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AmerGen SM

An Exelon/British Energy Company

RS-01-297

December 13, 2001

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

Clinton Power Station, Unit 1
Facility Operating License No. NPF-62
NRC Docket No. 50-461

Subject: Additional Reactor Pressure Vessel Fluence Information Supporting the License Amendment Request to Permit Uprated Power Operation at Clinton Power Station

References: (1) Letter from J. M. Heffley (AmerGen Energy Company, LLC) to U.S. NRC, "Request for License Amendment for Extended Power Uprate Operation," dated June 18, 2001

(2) Letter from J. B. Hopkins (U.S. NRC) to O. D. Kingsley (Exelon Generation Company, LLC), "Clinton Power Station, Unit 1 – Request For Additional Information (TAC No. MB2210)," dated October 3, 2001

(3) Letter from K. A. Ainger (Exelon Generation Company, LLC) to U.S. NRC, "Additional Information Supporting the License Amendment Request to Permit Uprated Power Operation at Clinton Power Station," dated October 17, 2001

In Reference 1, AmerGen Energy Company (AmerGen), LLC submitted a request for changes to the Facility Operating License No. NPF-62 and Appendix A to the Facility Operating License, Technical Specifications (TS), for Clinton Power Station (CPS) to allow operation at an uprated power level. The proposed changes in Reference 1 would allow CPS to operate at a power level of 3473 megawatts thermal (MWt). This represents an increase of approximately 20 percent rated core thermal power over the current 100 percent power level of 2894 MWt. The NRC in Reference 2 requested additional information regarding the proposed changes in Reference 1. The requested information included questions concerning reactor pressure vessel fluence. AmerGen responded to this request in Reference 3. In a November 13, 2001 telephone conference call between representatives of the NRC and AmerGen, the NRC requested additional information concerning our Reference 3 response. The attachment to this letter provides the information requested by the NRC.

A001

Should you have any questions related to this information, please contact Mr. Timothy A. Byam at (630) 657-2804.

Respectfully,

Kirk R. Jury

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

Attachments:

Affidavit
Attachment: Additional Reactor Pressure Vessel Fluence Information Supporting the License Amendment Request to Permit Uprated Power Operation at Clinton Power Station

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

STATE OF ILLINOIS	)	
COUNTY OF DUPAGE	)	
IN THE MATTER OF	)	
AMERGEN ENERGY COMPANY, LLC	)	**Docket Number**
CLINTON POWER STATION, UNIT 1	)	**50-461**

SUBJECT: Additional Reactor Pressure Vessel Fluence Information Supporting the License Amendment Request to Permit Uprated Power Operation at Clinton Power Station

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 13 day of December, 2001.

Anese L. Grigsby
Notary Public

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

ATTACHMENT

Additional Reactor Pressure Vessel Fluence Information Supporting the License Amendment Request to Permit Uprated Power Operation at Clinton Power Station

Question
In Reference 1, the response to question 1.1 states that the extended power uprate flux is calculated using the neutron transport calculation methodology approved by the NRC on September 14, 2001. Since the calculations for extended power uprate (EPU) were performed prior to the actual approval of the fluence methodology, provide clarification describing what is meant by the term "using the approved methodology."

Response
General Electric (GE) provided the methodology for reactor vessel fast neutron flux evaluations in Reference 2. The NRC subsequently approved this methodology in Reference 3. The approved methodology is based on synthesizing two, two-dimensional discrete ordinate calculations to produce a three-dimensional flux distribution at various locations. The methodology was benchmarked per Regulatory Guide 1.190, "Calculational and Dosimetry Methods for Determining Pressure Vessel Neutron Fluence," and bias and uncertainty estimates were calculated.

In Reference 1, when it was stated that the approved methodology was used to obtain the CPS EPU flux, this was a reference to the GE flux synthesis methodology (i.e., Reference 2) not including the bias term. Since the bias was not approved prior to issuance of the CPS Power Uprate Safety Analysis Report (PUSAR), no bias term was applied to the flux calculated for CPS EPU. With the bias term included, the Current Licensed Thermal Power (CLTP) flux remains bounding.

Question
Provide the pre-EPU and post-EPU peak reactor pressure vessel fluence and the location associated with these peak values.

Response

The pre-EPU peak vessel fluence is as follows.

Peak vessel inside diameter (ID) fluence:	8.7E18 n/cm^2 at 32 effective full power years (EFPY)

The post-EPU peak vessel fluence is as follows.

Peak vessel ID fluence:	7.5E18 n/cm^2 at 38 EFPY

The following table provides the location of the peak flux for both pre-EPU and post-EPU fluence calculations.

ATTACHMENT

Additional Reactor Pressure Vessel Fluence Information Supporting the License Amendment Request to Permit Uprated Power Operation at Clinton Power Station

Table 1
Location of Peak Flux

Peak Flux Location	Unit	Pre-EPU Value (Note 1)	Post-EPU Value
Azimuthal Location (Note 2)	degree	60, 30	65.25, 24.75
Axial location from bottom of active fuel	inches	45	75.90

Notes:
(1) Jet-pump shadowing effects are excluded
(2) Two numbers are provided because of the 45° mirror symmetry

ATTACHMENT

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REFERENCES

1. Letter from K. A. Ainger (Exelon Generation Company, LLC) to U. S. NRC, "Additional Information Supporting the License Amendment Request to Permit Uprated Power Operation at Clinton Power Station," dated October 17, 2001
2. Licensing Topical Report, "GE Methodology to RPV Fast Neutron Flux Evaluations," NEDC-32983P, Class III (GE Proprietary Information), dated August 2000
3. Letter from S. A. Richards (U.S. NRC) to J. F. Klapproth (GE Nuclear Energy), "Safety Evaluation for NEDC-32983P, General Electric Methodology for Reactor Pressure Vessel Fast Neutron Flux Evaluation (TAC No. MA9891)," dated September 14, 2001