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RS-01-032

February 28, 2001

United States Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D.C. 20555-0001

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 the License Amendment Request to Permit  
Up-rated Power Operations at Byron and Braidwood Stations

In Reference 1, we submitted proposed changes to Facility Operating License Nos. NPF-72, NPF-77, NPF-37 and NPF-66, and Appendix A, Technical Specifications (TS), for Braidwood Station, Units 1 and 2, and Byron Station, Units 1 and 2, respectively. The proposed changes would revise the maximum power level specified in each unit's license and the TS definition of rated thermal power. The NRC subsequently requested that additional information be provided regarding various technical issues related to these proposed changes as documented in References 2, 4, and 6. We responded to these requests for additional information in References 3, 5, and 7.

Clarifying Information for Question H.1.b – Spent Fuel Pool (SFP) Cooling Train Availability

On February 14, 2001, a telephone conference call was held between members of the NRC and the Exelon Generation Company (EGC), LLC, organizations to further clarify our initial response to Reference 5 Question H.1.b, "Prior to core offload, how many trains of the SFP cooling system are available and operable." The information below states the Byron Station and Braidwood Station policy on SFP cooling system availability.

The Byron Station and Braidwood Station policy is to have both trains of SFP cooling available to perform their intended function prior to core offload. This policy is founded on shutdown risk considerations and addressed in Outage Management Procedure OU-AA-103, "Shutdown Safety Management Program." Procedure OU-AA-103 identifies SFP cooling as a "Key Safety Function." Step 4.2.1 of this procedure states that "Every attempt should be made to build outage schedules with Key Safety Functions and Overall Unit Safety Levels of GREEN and/or YELLOW throughout the outage period...." A safety level of green is defined as follows:

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"Based on the combination of available pathways and activity types, a failure or error could be easily mitigated without presenting a significant challenge in the Key Safety Function." A safety level of yellow is defined as follows: "Based on the combination of available pathways and activity types, a failure or error can still be mitigated but would present a challenge in the Key Safety Function."

Two trains of SFP cooling must be available to have a safety level of green prior to core offload. Procedure OU-AA-103 also defines the term "available" as follows: "A system, structure, or component along with its necessary auxiliary systems, controls, instrumentation, and power supplies is capable of performing its intended function and can be placed in service by manual or automatic means."

As noted in Section 3.3 of procedure OU-AA-103, a "Shutdown Safety Review Board" reviews and approves the outage schedule and considers "major work activities and their relationship to each other so that key systems and components are available to ensure adequate Defense-in-Depth," where Defense-in-Depth is defined as "the concept of providing systems, structures, and components to ensure backup of Key Safety Functions using redundant, alternate, or diverse methods."

In addition, Outage Management Procedure OU-AP-104, "Shutdown Safety Management Program Byron/Braidwood," provides specific guidance for the deterministic status assessments for each Key Safety Function. Procedure OU-AP-104, Attachment 4, "Spent Fuel Pool Cooling – (FPC)" Configuration Guideline #3 states, "PERFORM work that could impact FC [spent fuel pool cooling] reliability during non-outage periods." Should an emergent problem arise, Configuration Guideline #4 states, "Place an outage high priority on emergent work affecting FC during the outage." There is one exception to Guideline #3. The SFP pumps are powered from a non-safety electrical bus; the "A" SFP pump from Unit 1 Bus 144; and the "B" SFP pump from Unit 2 Bus 244. During every second or every third refueling outage on a given unit, these buses are de-energized for inspection. This "bus outage" time may occur during core offload periods. If this should occur, temporary power is provided to the affected SFP pump in accordance with procedural requirements, or contingency plans are put in place to expeditiously restore power to the de-energized SFP pump should the need arise.

Procedure OU-AP-104 "Availability Guidelines" further state that to be considered "available," the SFP cooling train that is not operating must be capable of being properly aligned and put into operation within two hours.

In summary, Byron Station and Braidwood Station will not plan SFP cooling system maintenance during an outage period, except for periodic bus outages for inspection as noted above, and plan to have both SFP cooling system trains available prior to core offload.

Clarifying Information for Question E.2 – Operator Response Time to Feedwater Line Break

On February 15, 2001, a telephone conference call was held between members of the NRC and the EGC, LLC, organizations to discuss additional information regarding our responses to Question E.2 in References 3 and 7 regarding our justification for reducing the operator response time from 30 minutes to 20 minutes for isolating auxiliary feedwater (AFW) to the faulted steam generator (SG) during a feedwater line break (FLB) accident. The discussion below provides a brief chronology of the issue and provides the additional information.

The Westinghouse Electric Company provides guidance for the isolation of AFW to a faulted SG during a main steamline break (MSLB) accident outside of containment in Safety Analysis Standard 12.5, "Mass and Energy Releases Following a Steamline Rupture, Superheated Blowdowns Outside Containment." This standard gives "typical" values of 10 or 30 minutes for isolation of AFW to the faulted SG. In the 1997 timeframe, the MSLB outside containment accident analysis, performed to support the SG replacement project, prompted a reduction in the time for the operator to isolate AFW to the faulted SG from 30 minutes to 20 minutes. This change was due to environmental qualification issues with the SG pressure transmitters located in the steam tunnel area of the plant. The faulted SG isolation time requirement was documented in the Updated Final Safety Analysis Report (UFSAR), Section 3.11.10, "High Energy Line Break (HELB)." Isolation of a faulted SG is addressed in Byron (Braidwood) Emergency Operating Procedure, 1(2)B(Bw)EP-2, "Faulted Steam Generator Isolation Unit 1(2)," referred to as EP-2.

