ILLINOIS POLLUTION CONTROL BOARD
December 6, 1973

COMMONWEALTH EDISON COMPANY	)	
v.	)	PCB 73-295
ENVIRONMENTAL PROTECTION AGENCY	)	

MR. RICHARD E. POWELL and CHARLES E. WHALEN, Isham, Lincoln and Beale, appeared on behalf of Commonwealth Edison

MR. DELBERT D. HASCHEMEYER, Assistant Attorney General, appeared on behalf of the Environmental Protection Agency

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

Edison filed a Petition for Variance on July 16, 1973 which sought an extension of the variance originally granted on October 14, 1971, in PCB 71-129 and extended by operation of law in PCB 72-295 on December 31, 1972 when the Board lacked a quorum. On August 23, 1973, the Agency filed its Recommendation to deny the variance petition. Three days of hearings were held on August 27, September 13 and September 14, 1973. On October 9, 1973, Edison filed a Motion for Additional Time in order to file post hearing briefs, sought an Interim Variance until November 19, 1973, and filed a waiver until that date. The Board granted Edison's motion on October 11, 1973, and Edison's and the Agency's briefs were received on October 23 and October 24, 1973. On November 8, 1973, the Board ordered that Edison provide limited information clarifying the current status of Zion Unit #1, which was not evident from the record. Edison filed a Motion seeking an additional three weeks to reply to this Board order and filed a Waiver until December 7, 1973. The Board granted Edison an Interim Variance until December 7, 1973, to allow Edison time to comply with its Interim Order.

On November 27, 1973, Edison filed a Petition for Modification of Powerton Units 1-4 Operating Restrictions, a Motion for an Interim Variance, and a waiver. Edison filed an Information in Response to Board Order on November 30, 1973, which was requested by November 8, 1973 Order requesting additional information concerning Zion Unit 1.

The Board denies the Motion for interim variance because the Board has decided to rule on the original variance petition. Edison's request for a modification of the Powerton Units 1-4 operating restrictions is granted because the Board's ruling on November 29, 1973, modifying its original order in PCB 73-40, 72-441, and 72-492, altered the operating sequence to allow Edison to utilize all of its coal-fired capacity prior to utilizing its peaking units. The Board has incorporated this operating sequence in the present order which modifies the original variance granted in PCB 71-129 to reflect the operational sequence found in PCB 73-40.

Edison operates an electric power generating station, known as the Powerton Station, located near Pekin, in Tazewell County, Illinois. The Powerton Station contains five steam-electric generators with a sixth under construction and scheduled for operation in 1975. The units which are the subject of this variance request are Units 1-4 with an aggregate winter capacity of 350 mw. from twleve coal-fired steam generators without pollution control equipment to limit emissions. Unit 5, which is not subject to this variance proceeding, is an 850 mw. unit and is the largest coal-fired unit in Illinois.

The variance (PCB 72-295 and PCB 71-129), which Edison seeks to be extended, is subject to the following conditions:

(a) Powerton shall be the last unit on the Edison system committed to service and the first taken off after the daily peak period is passed. Powerton shall be committed only with sufficient lead time to insure that unit's availability for the peak period. When Powerton's capacity is required to meet a predicted daily load plus the operating reserve, the station will be initially loaded to approximately 50% capacity. Before the remaining capability of the Powerton units will be utilized, all other units on the Edison system--including the fast start peaking units--will be brought to full operating load, exclusive of emergency capability.

(b) The above shall not apply if weather conditions, which may cause icing on transmission lines exist, or if Edison's projected daily peak load equals or exceeds 70% of the projected annual peak load.

