

ILLINOIS POLLUTION CONTROL BOARD
November 21, 1991

COMMONWEALTH EDISON COMPANY,)
)
 Petitioner,)
)
 v.) PCB 91-29
) (Variance)
 ILLINOIS ENVIRONMENTAL)
 PROTECTION AGENCY,)
)
 Respondent,)
)
 and)
)
 ILLINOIS CHAPTER OF THE)
 SIERRA CLUB,)
)
 Intervenor.)

MR. ALAN P. BIELAWSKI, SIDLEY & AUSTIN, APPEARED ON BEHALF OF COMMONWEALTH EDISON COMPANY;

MS. LISA MORENO APPEARED ON BEHALF OF THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY.

OPINION AND ORDER OF THE BOARD (by R.C. Flemal):

This matter comes before the Board upon a February 21, 1991 petition for variance filed by the Commonwealth Edison Company ("Edison"). Edison requests a five-year variance from the requirements of 35 Ill. Adm. Code 302.211(d), a subsection of the Board's General Use Water Quality Standards for temperature, for the discharge from its Joliet, Will County, Crawford, and Fisk generating stations.

On February 22, 1991, the Illinois Chapter of the Sierra Club ("Sierra Club") filed an objection to the variance and a petition to intervene. On March 14, 1991, the Board granted Sierra Club's petition to intervene. Hearing was held in this proceeding on July 22, 1991 in Joliet, Illinois. No members of the public were present. The Illinois Environmental Protection Agency ("Agency") failed to file a recommendation, but stated at hearing that its position is that a variance is not necessary based on its belief that Section 302.211(d) does not apply to Edison's discharges. The Agency further stated that it does not oppose this variance request should the Board determine that a variance is necessary (Tr. at 12-13).

Prior to the filing of the variance petition, Sierra Club filed suit against Edison in federal district court, asking that the court enjoin Edison from future alleged violations of Section 302.211(d) at the Crawford, Fisk, and Will County plants, and to impose penalties on Edison for alleged past violations at these plants. Sierra Club also alleged that the Joliet Station discharges violated Section 302.211(d). A consent decree was entered in that federal court action under which Sierra Club agreed to withdraw its opposition to Edison's request for variance in the instant proceeding before the Board. The consent decree also contained certain conditions which would apply should the Board grant this request for variance. A copy of the decree was originally submitted to the Board on July 30, 1991, subject to United States Environmental Protection Agency ("USEPA") review. USEPA completed its review and a revised copy of the consent decree ("revised decree") was submitted to the Board on November 8, 1991.

The Board grants Edison's request for variance for the reasons presented below and subject to conditions contained in the Order below, for a period of five years from today's date.

DESCRIPTION OF FACILITIES

Edison is a public utility primarily engaged in the production, purchase, transmission, distribution, and sale of electricity. Edison's service area comprises roughly the northern third of Illinois, and is populated by approximately eight million people (Pet. at 1-2).

Edison operates four generating stations (Joliet, Will County, Crawford, and Fisk) that discharge heat to the Des Plaines River or to waterways that are tributary to the Des Plaines River.

Joliet Station

Joliet Station is a steam-electric generating facility capable of producing 1,414 gross megawatts of electricity. The station is located in Will County, approximately one mile southwest of the City of Joliet, Illinois, adjacent to the Des Plaines River. Joliet Station consists of three coal-fired units, all of which utilize open cycle, once-through condenser cooling systems.

The station has two thermal discharges to the Des Plaines River; one from Unit #6 on the east bank of the river and the other from Units #7 and #8 on the west bank. The maximum design temperature rise in the circulating cooling water is approximately 9.4°F, with a total circulating water flow rate of 2,620 cubic feet per second. Both thermal discharges flow into the Des Plaines River approximately one-half mile downstream of

the Brandon Road Lock and Dam, at river mile 285, which is about seven miles upstream of the I-55 Bridge.

