Exelon Generation Company, LLC
Quad Cities Nuclear Power Station
22710 206th Avenue North
Cordova, IL 61242-9740

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Exelon Nuclear

SVP-05-056

July 22, 2005

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Quad Cities Nuclear Power Station, Units 1 and 2
Renewed Facility Operating License Nos. DPR-29 and DPR-30
NRC Docket Nos. 50-254 and 50-265

Subject: Provisional Variance Request from National Pollutant Discharge Elimination System (NPDES) Permit No. IL 0005037

In accordance with Technical Specifications, Appendix B, Section 2.2, "Reporting Related to the NPDES Permits and State Certifications," enclosed is a provisional variance request from the NPDES Permit for Quad Cities Nuclear Power Station.

Should you have any questions concerning this letter, please contact Mr. W. J. Beck at (309) 227-2800.

Respectfully,

Timothy J. Tulon
Site Vice President
Quad Cities Nuclear Power Station

Attachment: Provisional Variance Request from NPDES Permit No. IL 0005037

cc: Regional Administrator – NRC Region III
NRC Senior Resident Inspector – Quad Cities Nuclear Power Station

CDD1

Attachment

Provisional Variance Request from NPDES Permit No. IL 0005037

Exelon Generation Company, LLC
Quad Cities Nuclear Power Station
22710 206th Avenue North
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PM-05-008

July 21, 2005

Mr. Mike Garretson
Manager, Compliance Assurance Section
Division of Water Pollution Control
Illinois Environmental Protection Agency
1021 North Grand Avenue East
Springfield, Illinois 62794

Subject: Quad Cities Nuclear Power Station
NPDES Permit No. IL0005037
Provisional Variance Request – Emergency Application

Dear Mr. Garretson:

Exelon Generation Company, L.L.C. ("Exelon") hereby requests that the Illinois Environmental Protection Agency ("IEPA" or "Agency") grant a provisional variance for Quad Cities Nuclear Power Station ("Quad Cities," "Station" or "Facility"), pursuant to Section 35(b) of the Environmental Protection Act ("Act") 415 ILCS 5/35. Exelon submits this Emergency Application for a provisional variance consistent with IEPA procedures at 35 Ill. Adm. Code 180.204. Quad Cities is located on the Mississippi River in Rock Island County. The Station discharges wastewater pursuant to NPDES Permit No. IL0005037, which IEPA issued on December 17, 2001, ("NPDES Permit"). The Station submitted its NPDES Permit renewal application to the Agency on November 18, 2004.

Station Description

Quad Cities Station is a nuclear-fueled steam electric generating facility located near Cordova, Illinois, on the Mississippi River at River Mile 506.8. The two boiling water reactors have a combined maximum generating capacity of 1824 megawatts electric. Circulating water used to cool and condense the steam from the generating process is withdrawn from and discharged to the Mississippi River.

Quad Cities operates a condenser cooling water system in open cycle mode. In this mode, cooling water is drawn from the Mississippi River into an intake canal, passes through the plant systems, and is discharged via diffusers into the Mississippi River

(Outfalls 001 and 002). The maximum design flow is 2253 cfs or 1,011,000 gpm. Open cycle operation with the diffusers was initially permitted by the IEPA on December 22, 1983.

Relief Requested

A provisional variance is being requested from the restrictions in Special Condition 6B of the NPDES Permit, which limit the number of excursion hours to 1% (87.6 hours) of the hours in a 12-month period ending with any month and, which provide that water temperatures in the Mississippi River shall at no time exceed by more than 3 °F the maximum limits of 86 °F in July, 86 °F in August and 85 °F in September.

