

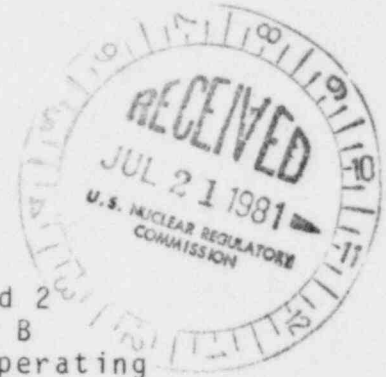


Commonwealth Edison

One First National Plaza, Chicago, Illinois
Address Reply to: Post Office Box 767
Chicago, Illinois 60690

July 16, 1981

Director of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555



Subject: Quad Cities Station Units 1 and 2
Proposed Amendment to Appendix B
Technical Specifications for Operating
Licenses DPR-29 and DPR-30 to
Correspond with NPDES Permit Limits
NRC Docket Nos. 50-254 and 50-265

Dear Sir:

Pursuant to 10 CFR 50.59, Commonwealth Edison proposes to amend Appendix B to Operating Licenses DPR-29 and DPR-30. This proposed amendment would allow the Appendix B non-radiological limits to correspond to those required by the National Pollutant Discharge Elimination System (NPDES) Permit No. IL0005037.

The proposed changes would eliminate sampling and monitoring which is currently required over and above NPDES requirements by the existing Technical Specifications. Specifically, chlorine and temperature monitoring requirements are reduced, and chemical effluents are addressed by maintaining a range of pH and by sampling for total dissolved solids. Existing Appendix B Technical Specifications directly specify limits for cumulative annual discharges of certain corrosion inhibitors and other chemicals used in the facility.

Commonwealth Edison has performed an extensive review of this proposed change, and has determined that use of the NPDES limits will provide more realistic environmental monitoring, with little if any change in the actual chemical and thermal discharges now being made to the Mississippi River in conjunction with station operation. A detailed item by item discussion of the rationale for the proposed change is provided in Attachment 1. A summary comparison of current Technical Specification requirements with NPDES permit requirements for Quad Cities Station is also provided in Attachment 2.

Additionally, in order to facilitate your review, five (5) copies of NPDES Permit No. IL0005037 are provided with this

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transmittal. Although this permit has expired, we currently operate under its provisions. We applied for renewal prior to permit expiration, and are currently awaiting action by the State of Illinois. should any changes be made in the permit it should be noted that Section E.3 (Reporting Requirements) of this proposed amendment requires the NRC to be notified of any such changes.

Attachments 3 and 4 contain complete proposed Appendix B Technical Specifications for Quad Cities Units 1 and 2. The entire Appendix B section with bases is being submitted for clarity purposes, however no change is proposed to Section E1.3/2.3, Fish Impingement.

These proposed changes have received On-Site and Off-Site review and approval with the conclusion that these changes are not safety related. In addition, since discharge limitations and associated surveillance of the NPDES permit will be observed, implementing this change will have minimal impact on the environment.

Pursuant to 10 CFR 170, Commonwealth Edison has determined that the proposed changes are a combined Class I and Class III amendment. As such, a fee remittance in the amount of \$4,400.00 is enclosed.

Please address any questions you may have concerning this matter to this office.

Three (3) signed originals and thirty-seven (37) copies of this letter are provided for your use.

Very truly yours,

Thomas J. Rausch

Thomas J. Rausch
Nuclear Licensing Administrator
Boiling Water Reactors

Attachments

cc: RIII Inspector - Quad Cities

SUBSCRIBED and SWORN to
before me this 16th
day of July, 1981

Rosalee A. Puente
Notary Public

2291N

ATTACHMENT 1
Commonwealth Edison Company
Rationale for the Request for
Modification of Quad-Cities Station
Appendix B, Nonradiological Technical Specifications

E1.1/2.1 Chlorine Effluent

Quad Cities Station is presently required under Appendix B, Nonradiological Technical Specifications, to periodically conduct monitoring during chlorination as follows:

1. Periodically during chlorination, but at least four times per calendar month, the total chlorine content of the water in the discharge bay shall be analyzed in order to characterize the condenser effluent prior to discharge into the Mississippi River.