The annual average capacity factors of the Joliet Station over the past five years have ranged from 24.5% to 39.9%, with the five-year average of about 30.6%. Edison's capacity factor projections for the Joliet Station for the next five years range from 19.4% to 31.7%. Maximum operation of the Joliet Station generally occurs during Edison's peak demand periods; that is, during day-time hours and during the summer months (Pet. at 3-4).

Will County, Fisk, and Crawford Stations

Will County, Crawford, and Fisk Stations (collectively, the "Canal Stations") are steam electric generating facilities capable of producing 1154, 581, and 342 gross megawatts of electricity, respectively. Will County Station is located in Romeoville, Illinois, near the intersection of the Chicago Sanitary and Ship Canal and Romeo Road. Crawford Station is located in Chicago, near the intersection of the Stevenson Expressway and Pulaski Avenue. Fisk Station is located near downtown Chicago, at the intersection of Loomis Street and the Chicago Sanitary and Ship Canal. The generating units of each Canal Station are coal-fired, and each utilizes open cycle, once-through condenser cooling systems.

The Canal Stations discharge into the Chicago Sanitary and Ship Canal: Will County at river mile 295.5, Crawford at river mile 318.5, and Fisk at river mile 322. The maximum design temperature rise in the circulating cooling water is approximately 11.1°F for Will County, 12.0°F for Crawford, and 12.2°F for Fisk.

The annual average capacity factors over the past five years, and the projected annual average capacity factors for the next five years for the Canal Stations, are as follows:

| | 1986 - 1991 | 1992 - 1996 |
|-------------|-------------|-------------|
| Will County | 28.2% | 26.0% |
| Crawford | 21.9% | 15.0% |
| Fisk | 21.7% | 26.0% |

As with Joliet Station, the Canal Stations are generally operated more during peak demand periods (Pet. at 4-5).

APPLICABLE REGULATIONS

Each of the discharges from these four generating stations is subject to secondary contact and indigenous aquatic life water quality standards (35 Ill. Adm. Code 303.441). The temperature

standard for secondary contact waters (35 Ill. Adm. Code 302.408) requires that:

[t]emperature . . . not exceed 34°C (93°F) more than 5% of the time, or 37.8°C (100°F) at any time. 35 Ill. Adm. Code §302.408.

However, the lower Des Plaines River between the Interstate 55 Bridge and the head of the Illinois River (confluence of the Des Plaines River with the Kankakee River), a segment known as the "Five-Mile Stretch", is subject to the more stringent general use water quality standards. Among other requirements, the general use standards governing temperature require that:

[t]he maximum temperature rise above natural temperatures shall not exceed 2.8°C (5°F); (Section 35 Ill. Adm. Code 302.211(d))

and that the temperature of the water not exceed 16°C (60°F), during winter months (Dec. through Mar.) or 32°C (90°F), during summer months (Apr. through Nov.), more than 1% of the hours in a 12 month period ending in any month, and never exceed these temperatures by more than 1.7°C (3°F) (35 Ill. Adm. Code 302.211(e)).

THERMAL DEMONSTRATION

In 1987, Edison requested that the Board determine, pursuant to 35 Ill. Adm. Code 302.211(f), that the thermal discharges from the Joliet Station have not caused and cannot reasonably be expected to cause significant ecological damage to the general use waters. The Board found that Edison had made the requisite showing under 302.211(f) (In the Matter of: Proposed Determination of No Significant Ecological Damage for the Joliet Generating Station, PCB 87-93, 105 PCB Op. 149, November 15, 1989.).

In the course of PCB 87-93, the Sierra Club, also participating as an intervenor, argued that Edison had failed to make a sufficient showing of no significant ecological impact because, among other reasons, the Joliet plant contributed to violations of Section 302.211(d) and (e) in the waters of the Five-Mile Stretch. In response, Edison argued that these provisions were inapplicable, principally because Joliet Station discharges into secondary contact waters. Edison further committed to implement an operating plan for the Joliet Station which would ensure that the Joliet Station would limit its megawatt output as necessary to avoid exceedences of the monthly maximum temperature standard of Section 302.211(e).