Edison has taken steps to lessen the environmental impact of operating Powerton Units 1-4, and alleges that the load factor, percent of the time that the Powerton units are in operation, has decreased from 42.3% in 1971 to 9.6% in 1972 to 6.5% in the first half of 1973 (R. 254). Edison alleged that by burning low

sulfur coal with a low ash content and higher heating value, they have instituted a 40% to 50% reduction in fly ash emissions per kw-hour (R. 255). Edison alleged that when this lower sulfur coal is combined with the reduction in load factor it results in an approximate 80% reduction in SO_2 and particulate emissions from the Powerton Units 1-4 (R. 255). While SO_2 emissions are not the actual subject of this variance request, SO_2 emissions are important due to the nuisance aspects of Powerton Units 1-4 operation and possible synergistic effects of SO_2 and particulate emissions.

The Agency presented information that showed Powerton Units 1-4 to have a capacity factor of between 12.6% and 2.5% with an average of 7.5% for the first half of 1973 (EPA Ex. 13). The percent of the days that Edison operated any of Powerton Units 1-4 was shown to range between 23% and 81% of the days during the first half of 1973 (EPA Ex. 11). Thus while the capacity factor is low, Edison has felt it necessary to operate at least one of the four units at some level on an average of half of the days.

Citizen testimony presented at the hearing, graphically illustrates that even with the limitations in the operation, the continued operation of Powerton Units 1-4 produces a substantial nuisance and hardship to the nearby citizens (R. 455-477). Mr. Billy Keen, who had testified in the prior hearing PCB 71-129, his wife, and Mrs. Monk testified that emissions from the Powerton Station result in substantial interference with their right to enjoy backyard outside activities such as picnics and swimming in their swimming pools (R. 456, 468, 469, and 476); builds up on window sills (R. 456); results in the need to continuously clean the inside of their houses (R. 467); and soils and stains the outside of their residences (R. 71, 475). They further testified that the emission causes coughing and a burning in their throats (R. 464, 476). They all testified that the emissions are worse during the summer, and that during the month of July the emissions are at their worst (R. 465, 468, and 477). Mr. Keen testified that the worst emissions were emitted from the shorter stacks (R. 459). He presented a photograph (EPA Ex. 19) which shows emissions from the Powerton Station moving toward his residence.

Edison presented data collected by the State, which shows that annual particulate averages exceed the allowable level, and that most of the time 24-hour standards are violated with some frequency (R. 318). The Agency calculated that a 5,300 mw. facility operating within the standards would produce the same amount of emissions as the 350 mw. produced by Powerton Units 1-4 while operating at the lower capacity factors from January to June 1973 (R. 385). The record clearly shows and the Board finds, that Powerton Units 1-4 result in air pollution when they are operated.

Edison, as in the original variance request, alleges that it needs 160 mw. of generating capability to provide "first contingency protection" for the Crawford sub-station serving downtown and mid-town Chicago on the 69 KV line (R. 49). Edison defines "first contingency protection" as that generating capability necessary to tolerate the loss of (a) two major generating units, (b) one generating unit and one transmission line, or (c) one major transmission line (R. 29). Edison further alleges that it needs the full generating capability of the Powerton Units 1-4 in order to provide power during necessary maintenance outages and to meet the expected 1974 summer peak (R. 86). Edison has been proceeding on schedule to make transmission system changes to obviate the need to retain Powerton Units 1-4 to provide first contingency protection, but those changes will not be completed until May 15, 1974 (R. 30). Edison alleges that it needs to maintain the ability until mid August 1974 to utilize Powerton Units 1-4 as zone protection in the event of an occurrence of one of the above three mechanical breakdowns and a malfunction in the new equipment which is to be installed prior to May 1974. The Agency alleged that Edison does not need to provide first contingency protection through the use of Powerton Units 1-4 (Recommendations, pp. 3-4) based upon the testimony of Dr. VanNess, an Agency witness, in PCB 72-295, that it would be possible to prevent overloads on the 69 KV system by switching power from another source, through the Powerton Station and then to the 69 KV system (R. 262, PCB 72-295). The Board finds that the Agency did not rebut Edison's testimony that only 70 mw. could be transferred through the Powerton Station (R. 184) and that 160 mw. was needed to provide the necessary protection (R. 159, 160). The Board recognizes that Edison will have to utilize Powerton Units 1-4 to provide first contingency protection. For this reason, the Board grants Edison an extension of the variance to operate Powerton Units 1-4 up to 160 mw. in order to provide first contingency protection for the 69 KV system until such time as the modifications to the transmission system are completed in mid-May 1974, and the need for first contingency protection has passed. The Board also grants Edison a variance to allow it to maintain Powerton Units 1-4 in order to provide additional protection against the overload of the 69 KV system from May 1974 until August 15, 1974. This additional insurance, in the event of a system breakdown and a malfunction in the new equipment, should be an extremely unlikely occurrence (R. 134).

