

RS-11-006

January 13, 2011

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 Low Temperature Overpressure Protection and Loss of Decay Heat Removal

- References:**
1. Letter from J. L. Hansen (Exelon Generation Company, LLC) to U.S. NRC, "License Amendment Request Regarding Low Temperature Overpressure Protection and Loss of Decay Heat Removal," dated June 29, 2010
 2. NRC Generic Letter 88-17, "Loss of Decay Heat Removal," dated October 17, 1988
 3. Letter from J. L. Hansen (Exelon Generation Company, LLC) to U.S. NRC, "Supplemental Information Supporting License Amendment Request Regarding Low Temperature Overpressure Protection and Loss of Decay Heat Removal," dated August 24, 2010
 4. Letter from M. J. David (U.S. NRC) to M. J. Pacilio (Exelon Nuclear), "Braidwood Station, Units 1 and 2, and Byron Station, Unit Nos. 1 and 2 – Request for Additional Information Related to Low Temperature Overpressure Protection (TAC Nos. ME4194, ME4195, ME4196, and ME4197)," dated November 30, 2010

In Reference 1, Exelon Generation Company, LLC (EGC) requested an amendment to Facility Operating License Nos. NPF-72 and NPF-77 for Braidwood Station, Units 1 and 2, and Facility Operating License Nos. NPF-37 and NPF-66 for Byron Station, Units 1 and 2. The proposed change revises Technical Specifications (TS) Section 3.4.12, "Low Temperature Overpressure

Protection (LTOP) System," to correct an inconsistency between the TS, and implementation of procedures and administrative controls for Safety Injection (SI) pumps required to mitigate a postulated loss of decay heat removal event as discussed in NRC Generic Letter (GL) 88-17, "Loss of Decay Heat Removal," (i.e., Reference 2). In Reference 3, EGC provided supplemental information for the proposed change.

In Reference 4, the NRC requested additional information to support review of the proposed change in Reference 1. In response to this request, EGC is providing the attached information.

EGC has reviewed the information supporting a finding of no significant hazards consideration, and the environmental consideration, that were previously provided to the NRC in Attachment 1 of Reference 1. The additional information provided in this submittal does not affect the bases for concluding that the proposed license amendment does not involve a significant hazards consideration. In addition, the additional 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 Mr. Richard W. McIntosh at (630) 657-2816.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 13th day of January 2011.

Respectfully,


Patrick R. Simpson
Manager – Licensing

Attachment: Response to Request for Additional Information

cc: NRC Regional Administrator, Region III
NRC Senior Resident Inspector – Braidwood Station
NRC Senior Resident Inspector – Byron Station
Illinois Emergency Management Agency – Division of Nuclear Safety

ATTACHMENT

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

BACKGROUND

In Reference 1, Exelon Generation Company, LLC (EGC) requested an amendment to Facility Operating License Nos. NPF-72 and NPF-77 for Braidwood Station, Units 1 and 2, and Facility Operating License Nos. NPF-37 and NPF-66 for Byron Station, Units 1 and 2. The proposed change revises Technical Specifications (TS) Section 3.4.12, "Low Temperature Overpressure Protection (LTOP) System," to correct an inconsistency between the TS, and implementation of procedures and administrative controls for Safety Injection (SI) pumps required to mitigate a postulated loss of decay heat removal event as discussed in NRC Generic Letter (GL) 88-17, "Loss of Decay Heat Removal," (i.e., Reference 2). In Reference 3, EGC provided supplemental information for the proposed change.

In Reference 4, the NRC requested additional information (RAI) to support review of the proposed change in Reference 1. In response to this request, EGC is providing the following information. The RAI questions are excerpted and shown below as bold and italicized text, and responses to the questions are included in the balance of this attachment.

NRC Request 1

Confirm that the current actions for responding to a loss of DHR using SI are substantially the same as those implemented in response to NRC staff approval of a 1990 amendment per letter from S. P. Sands (U.S. NRC) to T. J. Kovach (Commonwealth Edison Company), "Issuance of Amendments (TAC Nos. 76715, 76716, 76717 and 76718)," dated August 31, 1990 (ADAMS Accession No. ML020860179).

