

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

www.exeloncorp.com

SVP-12-028

March 29, 2012

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 from National Pollutant Discharge Elimination System  
(NPDES) Permit No. IL0005037

Pursuant to Appendix B, Section 2.2 (Reporting Related to the NPDES Permits and State Certifications) of the Renewed Facility Operating Licenses for Quad Cities Nuclear Power Station, enclosed is the provisional variance requested from NPDES Permit IL0005037 and the associated Illinois Environmental Protection Agency approval.

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

Respectfully,



Tim Hanley  
Site Vice President  
Quad Cities Nuclear Power Station

Enclosures: A – Provisional Variance Request from NPDES Permit No. IL0005037  
B – Approval of Provisional Variance from NPDES Permit No. IL0005037

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

CDD  
NRR

**Enclosure A**

Provisional Variance Request

from

NPDES Permit No. IL0005037

SVP-12-025

March 20, 2012

Mr. Roger Callaway (CAS-19)  
Wastewater Compliance Unit Manager  
Illinois Environmental Protection Agency  
Bureau of Water  
Compliance Assurance Section #19  
1021 North Grand Avenue East  
P.O. Box 19276  
Springfield, Illinois 62794-9274

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

Dear Mr. Callaway:

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 application for a provisional variance consistent with IEPA procedures at 35 Ill. Adm. Code 180.202.

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 August 26, 2010.

#### 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 5,914 megawatts thermal. 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 2,253 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 restriction in Special Condition 7B of the NPDES Permit that limits the number of excursion hours to 1% (87.6 hours) of the hours in a 12-month period ending with any month. Specifically, Special Condition 7B provides that the Station shall not cause water temperatures in the Mississippi River (beyond the mixing zone) to exceed by more than 3°F the maximum limits of 57°F in March.

Exelon requests that a provisional variance be issued to Quad Cities Station through the end of March allowing the station to exceed the maximum temperature limit stated in Special Condition 7(b) of NPDES Permit No. IL0005037 by no more than 5°F (62°F for March) or 2°F above ambient river temperature, whichever is greater. This relief shall begin on the date that the currently permitted 87.6 excursion hours are exhausted or on the date that Quad Cities Station's discharge first causes or contributes to an exceedance of the applicable permitted excursion hour temperature limit of 60°F in March. Quad Cities will notify the Agency when either of these events have occurred, thereby triggering the provisional variance. The provisional variance period will end on April 1, 2012.

### Necessity for Request

With Unit Two already removed from service for the refueling outage, the number of normal AC power supplies for both Units has been reduced from 4 transformers to 3. Removing Unit One at this time would further reduce the number of AC power supplies for both Units to 2. Further reducing the number of normal AC power sources at this time would increase the likelihood of a loss of normal AC power, reducing the margin of safety on both Units.

With both units offline, and not immediately able to return to service, the power that Quad Cities Station Unit One could generate as a result of the requested provisional variance would not be available to support the voltage requirements that could occur under changing grid conditions.

Special Condition 7B of NPDES Permit limits the temperature at the edge of the mixing zone to 57°F in March, 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 these limits due to the fact that the ambient temperatures of the River (measured upstream of

the discharge) generally remain below the non-excursion hour limit. 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 allow the Station to achieve compliance with a limit that already is exceeded even before any heat is added as a result of Station operations.

As you are aware, Illinois is in the midst of record breaking warm weather for this time of year. Quad Cities Station first began using excursion hours on Sunday, March 18, 2012 when it used 10.5 hours. On March 18, 2012, upstream river temperature was 57.0°F at 13:30 and downstream river temperature was 57.7°F at 13:00 representing a 0.7°F temperature rise with both Units operating. Quad Cities Station U-2 shutdown for a refuel outage early on March 19, 2012. Quad Cities Station began using excursion hours again on Monday, March 19, 2012. On March 19, 2012, upstream river temperature was 58.6°F at 15:00 and downstream river temperature was 59.0°F at 15:30 representing a 0.4°F temperature rise with U-1 operating at full power and U-2 shutdown for a refuel outage. As of 08:00 on March 20, 2012, Quad Cities Station accumulated 34.5 excursion hours due to the recent record breaking warm weather. Combined with the 33 excursion hours Quad Cities Station accumulated during July of 2011, the station has accumulated 67.5 excursion hours of the permit allowed 87.6 hours (1%) in a 12-month period ending with any month. With the current forecast, it is expected that Quad Cities Station will continue to accumulate excursion hours through the March 27-28 period. As a consequence of the record breaking warm weather and absence of cooling during the evening hours, high ambient river temperatures even at current flow rates of 75,000 cfs, the capacity of the Mississippi River to dissipate heat has been drastically reduced beyond its normal capabilities. The river is not cooling off during the evening hours as is typical this time of year. Without nighttime cooling, the river retains the heat introduced to it during the daytime hours, both upstream and downstream.