Because the Board has recognized Edison's need to operate Powerton Units 1-4 in order to provide first contingency protection this winter, Edison must be allowed to operate Powerton Units 1-4 for de-icing purposes to ensure that the necessary transmission lines remain in service. Consequently, the Board grants Edison a variance to operate Powerton Units 1-4 in order to de-ice the transmission lines between Powerton and Crawford Stations.

The Board agrees with the Agency that the failure to present evidence concerning the computer study of the probability of two units being out at the same time is a major oversight by Edison, however, the Board does not think it warrants denial of the variance. The Board's granting of the variance should not be taken as an approval of Edison's decision not to use overtime labor in complying with the previous Board order. However, little would now be gained by ordering overtime labor in the light of the testimony that equipment delays are the controlling time factor at the present time (R. 46).

The Board is next faced with the question of whether or not to extend the variance in order to allow Edison to utilize Powerton Units 1-4 to meet system demands during maintenance and summer peak load periods. Edison has alleged that they need Powerton Units 1-4 until October 15, 1974, when the four units will be retired from coal-fired service (R. 99). The Agency alleges that Edison has failed to meet its burden to show that it in fact needs Powerton Units 1-4 to meet system demands during both maintenance and peak periods. When deciding whether or not to grant an extension of the present variance, the Board must weigh the environmental degradation resulting from such operations versus the hardship placed upon Edison by the denial of the variance petition. An integral part of Edison's hardship is that hardship that would be placed upon Edison's customers in the event that Edison could not meet the demand for power.

Edison and the Agency have conducted monitoring studies in order to estimate the environmental impact in the surrounding area which would be caused by operating Powerton Units 1-4. Edison retained Argonne National Laboratory to perform modeling studies (Air Quality Display Model (AQDM)) to estimate the effects of the emission from Powerton Units 1-4 on long-term or annual ambient air quality. The model included a recently-updated inventory of all major emission sources (202 in number) in the Peoria area and an estimate of the total emissions from all the smaller sources in the region (R. 198). Edison alleged Argonne's AQDM model was used extensively by the Agency and by the Board in considering the recently adopted emission regulations (R. 195, 96, 200). Edison presented evidence concerning two sets of predictions: Impact on annual ambient air quality in the area and short term impact (24-hrs. or less) (Edison Ex. 8 and 9).

Edison Exhibit 8 shows the result of the computer modeling program to predict the annual particulate and sulfur dioxide ambient concentrations in the Peoria Major Metropolitan Area as predicted by the AQDM. Edison Exhibit 8 is based upon the result of Edison Exhibits 12-A thru 12-E; which are computer

determinations for all emissions in the Peoria region excluding Powerton Station, and a separate determination for each emission from the four individual stacks at the Powerton Station (Edison Ex. 12 A-E). The AQDM was based upon 1970 Peoria meteorological data (R. 201). The model predicted SO_2 and particulate levels for some 237 grid point locations (R. 207) based upon a seven kilometer grid system (R. 311). The results of the AQDM, presented in Edison Exhibit 8, purport to show that at the grid point of maximum ambient concentration resulting from emissions from all other sources that the SO_2 level would be as follows:

