

May 5, 2008

Mr. Charles G. Pardee  
Exelon Nuclear  
Exelon Generation Company, LLC  
4300 Winfield Road  
Warrenville, IL 60555

SUBJECT: BYRON STATION, UNITS 1 AND 2  
FOLLOW UP INSPECTION OF AN UNRESOLVED ITEM (URI)  
05000454/2008008; 05000455/2008008

Dear Mr. Pardee:

On March 28, 2008, the U. S. Nuclear Regulatory Commission (NRC) completed an inspection at Byron Station. This report documents the actions taken to review an URI from the 2005 safety systems design, performance and capability inspection at your Byron Station (URI 05000454/2005002-06; URI 05000455/2005002-06). The results were discussed on March 28, 2008, with members of your staff.

The inspection examined activities conducted under your license, as they relate to safety and to compliance with the Commission's rules and regulations, and with the conditions of your license. The inspector reviewed selected analyses, and records.

Based on the results of this inspection, the NRC identified a concern with respect to the single failure assumptions taken in your ultimate heat sink analyses. In a previous correspondence, you described a less conservative single failure assumption for the ultimate heat sink analysis and that analysis was approved by the agency. After further review, the NRC has determined that a modification is necessary to bring a facility into compliance with the rules or orders of the Commission. Specifically, the passive failures of electrical components need to be postulated to comply with 10 CFR Part 50, Appendix A. The staff assessed this issue as it relates to a backfit and determined that the provisions of 10 CFR 50.109 (a)(4), were applicable, in that, a modification is necessary to bring a facility into compliance with the rules or orders of the Commission.

The NRC has also determined that this is not a violation of NRC requirements due to the apparent change in NRC position promulgated by our earlier inaction on your previous correspondence. The circumstances surrounding the issue are described in detail in the subject inspection report.

You are requested to respond to this letter with a description of your intended actions to address the noncompliance including a proposed schedule to complete those actions.

You have 30 calendar days from the date of this letter to appeal the staff's determination. Such appeals will be considered to have merit only if they meet the criteria given in the NRC Inspection Manual Chapter 0609, Attachment 2. To the extent possible, your response should

not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

You should provide a response within 30 days of the date of this inspection report, with your proposed actions or the basis for your appeal, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission - Region III, 2443 Warrenville Road, Suite 210, Lisle, IL 60532-4352; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the Resident Inspector Office at the Byron Station Nuclear Plant.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any), will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records System (PARS) component of NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

**/RA/**

Ann Marie Stone, Chief  
Engineering Branch 2  
Division of Reactor Safety

Docket Nos. 50-454; 50-455

License Nos. NPF-37; NPF-66

Enclosure: Inspection Report No. 05000454/2008008; 05000455/2008008  
w/Attachment: Supplemental Information

cc w/encl: Site Vice President - Byron Station  
Plant Manager - Byron Station  
Regulatory Assurance Manager - Byron Station  
Chief Operating Officer and Senior Vice President  
Senior Vice President - Midwest Operations  
Senior Vice President - Operations Support  
Vice President - Licensing and Regulatory Affairs  
Director - Licensing and Regulatory Affairs  
Manager Licensing - Braidwood, Byron, and LaSalle  
Associate General Counsel  
Document Control Desk - Licensing  
Assistant Attorney General  
Illinois Emergency Management Agency  
J. Klinger, State Liaison Officer, State of Illinois  
P. Schmidt, State Liaison Officer, State of Wisconsin  
Chairman, Illinois Commerce Commission  
B. Quigley, Byron Station

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Ann Marie Stone, Chief  
Engineering Branch 2  
Division of Reactor Safety

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Illinois Emergency Management Agency  
J. Klinger, State Liaison Officer, State of Illinois  
P. Schmidt, State Liaison Officer, State of Wisconsin  
Chairman, Illinois Commerce Commission  
B. Quigley, Byron Station

DOCUMENT NAME:G:\DRS\Work in Progress\BYRON 2008 008 CEA.doc

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DATE	05/05/08	05/05/08	05/05/08	05/05/08			

**OFFICIAL RECORD COPY**

Letter to Mr. Charles Pardee from Ms. Ann Marie Stone dated May 5, 2008

SUBJECT: BYRON STATION, UNITS 1 AND 2; FOLLOW UP INSPECTION OF AN  
UNRESOLVED ITEM 05000454/2008008; 05000455/2008008

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U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos: 50-454; 50-455  
License Nos: NPF-37; NPF-66

Report Nos: 05000454/2008008; 05000455/2008008

Licensee: Exelon Generation Company, LLC

Facility: Byron Station, Units 1 and 2

Location: Byron, IL

Dates: March 21, 2008

Inspector: Caroline Enid Acosta Acevedo, Reactor Inspector

Approved by: Ann Marie Stone, Chief  
Engineering Branch 2  
Division of Reactor Safety

## SUMMARY OF FINDINGS

IR 05000454/2008008; 05000455/2008008; March 28, 2008; Byron Station, Units 1 and 2; routine inspection.