Based on current weather forecasts it is expected that the Station will likely consume a large percentage of its permitted excursion hours before Tuesday afternoon, March 20, 2012. Therefore, 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 for Quad Cities, Exelon commissioned extensive studies of the Station's thermal output and impacts. Exelon has shared drafts of those studies and its draft long-term regulatory relief proposal with Federal and State regulators, with whom related

discussions are currently underway. Quad Cities Station will submit a revised 316(a) report to the Illinois Pollution Control Board on or before May 15, 2012.

### 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. In addition, the current flows afford a delta T of approximate 1°F between the upstream and downstream temperatures. 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. These studies 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 suffer from being exposed to temperatures in the excursion zone (i.e. up to 5°F above the monthly standard) 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

Historically, Quad Cities Station has used 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. Over the last 48 hours, Quad Cities Station has used 34.5 of its permitted excursion hours and will have too few in reserve to deal with projected weather conditions during the rest of

March. Unless a provisional variance is issued, when the Station runs out of hours, it will have to shut down during all times that the ambient river temperatures are at or above the non-excursion hour limit. Based on river temperatures recorded so far this spring 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 these 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 if the ambient river temperatures exceed the applicable temperature limits. The only option is for the Station to shut down once the ambient River temperatures are at or exceed the NPDES permit monthly limit.

#### 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 using the NPDES Permit temperature monitoring curve or field measurements; (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 requests that a provisional variance be issued to Quad Cities Station through the end of March allowing the station to exceed the maximum temperature limit stated in Special Condition 7(b) of NPDES Permit No. IL0005037 by no more than 5°F (62°F for March) or 2°F above ambient river temperature, whichever is greater. The provisional variance would become effective on the date that the permitted 87.6 excursion hours are exhausted or on the date that Quad Cities discharge temperature first exceeds the applicable permitted excursion hour temperature limit of 60°F for March. The provisional variance period will end on April 1, 2012.

With Unit Two already removed from service for the refueling outage, the number of normal AC power supplies for both Units has been reduced from 4 transformers to 3. Removing Unit One at this time would further reduce the number of AC power supplies for both Units to 2. Further reducing the number of normal AC power sources at this time would increase the likelihood of a loss of normal AC power, reducing the margin of safety on both Units.

With both units offline, and not immediately able to return to service, the power that Quad Cities Station Unit One could generate as a result of the requested provtisional variance would not be available to support the voltage requirements that could occur under changing grid conditions.

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, Principal Environmental Analyst, Exelon Generation at (630) 657-3209.

Very Truly Yours,



Tim Hanley  
Site Vice President  
Quad Cities Station

TH/MS/sjo

CC: Mark Stuhlman  
John Petro  
Letterbook

**Enclosure B**

Approval of Provisional Variance

from

NPDES Permit No. IL0005037

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

March 21, 2012

Exelon Generation Company, L.L.C.	)	
Quad Cities Nuclear Power Station	)	
	)	
Petitioner,	)	
	)	
v.	)	IEPA – 12-11
	)	(Provisional Variance-Water)
ILLINOIS ENVIRONMENTAL	)	
PROTECTION AGENCY,	)	
	)	
Respondent.	)	

Re: Provisional Variance From Discharge Limits Contained in NPDES Permit IL0005037

Dear Mr. Hanley:

The Illinois Environmental Protection Agency (Agency) has completed its technical review of the attached provisional variance request, dated March 20, 2012 (Attachment A) for Exelon Generation Company, L.L.C.’s Quad Cities Nuclear Power Station (Quad Cities). Quad Cities is seeking a provisional variance through March 31, 2012, that would allow it to exceed the maximum temperature limit in Special Condition 6B<sup>1</sup> of NPDES Permit IL0005037 by no more than 5° (62° for March), or 2° above ambient river temperature, whichever is greater.

