. 134). It was alleged that the low sulphur content causes the ensuing fly ash to be resistant to removal by electrostatic precipitation, because SO<sub>2</sub> is a conductive gas (R. 135). Witness estimated the cost of conversion to low sulphur coal including cost of upgraded electrostatic precipitators at about \$15/kw. Mr. G. Nichols (Southern Research Institute) was called on to elaborate on the problems regarding low sulphur coal. Mr. Nichols testified that he had a crew conduct efficiency tests of the Wallace Station's ESP's, and conducted a study for CILCO on the feasibility of conversion to low sulphur coal (R. 239). He further testified that if low sulphur coal were burned at Wallace using the existing ESP's, their efficiency would drop off markedly. Pet. Exhibit #5 was introduced, giving a summary of this effect. The following table shows the expected increase in fly ash at both Wallace and Edwards.

Unit #1	Current Eff. 2 1/2% s. Coal	Est. Eff. Low sul. coal	Ratio of Emissions
Wallace #7	88	67	2.7
" #8	83	60	2.3
" #9	97	87	4.3
Edwards #1	98.5	92.0	5.3
" #2	98.5	92.0	5.3
" #3	96	93.7	6.3

In order for the stations to be in compliance with the particulate matter standard, while using low sulphur coal, Mr. Nichols projected that a load factor of 30% would be a probable maximum (R. 252). Under cross-examination Mr. Nichols stated that the abovementioned problems were of a technical nature and there was a reasonable possibility of solution (R. 262).

Mr. Otis Gibson (Illinois Coal Operators' Association) testified as to the economic impact on Illinois if CILCO were to divert its purchases out of the state. He testified that in 1972 Illinois mines produced 65 MM. tons of coal (R. 390) (Note CILCO uses 2 MM tons/yr.), of which about 50% is consumed in Illinois. There are about 20,000 people engaged in the coal mining business in Illinois (R. 394), and gross receipts from the sale of coal run \$320 MM. 98% of all Illinois coal is considered high sulphur (R. 399). Mr. Gibson testified that three coal mines had closed down in Illinois (production 4 MM. tons/yr) due to environmental reasons (R. 402). He also testified that there has been a shortage of coal cars in the country for quite a few years (R. 408). This testimony concurs with Mr. Gagnier's (R. 87). Upon cross-examination it was well pointed out that any loss of Illinois coal sales would result only if Illinois coal were used as is. This says that Illinois coal could be used in conjunction with pre- or post-cleanup operations (R. 418).

The record is clear that low sulphur coal is a potential alternate. Testimony highlighting the technical and availability problems was not adequate to prove that either problem is insurmountable. The record is rather weak as to how much real effort Petitioner expended in pursuing this alternate.

IV. Use of Desulphurization Techniques: A great deal of testimony was elicited regarding the state of the art of desulphurization. In order to present the facts as concisely and clearly as possible, the testimony will be presented by major plants discussed. Following this discussion there will be an analysis of attempts or progress made by Petitioner in this regard.

Mitsui Plant: Perhaps the area of greatest discussion and disagreement centers around the SO<sub>2</sub> desulphurization process used at the Mit-

sui Aluminum Company located in Omuta City, Japan. A number of exhibits were entered which outlined operations at this plant (R. Ex. 3A, 3, 8, 11, P. Ex. 8, 19). In addition many witnesses testified as to the operation of this plant.

Pet. Exhibit 11A outlines the general operation of the Mitsui plant. This plant generates 156 MW of electricity by use of a coal-fired boiler. The boiler utilizes a combination of coal and a low grade fine coal called "coal slime." The sulphur content is in the neighborhood of 2%. The unit is designed to remove 80% of the incoming sulphur from a high percentage (86%) of the 319,000 scfm flue gas flow. The operation for desulphurization is two Venturi scrubbers using calcium hydroxide (from carbide sludge) as a scrubbant. This then is a lime slurry system. As a byproduct, the system produces large volumes of calcium sulfite and calcium sulphate. Presently this sludge is pumped to a holding pond and stored. The Mitsui Company has plans for an additional 200 mw. installation utilizing limestone as a scrubbant. It is hoped that the sludge generated from this process can be converted to gypsum which can then be used for wallboard.

