Exelon Generation
4300 Winfield Road
Warrenville, IL 60555

www.exeloncorp.com

Exelon Nuclear

RS-01-275

November 30, 2001

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Dresden Nuclear Power Station, Units 2 and 3
Facility Operating License Nos. DPR-19 and DPR-25
NRC Docket Nos. 50-237 and 50-249

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

Subject: Additional Information Supporting the License Amendment Request to Permit Uprated Power Operation, Dresden Nuclear Power Station, Units 2 and 3, Quad Cities Nuclear Power Station, Units 1 and 2

References: (1) Letter from R. M. Krich (Commonwealth Edison Company) to U. S. NRC, "Request for License Amendment for Power Uprate Operation," dated December 27, 2000

(2) Letter from K. A. Ainger (Exelon Generation Company, LLC) to U. S. NRC, "Additional Mechanical Information Supporting the Request to Permit Uprated Power Operation at Dresden Nuclear Power Station and Quad Cities Nuclear Power Station," dated August 8, 2001

(3) Letter from T. W. Simpkin (Exelon Generation Company, LLC) to U. S. NRC, "Additional Risk Information Supporting the Request to Permit Uprated Power Operation at Dresden Nuclear Power Station," dated September 14, 2001

(4) Letter from K. A. Ainger (Exelon Generation Company, LLC) to U. S. NRC, "Additional Information Supporting the Request to Permit Uprated Power Operation at Dresden Nuclear Power Station," dated September 26, 2001

In Reference 1, Commonwealth Edison Company, now Exelon Generation Company (EGC), LLC, submitted a request for changes to the operating licenses and Technical Specifications for Dresden Nuclear Power Station, Units 2 and 3, and Quad Cities Nuclear Power Station, Units 1 and 2, to allow operation at uprated power levels. In a telephone conference on November 26, 2001, between representatives of EGC and Mr.

A001

L. W. Rossbach and other members of the NRC, the NRC requested additional information regarding these proposed changes. The attachment to this letter provides the requested information.

In addition, the attachment to this letter provides corrections to information previously provided in References 2, 3, and 4. These corrections have been discussed in telephone conferences on November 2, 2001, and November 27, 2001, between Mr. L. W. Rossbach of the NRC and Mr. A. R. Haeger and other representatives of EGC. The corrections do not materially affect the conclusions provided in Reference 2, 3, and 4.

Should you have any questions related to this letter, please contact Mr. Allan R. Haeger at (630) 657-2807.

Respectfully,

Keith R. Jury

K. R. Jury
Director – Licensing
Mid-West Regional Operating Group

Attachments:

Affidavit
Additional Information Supporting the License Amendment Request to Permit Uprated Power Operation, Dresden Nuclear Power Station, Units 2 and 3, Quad Cities Nuclear Power Station, Units 1 and 2

cc: Regional Administrator – NRC Region III
NRC Senior Resident Inspector – Dresden Nuclear Power Station
NRC Senior Resident Inspector – Quad Cities Nuclear Power Station
Office of Nuclear Facility Safety – Illinois Department of Nuclear Safety

STATE OF ILLINOIS	)	
COUNTY OF DUPAGE	)	
IN THE MATTER OF	)	
EXELON GENERATION COMPANY, LLC	)	**Docket Numbers**
DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3	)	**50-237 AND 50-249**
QUAD CITIES NUCLEAR POWER STATION, UNITS 1 AND 2	)	**50-254 AND 50-265**

SUBJECT: Additional Information Supporting the License Amendment Request to Permit Uprated Power Operation, Dresden Nuclear Power Station, Units 2 and 3, Quad Cities Nuclear Power Station, Units 1 and 2

AFFIDAVIT

I affirm that the content of this transmittal is true and correct to the best of my knowledge, information and belief.

Keith R. Jury

K. R. Jury
Director – Licensing
Mid-West Regional Operating Group

Subscribed and sworn to before me, a Notary Public in and

for the State above named, this 30 day of

November, 2001.

