



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

February 19, 2010

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

SUBJECT: BYRON STATION, UNIT NOS. 1 AND 2 - REQUEST FOR ADDITIONAL  
INFORMATION RELATED TO ONE-TIME EXTENSION OF ESSENTIAL  
SERVICE WATER TRAIN COMPLETION TIME (TAC NOS. ME2293 AND  
ME2294)

Dear Mr. Pardee:

By letter to the Nuclear Regulatory Commission (NRC) dated September 24, 2009 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML092680090), as supplemented by letters dated November 13, 2009 (ADAMS Accession No. ML093200065), and January 19, 2010 (ADAMS Accession No. ML100200075), Exelon Generation Company, LLC (the licensee), submitted a license amendment request proposing a one-time extension of the Completion Time to restore a unit-specific essential service water train to operable status for Technical Specification Limiting Condition for Operation 3.7.8, "Essential Service Water (SX) System," from 72 hours to 144 hours.

The NRC staff is reviewing your submittals, 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 (RAI). The RAI was discussed with your staff on February 19, 2010, and they agreed to respond by March 1, 2010.

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 50-454 and STN 50-455

Enclosure:  
Request for Additional Information

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REQUEST FOR ADDITIONAL INFORMATION

BYRON STATION, UNIT NOS. 1 AND 2

DOCKET NOS. STN 50-454 AND STN 50-455

The Nuclear Regulatory Commission (NRC) staff is reviewing Exelon Generation Company, LLC's (the licensee's) license amendment request (LAR) dated September 24, 2009 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML092680090), as supplemented by letters dated November 13, 2009 (ADAMS Accession No. ML093200065), and January 19, 2010 (ADAMS Accession No. ML100200075). The LAR requests a one-time extension of the Completion Time (CT) to restore a unit-specific essential service water train to operable status for Technical Specification (TS) Limiting Condition for Operation 3.7.8, "Essential Service Water (SX) System," from 72 hours to 144 hours. The NRC staff has determined that the following additional information is required to complete its review.

Question 1.

Background:

Section 2.3.2.1 of Attachment 5, "Risk Informed Evaluation," of the September 24, 2009, LAR states that risk significant plant equipment outage configurations were evaluated. This resulted in a list of protected equipment that will not be allowed to be unavailable for maintenance during the extended CT.

Regulatory Guide (RG) 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications," August 1998, describes a four element approach to integrated decisionmaking for TS changes. One of the engineering considerations in the four element approach is defense in depth. As discussed in Section 2.2.1 of the RG, one aspect of maintaining defense in depth is:

- System redundancy, independence, and diversity are maintained commensurate with the expected frequency and consequences of challenges to the system, e.g., there are no risk outliers. The following items should be considered.
  - Whether there are appropriate restrictions in place to preclude simultaneous equipment outages that would erode the principles of redundancy and diversity,
  - Whether compensatory actions to be taken when entering the modified AOT [allowed outage time] for preplanned maintenance are identified, ...

Issue:

During the extended CT, the 1B SX pump is the only operating SX pump for the operating unit (Unit 1). The NRC staff acknowledges that the 1A and 1B SX trains are cross-connected through 1SX033 and 1SX034. Although the 1A and 1B SX trains are cross-connected, the NRC staff is not certain of the licensee's position as to whether the components cooled in the 1A SX train are OPERABLE for satisfying TSs.

ENCLOSURE

- a. If the licensee evaluates that the components cooled by the 1A SX train are OPERABLE for purposes of satisfying TSs when the SX supply is from the 1B SX pump, then explain the justification for designating those components OPERABLE.
- b. If the components cooled by the 1A SX train are not OPERABLE for purposes of satisfying TSs, then explain why the components cooled by the 1B SX train are not on the protected equipment list (Table 14 in Attachment 5 of the LAR) during the extended CT in accordance with the guidance in RG 1.177 as explained in the Background, above. As a minimum, the components to consider are the 1B and 1D reactor containment fan cooler (RCFC) coils, 1B containment chiller, 1B charging pump, 1B safety injection pump, 1B containment spray pump, and 1B residual heat removal pump (either because of their oil cooler and/or cubicle cooler), the 1B control room and 1B containment refrigeration units. The NRC staff notes that if some components in the 1A train are not OPERABLE, then any action or event that makes the redundant component from the 1B train not OPERABLE could cause Unit 1 to enter Limiting Condition for Operation 3.0.3.

Question 2.

Issue:

The licensee's response in Section 2.1.8 of the January 19, 2010, supplement states, "The initial premise of the statement in question 8 assumes that a loss of the remaining SX pump on the operating unit leads to a loss of SX for that unit."

NRC staff response: The premise of question 8 does not assume that a loss of the remaining SX pump on the operating unit leads to a loss of SX for that unit. The question clearly refers to a loss of SX flow to all RCFCs in the operating unit not to a loss of all SX. The premise of the question assumes that the unit cross connects are open because the licensee has stated that a best estimate flow analysis shows that one SX pump can provide cooling to both units with the exception of the RCFCs and emergency diesel generators on the unit without an SX pump and one train of RCFCs on the unit with an available SX pump.

The supplement also stated, "Containment spray for Byron provides pressure reduction but does not provide a containment heat removal function." The supplement further states, "The only available means of removing heat from containment post LOCA are the RCFCs and the Residual Heat Removal System."

NRC staff response: The updated final safety analysis report (UFSAR) states the following:

6.2.2 Containment Heat Removal System

The containment heat removal system consists of the reactor containment fan cooler system and the containment spray system.

The UFSAR states the following on page 6.2-10:

Another containment heat removal system is the containment spray. During the injection phase of operation, the containment spray pumps draw water from the refueling water

storage tank and spray it into the containment through nozzles mounted high above the operating deck. As the spray droplets fall, they absorb heat from the containment atmosphere. Since the water comes from the refueling water storage tank, the entire heat capacity of the spray from the refueling water storage tank temperature to the temperature of the containment atmosphere is available for energy absorption.

The licensee is requested to revise their response considering that containment spray does remove some heat from the containment atmosphere.

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Sincerely,  
**/RA by P. Tam for/**  
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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NRR-088

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