Specifically, Exelon requests that a provisional variance be issued to Quad Cities Station, which: (1) grants relief from the 87.6 hour limitation for an additional 100 hours; and (2) which increases the maximum limits for July and August from 86^0 F to 88^0F and for September from 85^0F to 87^0F during the provisional variance period. During excursion hour periods these maximum standards can be exceeded by no more than 3^0 F. The provisional variance period will begin on the date that the 87.6 permitted excursion hours are exhausted or on the date that the Station first exceeds the current excursion hour limit (i.e., 89^0 in July and August or 88^0F in September), which is predicted to occur on or about July 23, 2005, based on current weather conditions and ambient river temperature conditions. The provisional variance period will end on the date that the additional 100 hours are used, but in no case later than 45 days following the start of the provisional variance period.

Necessity for Request

Special Condition 6B of NPDES Permit limits the temperature at the edge of the mixing zone to the maximum monthly temperature standards set forth at 35 Ill. Admin. Code 303.341 (86 °F in July and August and 85 °F in September), except when the Station is using excursion hours, during which time the temperatures at the edge of the mixing zone may be 3°F warmer than these limits. As a rule, the Quad Cities Station has been able to operate well within both the 87.6 excursion hour limit and the 3°F allowance due to the fact that the ambient temperatures of the River (measured upstream of the discharge) generally remain below the non-excursion hour limit. Even when the ambient river temperatures begin to approach the non-excursion hour limits, the significant river flows, which are generally characteristic of the Mississippi River, are sufficient to allow the Station to avoid using a significant percentage of its excursion hour allowance. It is only during periods when the ambient river temperatures are very close to or exceed the non-excursion hour limits or during periods of extreme low flows that the Station is forced to use a significant number of its excursion hour allowance.

When the ambient river temperatures exceed the non-excursion hour limits, the Station has no option other than to use excursion hours, and once its allotment of excursion hours is depleted, the Station must cease operating to maintain compliance with the

NPDES Permit. Partial deratings or adding cooling facilities (such as cooling towers) will not cause the Station to achieve compliance with the 87.6 excursion hour limit that already is exceeded even before any heat is added as a result of Station operations

Similarly, as ambient river temperatures begin to approach the temperatures allowed during excursion hour periods (i.e. 89°F in July and August and 88°F in September) the plant's ability to try to assure that river temperatures do not exceed these excursion hour temperatures through deratings becomes increasingly limited, and, ultimately, shutdown would become the only option. However, the instances in which ambient temperatures have reached these extreme temperatures have been very infrequent and short-lived.

During the drought years 1987 through 1989, Quad Cities Station used 45.2 hours in 1987, 108.3 hours in 1988 (allowed by Provisional Variance No. PCB-88-129), and 23.2 hours in 1989. From 1990 through 2000, high ambient river temperatures and low river flows resulted in Quad Cities Station using a total of 24.5 excursion hours. Between 1990 and 2000, maximum ambient river temperatures at the Quad Cities Station intake exceeded 86 °F on five occasions (July 14, 15, 16, 1995, when Mississippi River flow was 45,000 cfs and July 30, 31, 1999, when Mississippi River flow was 94,000 cfs).

In 2001, daily maximum ambient temperatures in the Mississippi River at the Quad Cities Station intake gradually increased from 76.9 °F on July 3rd to a high of 87.8 °F on August 8th. For eight days, maximum ambient river temperatures at the Quad Cities Station intake exceeded 86 °F. During that time, the Station used 57.5 hours of the 87.6 allowed. As in prior years, use of the excursion hours during 2001 was related to the ambient upstream river temperatures approaching and exceeding 86 °F. River flows were higher than normal during 2001, thereby reducing the number of excursion hours used.

As you are aware, Illinois is enduring its driest summer in 134 years on record, which began in March 2005. Ambient river temperatures recorded for July 2005 have been much warmer than normal. The daily maximum ambient temperatures in the Mississippi River at the Quad Cities Station intake have gradually increased from 75.2°F on July 5th to levels at or above the discharge limits. Specifically, on July 16th and 18th, 2005, the maximum ambient river temperature at the Quad Cities intake reached 86 °F. On July 17th, maximum ambient river temperatures at the intake exceeded 86 °F. These abnormal ambient river temperatures result from the combined effect of air temperature, dew point, wind speed and cloud cover. In addition, Mississippi River flow is presently at a dramatically low level of 39,000 cfs with a prediction to drop to 25,000 cfs by Sunday, July 24, 2005. Normal River flow for this time of year is 68,000 cfs. As a consequence of these unusually hot and humid weather conditions and drastically low flows, the capacity of the Mississippi River to dissipate heat has been drastically reduced beyond its normal capabilities.