Representative samples shall also be analyzed when not chlorinating to ascertain background conditions.

2. Periodically during chlorination, but at least four times per calendar month, the total chlorine content of the water downstream of the diffuser pipes shall be analyzed in order to judge the impact of condenser effluent after discharge into the Mississippi River.

Representative samples shall also be analyzed when not chlorinating to ascertain background condition.

The monitoring program, conducted by Commonwealth Edison Company (CECo.) since the chlorine surveillance requirement was enacted in 1974, has examined chlorine concentrations both in the intake forebay, discharge bay, spray canal and in the Mississippi River.

Commonwealth Edison Company, for reasons stated below, requests that this monitoring and the applicable environmental protection monitoring conditions be reduced to those specified in the Quad Cities Station NPDES permit. A comparison of NRC environmental Technical Specifications and NPDES permit requirements is presented in Attachment 2.

The chlorine monitoring program required by Appendix B exceeds that required in the Quad Cities Station NPDES Permit No. IL 005037. The NPDES permit program calls for samples to be collected weekly in the discharge bay during chlorination and tested for Total Residual Chlorine. The current Appendix B program, for which additional samples are collected above, at and downstream of the blowdown diffuser and the diffuser pipes in the river, in the intake forebay, and in the spray canal in addition to sampling for background chlorine levels when not chlorinating, requires annually an expenditure of about \$20,000 in addition to that required to conduct

the NPDES permit monitoring. Since the program began in 1974 and extended through 1980, CECO. has spent about \$170,000 conducting the additional chlorine sampling.

Total residual chlorine has never been detected either in the Mississippi River upstream of the Quad-Cities Station or downstream of the point of discharge to the river, near the eastern shore, 600 feet below the diffuser pipe and just below the blowdown pipe, or in the intake forebay since this surveillance began in 1974 (Industrial Bio-Test, 1974, 1975a and b; NALCO Environmental Sciences, 1976a and b; 1977a and b, 1978a and b, Hazelton Environmental Sciences 1979, Environmental Research and Technology, 1980).

The purpose of the NPDES permit and Appendix B E1.1 is to limit the amount of Total Chlorine being discharged to the river. However, the NPDES permit demands that the analyses be performed on a representative sample at the point of discharge to the river, not the discharge bay as required by Appendix B E.1.1. Measuring Total Chlorine in the discharge bay is not representative of the effluent Total Chlorine according to the NPDES permit.

In conclusion, we believe that it is appropriate to monitor and report chlorine discharge in accordance with NPDES permit requirements.

E1.2/2.2 Temperature Limitations

The Quad Cities water temperature monitoring system has been in operation since 1972, and was installed to assure compliance with Appendix B, Nonradiological Technical Specifications that were formulated from the applicable Illinois and Iowa Water Quality Standards relating to water temperature.

Ambient river water and discharge temperatures are monitored using temperature sensors which define the temperature regime upstream and downstream of the plant. Four temperature sensors are located approximately 600 feet downstream of the diffuser pipes, one sensor is located in the discharge bay, one temperature sensor is located upstream of the intake area to record ambient river temperature. In addition, a sensor is located on the return side (cold end) of the spray canal. Measurements from the sensors are telemetered into the station control room and recorded on strip chart recorders. Location of the sensors are indicated in Figure 1, which has been updated to reflect modifications associated with the spray canal.

The cold end sensor, as ordered by the NPDES, is used for determining the degree the station can use open cycle cooling.

Commonwealth Edison Company requests that this monitoring be modified and the applicable environmental monitoring protection conditions be changed to those required in the Quad Cities Station NPDES Permit.

