Exelon Generation
4300 Winfield Road
Warrenville, IL 60555

www.exeloncorp.com

Exelon Nuclear

RS-01-116

June 15, 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 Instrumentation and Controls Information Supporting the License Amendment Request to Permit Uprated Power Operation

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

In the referenced letter, Commonwealth Edison (ComEd) Company, now Exelon Generation Company (EGC), LLC, submitted a request for changes to the operating licenses and Technical Specifications (TS) for Dresden Nuclear Power Station (DNPS), Units 2 and 3, and Quad Cities Nuclear Power Station (QCNPS), Units 1 and 2, to allow operation at uprated power levels. In a discussion between EGC and Mr. L. W. Rossbach and other members of the NRC on May 16, 2001, the NRC requested additional information regarding these requested changes. The attachment to this letter provides the requested information.

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

Respectfully,

R. M. Krich
Director – Licensing
Mid-West Regional Operating Group

A001

Attachments:

Affidavit
Additional Instrumentation and Controls Information Supporting the License Amendment Request to Permit Uprated Power Operation

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 Instrumentation and Controls Information Supporting the License Amendment Request to Permit Uprated Power Operation

AFFIDAVIT

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

R. M. Krich
Director – Licensing
Mid-West Regional Operating Group

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

for the State above named, this 15th day of

June, 2001.

Notary Public

"OFFICIAL SEAL"
Timothy A. Byam
Notary Public, State of Illinois
My Commission Expires 11/24/2001

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

Question

1. *Table 5.1 of NEDC-32962P and NEDC-32961P provide changes in the analytical limit for certain plant parameters for the current and power uprate condition. The justification for these changes is based on the assumption that they do not increase the probability and consequences of postulated accidents, or reduce significantly the margin of safety. In order for the staff to complete their review, provide instrument setpoints and allowable values at both the current and uprate power conditions for the instrumentation identified in Table 5-1.*

Response:
The attached Tables 1 and 2 provide the instrument setpoint and allowable value information requested for both Dresden Nuclear Power Station (DNPS) and Quad Cities Nuclear Power Station (QCNPS). The functions listed correspond to the items in the referenced letter, Attachment E, "Power Uprate Safety Analysis Report," (PUSAR) Table 5-1, "Analytical Limits for Setpoints." Abbreviations for the tables are contained in Table 9 of this attachment.

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

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

Table 1: DNPS - Setpoints, Allowable Values, and Analytical Limits for PUSAR Table 5-1

		Setpoint	Allowable Value	Analytical Limit
APRM Calibration Basis	Current	NA	NA	2527 MWt
	Uprate	NA	NA	2957 MWt
APRM Scram				
TLO Flow Biased (% RTP)	Current	0.58Wd+60.6	0.58Wd+63.5	0.58Wd+67
	Uprate	0.56Wd+66	0.56Wd+67.4	0.56Wd+71.6
TLO Clamped	Current	116.5 % RTP	120 % RTP	125 % RTP
	Uprate	118.9 % RTP	122 % RTP	125 % RTP
SLO Flow Biased (% RTP)	Current	0.58Wd+56.5	0.58Wd+59.2	0.58Wd+63.5
	Uprate	0.56Wd+61	0.56Wd+63.2	0.56Wd+67.6
SLO Clamped	Current	115.4 % RTP	118.5 % RTP	121.5 % RTP
	Uprate	115.4 % RTP	118.5 % RTP	125 % RTP
APRM Rod Block				
TLO Flow Biased (% RTP)	Current	0.58Wd+48.6	0.58Wd+51.5	0.58Wd+55
	Uprate	0.56Wd+54	0.56Wd+55.4	0.56Wd+59
SLO Flow Biased (% RTP)	Current	0.58Wd+44.5	0.58Wd+47.2	0.58Wd+51.5
	Uprate	0.56Wd+49	0.56Wd+51.2	0.56Wd+55.6
APRM Neutron Flux Scram	Current	116.5 % RTP	120 % RTP	125 % RTP
	Uprate	118.9 % RTP	122 % RTP	125 % RTP
Rod Block Monitor (% RTP)		No Change	No Change	No Change
Rod Worth Minimizer % RTP – based on FW and steam flow (Note 1)	Current	FW 20 % STM 14 %	10 % RTP	10 % RTP
	Uprate	FW 11.59 % STM 13.76 %	10 % RTP	10 % RTP
Vessel High Pressure Scram		No Change	No Change	No Change
High Pressure ATWS RPT		No Change	No Change	No Change
SRV set pressure		No Change	No Change	No Change
SSV set pressure		No Change	No Change	No Change
SRV relief function		No Change	No Change	No Change
RV setpoints		No Change	No Change	No Change
TSV and TCV Scram Bypass based on Turbine First Stage Pressure (Note 1)	Current	279.6 psig	45 % RTP (294 psig)	45 % RTP
	Uprate	231 psig	38.5 % RTP (245.1 psig)	38.5 % RTP
Condenser Vacuum – Low	Current	22.4 "Hg vac	21.15"Hg vac	21 "Hg vac
	Uprate	22.2 "Hg vac	21.4 "Hg vac	21 "Hg vac
Main Steam Line High Flow (Analytical limit is defined in % of rated steam flow. Instruments measure psid. Both psid and % steam flow are provided.)	Unit 2 Current	135 psid	160.5 psid	120 % (170.8 psid)
	Unit 2 Uprate	250 psid (118.8%)	259.2 psid (120%)	125 % (303.9 psid)
	Unit 3 Current	110 psid	117.1 psid	120 % (123.4 psid)
	Unit 3 Uprate	243 psid (133.3 %)	252.6 psid (134.8 %)	140 % (292.5 psid)
Feedwater Flow/Recirculation Cavitation Interlock		No Change	No Change	No Change
Low Steam Line Pressure		No Change	No Change	No Change
IC System Steam Line Flow		No Change	No Change	No Change
IC System Condensate Line Flow		No Change	No Change	No Change
HPCI Steam Line Flow		No Change	No Change	No Change
Main Steam Line Tunnel High Temperature Isolation		No Change	No Change	No Change
Reactor Low Water Level	Current	13.62 "RWL	10.24 "RWL	8 "RWL
	Uprate	6.02 "RWL	2.65 "RWL	0 "RWL