As a result of these extreme conditions, on Saturday, July 16, 2005, Quad Cities Station used 5 excursion hours, on Sunday, July 17th, the Station used 16 excursion hours, and on Monday July 18th, Quad Cities used 7.5 excursion hours, totaling 28.5 excursion hours to date.

Based on long range weather forecasts, it is very likely that the unusual drought and temperature conditions experienced this summer will continue for several weeks, causing the ambient river temperatures to exceed the non-excursion hour limits for significant periods of time, and, at times, to approach the excursion hour limits. Under these circumstances, it is expected that the Station may use up all of its permitted excursion hours or contribute to River temperatures exceeding excursion hours limits on or about July 23, 2005. Unless relief is granted by way of this provisional variance request, it is likely that the Station will be forced to shut down for correspondingly significant durations.

In cooperation with IEPA's request that Exelon explore long- term thermal relief options, Exelon retained: (1) expert biologists to conduct a Fisheries Biothermal Assessment, which defines fish responses to thermal impacts; and (2) a renowned expert on fresh water mussels to perform a Unionid Mussel Biothermal Assessment, which evaluates possible impacts to mussels from plant operations under existing and proposed thermal conditions. Exelon has shared drafts of these studies and its draft long- term regulatory relief proposal with federal and State regulators, including IEPA, USEPA, USFWS, Iowa DNR, and Illinois DNR, with whom related discussions are currently underway. The next scheduled meeting with these agencies is scheduled for early August. The goal of Exelon's long- term regulatory relief proposal is to substantially mitigate the need for the emergency type relief requested herein. However, current and forecasted extreme weather, drought conditions and lowering river flows compel this urgent request for relief.

Assessment of Environmental Impacts

Because Quad Cities Station is not proposing to increase cooling water flows or increase the temperature of cooling water discharges, there will be no increase in impingement or entrainment as a result of the issuance of the requested Provisional Variance. Additionally, because the ambient river temperature increase has been gradual, resident fish species have either acclimated to the higher temperature or have found thermal refuge. Therefore, resident fish species will not be subject to any heat shock as a result of increasing the allotment of excursion hours for Quad Cities Station.

The biological studies undertaken as part of Exelon's above-mentioned investigation of long-term, permanent relief options considered the effects on species of fish and shellfish that could result from increasing the number of excursion hours available to the plant. While these studies currently are under review, they fully support the conclusion that granting the requested Provisional Variance will not cause significant or unacceptable adverse effects to these species. Species of fish that are likely to be

impacted from being exposed to temperatures in the excursion zone will already have taken refuge from the higher than normal ambient river temperatures. Therefore, no fish mortality should result from operations authorized by the Provisional Variance.

Shellfish do not have similar thermal avoidance capabilities. However, the recently conducted biological studies show that the mussel (unionid) species in beds that are closest to the plant's discharge are generally more temperature tolerant, and are capable of surviving relatively short-term elevated thermal exposures. Species thought to be less thermally-tolerant inhabit beds located further downstream, in the Cordova Bed, located about 1 mile downstream from the plant. However, because the considerable distance between the plant to the Cordova and the flow characteristics of the River (that cause much of the plant's thermal discharge to avoid the Cordova Bed) the Provisional Variance should not cause any appreciable harm to mussel species downstream of the plant.