The Illinois Water Quality Standards require the following: (1) There shall be no abnormal temperature changes that may adversely affect aquatic life unless caused by natural conditions; (2) The normal daily and seasonal temperature fluctuations that existed before the addition of heat due to other than natural causes shall be maintained; (3) The maximum temperature rise above natural temperatures shall not exceed 5°F; (4) in addition, the water temperature at representative locations in the river shall not exceed monthly maximum temperatures during more than 1% of the hours in the twelve month period ending in any month. At no time shall the water temperature at such locations exceed the monthly maximum limits by more than 3°F. The monthly maximums are: Jan. 45°F, Feb. 45°F, Mar. 57°F, Apr. 68°F, May 78°F, June 85°F, Jul. 86°F, Aug. 86°F, Sept. 85°F, Oct. 75°F, Nov. 65°F, and Dec. 52°F (IPCB, March 1977 as amended July 1979). Temperature criteria specified above apply outside a mixing zone of 26 acres (area of a circle with a radius of 600 ft.). Since all four sensors are located 600 ft. downstream of the condenser cooling water diffuser pipe discharge and are spaced approximately 400 ft. apart on a line perpendicular to the current flow, to indicate whether a temperature violation occurred, all four temperature sensors would have to measure an applicable temperature increase or change.

A search of temperature monitoring data portion of the NRC semi-annual environmental monitoring reports from February, 1976 through July, 1980 showed at no time did all four sensors record excursions at the same time. In the case of the 5°F differential temperature limit, excursions were never detected at more than one sensor per occurrence. Excursions of the 2°F/hour criteria were never detected at more than two sensors at the same time. Excursions detected simultaneously at two sensors occurred on a total of six occasions. It is therefore, apparent that the sensors have never detected a noncompliant situation.

At the time the temperature system was installed in 1972, the design was adequate to comply with the applicable Illinois and water quality criteria. It was believed that this was the best system that would demonstrate thermal compliance based on then known information concerning river hydrology and performance of the multiport diffuser system. However, based on later studies conducted by Parr and Sayre (IIHR, 1977), it can be concluded that the present temperature monitoring system is incapable of determining whether or not the station is in compliance with Illinois and Iowa standards because of two reasons: (1) the fixed position of the sensors in the river; and (2) placement of the sensors in the water column.

It can be concluded from Parr and Sayre's study that the thermal plume is not always a rectangle which would be required for adequate monitoring by the four fixed position sensors. The shape of the plume varies according to changes in river discharge and diffuser pipe discharge. Since the shape of the plume does not always conform to the boundaries set by the sensors, then all four sensors will not always be able to monitor its presence.

Parr and Sayre's study also indicated that highest excess temperatures tend to occur near the water surface except in the winter months when ambient river temperature falls below 39°F and the highest temperature rises are near the bottom of the river. Since the thermal plume is typically found near the water surface and sensors in the river are positioned two to four feet above the bottom, the sensors often are under the thermal plume. Because of commercial barge traffic, it is not possible to position sensors at or near the water surface. Consequently, it is not feasible to develop a continuous in situ monitoring system that would adequately document river temperature excursions.

The Quad Cities Station NPDES Permit No. IL0005037 requires only the monitoring of daily average temperatures of the spray canal return prior to mixing with river water, river intake water, combined river and canal streams and seasonal (quarterly) plume measurements of the discharge in the Mississippi River. These quarterly field surveys which are performed by the University of Iowa Institute of Hydraulic Research in accordance with the NPDES permit, Attachment G, Paragraph 4b, have indicated no violations of thermal criteria. These field surveys are more accurate than the temperature monitoring system because the temperatures are measured at various depths in the river during these surveys.

Finally the operation of this system imposes a maintenance burden upon Commonwealth Edison Company. Because of the difficulty in maintaining sensors located in the river off of station property, the system requires full time personnel to calibrate and replace individual sensors and cables on a weekly and sometimes daily basis. The current Appendix B program which is a requirement in addition to that required to conduct NPDES permit monitoring has resulted in expenditures which have been significant ranging as high as \$100,000 per year.

Therefore, we believe that these factors adequately justify this request for modification of the present Appendix B thermal discharge surveillance requirement to that specified by the NPDES permit.

