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Exelon Nuclear

10 CFR 50.73

January 11, 2011
BW110002

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 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

Subject: Licensee Event Report 2010-006-00 – Technical Specifications Allowed Outage Time Extension Request for Component Cooling System Contained Inaccurate Design Information That Significantly Impacted the Technical Justification

The enclosed Licensee Event Report (LER) is being submitted in accordance with 10 CFR 50.73, "Licensee event report system," paragraph (a)(2)(ii)(B), as an unanalyzed condition that significantly degraded plant safety, and paragraph (a)(2)(v)(B) as a condition that could have prevented the fulfillment of a system's safety function. On November 12, 2010, it was identified that the Technical Specifications Allowed Outage Time extension request for the Component Cooling system contained inaccurate design information that significantly impacted the technical justification. 10 CFR 50.73(a) requires an LER to be submitted within 60 days following discovery of the event. Therefore, this report is being submitted by January 11, 2011.

There are no regulatory commitments contained in this letter. Should you have any questions concerning this submittal, please contact Mr. Ronald Gaston, Regulatory Assurance Manager, at (815) 417-2800.

Respectfully,

Amir Shahkarami
Site Vice President
Braidwood Station

Enclosure: LER 2010-006-00
cc: NRR Project Manager – Braidwood Station
Illinois Emergency Management Agency – Division of Nuclear Safety
US NRC Regional Administrator, Region III
US NRC Senior Resident Inspector (Braidwood Station)
Illinois Emergency Management Agency - Braidwood Rep

NRC FORM 366 (10-2010) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 10/31/2013

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA/Privacy Section (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects.resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

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4. TITLE

Technical Specifications Allowed Outage Time Extension Request for Component Cooling System Contained Inaccurate Design Information That Significantly Impacted the Technical Justification

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
									Braidwood Station Unit 2	05000457
11	12	2010	2010	- 006 -	00	01	11	2011	FACILITY NAME: N/A	DOCKET NUMBER: N/A

9. OPERATING MODE

1

10. POWER LEVEL

100

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: *(Check all that apply)*

- ☐ 20.2201(b)
- ☐ 20.2201(d)
- ☐ 20.2203(a)(1)
- ☐ 20.2203(a)(2)(i)
- ☐ 20.2203(a)(2)(ii)
- ☐ 20.2203(a)(2)(iii)
- ☐ 20.2203(a)(2)(iv)
- ☐ 20.2203(a)(2)(v)
- ☐ 20.2203(a)(2)(vi)
- ☐ 20.2203(a)(3)(i)
- ☐ 20.2203(a)(3)(ii)
- ☐ 20.2203(a)(4)
- ☐ 50.36(c)(1)(i)(A)
- ☐ 50.36(c)(1)(ii)(A)
- ☐ 50.36(c)(2)
- ☐ 50.46(a)(3)(ii)
- ☐ 50.73(a)(2)(i)(A)
- ☐ 50.73(a)(2)(i)(B)
- ☐ 50.73(a)(2)(i)(C)
- ☐ 50.73(a)(2)(ii)(A)
- ☒ 50.73(a)(2)(ii)(B)
- ☐ 50.73(a)(2)(iii)
- ☐ 50.73(a)(2)(iv)(A)
- ☐ 50.73(a)(2)(v)(A)
- ☒ 50.73(a)(2)(v)(B)
- ☐ 50.73(a)(2)(v)(C)
- ☐ 50.73(a)(2)(v)(D)
- ☐ 50.73(a)(2)(vii)
- ☐ 50.73(a)(2)(viii)(A)
- ☐ 50.73(a)(2)(viii)(B)
- ☐ 50.73(a)(2)(ix)(A)
- ☐ 50.73(a)(2)(x)
- ☐ 73.71(a)(4)
- ☐ 73.71(a)(5)
- ☐ OTHER

Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER *(Include Area Code)*
Ronald Gaston, Regulatory Assurance Manager	(815) 417-2800