Response

At the time the amendment was approved, Revision 55 of procedures 1/2BOA PRI-10 and 1/2BwOA PRI-10 were in place at Byron and Braidwood Stations, respectively, for responding to loss of Residual Heat Removal (RH) System cooling during Modes 4, 5 or 6. The current procedure revisions are as follows:

<u>Procedure No.</u>	<u>Revision No.</u>
1BOA PRI-10	104
2BOA PRI-10	104
1BwOA PRI-10	105
2BwOA PRI-10	103

A review of the Revision 55 procedures against the current revisions reveals that the procedures have not been significantly changed with respect to SI hot leg injection. Recovery using the SI Pump Hot Leg Injection flow path was governed by Attachment G of Revision 55, this method is currently addressed by Attachment E; however, the actions have not changed in any significant manner.

Based on a historical review of the operator training involving conditions that use the SI pump during a loss of decay heat removal event and a comparison of procedures then and now for responding to a loss of RH System cooling during Modes 4, 5 or 6, EGC confirmed that

recovery from a loss of decay heat removal using SI is substantially the same as when implemented in response to the NRC approval of the 1990 amendment.

NRC Request 2

Provide assurance that current operators are capable of performing the actions required to initiate SI in response to a loss of DHR during mid-loop operation within the time available to prevent core uncovering.

Response

There have been changes in operator human performance since the amendment was approved; specifically, the use of three way communication and peer checks. These events have not been validated with timing since there is no requirement to "time validate" SI injection to the reactor coolant system (RCS) during a loss of decay heat removal event. However, other actions requiring time validation, such as actions associated with steam generator tube rupture and cold leg recirculation are time validated and with training continue to be able to satisfy the expectations of the procedure in a timely manner using three way communication and peer checks.

A review of the training performed on the operators was conducted. The operators are trained on a loss of RH System cooling prior to every outage in accordance with INPO Significant Operating Experience Report (SOER) 09-1, "Shutdown Safety." In accordance with the Shutdown Safety Management Program, operators are briefed at least once per shift on the time to RCS boil and the time to core uncovering, as well as the priorities for restoring RCS cooling in the event of a loss of decay heat removal event (e.g., steaming intact/non-isolated steam generators, feed and bleed, refuel cavity to fuel pool cooling, SI pump hot leg injection, accumulator injection, and inventory addition from the refueling water storage tank). In addition, an Infrequent Plant Activity (IPA) briefing, which includes Just-In-Time training, is conducted in accordance with Byron operating procedure BOP RC-4 and Braidwood operating procedure BwOP RC-4 for performing a RCS drain prior to lowering level to the reactor vessel flange and whenever the RCS is taken to a reduced inventory condition.

Considering the sufficiency of training, and its emphasis on demonstrating the proficiency of operator human performance during a loss of decay heat removal, EGC reasonably concludes that the operators are capable of performing the actions in a timely manner.

NRC Request 3

Are there any other actions added to or modifications impacting the loss of DHR scenario over the last 20 years (since the 1990 amendment)? For example, have there been modifications to the control room or to procedures that have incrementally added workload, reduced time available, or added concurrent/overlapping tasks, which could add to the workload of operators and distract them from timely initiation of SI?

Response

EGC design change processes are required to appropriately capture needed updates to the control room simulator to maintain fidelity with the control room, and related training and procedures to operation of the stations. Considering factors that could impact operator response, Training evaluated the cumulative impact that modifications have had since 1990 upon the simulator and operator response in procedures. A training review of modifications to the simulator did not identify any changes that would appreciably impact the time for initiating SI to the RCS in response to a loss of decay heat removal event. Based on this training review, and the reviews described above in response to procedures and standards, we have identified no issues involving modifications that have add to the workload of operators in a manner that would distract them from timely initiation of SI.

There were minor changes to the stroke times for the following valves:

<u>Valve No.</u>	<u>Description</u>
1/2SI8802A/B	RCS hot leg injection valves
1/2SI8809A	RH to cold legs A and D isolation valves
1/2SI8821	SI pump to cold legs isolation valves

However, the changes in stroke times for the above valves would not prevent timely initiation of SI to the RCS in response to a loss of decay heat removal event.

REFERENCES

1. Letter from J. L. Hansen (Exelon Generation Company, LLC) to U.S. NRC, "License Amendment Request Regarding Low Temperature Overpressure Protection and Loss of Decay Heat Removal," dated June 29, 2010
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