Period	Excluding Powerton 1-4	Including Powerton 1-4	%Powerton Contribution
8/70 - 7/71	135.48 $\mu g/m^3$	139.00 $\mu g/m^3$	2.5
8/71 - 7/72	135.85 $\mu g/m^3$	137.48 $\mu g/m^3$	1.2
8/72 - 7/73	136.96 $\mu g/m^3$	137.34 $\mu g/m^3$	0.2

Edison Exhibit 8 also shows that at the point of maximum Powerton Contribution, the ambient SO_2 concentration would be:

Period	Excluding Powerton 1-4	Including Powerton 1-4	% Powerton Contribution
8/70 - 7/71	51.48 $\mu g/m^3$	66.34 $\mu g/m^3$	22.6
8/71 - 7/72	52.53 $\mu g/m^3$	57.55 $\mu g/m^3$	9.7
8/72 - 7/73	55.74 $\mu g/m^3$	57.55 $\mu g/m^3$	3.1

Edison Exhibit No. 8 also shows the maximum particulate matter levels predicted by the AQDM as follows:

Period	Excluding Powerton 1-4	Including Powerton 1-4	% Powerton Contribution
8/70 - 7/71	162.94 $\mu g/m^3$	166.43 $\mu g/m^3$	2.10
8/71 - 7/72	162.94 $\mu g/m^3$	163.66 $\mu g/m^3$	0.40
8/72 - 7/73	162.95 $\mu g/m^3$	163.36 $\mu g/m^3$	0.25

Edison Exhibit No. 8 shows also that at the point of maximum Powerton Contribution, the particulate levels would be

Period	Excluding Powerton 1-4	Including Powerton 1-4	% Powerton Contribution
8/70 - 7/71	79.43 $\mu g/m^3$	101.29 $\mu g/m^3$	21.6

Period	Excluding Powerton 1-4	Including Powerton 1-4	%Powerton Contribution
8/71 - 7/72	79.44 ug/m^3	84.5 ug/m^3	6.0
8/72 - 7/73	79.47 ug/m^3	81.85 ug/m^3	2.9

Edison Exhibit 9 is a listing of the three points within the Peoria-Pekin vicinity that had the highest reported particulate level concentrations from 1967 thru 1971. At all three points, for all five years, the annual geographic mean value has exceeded the primary annual ambient air quality particulate standards of 75 ug/m^3. The 1971 values ranged from 93 to 101 ug/m^3, and the maximum values ranged from 256 to 398 micrograms per cubic meter. The maximum 24-hr. concentrations, which is not to be exceeded more than once per year, is 260 micrograms per cubic meter. Edison Exhibit No. 9 clearly shows,and the Board so finds, that the ambient air quality in the Peoria-Pekin vicinity exceeds the primary air quality standard for both the annual geographic mean and the maximum 24-hr. concentration. Edison's monitoring sites included high-vol samplers for particulate monitoring and 14 lead candle and 2 continuous SO_2 monitoring devices (R. 209).

The Agency alleged Edison's systems did not include a value for the terrain of the vicinity (R. 209) and did not consider short-run effects (R. 210). The Agency also pointed out that Edison's values are based upon grid location points which do not necessarily coincide with the point at which the maximum level of the pollutant would occur and therefore does not include the worst 24-hr. period or the greatest annual value (R. 276). The Agency further alleged that Edison's modeling did not include a frequency factor for the occurrence of adverse meteorological conditions (R. 305) and did not calculate values for an inversion (R. 322). Edison alleges that Exhibit 8 and 9 show that emissions from Powerton Units 1-4 have had little impact on annual ambient air quality in the Peoria-Pekin area (P. 14 of Edison's brief).