The process was started up on March 29, 1972, on scrubber "B" and on April 10, 1972, on scrubber "A". Performance tests were completed on May 13, 1972, and on October 17, 1972, the plant was shut down for power plant maintenance. From November 7, 1972, to June 12, 1973, the plant was run on one or the other scrubber. On June 12, 1973, both scrubbers were operated in tandem at 45% of the total flue gas each. On July 5, 1973, the unit was shut down for boiler maintenance and the units inspected. There is no doubt that this unit has had the highest degree of success of all desulphurization units in existence today.

Much controversy centers around the modes of operation of the Mitsui plant as related to American power plant operations. This point was first brought out by Mr. Gagnier (R. 206). The Mitsui plant is run to supply electricity to a steady state unit and is defined as a base load unit, that is, it does not suffer swings in demand. It was alleged that this swingloading would change the flow of flue gas to the scrubbers and thereby interfere with L/G ratios (R. 215). Mr. A. U. Slack (T.V.A.) further elaborated on this problem. He testified that the control of pH in the scrubbant is extremely important in reducing scaling on the unit, and that if one has a "swinging load" control of pH would be extremely difficult.

Mr. F. Princiotta (U.S. Environmental Protection Agency) testified that the unit is basically a base load unit, but that there were occasions under which variations did occur (R. 560). He testified that the variations were not infrequent. Mr. Princiotta further pointed out that to the best of his knowledge when the load swings, the liquor flow to the scrubbers is kept constant and pH is adjusted by addition of carbide sludge. Dr. H. E. Hesketh next testified. Dr. Hesketh was the author of a number of reports on the Mitsui plant and had visited the operation as recently as July 1973. He stated that pH samples are taken about every 1/2 hour and that control of pH was not difficult (r. 716).

He also testified that the process could be adapted to U.S. swing load plants with no problems (R. 717). (See Pet. Ex. 11A pp. 27-28.)

The second main contested point was that of open vs. closed loop operations. This is in regard to reutilization of chemicals from recirculation ponds. This point is very important as it directly affects operating and raw material costs. It also significantly affects volumes of sludge produced as byproducts. The testimony on this point is a bit confusing. Mr. Gruber felt that based on the literature the plant does not recycle its effluent and is thus an open loop system (R. 209). Mr. Slack also testified that it is an open loop system (R. 323). He stated this because the pond liquor is unsaturated and that one of the effects of this is possible water pollution (R. 329). However, under cross-examination the witness testified that he did not know that there is effluent coming off the sludge pond (R. 378). Mr. Princiotta testified that as a result of samples taken from the Mitsui pond it is indicated that closed loop operation is used part of the time (R. 555), and that they try to operate in a closed loop. Dr. Hesketh testified that he feels that under normal rainfall conditions the system is closed loop and that under high rainfall conditions overflow of ponds can cause an open loop effect (R. 713).

The third main point of contention is the scrubbant used. The Mitsui plant uses carbide sludge which is a form of lime (calcium hydroxide). There was much testimony as to the differences between the sludge used in Japan vs. the available form of lime in the U.S. Both chemical activity and scaling were discussed. Mr. Slack testified that there were significant differences between freshly hydrated lime and carbide sludge based on his conversation with the National Lime Association (R. 326). He felt that carbide sludge would not scale to the extent that lime would. Mr. Princiotta stated that experimental evidence by a few operations has shown no significant scaling differences between the types of lime (R. 616). Dr. Hesketh offered the results of a study he performed to try and clear up this problem. Regarding the area of reactivity the following was found.