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

14. SUPPLEMENTAL REPORT EXPECTED

☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☒ NO

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR
N/A	N/A	N/A

ABSTRACT *(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)*

On September 27, 1987, a License Amendment Request (LAR) was submitted for Byron and Braidwood Stations to request an increase in the Allowed Outage Times (AOT) from 72 hours to seven days for several systems, including the Component Cooling (CC) System and an Emergency Core Cooling System (ECCS) sub-system (i.e., the Residual Heat Removal (RH) System). This LAR was based on the 1984 WCAP-10526, which provided a probabilistic risk assessment technical justification. On July 7, 2010, an issue was identified concerning an apparent discrepancy in this 1987 LAR. Based on CC design discrepancies that have been known to exist approximately since the 1987 timeframe, the CC system description contained in the WCAP was incorrect and was likely also modeled incorrectly in the PRA analysis. In the WCAP CC system description, the common CC system pump was described as a maintenance spare that could be substituted for any of the CC system unit-specific pumps. Due to the design discrepancies, the common pump could not be substituted for either unit's B CC trains. This discrepancy would have significantly impacted the PRA results of the WCAP and possibly affected NRC approval of the LAR. In addition, another potentially significant discrepancy was discovered in the RH system analysis of the WCAP, in that it did not correctly account for the operational requirement to preemptively split CC trains in a post accident scenario. The Technical Specifications for CC and RH were declared non-conservative and administrative controls put in place to restrict their AOTs to 72 hours, and ensuring the Unit 0 CC pump shall not be used to satisfy the requirements of the 1B or 2B CC pump. The most probable causes are limited procedural guidance for preparing correspondence, and ambiguity in intended system operation. The cause of the inaccurate LAR is indeterminate due to the timeframe when the event occurred. Modifications are being investigated to the CC system to eliminate the design discrepancies.

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NARRATIVE

A. Plant Conditions at Time of Condition Discovery and Background Information:

Event Date: November 12, 2010 Event Time: 1444 CDT

Unit: 1 MODE: 1 Reactor Power: 100 percent
Unit: 2 MODE: 1 Reactor Power: 100 percent

Unit 1 Reactor Coolant System [AB]: Normal operating temperature and pressure
Unit 2 Reactor Coolant System: Normal operating temperature and pressure

Pertinent original design basis of the Component Cooling Water (CC) [CC] system:

The CC system is a shared system between the two units and consists of five pumps (two per unit and one common), three heat exchangers (one per unit and one common), and two surge tanks (one per unit). Make-up water to the surge tanks is not safety-related.

The bounding design basis scenario for the CC system is the simultaneous Loss of Coolant Accident (LOCA) and Loss of Offsite Power on one unit and the normal shutdown on the other unit. To account for the design requirement to mitigate a passive single failure in the long term, the CC system trains on the accident unit must be separated preemptively at the onset of a design basis LOCA scenario.

B. Description of Event:

On September 27, 1987, a License Amendment Request (LAR) was submitted for Byron and Braidwood Stations to request an increase in the Allowed Outage Times (AOTs) from 72 hours to seven days for several systems, including the CC System and an Emergency Core Cooling System (ECCS) sub-system (i.e., the Residual Heat Removal (RH) [BP] System). This LAR was approved by the NRC via License Amendments 14 and 4 for Byron and Braidwood Stations, respectively, issued January 21, 1988. This LAR was based on the 1984 Westinghouse Commercial Atomic Power (WCAP) -10526, "Byron Generating Station Limiting Condition for Operation Relaxation Program," which provided a Probabilistic Risk Assessment (PRA) technical justification for the AOT extensions.

On July 7, 2010, an issue was identified concerning an apparent discrepancy in WCAP-10526. Based on CC design discrepancies involving the common CC system's pump, that have been known to exist approximately since the 1987 timeframe, the CC system description contained in the WCAP was incorrect and therefore, was likely modeled incorrectly in the PRA analysis.