Edison also modeled the short-term (24-hr. or less) effect of the operation of Powerton Unit 1-4 upon ambient air quality in the area (R. 258). Because of the restrictions that had been placed upon Edison's operation of Powerton Units 1-4, Edison assumed as the "worst case" that the units would be operated for an extended period to prevent the formation of ice on the transmission lines (R. 258-59). Edison Exhibit No. 11 supports Edison's choice of an operational level of 60% as being the worst case on record since the use restrictions, as it shows that during December, 1972, Edison operated Powerton Units 1-4 on a daily average 5,167 mw. hours. Operation at 100% capacity for a 24-hr. period would equal 8400 mw. hours. Edison's short term

model was further based upon the wind blowing from the same direction and at the same speed during the entire 3 or 24-hr. averaging period (R. 261). Edison alleges that with the above "very conservative assumptions", the operation of Powerton Units 1-4 would not result in violations of the short term primary or secondary air quality standard (R. 260, Edison Ex. 10). Edison Exhibit 10 shows the estimations of the short term concentrations of particulate and SO_2 levels for various unit loadings and stability classifications as follows:

Particulate

Load	Stability	Time (hrs.)	Estimate of Maximum Ground Level Concentration
215	Neutral	24	90 $\mu g/m^3$
215	Unstable	24	123 $\mu g/m^3$
350	Unstable	3	503 $\mu g/m^3$

Sulfur Dioxide

Load	Stability	Time (hrs.)	Estimate of Maximum Ground Level Concentration
215	Neutral	24	145 $\mu g/m^3$
215	Unstable	24	196 $\mu g/m^3$
350	Unstable	3	808 $\mu g/m^3$

The primary and secondary ambient air quality standards are:

	Time (hrs.)	Primary	Secondary
Particulate	24	260 $\mu g/m^3$	150 $\mu g/m^3$
SO_2	24	365 $\mu g/m^3$	260 $\mu g/m^3$
	3		1300 $\mu g/m^3$

Edison alleges that continuing operation of Powerton Units 1-4 under the current operating restrictions (see page 2 of this opinion for a listing of the operating restrictions) will not have a significant affect on the air quality in the area (Edison Ex. 8, page 14 Edison's Brief and Argument).

The Agency calculated a particulate emission rate of 4.83 lbs./M Btu's for Units 2, 3, and 4 and 6.31 lbs./M Btu's for Unit 1, and calculated a SO_2 emission rate of 6.43 lbs./M Btu's for all four units (EPA Ex. 8).[2] The Agency emphasized, and it should be pointed out, that Powerton Units 1-4 are the only investor owned plant in Illinois without any particulate control equipment (EPA Ex. 7).

The Agency characterized Edison's Exhibit 8, which shows that Powerton Units 1-4 caused a 3.1% increase at the point of maximum concentration in particulate levels for August 1972 thru July 1973, as occurring during intermittent low capacity operation. The Agency alleges that the only logical conclusion that can be drawn is that when Powerton Units 1-4 operate, they cause a much higher and truly significant impact on air quality (Page 5, Agency Post Hearing Brief). The Agency characterized Edison's modeling as comparing a dispersion model to approximately 25 selected monitor readings taken at specific locations. Stability class frequency distributions were not taken into consideration, nor were topographical feastures and certain meteorological conditions. The Agency also pointed out the relatively short stack heights at Powerton Units 1-4 of between 300 and 350 feet (EPA Ex. 8).

The Agency modeling evidence (EPA Ex. 21 thru 25) was refused by the Hearing Officer based upon Edison's objections that it assumed at a 24-hr., 365 day operation; the Agency used the maximum sulfur content in the fuel rather than the average content; and that there was no foundation for the particulate level (R. 570, 571). However, Exhibit 21 thru 25 were accepted as pointing out the predicted location and direction of the point of maximum concentration (R. 583).

The Board overturns the ruling of the Hearing Officer and admits Agency Exhibits 21 thru 25 into evidence without the qualification. The objections raised by Edison should go to the weight to be given the computer modeling, not to its admissibility. The Exhibits were discussed, offered into evidence, cross-examined, and should have been admitted.