<u>SAMPLE</u>	<u>REACTIVITY (RELATIVE)</u>
Slaked Pebble Lime	1.00
Slaked Lime	0.78
Wet Carbide Sludge (USA)	0.60
Dry Carbide Sludge (Japan)	0.57
Wet Carbide Sludge (Japan)	0.48

The main finding is that while the Mitsui plant is operating well, there are significant questions as to its total applicability to U.S. power plants. In summary, the evidence on this plant would tend to favor the Respondent's position that the technology is directly translatable to the U.S. This is stated because the main witnesses for Respondent (Hesketh, Princiotta) had direct contact with the Mitsui plant, while other witnesses were depending in part on second-hand information.

Tennessee Valley Plant: The T.V.A. in cooperation with the Federal Environmental Protection Agency has been active in desulphurization techniques for years. Mr. A. Slack testified as to the progress and problems at these installations. Mr. Slack said that the T.V.A. has chosen limestone over lime as a scrubbing medium because it is economical and is less sensitive to scaling. The pH is also easier to control (R. 332).

Chemco is presently under construction at the T.V.A. Widow Creek station with a 550 M.W. limestone scrubbing unit. This is due to be completed in early 1975. Mr. Slack stated that he considers the unit to be a test unit and that although they are encouraged by past work, they have no guarantee of success (R. 334). Mr. Frank Princiotta testified that limestone is not less expensive (R. 566).

Shawnee (T.V.A.) pilot plant is a small 10 mw unit. It is used to test various different conditions. The unit was built by Bechtel, for maximum flexibility. It can evaluate four scrubber types (Resp. Ex. 3). The types of scrubbers tested are marble bed, Venturi, after spray, and turbulent contact (R. 571). It was admitted that reliability studies have only been carried out for the last three months (R. 572). Mr. Princiotta testified that based on experience at Shawnee there are some erosion problems; however, it is hoped that upgraded parts will alleviate this (R. 574). Shawnee has had no problems with pump wear (R. 576), nor any significant problems with mist eliminator pluggage (R. 578).

It must be remembered that this plant is only of 10 mw capacity and is used to generate information for larger plants (100+ mw). It cannot be considered to be a viable full-scale plant.

Will County (Com Ed plant): This plant is located in Romeoville, Illinois. It is a limestone scrubbing system with throwaway product, manufactured by Babcock & Wilcox. The plant was started up in February 1972 as a 175 mw retrofit unit. There are two parallel scrubbing systems containing Venturis for particulate removal and turbulent contact adsorbers for SO<sub>2</sub> removal (Res. Ex. 3). Mr. D. Gifford, who is the project engineer for Com Ed in charge of the Will County station, testified as to the reliability of the Will Co. station (R. 428-439). During 1972 the (A) scrubber was operated for 29.5% of the time and the (B) scrubber for 25.5% of the time. Simultaneous operation was 469 hours or 9.6%. The longest continuous period of operation was 21 days for (A) and 6 days simultaneously. The largest problem has been mist eliminator pluggage. Other problems were reheater pluggage, electrical trips, joint failure, plugged lines, vibration, nozzle pluggage, and other mechanical problems. The history of problems repeated itself during 1973 with scrubber operating time even lower than for 1972. In this unit both scrubbers are needed to handle the total gas flow. Mr. Gifford also elaborated on the problems of waste disposal, saying that the sludge has the consistency of toothpaste (R. 437), and that it is not suitable as landfill. The magnitude of the problem was



pointed out in that if the unit operated at 70% capacity and the sludge was 33% solids, there would be 350,000 tons or 259,000 yds<sup>3</sup>. This would cover a five-acre area 32 ft. deep in one year (R. 438).

Mr. Princiotta testified that he had visited the Will County station. He felt the major problem had been dimster pluggage and that they were well on the way to solving that problem (R. 569).

Monsanto Catalytic Oxidation Process at Wood River, Ill.: This plant, owned by Illinois Power Company, is the first commercial operation of a catalytic oxidation system. The plant is a 100 mw coal-fired unit. Electrostatic precipitators precede the catalytic oxidation unit to prevent pluggage of the catalyst bed. The plant produces a salable H<sub>2</sub>SO<sub>4</sub> byproduct. The operation is being partly funded by the Federal Environmental Protection Agency. The original cost estimate was \$6.8 MM, costs to date are \$9.1 MM. The system is still not functioning (R. 265-69).