Based on its review, the Agency GRANTS the District a provisional variance subject to the specific conditions set forth below.

*Background*

Quad Cities 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 5,914 megawatts thermal. Circulating water used to cool and condense the steam from the generating process is withdrawn from, and discharged to, the Mississippi River.

<sup>1</sup> In its request, Quad Cities mistakenly refers to this condition as Special Condition 7B.

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 2,253 cfs or 1,011,000 gpm. Open cycle operation with the diffusers was initially permitted by the IEPA on December 22, 1983.

Special Condition 6B of NPDES Permit IL00005037 (Attachment B) limits the temperature at the edge of the mixing zone to 57°F in March, except when Quad Cities is using excursion hours, during which time the temperatures at the edge of the mixing zone may be 3°F warmer than these limits. It is 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 Quad Cities is forced to use a significant number of its excursion hour allowance.

Once its allotment of excursion hours is depleted, Quad Cities must cease operating to maintain compliance with the NPDES Permit. As noted in its request (Attachment A) partial deratings or adding cooling facilities (such as cooling towers) will not allow Quad Cities to achieve compliance with a limit that already is exceeded even before any heat is added as a result of station operations.

Illinois is experiencing record breaking warm weather for this time of year; therefore Quad Cities began using excursion hours on Sunday, March 18, 2012. As of 8:00 am on March 20, 2012, Quad Cities accumulated 34.5 excursion hours due to the recent record breaking warm weather which, when combined with the 33 excursion hours Quad Cities accumulated during July of 2011, station had accumulated 67.5 excursion hours of the permit allowed 87.6 hours (1%) in a 12-month period ending with any month.

On March 21, 2012, Quad Cities reached the limit of its permitted excursion hours at approximately 4:00 am. Therefore, unless relief is granted by way of this provisional variance request, it is likely that the Quad Cities will be forced to shut down for correspondingly significant durations.

Quad Cities' request states that Unit Two has already been removed from service for the refueling outage. As a result, the number of normal AC power supplies for both Units has been reduced from four transformers to three. Removing Unit One at this time would further reduce the number of AC power supplies for both Units to two. Further reducing the number of normal AC power sources at this time would increase the likelihood of a loss of normal AC power, reducing the margin of safety on both Units.

#### *Relief Requested*

Special Condition 6B of NPDES Permit IL00005037 limits the number of excursion hours to 1% (87.6 hours) of the hours in a 12-month period ending with any month. Specifically, Special Condition 6B provides that Quad Cities shall not cause water

temperatures in the Mississippi River (beyond the mixing zone) to exceed by more than 3°F the maximum limits of 57°F in March.

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
F°	45	45	57	68	78	85	86	86	85	75	65	52

Quad Cities is requesting a provisional variance through March 31 that allows it to exceed the maximum temperature limit stated in Special Condition 6B of NPDES Permit No. IL0005037 by no more than 5° F (62°F for March) or 2°F above ambient river temperature, whichever is greater. Quad Cities had asked that the relief begin on the date that the currently permitted 87.6 excursion hours are exhausted or on the date that Quad Cities' first causes or contributes to an exceedance of the applicable permitted excursion hour temperature limit of 60°F in March. The provisional variance period will end on April 1, 2012.

Quad Cities has exhausted its excursion hours.

#### *Agency Determinations*

The Agency has reviewed the requested provisional variance and has concluded the following:

1. Any environmental impact from the requested relief shall be closely monitored and the Agency shall be immediately notified of any adverse impacts.
2. No reasonable alternatives appear available;
3. No public water supplies should be affected;
4. No federal regulations will preclude the granting of this request; and
5. Quad Cities will face an arbitrary and unreasonable hardship if the request is not granted.

#### *Conditions*

The Agency hereby GRANTS Quad Cities a provisional variance from subject to the following conditions:

- A. The provisional variance shall begin on March 21, 2012, and shall end no later than April 1, 2012.
- B. Quad Cities shall provide the best operation of its station to produce the best effluent possible at all times. At no time, during the variance period, shall Quad Cities cause water temperature in the Mississippi River (beyond the mixing zone) to exceed 62° or 2° F above ambient river temperature, whatever is greater.