Mr. David Kolaz, testified concerning the results of Agency computer modeling studies using the air quality display model for different combinations of the Powerton Units (R. 511). The Agency's air quality display model is a derivative of the Federal government air quality display model (R. 513). The model allows

one to compute the annual average concentration of particulates and SO_2 and uses a statistical analysis to compute short-term concentrations, based on the average annual concentration (R. 514). The Agency's model also utilizes various meteorological conditions or classes, in the form of a percent frequency of occurrence for six wind speed classes, sixteen wind directions, and five stability classes (R. 514). The model is setup so as to allow the calculation of a concentration at every half a kilometer in a square grid pattern and 12 non-grid receptors (R. 515). The closest receptor to the Powerton station was located 1/2 kilometer east and north of the Powerton station (R. 521). The Agency's model was based upon particulate and SO_2 emission rates contained in EPA Exhibit 8 (R. 523). Based upon the Agency's modeling, the point of maximum particulate concentration would occur 7 kilometers north of the power station (R. 528). The Agency's calculation of maximum concentrations for Powerton's Units 1-4, including Powerton Unit 5, would be 6 micrograms per cubic meter for particulates and 4 micrograms per cubic meter for SO_2 excluding background levels (R. 529, EPA Ex. 21). As pointed out by Edison's cross-examination of Mr. Kolaz the Agency's modeling was based upon the assumption that Powerton Units 1-4 operated 24-hrs. a day seven days a week at 100% capacity (R. 532).

Jack Coblenz, the Agency Manager of the Division of Air Pollution - Technical Services Section, testified that a down washing effect could occur at the Powerton station site (R. 544). This could result in higher than predicted levels since dispersion models assume a flat surface and assume no down-wash (R. 541). Mr. Coblenz further testified that dispersion modeling is accurate within 50% or that the numbers the Agency or that Edison calculated could be in error from one half to double the actual value (R. 545). Edison's model showed that at the point of maximum concentration Powerton would contribute 0.5% in 1971, 0.3% in 1972, and 0.2% in 1973 of the pollution level (R. 547, 548). The point Edison showed as the point of maximum concentration is located in the heart of Peoria where emissions from other sources, closer in relationship than the Powertion station, would have had a very large affect (R. 547). In examining receptor #66 of the Edison data, Mr. Coblenz testified that there was in fact another contributor whose actual emissions were much less than Powerton, but were so close to the receptor that they had a greater effect than Powerton (R. 548).

Because the Agency's model contains some 196 grid points in the area represented as one grid in the Edison data, the Agency's model should predict the theoretical point of maximum concentration with a greater degree of accuracy (R. 549). Mr. Coblenz further testified that because Powerton Units are located in a river valley,

the effect would be that winds would tend to follow the valley so that the frequency of winds from the Powerton Station to Pekin and Peoria would be much greater than the wind frequency direction as given by a weather station located outside the valley (R. 552). Mr. Coblenz testified that wind direction from the south, southeast, and southwest occurred at a 40% frequency, but along the river valley would occur at a greater frequency so that instead of the plume dispersing east and west, the pollution would generally go up the valley summer and spring and in the winter time would go down the valley to the south (R. 553).

Based upon the modeling evidence presented, the Board finds that Powerton Units 1-4 contribute a significant amount of particulate and SO_2 pollution to the Pekin-Peoria area. Such pollution must be weighed against any request for an extension to meet peak loads.

Edison alleges that they need the power from Powerton Units 1-4 in order to meet the 1974 summer and maintenance period peaks. Edison presented testimony that their planned reserve for 1974 would be 2,839 megawatts which includes Zion Unit 1 at 1,100 megawatts, Zion Unit 2 at 935 megawatts (85% capacity), Powerton Units 1-4 at 350 megawatts, and Waukegan and Sabrooke Units at 1,092 megawatts (R. 75). Edison alleges that the loss of Powerton Units 1-4 would reduce their summer peak to 2,489 or 19% (R. 77, 144). Edison further alleges that because they are burning low sulfur coal they have a 375 megawatt power peak reduction (R. 82). Edison has always stated that because of their great degree of interconnection with other systems that they must maintain only a 14% planned reserve (R. 145). They testified that they have an additional 1600 to 1800 megawatts available in the event of an emergency (R. 146). Edison has contracted to sell 410 megawatts during the summer of 1974 (R. 143). Edison's "planned reserve" is a long-range planning concept which does not include the actual reserve that might exist on a given day. As Edison points out the actual daily reserve available at a given point and time determines whether or not Edison can meet a system demand. Edison's estimated total peak load for the summer of 1974 is 14,170 megawatts (R. 72). Edison's planned reserve for the summer of 1974 equals 22.1% (R. 73). Edison has testified that 14.0% planned reserve is adequate to meet system-wide demands. Edison's planned reserve of 14% is based upon a design that will allow Edison to meet the peak loads in the event of system-forced outages.