The plant went on line September 4, 1972, and has operated only part of 17 days (less than 200 hrs.). The major problem has been fouling of the catalyst bed due to problems in the reheaters. The use of oil rather than gas in the reheaters had given rise to an oily film which plugged the system. Work is underway to redesign the unit (R. 272).

The following other plants were mentioned in the testimony. These plants are, or shortly will be, coming on stream.

PLANT	MW	NEW OR RETRO	STARTUP	FUEL
Duquesne Light	100	R	May 1973	2.3% Coal
Kansas City Power	840	N	1973	3.2% Coal
Boston Edison	150	R	1972	Oil
Ohio Edison	1800	N	1974-75	3.0% Coal

There are additionally many other plants under construction using all types of available technology. Statements of witnesses as to the availability at the present technology is widely argued. The next year should present major answers, as many problems are undergoing study and many plants are undergoing revisions.

One of the main questions in the instant case is what has the Petitioner done in the way of adding to the technology developed, or what attempts at compliance have been made. Unfortunately data surrounding CILCO's expenditures relating to desulphurization are muddled. The Board would be very interested in getting clarification on these points. The major points in question are CILCO's pilot study at the E. D. Edwards plant and CILCO's anticipated work at Duck Creek. This information would weigh heavily on Petitioner's claim to have made a "good faith" effort to comply.

Much testimony was elicited as to CILCO's past pollution control expenditures. Mr. R. Viets testified (RV 1 to RV-52) as to these expend-

itures, stating a total in excess of \$13 MM. These figures relate mainly to equipment used to control particulates. Many of the items mentioned, e.g., stack modifications and ash handling equipment and conversion to gas, are of dubious value in ascertaining Petitioner's "good faith." It is also important to note that the instant case deals with sulphur dioxide control and not particulate control. The expenditures Petitioner has made in relation to particulates are no more than what has been required of every other major facility in the state in similar circumstances. These monies cannot be used as a justification for variance from sulphur dioxide regulations.

Resp. Ex. 2 was tendered. This is a report outlining a cost study for a pilot plant SO<sub>2</sub> unit at the E. D. Edwards plant. Mr. Haynes (CILCO employee) testified that the pilot plant was now in a shakedown period at E. D. Edwards (R. 536). Testimony as to the intended use of the study is not available. The Board is left to ponder the question. From Resp. Ex. 2 the following data as to the size and scope of the project were gleaned.

Total estimated cost	\$234,802
Duration of initial test	6 months
Volume flow	10,000 cfm.
Scrubbant	Limestone

Comparisons with the T.V.A. project which treats 30,000 cfm or 10 mw would indicate this to be a rather small 3-4 mw installation. The question still remains as to whether this unit was intended as a prototype for the Duck Creek plant.

Petitioner entered Ex. #3 which is an SO<sub>2</sub> control study for the R. S. Wallace and E. D. Edwards stations. Petitioner's Exhibit #4 updated the cost estimates to 1972 dollars. When all factors are considered, the final estimates were \$31.5 MM for R. S. Wallace and \$63 MM for E. D. Edwards. Estimates for operating costs were about \$2 MM/yr. and \$5.1 MM/yr. at Wallace and Edwards respectively. Under cross-examination it was determined that much of the anticipated costs were based on estimates of contingency and inflation. Although the Board has not enough information to rule on the validity of CILCO's figures, it is safe to say that the estimates would vary depending on who is doing the calculations.

Testimony alluded to the anticipated Duck Creek installation. In its recommendation the Agency states that CILCO plans to construct a new generating station with SO<sub>2</sub> scrubbing (Pg. 2). Mr. R. Viets testified (RV 14) that \$41,000,000 was committed by contract or by intent for pollution control devices at Duck Creek. Of this \$20 MM was slated for SO<sub>2</sub> removal equipment. During cross-examination it was very unclear as to whether SO<sub>2</sub> removal at Duck Creek is planned, budgeted, or committed. There was some argument over whether the subject of Duck Creek was germane to the instant case. The Board feels it is. This point will not only display what attempts Petitioner is making toward future compliance, but also will be part of a discussion regarding the Wallace and Edwards case.