Note 1: The Technical Specifications permissive or operability requirement is an Allowable Value which is conservatively treated as an Analytical Limit.

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

Table 2: QCNPS - Setpoints, Allowable Values, and Analytical Limits for PUSAR Table 5-1

		Setpoint	Allowable Value	Analytical Limit
APRM Calibration Basis	Current	NA	NA	2511 MWt
	Uprate	NA	NA	2957 MWt
APRM Scram				
TLO Clamped	Current	119 % RTP	120 % RTP	125 % RTP
	Uprate	119 % RTP	122 % RTP	125 % RTP
TLO Flow Biased (% RTP)	Current	0.58Wd+60.6	0.58Wd+63.4	0.58Wd+67
	Uprate	0.56Wd+66	0.56Wd+67.4	0.56Wd+71.6
SLO Flow Biased (% RTP)	Current	0.58Wd+56.4	0.58Wd+59.1	0.58Wd+63.5
	Uprate	0.56Wd+61	0.56Wd+63.2	0.56Wd+67.6
SLO Clamped	Current	115.2 % RTP	118.4 % RTP	121.5 % RTP
	Uprate	115.2 % RTP	118.4 % RTP	125 % RTP
APRM Rod Block				
TLO Flow Biased (% RTP)	Current	0.58Wd+48.6	0.58Wd+51.4	0.58Wd+55
	Uprate	0.56Wd+54	0.56Wd+55.4	0.56Wd+59
SLO Flow Biased (% RTP)	Current	0.58Wd+44.4	0.58Wd+47.1	0.58Wd+51.5
	Uprate	0.56Wd+49	0.56Wd+51.2	0.56Wd+55.6
APRM Neutron Flux Scram	Current	119 % RTP	120 % RTP	125 % RTP
	Uprate	119 % RTP	122 % RTP	125 % RTP
Rod Block Monitor (% RTP)		No Change	No Change	No Change
Rod Worth Minimizer % RTP – based on FW and Steam flow (Note 1)	Current	FW 18.7 % STM 15.5 %	10 % RTP	10 % RTP
	Uprate	FW 16.6 % STM 14.2 %	10 % RTP	10 % RTP
Vessel High Pressure Scram		No Change	No Change	No Change
High Pressure ATWS RPT		No Change	No Change	No Change
SRV set pressure		No Change	No Change	No Change
SSV set pressure		No Change	No Change	No Change
SRV relief function		No Change	No Change	No Change
RV setpoints		No Change	No Change	No Change
TSV and TCV Scram Bypass based on Turbine First Stage Pressure (Note 1)	Current	316 psig	45 % RTP (350 psig)	45 % RTP
	Uprate	221.5 psig	38.5 % RTP (244.8 psig)	38.5 % RTP
Condenser Vacuum – Low	Current	23 "Hg vac	21.8 "Hg vac	21 "Hg vac
	Uprate	22.2 "Hg vac	21.6 "Hg vac	21 "Hg vac
Main Steam Line High Flow (Analytical limit is defined in % of rated steam flow. Instruments measure psid. Both psid and % steam flow are provided.)	Current	144 psid (133%)	138 % (157.5 psid)	140 % (163.4 psid)
	Uprate	242 psid (133%)	254.3 psid (135%)	140 % (292.5 psid)
Feedwater Flow/Recirculation Cavitation Interlock		No Change	No Change	No Change
Low Steam Line Pressure		No Change	No Change	No Change
RCIC Steam Line Flow		No Change	No Change	No Change
HPCI Steam Line Flow		No Change	No Change	No Change
Main Steam Line Tunnel High Temperature Isolation		No Change	No Change	No Change
Reactor Low Water Level	Current	14.6 "RWL	11.8 "RWL	8 "RWL
	Uprate	6.6 "RWL	3.8 "RWL	0 "RWL