In PCB 87-93, the Board addressed these issues as follows:

The Board finds that 302.211(d) and (e) do apply to the effect of Edison's discharges. Although Secondary Contact Standards may govern at the point of a particular discharge, it is possible for an entity located upstream of the beginning of the General Use waters to cause or contribute to exceedances (sic) of the General Use Water Quality Standards. In fact, the reason the Board required Edison to perform a thermal demonstration under subsection (f) is because the Board recognized that a source which discharges to Secondary Contact waters could affect downstream General Use waters.

The Board finds, however, that in this proceeding the issues of whether violations of the 302.211 standards have occurred in the Five-Mile Stretch and, if they have, whether Edison is responsible for them, is at best ancillary to the matters at hand. The only proper forum for the Board to hear allegations of violation of the Board's rules is an enforcement action brought pursuant to Title VIII of the Illinois Environmental Protection Act. The Board cannot and will not here reach the issue of whether Edison is in violation of any Board water quality standard.

Consideration of whether there is non-compliance of the waters of the Five-Mile Stretch with the Board's water temperature standards can enter the immediate case only where non-compliance stands as proof of significant ecological damage associated with Edison's discharge. The Board finds that there is no substantive indication that any of the observed temperatures in the Five-Mile Stretch have caused significant ecological damage. PCB 87-93 at 19; 105 PCB Op. at 167.

Regarding whether Edison's operating plan was acceptable to satisfy the requirements of Section 302.211(e), the Board found:

The Board believes that Edison has a viable monitoring program . . . which, although not field tested at the time of hearing, is capable of assuring adjustments to operations should they prove necessary to ensure compliance. PCB 87-93 at 21; 105 PCB Op. at 169.

HARDSHIP

Edison believes that a requirement to come into immediate compliance with the Section 302.211(d) standards would result in arbitrary or unreasonable hardship. The hardship results from the difficulty in determining how to measure whether the Joliet Station discharge has been contributing to violations of the Section 302.211(d) standard, due to the distance from the Joliet

Station discharge and the beginning of general use waters, and how to adjust plant operations based upon the measurements (Pet. at 8).

Edison explains that for its plants that discharge directly to general use waters, compliance is demonstrated by showing that the area and dimensions of the discharge plume which is more than 5° F above the temperature of the water at the intake¹ is within the mixing zone constraints permitted by the Board's regulations (35 Ill. Adm. Code 302.102). The two temperature measurements that are compared (i.e., the temperature of the water at the intake and the temperature at the edge of the mixing zone) are taken contemporaneously, because the 5°F standard applies at the point of discharge. Edison further states that from an operational perspective, it is relatively easy to determine the level at which a plant can operate without causing the standard to be violated. As the size of the plume begins to approach the size of an allowable mixing zone, the plant's output is controlled to assure that the plume does not exceed the applicable restrictions (Pet. at 9).

Edison submits that the Section 302.211(d) regulations cannot be applied to Joliet in the same manner, nor is a similar operational strategy viable. The 5°F temperature rise standard applies beginning at the I-55 bridge. The bridge is about 7 miles downstream from the Joliet Station discharge. The water discharged from the station takes anywhere from 10 to 45 hours to travel to the I-55 bridge. During that time interval, the temperature of the water in the river is influenced by a number of factors in addition to the Joliet discharge, such as diurnal radiation heating, evaporative and conductive heat exchange affected by air temperature, cloud cover, wind speed, and humidity; and other discharges of heated water into the river between the Joliet Station discharge and the I-55 bridge. Edison believes that the time lag for effluent travel and other variables make operational changes designed to achieve compliance unworkable (Pet. at 10). The difficulties in temperature measurement comparison, operational changes, and possible future modelling are supported by affidavits of Jeffrey Smith and Dr. Forrest Holly submitted by Edison with its petition (Exhs. A and B, respectively).