Alternatives to Requested Relief

Quad Cities Station generally uses excursion hours during periods of extreme heat and low-river flows. Due in part to the mixing capacity provided by the Mississippi River, and the fact that ambient river temperatures rarely exceed the non-excursion hour NPDES Permit limits, only a relatively small percentage of the permitted excursion hours typically are used to cover any one of these periods. Additional hours are kept in reserve to deal with future periods of extreme weather or other contingencies. However, this year, the unusually dry, hot and humid weather conditions have caused the ambient river temperatures to approach and exceed the non-excursion hour discharge temperature limits more often and for longer periods of time than normally occurs. As a result, Quad Cities Station was required to use a substantial number of the permitted excursion hours and has too few in reserve to deal with projected weather conditions during the rest of July, August and September. Currently, Quad Cities is expected to run out of permitted excursion hours on or about July 23, 2005. In addition, ambient River temperatures may begin to approach the current excursion hour limit for July (i.e. 89°F) in the next few days.

Unless a provisional variance is issued, when the Station runs out of permitted excursion hours, it will have to shut down during all times that the ambient river temperatures are at or above the non-excursion hour limit, or when ambient temperatures approach the excursion hour limits. Based on river temperatures recorded so far this summer and long range weather projections for the balance of the season, it is likely that there will be a number of extended periods during which ambient river temperatures will be at or above the non-excursion hour limits, and infrequent periods when the temperatures approach even the excursion hour limits.

As previously explained, neither the option of derating the units nor of obtaining additional temporary cooling capacity will allow the Station to maintain compliance with the limitation of 87.6 excursion hours if the ambient river temperatures exceed the

applicable temperature limits. The only option would be for the Station to shut down once the ambient River temperatures are at or exceed 86° F in July and August, or 85°F in September. Similarly, without relief from the excursion hour limits, plant shut down would be required if the ambient temperatures approach these limits.

Without the power that Quad Cities Station could generate as a result of the requested provisional variance, there is increased risk that the energy needs of Exelon's customers may not be met during the next few weeks, when there is the greatest demand for electricity resulting from extreme heat conditions. In addition, depending on the operating status of other generating stations in the area, Quad Cities Station continued operation may be essential for voltage support for the Commonwealth Edison Company and Mid American Transmission systems.

Mitigative Actions to be Taken During the Variance Period

During the period when the Station uses any additional excursion hours authorized by the requested provisional variance, Quad Cities Station will do the following: (1) continuously monitor the intake and discharge temperatures and assess water temperatures at the edge of the mixing zone specified in the NPDES Permit; (2) on a daily basis, inspect the intake and discharge areas to assess any mortalities to aquatic life, and report the results of these monitoring activities to the Agency within 30 days of the expiration of the provisional variance (or such other time as agreed upon by the Agency); and (3) notify the Agency of any significant adverse environmental conditions observed that might be caused by operations authorized by the provisional variance, including mortalities to fish or other aquatic life, investigate the cause of such conditions, provide the Agency updates regarding the situation, including when normal conditions return, and submit a report to the Agency regarding these matters within 30 days of the expiration of the provisional variance period (or such other time as agreed upon by the Agency).

Summary

Exelon seeks relief from Special Condition 6B of Quad Cities NPDES permit as described above. For the reasons described above, Exelon believes that not granting this provisional variance to Quad Cities Station will impose an arbitrary and unreasonable hardship. A negative decision will almost certainly result in a loss of generating capacity in Northern Illinois during periods of great electrical demand and could impact voltage support for the Commonwealth Edison Company and Mid American Transmission systems. There are presently no provisional variance orders in effect for Quad Cities Station.

If you should have any questions regarding these matters, please feel free to contact Vicki Neels at (309) 227-3200 or Mark Stuhlman at (309) 227- 2765 from Quad Cities or John Petro, Senior Environmental Analyst, Exelon Generation at (630) 657-3209.

Very Truly Yours,

Timothy K Hanley for

William R. Gideon
Plant Manager
Quad Cities Station

CC: Marcia Wilhite, IEPA
Roger Calloway, IEPA
Blaine Kinsley, IEPA
Connie Tonsor, IEPA