



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

March 11, 2010

Mr. Charles G. Pardee  
President and Chief Nuclear Officer  
Exelon Nuclear  
4300 Winfield Road  
Warrenville, IL 60555

SUBJECT: BRAIDWOOD STATION, UNITS 1 AND 2, AND BYRON STATION, UNIT NOS. 1 AND 2 - REQUEST FOR ADDITIONAL INFORMATION RELATED TO LARGE BREAK LOSS-OF-COOLANT ACCIDENT ANALYSIS USING ASTRUM (TAC NOS. ME2941, ME2942, ME2943, AND ME2944)

Dear Mr. Pardee:

By letter to the Nuclear Regulatory Commission (NRC) dated December 16, 2009, (Agencywide Documents Access and Management System Accession No. ML093510099), Exelon Generation Company, LLC (the licensee), submitted a license amendment request to revise Technical Specifications Section 5.6.5, "Core Operating Limits Report (COLR)," to replace the existing reference for the large break loss-of-coolant accident (LOCA) analysis methodology with a reference to WCAP-16009-P-A, "Realistic Large Break LOCA Evaluation Methodology Using Automated Statistical Treatment of Uncertainty Method (ASTRUM)."

The NRC staff is reviewing your submittal, and has determined that additional information is required to complete its review. The specific information requested is addressed in the enclosed Request for Additional Information. Your staff has agreed to respond within 45 days after the date of this letter.

The NRC staff considers that timely responses to requests for additional information help ensure sufficient time is available for staff review and contribute toward the NRC's goal of efficient and effective use of staff resources. If circumstances result in the need to revise the requested response date, please contact me at (301) 415-1547.

Sincerely,

A handwritten signature in black ink, appearing to read "Marshall J. David".

Marshall J. David, Senior Project Manager  
Plant Licensing Branch III-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. STN-456, STN-457,  
STN 50-454, and STN 50-455

Enclosure:  
Request for Additional Information

cc w/encl: Distribution via Listserv

REQUEST FOR ADDITIONAL INFORMATION

BRAIDWOOD STATION, UNITS 1 AND 2

AND BYRON STATION, UNIT NOS. 1 AND 2

DOCKET NOS. STN 50-456, STN 50-457

STN 50-454, AND STN 50-455

By letter to the Nuclear Regulatory Commission (NRC) dated December 16, 2009, (Agencywide Documents Access and Management System Accession No. ML093510099), Exelon Generation Company, LLC (the licensee), submitted a license amendment request to revise Technical Specification (TS) Section 5.6.5, "Core Operating Limits Report (COLR)," to replace the existing reference for the large break loss-of-coolant accident (LOCA) analysis methodology with a reference to WCAP-16009-P-A, "Realistic Large Break LOCA Evaluation Methodology Using Automated Statistical Treatment of Uncertainty Method (ASTRUM)." The NRC staff has determined that following additional information is required to complete its review.

1. The following information concerning safety injection accumulators is abridged from NURGEG-1431, Volume 2, "Standard Technical Specifications for Westinghouse Plants," *Bases*:

The Limiting Condition for Operation (LCO) concerning the operability of the accumulators provides assurance that the [Title 10 of the *Code of Federal Regulations* (10 CFR)] 50.46 acceptance criteria are met. The large and small break loss-of-coolant accident (LOCA) analyses are performed at the minimum nitrogen cover pressure, since sensitivity analyses have demonstrated that higher nitrogen cover pressure results in a computed peak clad temperature benefit. The accumulators satisfy criterion 3 of 10 CFR 50.36(c)(2)(ii). For an accumulator to be considered operable, the limits established in the Surveillance Requirements (SRs) for contained volume, boron concentration, and nitrogen cover pressure must be met.

Although it is clear that the above passage was written with respect to a conservative, bounding LOCA methodology, the net effect of increased cover pressure applies to the statistical approach as well. The overall effect could be a widening of the statistical base of LOCA results, and could potentially result in a lower peak clad temperature (PCT) prediction at the 95/95 upper tolerance limit.

Pursuant to 10 CFR 50.36(c)(2)(ii)(B), an LCO is required for a process variable, design feature, or operating restriction that is an initial condition of a design basis accident or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

Enclosure

The range of accumulator nitrogen cover pressure is constrained by SR 3.5.1.3. SR 3.5.1.3 proscribes a peak pressure that is lower than the analyzed range accompanying the subject license amendment request to implement the ASTRUM methodology. Explain how this proposed, increased analytic range remains in compliance with 10 CFR 50.36(c)(2)(ii)(B), since the analyzed range of accumulator pressure falls outside the pressure range specified for TS operability.

2. Provide information analogous to that requested in Item 1, above, for the assumed safety injection temperature range, with respect to SR 3.5.4.1, concerning the refueling water storage tank temperature.
3. The HOTSPOT PCT elevation for Byron/Braidwood Unit 1, shown in Figure 17-1 of the license amendment request, appears to jump to a height that is above the top of active fuel. Please provide additional discussion clarifying the result depicted in this figure. In this discussion, please explain how the HOTSPOT PCT elevation is determined, the context of the HOTSPOT PCT elevation, and why a PCT elevation that is 12' high in the fuel assembly is an expected result.

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Sincerely,

/RA/

Marshall J. David, Senior Project Manager  
Plant Licensing Branch III-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

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**ADAMS Accession No.:** ML100690463

\* RAI E-Mail Date

NRR-088

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