Westinghouse Electric Company Safety Analysis Standard 16, "Feedline Rupture," does not provide guidance for operator response time to isolate AFW to the faulted SG during a FLB accident; however, licensee specific concurrence is obtained for the assumed operator response time and subsequently used in the FLB accident analysis. The existing analysis for Byron Station and Braidwood Station assumed it would take the operator 30 minutes to isolate AFW to the faulted SG. The FLB accident analysis performed in support of power uprate identified a need to reduce the time for the operator to isolate AFW to the faulted SG in order to meet the acceptance criteria of no boiling in the Reactor Coolant System (RCS) hot leg. The 30 minute isolation time was reduced to 20 minutes which satisfied the accident acceptance criteria and was also consistent with the isolation time for the MSLB accident noted above. The new faulted SG isolation time requirement will be documented in UFSAR Section 15.2.8, "Feedwater System Pipe Break," upon approval of the power uprate license amendment request.

The operators' ability to complete faulted SG isolation for the MSLB accident has been previously verified and documented. Personnel from 13 different operating crews were evaluated on the training simulator. All crews completed isolation of AFW to the faulted SG during a MSLB accident using procedure EP-2 in less than 20 minutes. The average crew time to isolate the faulted SG was approximately 7.4 minutes, while the maximum time was 17 minutes. Since procedure EP-2 is also used for SG isolation during the FLB accident, using the identical procedure steps, the validation times for faulted SG isolation obtained for the MSLB accident are directly applicable to the FLB accident; therefore, there was no need to perform a redundant operator response time validation exercise.

Clarifying Information for Question E.5 – Simulator Testing Standard

During the above noted February 15, 2001, telephone conference call, clarification was requested regarding our response to Question E.5 in References 3 and 7 addressing the standard for performing modifications to the training simulator. Simulator modifications at both Byron Station and Braidwood Station have been and will be made in accordance with the 1985 revision of American Nuclear Society/American National Standards Institute (ANS/ANSI) 3.5, "Nuclear Power Plant Simulators for Use in Operator Training," Section 5.3, "Simulator Modifications" and Section 5.4, "Simulator Testing." Training procedure TQ-AA-302, "Simulator Certification Testing and Reporting," defines the training simulator testing program requirements and references ANS/ANSI 3.5 – 1985.

References

1. Letter from R. M. Krich (Commonwealth Edison Company) to U.S.NRC, "Request for a License Amendment to Permit Up-rated Power Operations at Byron and Braidwood Stations," dated July 5, 2000
2. Letter from G. F. Dick (U.S. NRC) to O. D. Kingsley (Commonwealth Edison Company), "Byron and Braidwood - Request for Additional Information Regarding the Power Up-rate Request," dated October 19, 2000
3. Letter from R. M. Krich (Commonwealth Edison Company) to U.S. NRC, "Response to Request for Additional Information Regarding the License Amendment Request to Permit Up-rated Power Operations at Byron and Braidwood Stations," dated November 27, 2000
4. Letter from G. F. Dick (U.S. NRC) to O. D. Kingsley (Commonwealth Edison Company), "Byron and Braidwood - Request for Additional Information Regarding the Power Up-rate Request," dated November 21, 2000
5. Letter from R. M. Krich (Commonwealth Edison Company) to U.S. NRC, "Response to Request for Additional Information Regarding the License Amendment Request to Permit Up-rated Power Operations at Byron and Braidwood Stations," dated December 21, 2000
6. Letter from G. F. Dick (U.S. NRC) to O. D. Kingsley (Commonwealth Edison Company), "Byron and Braidwood - Request for Additional Information Regarding the Power Up-rate Request," dated December 22, 2000
7. 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 Up-rated Power Operations at Byron and Braidwood Stations," dated January 31, 2000

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Should you have any questions or concerns regarding this information, please contact  
Mr. J. A. Bauer at (630) 663-7287.

Respectfully,



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

cc: Regional Administrator – NRC Region III  
NRC Senior Resident Inspector – Braidwood Station  
NRC Senior Resident Inspector – Byron Station  
Office of Nuclear Safety – Illinois Department of Nuclear Safety

STATE OF ILLINOIS )  
COUNTY OF DUPAGE )  
IN THE MATTER OF )  
EXELON GENERATION COMPANY, LLC ) Docket Numbers  
BYRON STATION UNITS 1 AND 2 ) STN 50-454 AND STN 50-455  
BRAIDWOOD STATION UNITS 1 AND 2 ) STN 50-456 AND STN 50-457

**SUBJECT: Additional Information Supporting the License Amendment Request to Permit Up-rated Power Operations at Byron and Braidwood Stations**

**AFFIDAVIT**

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

  
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R. M. Krich  
Director – Licensing

Subscribed and sworn to before me, a Notary Public in and for the State above named, this 28<sup>th</sup> day of

February, 2001.

  
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Notary Public