Edison's planned reserve figures assume that Zion Unit 1 will provide 1,100 mw. or 100% capacity (R. 75) and that Zion Unit 2 will provide 935 mw. or 85% capacity (R. 75, 76). Zion Unit 1 is currently licensed at 935 mw. (85%) capacity by the Atomic Energy Commission; but it has not operated above 688 mw. due to mechanical operating restrictions (Edison Information in Response

To Board Order, November 30, 1973). Edison will shut down Zion Unit 1 before February 3, 1974, to eliminate the mechanical operating restriction, and will return the Unit to service by April 28, 1974 (Edison Information, November 30, 1973). Once the modifications have been completed, Zion Unit 1 will be tested at 75% capacity (Edison Information, November 30, 1973). Once the 75% testing has been completed in early June, 1974, Edison will operate Zion Unit 1 at 85% or 935 mw. (Edison Information, November 30, 1973). Edison further assumed that Zion Unit 2 will provide 935 mw. of capacity (85% of its design capacity) for the summer of 1974, but the record shows that construction of the unit will not be completed until December, 1973 (R. 75, 76). Consequently, 2839 megawatts of the estimated reserve includes 2,035 mw. of capacity from two nuclear units that have not yet demonstrated their total reliability and 935 mw of that planned reserve are from a unit that is still being constructed. Edison points out that without 2,035 mw. from these units, Edison's planned reserve would only be 804 mw., or 5.6%, which is totally inadequate to protect against forced outages (R. 79, 80).

The Board in its Order in PCB 73-40, as modified on November 30, 1973, issued a priority of operation order that requires Waukegan Station above 355 mw. be the last coal-fired facility in the Edison system to go on line. The Board thus changed its previous Order in PCB 71-129 which required that Powerton Units 1-4 above 50% be the last coal-fired unit to go on line. The Board's Order, as modified in PCB 73-40, also recognizes that, there existed a need to conserve oil and gas. The Board ordered that Waukegan above 355 mw. and the Powerton Units above 50% capacity be operated prior to the fast-start peaking units.

The change in operating sequence represents a substantial change in the Board's position as to the operating sequence of Edison capacity. It would tend to change the figures presented in the record that show the daily load factor at the Powerton Units 1-4 as being substantially below 20%. The Board points out, however, that the variance granted in the Waukegan case was a short-term six month variance that requires Edison to submit monitoring data before the variance will be extended (Order of the Board, PCB 73-40, October 4, 1973). The Board hopes that as a result of that monitoring data, Edison will be allowed to operate Waukegan ahead of Powerton Units 1-4. However, the Board finds that Edison and the Agency have failed to present substantial evidence to warrant the modification of the October 4, 1974 Order. Testimony as to the adverse health effects of the computed Waukegan Power Plant emissions was the basis of the Board's order ordering the priority schedule in Edison's system. The Board notes, however, that this variance and the operational sequence is subject to being changed pending the result of monitoring data concerning the Waukegan emissions.