This report covers a follow up inspection of an unresolved item (URI) by regional inspectors. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

**A. NRC-Identified and Self-Revealed Findings**

No violations of significance were identified.

**B. Licensee-Identified Violations**

No violations of significance were identified.

## REPORT DETAILS

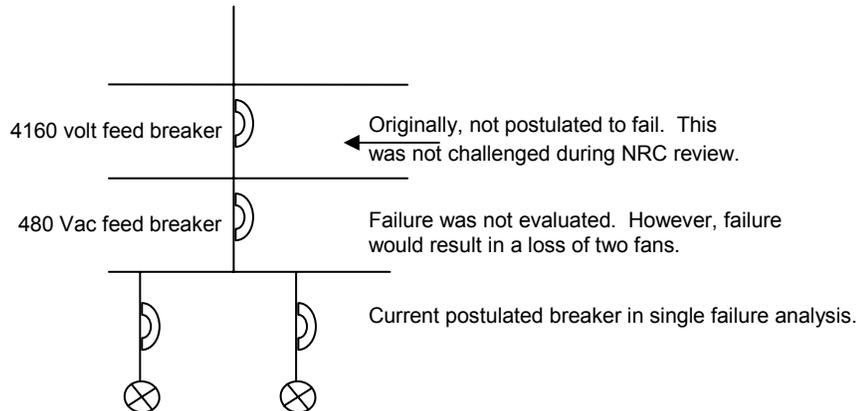
### 4. OTHER ACTIVITIES

#### 4OA5 Other Activities

##### .1 (Closed) URI 05000454/2005002-06; 05000455/2005002-06: Concerns With Single Failure Assumptions

###### a. Inspection Scope

During the 2005 NRC safety systems design and performance capability inspection, the inspectors noted that in Technical Specification (TS) Amendment No. 95 for Byron Station (changes to the ultimate heat sink to support steam generator replacement), the most limiting single failure evaluated was the failure of active breakers or switches in the 480 Vac service water cooling towers (SXCT) bus which resulted in the failure of one service water cooling tower fan. The inspectors noted that the licensee did not address the 480 Vac feed breakers between the 4160/480 Vac transformer and bus 131Z (for example). The inspectors also noted that a single failure of either of the breakers would de-energize the bus and result in a loss of two service water cooling tower fans. See below for an illustration of the configuration.



The licensee disagreed, stating the breakers were normally closed and therefore, a passive failure need not be considered.

The configuration of the breakers and the licensee's assessment that passive failures need not be considered was previously reviewed and approved by the NRC. Specifically, in response to a request for additional information (RAI) dated July 30, 1997, the licensee stated that failure of the 4160 volt feed breakers was not postulated because the breakers did not automatically open on a loss-of-offsite power load sequence and therefore remained in the closed position for the accident. In the Safety Evaluation Report for the issued Amendment No. 95, dated December 12, 1997, the NRC "determined that the licensee's revised analysis is based on conservative assumptions including the most limiting single active failure as documented in the

licensee's July 30, 1997, submittal in response to the staff's request for additional information. The licensee's proposed change to LCO 3.7.5.d is, therefore, acceptable."

The issue was unresolved pending determination on whether the loss of the 4160 feed breaker should have been considered as the single failure.

Subsequent to the initiation of the URI, the inspectors held several discussions with the Electrical Branch in NRR and the Office of the General Counsel. The inspectors concluded that although Amendment No. 95 did not adequately distinguish single failure of electrical components (active vs passive), the failure of these feed breaker should have been considered in the licensee's analyses. As defined in 10 CFR Part 50, Appendix A:

"A single failure means an occurrence which results in the loss of capability of a component to perform its intended safety functions. Multiple failures resulting from a single occurrence are considered to be a single failure. Fluid and electric systems are considered to be designed against an assumed single failure if neither (1) a single failure of any active component (assuming passive components function properly) nor (2) a single failure of a passive component (assuming active components function properly), results in a loss of the capability of the system to perform its safety functions."