Anese L. Grigsby

Notary Public

OFFICIAL SEAL
ANESE L. GRIGSBY
NOTARY PUBLIC, STATE OF ILLINOIS
MY COMMISSION EXPIRES 3-13-2005

Attachment
Additional Information Supporting the License Amendment Request to Permit Uprated Power Operation,
Dresden Nuclear Power Station, Units 2 and 3
Quad Cities Nuclear Power Station, Units 1 and 2

Corrections to Previously-Submitted Material

(Applies to both Quad Cities Nuclear Power Station (QCNPS) and Dresden Nuclear Power Station (DNPS)) In Reference 1, the response to Question 11.B states, in part, "All MOVs in the Generic Letter (GL) 89-10, 'Safety-Related Motor-Operated Valve Testing And Surveillance,' program have been evaluated for EPU process and ambient conditions changes, including parameters such as fluid flow, temperature, pressure, differential pressure and ambient temperature. These evaluations confirmed that the existing analysis for each MOV bounds the EPU conditions."

This statement should be corrected to read as follows. The corrected information is in italics.

> All MOVs in the Generic Letter (GL) 89-10, "Safety-Related Motor-Operated Valve Testing And Surveillance," program have been evaluated for EPU process and ambient conditions changes, including parameters such as fluid flow, temperature, pressure, differential pressure and ambient temperature. *In some cases, the pre-EPU MOV calculations were revised for EPU conditions. Since the parameter changes were minor, there were no changes required to any MOV settings.*

(Applies to DNPS only) In Reference 2, in the response to Question 11, the estimated core damage frequency (CDF) for the seismic dam failure scenario without a loss of coolant accident (LOCA) was provided as 9E-6/yr. Subsequent to submittal of this information, EGC has identified an error in this estimate. With this error corrected, the estimated CDF for the seismic dam failure scenario is 1E-5/yr. This correction does not affect the conclusion provided in Reference 2.

(Applies to DNPS only) In Reference 3, in the response to Question 2, the estimated CDF for the seismic dam failure scenario coincident with a small LOCA was provided as 1.9E-6/yr. The error noted in the paragraph above also affects this estimate. With this error corrected, the estimated CDF for the seismic dam failure scenario coincident with a small LOCA is 2E-6/yr. This correction does not affect the conclusion provided in Reference 3.

Responses to NRC Questions

Question

1. *(Applies to both QCNPS and DNPS) Describe how the main generator rated output was increased for the extended power uprate (EPU) condition.*

Response

As noted in Section 7.1, "Turbine-Generator," of the Safety Analysis Report (Attachment E of Reference 4), the main generator was rated at 828 mega-watts electric (MWe) at a 0.90 power factor (i.e., 920 MVA) prior to the EPU. The General Electric (GE) Company evaluated the main generator for EPU conditions and determined that the generator was acceptable for operation at 912 MWe at a 0.95 power factor (i.e., 960 MVA), provided that stator heat removal capability was increased. For DNPS, as noted in Reference 4, Attachment G, "Plant Modifications to Support Power Uprate," increased stator heat removal capability will be provided by re-sizing

orifices in the service water system supply to the stator cooling system to provide additional flow. For QCNPS, subsequent plant-specific measurements and analysis determined that existing cooling capability will accommodate EPU conditions.

Question

2. *(Applies to DNPS only) In the information provided in Reference 3, the earthquake goes up in steps of 0.1g, until it reaches G8 and then this step goes up by 0.2g. From a quick estimate, this will underestimate the CDF values by about 10% for the non-LOCA and 20% for the LOCA event. Why shouldn't G8 cover 0.7 - 0.8g and a new G9 cover 0.8 - 0.9g and then have a new final step of G10 >0.9g?*

Response

Splitting the G8 interval into two 0.1g magnitude ranges will increase the presently calculated non-LOCA scenario total CDF by approximately 0.2% and reduce the presently calculated LOCA scenario total CDF by approximately 0.2%. This would not affect the reported results.

Question

3. *(Applies to DNPS only) Regarding the information provided in Reference 3, could DNPS provide the equation for calculating the seismic non-LOCA, such as:*

   *CDF = S * DF * [ICF + HEPi + (CWDTF * CSTF) + (HEPI + CSTF)]*

   S - Seismic Hazard Value
   DF - Dam Failure
   ICF - Isolation Condenser Fails
   HEPi - Early alignment of CWDT or CST
   CWDTF - Clean Demin. Water Tank Failure
   CSTF - 1A Condensate Storage Tank Failure
   HEPI - Later alignment of CST supply to IC

   Also, is credit being taken for the 2/3A or 2/3B CSTs?