The Board examined the Monthly Load and Capacity Schedule (EPA Ex. 10) by subtracting the restricted output and outage of Zion Unit 1 (Edison Information, November 30, 1973); by subtracting the output of Waukegan above 355 mw.; by subtracting Powerton Units 1-4 350 mw. production; and by removing the 1726 mw. of peak production. This series of mathematical calculations resulted in the following excess capacity over the monthly projected peak load estimates:

	Dec.	Jan.	Feb.	Mar.	April	May
Excess Mw.	553	113	-555	-345	255	210

Operation of Waukegan without any operating restrictions during the air quality testing program would supply an additional 590 mw. which would offset the negative values for February and March. Thus, even if the Board grants Edison a variance to operate Powerton Units 1-4 to meet peak loads during December through May; Edison should not have to operate Powerton Units 1-4 (or Waukegan above 355 mw. when not conducting air monitoring studies) unless a mechanical malfunction occurs. Operation of Powerton Units 1-4 to provide "first contingency protection" and during de-icing periods would tend to increase the excess capacity figures.

The Board is faced with a decision as to whether or not to grant Powerton a variance to operate during peak periods. Edison's own testimony that their planned reserve equals 2,839 mw. (22.1%) would normally be sufficient as to deny the variance request to meet the summer peak period. However, in light of Edison's inclusion of power from Zion Unit 2 and from Zion Unit 1 above the level at which it is currently operational, the Board has decided to grant Edison the right to use Powerton Units 1-4 to meet system demand both as to maintenance and peak period until October 15, 1974 at which time Powerton Units 1-4 will be shut down.

The Board notes that Edison has evidently contracted to sell 410 megawatts in the summer of 1974 (R. 143). Because Edison has been granted variances to operate Powerton Units 1-4 and Waukegan above 355 mw. as the last coal-fired units to be placed on line before use of the peaking units, the sale of 410 mw. during the peak period would subject the citizens surrounding the two power plants to potentially dangerous pollution levels. Operation of pollution sources to provide energy to people outside Edison grid system may be unreasonable. It is one thing to subject the citizens to air pollution in order to protect fellow citizens on the same Edison system from blackouts; but, it is quite different to subject citizens to air pollution merely to satisfy a contractual obligation to deliver power outside the system. Edison has failed to provide any information regarding the ultimate consumption of that power or necessity of supplying the power. The present record is woefully

lacking of any information regarding the contract to to sell the 410 mw. at a time Edison is seeking variance to operate four units that lack any pollution abatement equipment. The Board does not make any ruling on the propriety of this contract in granting this variance request. However, the Board will again be faced with this question when ruling on any extension of the variance that Waukegan Station is currently operating under (including any system operation sequence changes). Edison has the burden of establishing the need to operate its units while supplying power (excess capacity) to systems outside Edison's own grid.

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

ORDER

The Board hereby grants to Commonwealth Edison a variance to emit particulate matter in excess of regulation limits until October 15, 1974, subject to the following conditions.

1. Powerton Units 1-4 shall be the next to last coal-fired Units on the Edison system committed to service and the second coal-fired unit taken off after the daily peak period is passed. Powerton Units 1-4 shall be committed only with sufficient lead time to insure that unit's availability for the peak period. When Powerton Unit 1-4 capacity is required to meet a predicted daily load plus the operating reserve, the station will be initially loaded to approximately 50% capacity. Before the remaining capability of the Powerton Units 1-4 will be utilized, all other coal-fired units on the Edison system--except Waukegan above 355 mw.--will be brought to full operating load, exclusive of emergency capability. Coal-fired units shall be operated prior to the operation of fast-start peaking units.

2. The above shall not apply if weather conditions, which may cause icing on transmission lines exist or if Edison's projected daily peak load equals or exceeds 70% of the projected annual peak load.

3. This Order is subject to further Board Orders in the event that Edison or the Agency demonstrates to the Board that operation of Powerton Units 1-4 present a greater health risk than operation of Waukegan Station.

IT IS SO ORDERED.

I, Christan L. Moffett, Clerk of the Illinois Pollution Control Board, hereby certify the above Opinion and Order were adopted on the 6th day of December, 1973 by a vote of 4-0.

Christan L. Moffett, Clerk
Illinois Pollution Control Board