As explained below in the section concerning the compliance plan, Edison proposes to submit an adjusted standard petition or site-specific rulemaking petition to the Board, and requests the time in the instant proceeding to complete needed studies prior to submission of the proposal. Edison submits that while the studies are being conducted, it "will continue to be subject to

¹ The "natural temperature" of the water, as those terms are used in Section 302.211(d) is considered to be the temperature of the water at the intake to the plant.

claims that its operations at Joliet and the Canal Stations violate §302.211(d), and thus subject to claims for substantial civil penalties and possibly drastic, though environmentally unjustified, judicially imposed deratings of its plants" (Pet. at 15-16). Edison believes absent the grant of a variance, it appears that its only protection from such claims would be to build cooling towers at a very substantial cost or derate its units (Pet. at 16). The affidavit of Jeffrey Smith explains that the cost to Edison of attempting to comply with §302.211(d) is likely to be upwards of \$100 million (1988 estimate), if the company were required to install cooling towers. In addition, cooling towers are likely to cause significant fogging in the area, particularly along State Route 6. (Pet. Exh. A at 10).

COMPLIANCE PLAN

Edison has committed to initiate an adjusted standard or site-specific proceeding before the Board following completion of studies to be conducted (revised decree at ¶13). Edison states that it does not have the information necessary to meet its burden of proof in an adjusted standard or site-specific proceeding and discusses its plan as follows:

The affidavit of Dr. Robert Otto (Exhibit C) explains that while there is a good deal of information, of a qualitative nature, supporting the conclusion that temperature is not the factor limiting the ecology of the Five-Mile Stretch, additional data and information is needed to support the preparation of analyses required to obtain site specific relief.

To collect the needed data and information, Edison proposes to design and conduct various studies of the Five-Mile Stretch. The design and implementation plans for the studies would be developed in consultation with the appropriate environmental and conservation authorities. The overall objectives of the studies would be as follows: (1) measure and assess the physical contours and characteristics of the Five-Mile Stretch to better understand how the physical makeup of the river affects its ability to support and sustain aquatic life; (2) measure and compute the thermal environment in the waters of the Five-Mile Stretch to better understand the extent to which the waters are affected by the various heat inputs, particularly at locations where the physical habitat appears conducive to aquatic life propagation; (3) sample and analyze waters, sediments and organisms for toxic materials to determine the extent to which these materials may limit aquatic life in the Five-Mile Stretch; and (4) determine and access current populations of

macrophytes, macroinvertebrates and fishes (Pet at 14-15).

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Dr. Otto estimates that the studies discussed above will take about four years to design and implement. Thereafter, it will take at least a year to prepare a report of the findings and conclusions, submit a petition for site specific relief to the Board and for the Board to deliberate and issue its decision. (Pet. at 14-15).

In addition, the Board notes that the revised decree includes provisions on how the study is to be conducted, including working with all affected governmental agencies² to develop the scope and duration of the study (to be completed in five years from any grant of variance), and working with Sierra Club and its experts in conducting the study. The revised decree further states:

[Edison] and Sierra Club agree that there is a need to gather additional information concerning the ecology of the Chicago Sanitary and Ship Canal and the lower Des Plaines River and further assess the impacts industrial and municipal discharges are having on these waters. Following completion of such studies, [Edison] and Sierra Club agree the [Edison] shall propose that the [Board] promulgate thermal standards or alternative NPDES permit effluent limitations consistent with §316(a) of the [Clean Water] Act that would apply to [Edison's] Plants in lieu of the existing standards. Revised decree at ¶7.