Petitioner claims that if ordered to abate its sulphur dioxide emissions, an unreasonable and arbitrary hardship would be incurred by itself and its customers. The above-stated cost figures for desulphurization equipment are alleged as proof in part of the hardship which would befall Petitioner. Even if the Board were to accept the \$31.5 MM and \$63 MM figures given above, Petitioner has not shown how this expenditure would cause an arbitrary hardship. There can be no doubt that these sums of money are great, and that one would not expect this type of expenditure without a reasonable chance of success. However, future proceedings should show in detail how this expenditure would affect both Petitioner and its customers. Petitioner's allegations as to hardship on its customers were left untouched. Respondent's Exhibit 13 shows that attempts have been made to convince the Illinois Commerce Commission to pass environmental costs on to the consumers (this could be, if accepted, a hardship on consumers); however, this action has not been finalized. Petitioner has failed to show how curtailment of part of its facilities would affect the public at large. In other recent actions, e.g., Commonwealth Edison v. Environmental Protection Agency, PCB 73-295, much testimony attesting to the public's need for the subject capacity was elicited. Testimony of this type was lacking in the instant case. Also lacking was testimony detailing Petitioner's ability to purchase electricity to make up for possible curtailments. Answers to questions such as this are necessary to determine hardship on the consumer.

The last major point of concern to the Board is that of environmental impact. Modeling studies have been conducted by both the Petitioner and the Agency.

Mr. Gruber (for Petitioner) testified as to a study made on SO<sub>2</sub> dispersion (R. 433-506). A study on the R. S. Wallace Station was conducted using one equivalent stack and on the E. D. Edwards plant using two stacks. Eight different wind directions were used, and 1965 to 1969 Peoria meteorological data were used in the study. Only three out of seven atmospheric states were used (unstable, stable, and natural). The study was alleged to have taken into account such variables as stack height, full load operating conditions of the plant, and variations in terrain. All studies were conducted around a twelve-month calendar year (Petitioner's Exhibits 10, 11, 12). The primary ambient air quality standard for SO<sub>2</sub> is 0.03 ppm annual arithmetic mean.

Under cross-examination the dispersion model was attacked for various reasons. The concept of utilizing one equivalent stack was admitted to be different than actual stacks. Also the model may not yield the highest concentrations because of simplifying assumptions. The main attack centered around the proposition that terrain was not adequately taken into account. It must also be noted that the figures portrayed in the exhibit represent only the sources contributing to ambient air SO<sub>2</sub> concentrations and background is excluded. Another important point is that the data generated is for annual means and does not take into account inversions. There is no estimate of 24 hr. concentrations (standard 0.14 ppm).

Mr. L. Haynes explained Pet. Exhibits 13, 14, 15, 16 which are maps of the Peoria area with SO<sub>2</sub> data for the years 1968, 69, 70, 71, 72, and 73. This data was obtained by four different acceptable monitoring methods. The data show that in most cases the SO<sub>2</sub> concentration is trending downward, and in many cases meets the air quality standards. The thrust of these exhibits was to show that when the isopleths generated in Pet. Ex. 9, 10, 11, 12 are superimposed on Exhibit 13, the model data is very conservative. The following table will help to understand the data tendered:

Location of Data Station	Reported SO <sub>2</sub> Concentration						Max. Proj. SO <sub>2</sub> Wallace & Edwards Per CILCO Model
	68	69 <sup>2</sup>	70	71	72	73	
Sheridan	0.022	.015	.017	-	.007	.006	0.002
South Stanley	0.022	.020	.020	.018	-	-	0.015
Caroline & Jeff.	0.026	0.023	.020	0.016	-	-	0.010
West Washington	0.062	0.062	.048	.043	-	-	0.002
Jefferson	.048	.030	.035	.031	-	-	.001
Liberty St.	-	-	-	-	.036	.032	.011