Note 1: The Technical Specifications permissive or operability requirement is an Allowable Value which is conservatively treated as an Analytical Limit.

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

Question

2. *Attachment G for both Dresden and Quad Cities states that "various instruments will require scaling/setpoint changes."*
   A) List the instruments which will require scaling changes;
   B) Confirm that all the instruments which require setpoint changes are included in the submittal;
   C) List the instruments which will be replaced to accommodate the extended power uprate.

Response:

The attached tables define the instruments that require scaling changes (i.e., Tables 3 and 4), additional setpoint changes that were not discussed in the license amendment request (i.e., Tables 5 and 6), and instruments being replaced in conjunction with Extended Power Uprate (i.e., Tables 7 and 8). Abbreviations for the tables are contained in Table 9 of this attachment.

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

TABLE 3: DNPS SCALING CHANGES REQUIRED FOR EXTENDED POWER UPRATE

Device / Parameter	Current	Uprate
Main Steam Line Flow Transmitters & Control Room Indicators	0 – 3 Mlb/hr	0 – 3.5 Mlb/hr
Main Steam Total Flow Control Room Recorders & Computer Points (Note 1)	0 – 12 Mlb/hr	0 – 14 Mlb/hr
Feedwater Pump Flow Transmitters, Control Room Indicators, & Computer Points	0 – 6 Mlb/hr	0 – 7 Mlb/hr
Feedwater Total Flow Control Room Recorders & Computer Points (Note 1)	0 – 12 Mlb/hr	0 – 14 Mlb/hr
Turbine First Stage Shell Pressure (preliminary)	0 – 1080 psig	0 – 1010 psig
Turbine Steam Flow Control Room Recorder	0 – 12 Mlb/hr	0 – 14 Mlb/hr
Turbine Intermediate Pressure - Power Load Unbalance	0 – 236.8 psia	0 – 288 psia
Other Turbine related changes, e.g., Generator Rated Current for Power Load Unbalance and Turbine Differential Expansion Detector (Note 2)	In accordance with turbine manufacturer's recommendation	

Note 1: Feedwater Control System loop logic being revised for 14 Mlb/hr span as required.
Note 2: Turbine manufacturer's recommendations have not been finalized.

TABLE 4: QCNPS SCALING CHANGES REQUIRED FOR EXTENDED POWER UPRATE

Device / Parameter	Current	Uprate
Main Steam Line Flow Transmitters & Control Room Indicators	0 – 3 Mlb/hr	0 – 3.5 Mlb/hr
Main Steam Total Flow Control Room Recorders & Computer Points (Note 1)	0 – 12 Mlb/hr	0 – 14 Mlb/hr
Feedwater Pump Flow Transmitters, Control Room Indicators, & Computer Points	0 – 6 Mlb/hr	0 – 7 Mlb/hr
Feedwater Total Flow Control Room Recorders & Computer Points (Note 1)	0 – 12 Mlb/hr	0 – 14 Mlb/hr
Turbine First Stage Shell Pressure (preliminary)	0 – 1110 psig	0 – 1010 psig
Turbine Steam Flow Control Room Recorder	0 – 12 Mlb/hr	0 – 14 Mlb/hr
Power Load Unbalance – Turbine Intermediate Pressure	0 – 236.8 psia	0 – 288 psia
Other Turbine related changes, e.g., Generator Rated Current for Power Load Unbalance and Turbine Differential Expansion Detector (Note 2)	In accordance with turbine manufacturer's recommendation	

Note 1: Feedwater Control System loop logic being re-calibrated for 14 Mlb/hr span as required.
Note 2: Turbine manufacturer's recommendations have not been finalized.