Response:

Six unsuccessful end-state sequences are calculated using an event tree approach for each of the seismic magnitude intervals. Using the nomenclature above, these sequences are:

S x DF x [1-ICF(fragility)] x [1-CWDTF(fragility)] x [1-HEPi] x [1-CSTF(fragility)] x HEPI

S x DF x [1-ICF(fragility)] x [1-CWDTF(fragility)] x [1-HEPi] x CSTF(fragility)

S x DF x [1-ICF(fragility)] x [1-CWDTF(fragility)] x HEPi x [1-CSTF(fragility)] x HEPdep(1.0)

S x DF x [1-ICF(fragility)] x [1-CWDTF(fragility)] x HEPi x CSTF(fragility)

S x DF x [1-ICF(fragility)] x CWDTF(fragility) x [1-CSTF(fragility)] x HEPi

S x DF x [1-ICF(fragility)] x CWDTF(fragility) x CSTF(fragility)

The volume of all three condensate storage tanks (CSTs) (i.e., 1A CST, 2/3A CST and 2/3 B CST) is used in the analysis. With respect to seismic induced failure, since the CSTs are normally operated crosstied, all three CSTs are modeled as a single entity with the limiting seismic capacity of the 1A CST. The 2/3 A and 2/3 B CSTs have greater seismic capacity than the 1A CST.

Question

4. *(Applies to DNPS only) Regarding the information provided in Reference 3, what is the SORV failure probability used in the LOCA case pre- and post-uprate? Also, it is not clear what the numbers represent in the last sentence in the second to last paragraph (i.e., ... 1.9E-6/yr to 2.1E-6/yr with an EPU delta of 4.6E-8/yr.) The base case LOCA (without considering SORV) is 1.9E-6/yr. This base case increases to 2.1E-6/yr when the SORV failure probability is included. When EPU is considered does the base case value with SORV consideration increase by an additional 4.6E-8, which is totally due to the increased probability of an SORV due to the cycling of the valves? In essence, the EPU value would then be 2.146E-6.*

Response

The stuck open relief valve (SORV) failure probability used in the LOCA case is 6.75E-3 (pre-EPU) and 8.1E-3 (post-EPU).

As noted above, the corrected CDF for the base case LOCA is 2E-6/yr. A sensitivity study showed that inclusion of the SORV raises the CDF from 2E-6/yr. to 2.2E-6/yr. pre-EPU. The EPU delta above this value is 5.8E-8/yr. This delta would raise the post-EPU CDF to slightly less than 2.3E-6/yr.

Question

5. *(Applies to DNPS only) Regarding the information provided in Reference 3, if recirculation of water from the discharge canal to the intake canal is credited to maintain diesel generator cooling water for the 24-hour mission time of the risk assessment, should the assessment evaluate further operator actions?*

Response

As discussed in Reference 3, water in the discharge canal can be recirculated to the intake canal by means of the de-icing line slide gate. The slide gate was not evaluated in the seismic probabilistic analysis because of unknown fragility. However, for the scenario evaluating the risk of seismically-induced dam failure for which isolation condenser makeup would be required, offsite power is assumed to be lost due to the seismic event. Therefore, the circulating water system valves would remain open. In this scenario, backflow from the discharge canal through the circulating water system would provide a direct recirculation path to the intake canal, as

discussed in Updated Final Safety Analysis Report (UFSAR) Section 9.2.5.2, "System Description." Therefore, no operator action is required to establish recirculation flow and diesel cooling is available for the entire 24 hour mission time.

References

1. Letter from K. A. Ainger (Exelon Generation Company, LLC) to U. S. NRC, "Additional Mechanical Information Supporting the Request to Permit Uprated Power Operation at Dresden Nuclear Power Station and Quad Cities Nuclear Power Station," dated August 8, 2001

2. Letter from T. W. Simpkin (Exelon Generation Company, LLC) to U. S. NRC, "Additional Risk Information Supporting the Request to Permit Uprated Power Operation at Dresden Nuclear Power Station," dated September 14, 2001

3. Letter from K. A. Ainger (Exelon Generation Company, LLC) to U. S. NRC, "Additional Information Supporting the Request to Permit Uprated Power Operation at Dresden Nuclear Power Station," dated September 26, 2001

4. Letter from R. M. Krich (Commonwealth Edison Company) to U. S. NRC, "Request for License Amendment for Power Uprate Operation," dated December 27, 2000