Consistent with the definition of a single failure presented in 10 CFR Part 50, Appendix A, and General Design Criterion 44, the spurious failure/opening of the 4160 volt or 480 Vac should have been considered a valid single failure and assessed. In reviewing the licensee's Amendment No. 95, the NRC did not evaluate the potential for a passive failure of the electrical breakers even though passive failures were required to be evaluated under 10 CFR Part 50, Appendix A.

The current NRC staff position regarding the requirement to evaluate single passive failures of the electrical breakers is different than the position communicated in the Safety Evaluation Report for Amendment No. 95. Therefore, the provisions of 10 CFR 50.109 apply. That section defines backfitting as "the modification of or addition to systems, structures, components, or design of a facility, any of which may result from a new or amended provision in the Commission rules or the imposition of a regulatory staff position interpreting the Commission rules that is either new or different from a previously applicable staff position." After consultation with NRR and the Office of General Counsel, the inspectors determined that no backfit analysis is required under 10 CFR 50.109(a)(2) because the provisions of 10 CFR 50.109 (a)(4), were applicable, in that, a modification is necessary to bring a facility into compliance with the rules or orders of the Commission.

The inspectors and members of the Electrical Branch in NRR discussed the conclusions and the need to be in compliance with the licensee. The licensee initiated corrective actions 00711704 and 663350. To compensate for the nonconforming condition, the licensee continued implementing an administrative control to allow only one fan out of service (OOS), compared to two allowed by TS. By allowing only one fan OOS, the licensee maintains the required five fans needed to mitigate their design basis accident (LOCA concurrent with LOOP in one unit and LOOP in the other unit), assuming the remaining two are lost due to the single failure of the breakers.

In addition, the licensee plans to reanalyze their design basis which may require a TS change to increase the number of UHS fans required to be operable from six to seven. Consequently, the licensee invoked the provisions of NRC Administrative Letter (AL) 98-10, "Dispositioning of Technical Specifications That Are Insufficient to Assure Plant Safety" until such time the TS are revised or an engineering analysis demonstrates six fans are still acceptable for operability.

This URI does not result in a violation because the NRC approved the original design basis analysis in the amendment request.

Based on this review, this unresolved item is closed.

#### 4OA6 Management Meeting(s)

##### .1 Exit Meeting Summary

- On March 28, 2008, the inspectors presented the inspection results to Mr. Hoots, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors confirmed that none of the potential report input discussed was considered proprietary.

##### .2 Interim Exit Meetings

An interim meeting was conducted for:

- An exit meeting was presented to Mr. Blondin and his staff on Friday, December 14, 2007.

ATTACHMENT: SUPPLEMENTAL INFORMATION

**SUPPLEMENTAL INFORMATION**

**KEY POINTS OF CONTACT**

Licensee

D. Hoots, Site Vice President  
B. Grundmann, Regulatory Assurance Manager  
A. Daniels, NOS Manager  
J. Langan, Licensing Engineer  
T. Hulbert, NRC Coordinator

Nuclear Regulatory Commission

A.M. Stone, Chief, Engineering Branch 2  
B. Jones, Byron Resident Inspector (acting)

**LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED**

Closed

05000454/2005002-06; 05000455/2005002-06	URI	Concerns with Single Failure Assumptions
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## LIST OF DOCUMENTS REVIEWED

The following is a partial list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspector reviewed the documents in their entirety, but rather that selected sections or portions of the documents were evaluated as part of the overall inspection effort. Inclusion of a document on this list does not imply NRC acceptance of the document or any part of it, unless this is stated in the body of the inspection report.

### 4OA5 Other Activities

- 00663350; Resolution of 2005 SSDI Unresolved Item on UHS; August 22, 2007
- 00711704; Resolution of NRC URI on UHS Design Basis; December 14, 2007
- ComEd Letter; Response to Request for Additional Information (RAI) - Ultimate Heat Sink Technical Specification Amendment; dated July 30, 1997
- NRC Letter; Issuance of Amendments; dated December 12, 1997

## LIST OF ACRONYMS USED

AL	Administrative Letter
OOS	Out of Service
RAI	Request for Additional Information
SRP	Standard Review Plan
SXCT	Service Water Cooling Tower
TS	Technical Specifications
URI	Unresolved Items