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

TABLE 5: ADDITIONAL DNPS SETPOINT CHANGES FOR EXTENDED POWER UPRATE

Parameter	Current Nominal Setpoint	Uprate Nominal Setpoint
APRM Flow Biased Rod Block – Clamp	None	108 % RTP
Off Gas Condenser Outlet Hi Temp Alarm	150 °F	165 °F
Condenser Low Vacuum Alarms ("Hg vacuum)	24.5 / 24.5	24 / 23.5
Isolation Condenser Initiation Time Delay (Note 1)	15 seconds	13 seconds
LPCI Swing Bus Time Delay	20 seconds	17 seconds
Stator Water Cooling Low Flow / Pressure Alarm	472 gpm	526 gpm
Stator Water Cooling Low Flow / Pressure Runback	448 gpm	496 gpm
Stator Between Bar High Temperature Alarm	78 °C	83 °C
Reactor Recirculation MG Set High / High-High Temp Alarms	210 °F / 230 °F	215 °F / 230 °F
Turbine Differential Expansion Alarm	Manufacturer's	recommendation

Note 1: Isolation Condenser Initiation Time Delay change discussed in PUSAR Section 3.8. Value provided is the nominal time delay setpoint.

TABLE 6: ADDITIONAL QCNPS CITIES SETPOINT CHANGES FOR EXTENDED POWER UPRATE

Parameter	Current Nominal Setpoint	Uprate Nominal Setpoint
APRM Flow Biased Rod Block – Clamp	None	108 % RTP
Off Gas Condenser Outlet High Temperature Alarms	140 °F	165 °F
Condenser Low Vacuum Alarms ("Hg vacuum)	24 / 24.5	24.5 / 24.5
LPCI Swing Bus Time Delay	20 seconds	17 seconds
Stator Water Cooling Low Flow / Pressure Alarm	472 gpm	526 gpm
Stator Water Cooling Low Flow / Pressure Runback	448 gpm	496 gpm
Stator Between Bar High Temperature Alarm	78 °C	83 °C
Reactor Recirculation MG Set High / High - High Temp Alarm	210 °F / 221 °F	215 °F / 230 °F
Turbine Over-Speed Trip – Mechanical (Note 1)	110 %	110.8 %
Turbine Backup Electrical Over-Speed Trip (Note 1)	110.5 %	111.5 %
Turbine Differential Expansion Alarm	Manufacturer's	recommendation

Note 1: Revised setpoints are consistent with Turbine manufacturer's recommendations and current Dresden over-speed setpoints.

TABLE 7: DNPS INSTRUMENTS BEING REPLACED FOR EXTENDED POWER UPRATE

Device / Parameter	Uprate Change
Main Steam Line High Flow Differential Pressure Indicating Switches	Uprate setpoint exceeds current span – 200 psid switches being replaced with 400 psid switches
APRM Flow Control Trip Reference Card	Clamp function added for APRM Flow Biased Rod Block
Off Gas Condenser Outlet Gas Temperature Switches	Uprate setpoint exceeds current span – 150 °F switch being replaced with 250 °F switch
Isolation Condenser Time Delay Relay	Replacement of obsolete time delay relay in conjunction with uprate setpoint change

TABLE 8: QCNPS INSTRUMENTS BEING REPLACED FOR EXTENDED POWER UPRATE

Device / Parameter	Uprate Change
Main Steam Line High Flow Differential Pressure Switches	Uprate setpoint exceeds current span – 200 psid switches being replaced with 400 psid switches
APRM Flow Control Trip Reference Card	Clamp function added for APRM Flow Biased Rod Block
Off Gas Condenser Outlet Gas Temperature Switches	Uprate setpoint exceeds current span – 150 °F switch being replaced with 250 °F switch

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

Table 9: Abbreviations for Tables 1-8

APRM	Average Power Range Monitor
ATWS RPT	Anticipated Transient Without Scram Recirculation Pump Trip
FW	Feed Water
HPCI	High Pressure Coolant Injection
IC	Isolation Condenser
LPCI	Low Pressure Coolant Injection
MG	Motor Generator
MWt	Megawatts Thermal
Mlb	Million pounds
RCIC	Reactor Core Isolation Cooling
RTP	Rated Thermal Power
RV	Relief Valve
RWL	Reactor Water Level
SLO	Single Loop Operation
SRV	Safety/Relief Valve
SSV	Spring Safety Valve
STM	Steam
TCV	Turbine Control Valve
TLO	Two Loop Operation
TSV	Turbine Stop Valve
W_d	Percent of rated reactor recirculation drive flow