In the WCAP-10526 CC system description, the common CC system's pump was described as a maintenance spare that could be substituted for any of the CC system's unit-specific pumps. Subsequent to the issuance of the WCAP, it became known that if the common CC system pump is aligned to substitute for either unit's B CC train pump, then it would be isolated from its unit surge tank upon splitting of the CC system's trains. Also, with the common CC system pump in this configuration, it would be powered by electrical division II while providing cooling to the A train of the RH system. With either of these discrepancies, the common CC system pump could not be considered an operable pump while aligned to either unit's B CC train. Though these design discrepancies were known, the Technical Specifications (TS) implications were not recognized and the B CC trains were considered operable when the common CC pump was aligned to them.

An assessment was conducted of the significance of this design discrepancy on the PRA modeling assumptions and conclusions of WCAP-10526. On November 12, 2010, it was concluded the CC system design discrepancies would result in a negative impact on the PRA analysis results which justified the AOT extension for the CC system.

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In addition, another potentially significant discrepancy was discovered in both the CC and RH system analyses, in that it did not correctly account for the operational requirement to preemptively split CC trains in a post accident scenario.

Re-creation of the 1984 vintage PRA modeling and analysis was not feasible in order to determine a quantitative value to this discrepancy. Therefore, it is unknown whether this negative impact would have been significant enough to have impacted NRC approval of the LAR for CC and RH. However, Exelon Generation Company, LLC (EGC) concluded that it would have been significant enough to impact the NRC's approval of the LAR and that the AOT for TS 3.7.7, "Component Cooling," and TS 3.5.3, "ECCS- Operating" (RH Sub-system) should be considered non-conservative and the provisions of NRC Administrative Letter 98-10, "Dispositioning of Technical Specifications That are Insufficient to Assure Plant Safety," be invoked.

The following administrative controls have been implemented at Byron and Braidwood Stations pending modifications to address the CC design discrepancies:

- The AOT for TS 3.7.7, "Component Cooling" Condition B for one required CC pump inoperable has been restricted to 72 hours
- The AOT for TS 3.5.2, "ECCS-Operating" Condition A has been restricted to 72 hours for an inoperable RH train
- The U0 CC pump shall not be used to satisfy the requirements of the 1B or 2B CC pump.

This condition is reportable to the NRC pursuant to 10 CFR 50.73(a)(2)(ii)(B) as an unanalyzed condition that significantly degraded plant safety, and 10 CFR 50.73(a)(2)(v)(B) as a condition that could have prevented the fulfillment of a system's safety function.

C. Cause of Event

The most probable causes of the event are limited procedural guidance for preparing correspondence, and ambiguity in intended system operation. The root cause of the inaccurate LAR in the 1987 timeframe was indeterminate due to the timeframe when the event occurred. The processes in place for preparing and reviewing LARs in the 1987 timeframe were not as robust as the current processes.

D. Safety Consequences:

The design basis safety function of the CC system is to remove the post LOCA heat load from the containment sump during the ECCS recirculation phase. The containment sump is the suction source for the ECCS pumps during the recirculation phase.

There were no actual safety consequences resulting from this condition. No actual loss of a safety function occurred. However, the potential existed for more severe conditions to have developed, when the common CC system pump was aligned to replace either unit's B CC train pump and CC trains split. With the postulation of design basis assumptions, a loss of the CC safety function could have occurred and, if not mitigated, would in turn lead to a loss of the ECCS.

A three year historical review of times the common CC system pump replaced either unit's B train pump while in the mode of applicability resulted in finding two instances for Unit 1 and two for Unit 2. The duration time frames were 80 and 138 hours for Unit 1, and 59 and 281 hours for Unit 2.

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NARRATIVE

E. Corrective Actions:

The corrective actions include:

- Investigate modification of the CC system to eliminate the design discrepancies with the common CC pump and the need to pre-emptively split CC trains.
- A review of the current LAR preparation and review process concluded it is sufficiently robust to minimize potential inaccurate information from not being identified.
- Training will be conducted to appropriate Site personnel to raise awareness of the circumstances and missed opportunities for recognizing the significance and implications of the design discrepancies.
- An extent of condition review will be conducted.

F. Previous Occurrences:

There have been no previous, similar Licensee Event Reports identified at the Braidwood Station.

G. Component Failure Data:

Manufacturer	Nomenclature	Model	Mfg. Part Number
N/A	N/A	N/A	N/A