- C. During the variance period, Quad Cities must continuously monitor intake, discharge and receiving water temperatures and visually inspect intake and discharge areas at least three times daily to assess any mortalities to fish and other aquatic life.
- D. Quad Cities shall document environmental conditions during the term of the provisional variance, including the activities described in C. above of this Section, and submit the documentation to the Agency and the Department of Natural Resources within 30 days after the provisional variance expires.
- E. Quad Cities shall immediately notify the Agency and the Department of Natural Resources of any unusual conditions, including mortalities to fish or other aquatic life; immediately take action to remedy the problem; investigate and document the cause and seriousness of the unusual conditions while providing updates to the Agency and the Department of Natural Resources as changes occur until normal conditions return; notify the Agency and the Department of Natural Resources when normal conditions return; and submit the documentation to the Agency and the Department of Natural Resources within 30 days after normal conditions return.
- F. Quad Cities shall develop and implement a response and recovery plan to address any adverse environmental impact due to thermal conditions resulting from the provisional variance, including loss and damage to aquatic life.
- G. Quad Cities shall notify Roger Callaway of the Agency by telephone at 217/782-9720 when Quad Cities' discharge first causes or contributes to an exceedance of the applicable permitted excursion hour temperature limit of 60°F in March. Written confirmation of each notice shall be sent within five days to the following address:

Illinois Environmental Protection Agency  
 Bureau of Water - Water Pollution Control  
 Attention: Roger Callaway  
 1021 North Grand Avenue East, MC #19  
 Springfield, Illinois 62794-9276

- H. Quad Cities shall sign a certificate of acceptance of this provisional variance and forward that certificate to Roger Callaway at the address indicated above within one day of the date of this order. The certification should take the following form:

I (We) \_\_\_\_\_, hereby accept and agree to be bound by all terms and conditions of the provisional variance granted by the Agency in \_\_\_\_\_ dated \_\_\_\_\_.

\_\_\_\_\_  
Petitioner

\_\_\_\_\_  
Authorized Agent

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

Quad Cities shall continue to monitor and maintain compliance with all other parameters and conditions specified in its NPDES Permit No. IL0005037

*Conclusion*

The Agency grants this provisional variance in accordance with its authority contained in Sections 35(b), 36 (c), and 37(b) of the Illinois Environmental Protection Act (415 ILCS 5/35(b), 36(c), and 37(b) (2004). The decision to grant this provisional variance is not intended to address compliance with any other applicable laws or regulations.

Sincerely,

  
Julie Armitage  
Acting Chief Legal Counsel

cc: Marcia Willhite  
Roger Callaway  
Vera Herst

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

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SVP-12-026

March 21, 2012

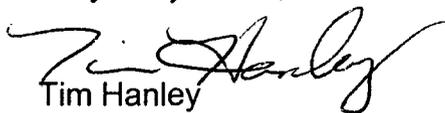
Mr. Roger Callaway (CAS-19)  
Wastewater Compliance Unit Manager  
Illinois Environmental Protection Agency  
Bureau of Water  
Compliance Assurance Section #19  
1021 North Grand Avenue East  
P.O. Box 19276  
Springfield, Illinois 62794-9274

Re: Quad Cities Nuclear Power Station NPDES Permit No. IL0005037  
Provisional Variance Request – Emergency Application – IEPA 12-11

Dear Mr. Callaway:

Thank you for the time, consideration and attention IEPA dedicated to Exelon's provisional variance request. We sincerely appreciate all of your efforts. Below is Quad Cities Station's Certificate of Acceptance of the Provisional Variance Order issued by IEPA in this matter.

Very Truly Yours,



Tim Hanley  
Site Vice President  
Quad Cities Station

TH/MS/sjo

CC: Mark Stuhlman  
John Petro  
Letterbook

## Certificate of Acceptance

I(We), Tim Hanley, hereby accept and agree to be bound by all terms and conditions of the provisional variance granted by the Agency in matter IEPA 12-11 dated March 21, 2012.

Exelon Generation Co. L.L.C/Quad Cities Station  
Petitioner

  
Authorized Agent

Site Vice President  
Title

03/21/2012  
Date