ENVIRONMENTAL IMPACT

In PCB 87-93, the Board found that Edison successfully demonstrated that the heat discharges from the Joliet Station have not caused and cannot be reasonably expected to cause significant ecological damage to the waters of the Five-Mile Stretch. In so doing, the Board also found that the temperature of the waters of the Five-Mile Stretch was not a factor limiting its quality, and that other factors continue to override the effect of temperature on the waterway. These overriding factors include loss of habitat due to channelization, disruption of habitat due to barge traffic, and the presence of heavy metals and other pollutants in the system (PCB 87-93 at 20).

² Agency, USEPA, and the Illinois Department of Conservation.

Edison states that its projections for Joliet Station's operations during the next five years are in line with the projections Edison presented to the Board in PCB 87-93. Edison further states that it will operate Joliet Station in accordance with an operating plan that ensures compliance with §302.211(e), as it committed to do in PCB 87-93 (Pet. at 15-16).

DISCUSSION AND CONCLUSIONS

In consideration of any variance, the Board determines whether, a petitioner has presented adequate proof that immediate compliance with the Board regulations at issue would impose an arbitrary or unreasonable hardship (Ill. Rev. Stat. 1989, ch. 111½, par. 1035(a)). Furthermore, the burden is upon the petitioner to show that its claimed hardship outweighs the public interest in attaining compliance with regulations designed to protect the public (Willowbrook Motel v. Pollution Control Board (1977), 135 Ill.App.3d, 481 N.E.2d, 1032). Only with such showing can the claimed hardship rise to the level of arbitrary or unreasonable hardship.

The Board finds that based upon the facts and circumstances of this case, denial of variance would impose an arbitrary or unreasonable hardship upon Edison. The hardship outweighs any risk of environmental harm posed by the heat discharges from Edison's plants, for the time period of the variance, especially since interim standards are today imposed on the Joliet and Canal Stations in the following Board order. The interim standards are also allowed for in the revised decree upon grant of variance.

A variance by its nature is a temporary reprieve from compliance with the Board's regulations (Monsanto Co. v. IPCB (1977), 67 Ill. 2d 276, 367 N.E. 2d 684), and compliance is to be sought regardless of the hardship that the task of eventual compliance presents an individual polluter (Id.) Accordingly, except in certain special circumstances, a variance petitioner is required, as a condition to grant of variance, to commit to a plan that is reasonably calculated to achieve compliance within the term of the variance. The Board finds that in this instance, extraordinary circumstances exist which allow for grant of variance even though compliance will not be achieved during the term of the variance. Included in these circumstances are the distal location of the Joliet Station and Canal Stations relative to the point of application of the General Use Water Quality Standards, the unique nature of thermal discharges and unknown

effect of those discharges on the receiving waterways³, and the study, which all parties agree is necessary.

Furthermore, this situation is also extraordinary since whether Edison is actually violating the standards is not known and is also part of the subject of the study to be completed. Therefore, the Board believes that the circumstances in this instance call for departure from the norm, and grants variance even though the state of compliance of the petitioner is not now known, and may not be known during the term of the variance.

The Board accordingly grants variance subject to conditions as indicated in the order below. In adding some of the terms of the consent decree to its order as conditions upon this grant of variance, the Board notes that it only includes those items that pertain to the interim standards and the study to be conducted. The Board specifically excludes those items pertaining to the conduct between Edison, the government agencies, and Sierra Club as being outside the purview of this variance proceeding and solely within the province of the revised decree.

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

ORDER

Petitioner, Commonwealth Edison Company ("Edison"), is hereby granted variance from the temperature standards of 35 Ill. Adm. Code 302.211(d), for the discharges from its Joliet, Will County, Crawford, and Fisk generating stations (hereinafter, "the Company's Plants"), subject to the following conditions:

- (1) Variance terminates on November 21, 1996, or when compliance is demonstrated, whichever is earlier.
- (2) Except as provided below, for the period the variance is in effect, the Company's Plants shall comply with the following interim temperature standards ("Interim Standards") to be measured at the I-55 Bridge:

January-March 60°F

³ In PCB 87-93, the Board also found that other limiting factors continue to exist that override the effect of temperature on this waterway, including loss of habitat due to channelization, disruption of habitat due to barge traffic, and the presence of heavy metals and other pollutants in the system. The Board expressed hope that this situation can be reversed in the not-distant future (PCB 87-93 at 20, 105 PCB Op. 168).

| | |
|-------------|------|
| April 1-15 | 70°F |
| April 16-30 | 75°F |
| May 1-15 | 80°F |
| May 16-31 | 85°F |
| June | 88°F |
| July-August | 90°F |
| September | 86°F |
| October | 75°F |
| November | 65°F |
| December | 60°F |

- (3) The Company's Plants may cause the water temperature at the I-55 Bridge to exceed the Interim Standards by no more than 3°F for 1% of the hours in the twelve month period ending with any month. In addition, for each period from April through June that the Interim Standards are in effect, the Company's Plants may cause the water temperature at the I-55 Bridge to exceed the Interim Standards by no more than 3°F for an additional 30 hours.
- (4) The Interim Standards shall not constitute any evidence with regard to the appropriate level at which to set final thermal standards or alternative NPDES permit effluent limitations.
- (5) Edison shall initiate a study (the "Study"), which will include the following measures:
 - a. Edison will retain a panel of experts qualified to formulate, direct and oversee the conduct of the Study;
 - b. Edison shall use its best efforts to work with all affected governmental agencies, including the Illinois Environmental Protection Agency, the United States Environmental Protection Agency, and the Illinois Department of Conservation to develop the scope and duration of the Study;
 - c. Edison shall use its best efforts to complete the Study and any proceedings before the Board to establish thermal standards or alternative effluent limitations for the Company's Plants within five years.
- (6) Following completion of the Study, Edison shall initiate proceedings before the Board

to establish thermal standards or alternative NPDES permit effluent limitations consistent with §316(a) of the Clean Water Act applicable to the Company's Plants.

- (7) Edison shall install and use its best efforts to maintain 24-hour temperature monitors during the period of the Study at the following locations:
- a. On the Chicago Sanitary and Ship Canal above Edison's Will County Station discharge;
 - b. At the Brandon Road Lock and Dam, or, in the event Edison is not given permission to install a monitor at that location, at an alternate location agreeable to both Sierra Club and Edison;
 - c. At the I-55 Bridge on the Des Plaines River;
 - d. On the Kankakee River, near Edison's Braidwood Station.

Within 45 days of the date of this Order, Petitioner shall execute and forward to Lisa Moreno, Division of Legal Counsel, Illinois Environmental Protection Agency, 2200 Churchill Road, Post Office Box 19276, Springfield, Illinois 62794-9276, a Certification of Acceptance and Agreement to be bound to all terms and conditions of this variance. The 45-day period shall be held in abeyance during any period that this matter is being appealed. Failure to execute and forward the Certificate within 45 days renders this variance void and of no force and effect as a shield against enforcement of rules from which variance was granted. The form of said Certification shall be as follows:

CERTIFICATION

I (We), _____,
hereby accept and agree to be bound by all terms and conditions
of the Order of the Pollution Control Board in PCB 91-29 November
21, 1991.

Petitioner

Authorized Agent

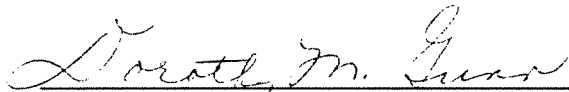
Title

Date

Section 41 of the Environmental Protection Act, Ill. Rev. Stat. 1989 ch. 111 ½ par. 1041, provides for appeal of final Orders of the Board within 35 days. The Rules of the Supreme Court of Illinois establish filing requirements.

IT IS SO ORDERED.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above Opinion and Order was adopted on the 31st day of November, 1991, by a vote of 6-0.



Dorothy M. Gunn, Clerk
Illinois Pollution Control Board