E1.3/2.3 Fish Impingement

No change is proposed to this section.

E.1.4/2/4 Chemical Effluent

The objective of section E1.14 of Appendix B is to avoid degradation of the river by inhibiting the discharge of certain chemicals into the circulating water. As of October 1, 1978 all the sources for those chemicals listed in section E.1.4 were interfaced with the waste water treatment plant where, if they were present, they would be treated. The NPDES permit has no requirement to measure for or limit usage of these chemicals. However, the NPDES permit requires that the circulating water discharge to the river meet the requirement of having a pH of 6 to 9 and a Total Dissolved Solids of less than 750 mg/l over natural river background. These two parameters would include the effect of the chemicals listed in section E.1.4. The station has shown little effect on the values of effluent stream pH and total dissolved solids. It is requested that the monitoring requirements for chemical effluents be changed to reflect the requirements of the NPDES permit.

E3.0 Reporting Requirements

The reporting requirements have been reformed for increased clarity, and to highlight the EPA requirement for a 30 day report anytime an Appendix B LCO is exceeded. The annual reporting requirement remains unchanged, and the Directorate of Licensing (NRR) is now required to be notified of any changes in the monitoring requirements in the NPDES permit.

ATTACHMENT 2

Comparison of NRC Environmental Technical Specification and NPDES Permit Requirements for Quad Cities Station

<u>Parameter</u>	<u>100 ETS</u>		<u>NPDES Permit</u>	
	<u>Limit</u>	<u>Monitoring Requirement</u>	<u>Limit</u>	<u>Monitoring Requirement</u>
Temperature	5°F T above ambient; 2°F/hr rate of change except during changes in mode of condenser cooling.	Four temperature sensors 600 feet downstream of the diffuser pipes, one sensor in discharge bay, two sensors in intake area to determine ambient temperature (continuous recording).	5°F T above ambient; water temperature at representative locations in the main river not to exceed the maximum limits specified by 1PCB March, 1977 as amended July, 1979, more than one percent of the hours in the 12 month period ending with any month. Water temperature at these locations shall not exceed maximum limits specified above by more than 3°F. Water temperatures and differentials specified in Iowa Water Quality Standards shall be met.	Daily average temperature of canal at intake prior to mixing with river. Daily average temperature of intake river water. Daily average temperature of combined river and canal streams Countour of 3°C isotherm on quarterly basis downstream of discharge at 1.0°C intervals.

<u>Parameter</u>	<u>NRC ETS</u>		<u>Monitoring Requirement</u>	<u>NPDES Permit</u>	
	<u>Limit</u>			<u>Limit</u>	<u>Monitoring Requirement</u>
Chlorine (total)	Number of Operating Circulating Water Pumps	Maximum Average Cl_2 Conc. (ppm) During Chlorination Prior to Discharge to River	Four times per month total chlorine measured in the discharge bay before and during chlorine cycle; before, at and downstream of the diffuser pipes during the chlorine cycle when the station is operating open or partial closed cycle; before and downstream of spray canal blowdown line during closed cycle operation.	0.2 ppm daily average 0.3 ppm daily maximum chlorine injection not to exceed 160 minutes a day.	Diffuser, spray canal blowdown discharge. Once weekly during chlorination cycle monitoring frequency during discharge.
	2	1.50			
	3	1.00			
	4	.75			
	5	.60			
	6	.50			
Chemical Effluent	NaNO_2	1000 lb/yr.	Total amount of chemicals used will be recorded and reported in the annual report.	No requirement to measure or limit usage of chemicals. Required to monitor and maintain a pH in the circulating water discharge to the river of 6 to 9 and a Total Dissolved Solids (TDS) concentration of 750 mg/l over natural river background TDS and pH are monitored at a frequency of 5 times per week.	
	NaSO_3	1000 lb/yr.			
	NaOH	1000 lb/yr.			
	Na_3PO_4	1000 lb/yr.			
	Morpholine	500 lb/yr.			
	H_2SO_4	120,000 gal/yr			
	NaOH	120,000 gal/yr			