At this point in the proceedings Petitioner introduced Exhibits 17 and 18 which are compliance plans for both R. S. Wallace and E. D. Edwards. The plans call for reduction of the R. S. Wallace load to 13% average yearly load. This program is to begin in 1976. From 1976 Wallace will be used as a peaking unit only. The Edwards compliance plan calls for only continued monitoring and the possibility of installation of SO<sub>2</sub> abatement equipment "as soon as reliable SO<sub>2</sub> emission control equipment becomes commercially available." The Board finds that these are not viable compliance plans. A compliance plan is one which will allow an emitter to come into compliance with an applicable regulation. A statement which in essence proposes to continue exceeding the limit with vague promises for the future is insufficient, nor is a statement that Petitioner is contributing a minor portion of the pollution in the area sufficient. Regulations are passed not only to protect the quality of the ambient air but also to allow "room" for future expansion.

Mr. Gary Melvin testified for the Agency regarding Air SO<sub>2</sub> Modeling (GM 3-57). Mr. Melvin stated that the Gruber model was adequate as a 24-hr. model, but did not go far enough, in that it does not yield data on short-term concentrations. Exhibit 17 was introduced to show what 3-hr. concentrations would be around the Wallace Station under certain weather conditions. Under cross-examination it was pointed out that the weather data used was in part assumed and tended to yield higher SO<sub>2</sub> concentrations. It was also pointed out that part of the model was conducted using full plant load at varying sulphur levels.

One fact seems apparent about dispersion modeling: The assumptions used to generate the data can drastically affect the final results. It

is also clear that under the best conditions CILCO's emissions have a negligible impact on the community, whereas under the worst conditions the impact is significant.

Summary: Although the record in this case is voluminous, many vitally important parts were left unanswered. Regarding the subject of hardship, Petitioner has not followed up its initiatives regarding hardship. Much of the data pertaining to the use of low sulphur coal was weak in that it did not fully explore the economics of multi-car load coal shipments. The status of coal désulphurization technology is admittedly open to question. It is clear that at any future action of this type a new wealth of information will be available. CILCO should be able to add to this information by relating specifics as to its pilot study and its work at the proposed Duck Creek facility. The Board has held that research and development may be a viable alternate to a firm compliance plan (Union Oil Corp. v. Environmental Protection Agency, PCB 72-447); however, the burden of proof is squarely on the Petitioner.

Regarding the subject of environmental impact: Again the burden of proof is on the Petitioner. When faced with data that is only partially complete, or which only gives favorable results, and such data is strongly rebutted, the Board will endeavor to insure that the residents of the community are protected. Data must not only show that on the average citizens will be protected, but also that periodic excursions will not be harmful.

In dismissing this Petition as premature, the Board wishes to again emphasize its rationale. Petitioner has filed for a variance from a regulation which will not be effective until 1975. A variance is in fact a shield from prosecution for violations of our rules and regulations. If there is no violation, there can be no variance. The Board does not make advisory rulings. Here the action is not ripe. (Swords v. Environmental Protection Agency, PCB 70-6; Environmental Protection Agency v. Borden Chemical Company, PCB 71-23; City of Carbondale v. Environmental Protection Agency, PCB 73-430). It was on its face an improper petition. Significant time and funds were expended by both parties to present testimony in an attempt to gain a variance which could not be granted under the Environmental Protection Act. It is again hoped that if a future action of this type is required, some of the time and funds expended can be recovered by incorporating this record.

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

ORDER

IT IS THE ORDER of the Pollution Control Board that Petitioner's

request for a variance be dismissed.

IT IS SO ORDERED.

Mr. Henss dissents.

I, Christan L. Moffett, Clerk of the Illinois Pollution Control Board, certify that the above Opinion and Order was adopted by the Board on the 7<sup>th</sup> day of March, 1974, by a vote of 4 to 1.

Christan L. Moffett