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June 26, 2012

U. S. Nuclear Regulatory Commission
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Braidwood Station, Units 1 and 2
Facility Operating License Nos. NPF-72 and NPF-77
NRC Docket Nos. STN 50-456 and STN 50-457

Byron Station, Units 1 and 2
Facility Operating License Nos. NPF-37 and NPF-66
NRC Docket Nos. STN 50-454 and STN 50-455

Subject: Additional Information Supporting Request for License Amendment Regarding Measurement Uncertainty Recapture Power Uprate

- References:
1. Letter from Craig Lambert (Exelon Generation Company, LLC) to U. S. NRC, "Request for License Amendment Regarding Measurement Uncertainty Recapture (MUR) Power Uprate," dated June 23, 2011 [ML11 1790030]
 2. Letter from J. Wiebe (U. S. NRC) to M. J. Pacilio (Exelon Generation Company, LLC), "Byron Station, Unit Nos. 1 and 2, and Braidwood Station, Units 1 and 2 – Request for Additional Information Related to Measurement Uncertainty Recapture Uprate (TAC Nos. ME6587, ME6588, ME6589, and ME6590)," dated June 13, 2012 [ML12157A063]
 3. Letter from Kevin F. Borton (Exelon Generation Company, LLC) to U. S. NRC, "Additional Information Supporting Request for License Amendment Regarding Measurement Uncertainty Recapture Power Uprate," dated May 16, 2012 [ML12138A091]
 4. Letter from Kevin F. Borton (Exelon Generation Company, LLC) to U. S. NRC, "Additional Information Supporting Request for License Amendment Regarding Measurement Uncertainty Recapture Power Uprate," dated March 30, 2012

In Reference 1, Exelon Generation Company, LLC (EGC) requested an amendment to Facility Operating License Nos. NPF-72, NPF-77, NPF-37 and NPF-66 for Braidwood Station, Units 1 and 2, and Byron Station, Units 1 and 2, respectively. Specifically, the proposed changes revise the Operating License and Technical Specifications to implement an increase in rated thermal power of approximately 1.63% based on increased feedwater flow measurement accuracy.

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The requested information in Reference 2 regarding the Spent Fuel Pool (SFP) rebar stresses is provided in Attachment 1 to this letter. The requested information provides additional detail to information previously provided by EGC to the NRC in References 3 and 4. As noted in Reference 2, this information was discussed with the NRC during a conference call on May 23, 2012.

EGC has reviewed the information supporting a finding of no significant hazards consideration and the environmental consideration provided to the NRC in Reference 1. The additional information provided in this submittal does not affect the previously stated bases for concluding that the proposed license amendment does not involve a significant hazards consideration in Reference 1. In addition, the information provided in this submittal does not affect the bases for concluding that neither an environmental impact statement nor an environmental assessment needs to be prepared in connection with the proposed amendment.

There are no regulatory commitments contained in this letter.

Should you have any questions concerning this letter, please contact Leslie E. Holden at (630) 657-3316.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 26th day of June 2012.

Respectfully,



Kevin F. Borton
Manager, Licensing - Power Upgrade

Attachment 1 Response to Request for Additional Information, NRC Letter dated June 13, 2012, (Non-Proprietary) [ML12157A063]

ATTACHMENT 1

**RESPONSE TO REQUEST FOR
ADDITIONAL INFORMATION
NRC Letter dated June 13, 2012
[ML12157A063]**

(NON-PROPRIETARY)

NRC Request 1

Exelon's letter, dated May 16, 2012, in response to the NRC's letter dated May 10, 2012, references the NRC safety evaluation (SE) for stretch power uprate, dated May 4, 2001. In this NRC SE for stretch power uprate, it is stated that the licensee performed an analysis of the spent fuel pool (SFP) structure that confirmed the maximum rebar stress of 53.7 ksi for the maximum bulk pool temperature of 162.7°F to be within the allowable limit of 54 ksi.

Exelon's letter, dated May 16, 2012, states that a detailed evaluation of the SFP structure for a bounding temperature of 167°F resulted in a maximum rebar stress of 30.3 ksi.

During a May 23, 2012, conference call to clarify why the rebar stress is now significantly less than that provided in 2001, Exelon provided information not included in previous submittals to explain the reason for the reduction in stress.

- (1) Submit the explanation for the significant reduction in rebar stress from 53.7 ksi to 30.3 ksi. The response, as a minimum, should include the description of the methodology and parameters used in the MUR evaluation that are different from those used in the evaluation performed for the stretch power uprate and an explanation how these differences affect the rebar stress calculation;*
- (2) Confirm that the detailed evaluation for the MUR condition is consistent with the plant licensing basis, including Section 3.8.4 of the Byron and Braidwood updated final safety analysis report.*

Response

- (1) The Measurement Uncertainty Recapture (MUR) power uprate evaluation of the effects of spent fuel pool (SFP) peak temperature on rebar stresses used the same methodology and governing load combinations as the previous evaluations, but eliminated an unnecessary conservatism in applying the thermal moment due to axial temperature increase. In previous evaluations, including the stretch power uprate (References A1-1 and 2), the TEMCO computer program was used to consider the effect of the redistribution of thermal stresses on the thermal moments due to temperature gradient effects that resulted from section cracking*. The thermal moment induced by the axial temperature increase was conservatively treated as a mechanical moment. This was an unnecessary conservative assumption since thermal moments are not mechanical loads and the resulting stresses would be reduced/relieved due to allowed modeling of concrete cracking. For the MUR power uprate evaluation, the thermal moment due to axial temperature increase was converted to an equivalent thermal gradient and applied to the TEMCO program. Removing this unnecessary conservatism resulted in the reduction in the rebar stresses postulated in the TEMCO program.
- (2) The MUR power uprate evaluation for the SFP is consistent with the plant licensing basis requirements described in the applicable portions of UFSAR Section 3.8.4, specifically, the use of the design basis loading combinations and the use of the

* Redistribution of thermal stresses as a result of section cracking is consistent with ACI 349 Appendix A, "Thermal Considerations."

TEMCO computer program for evaluating the stress in the SFP reinforced concrete structure as described in Section 3.8.4.4.

REFERENCES:

- A1-1 Letter from R. M. Krich (Exelon Generation Company, LLC) to U. S. NRC, "Response to Request for Additional Information Regarding the License Amendment Request to Permit Upgraded Power Operations at Byron and Braidwood Stations," Letter RS-00-158, dated December 21, 2000 [ML003780801].
- A1-2 Letter from U. S. NRC to Mr. O. D. Kingsley (Exelon Generation Company, LLC), "Issuance of Amendments; Increase in Reactor Power, Byron Station, Units 1 and 2, and Braidwood Station, Units 1 and 2 (TAC Nos. MA9428, MA 9429, MA9426, and MA9427)," May 4, 2001 [ML011420274].