

Exelon Generation Company, LLC
Braidwood Station
35100 South Rt 53, Suite 84
Braceville, IL 60407-9619
Tel. 815-417-2000

www.exeloncorp.com

November 24, 2004
BW0400106

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

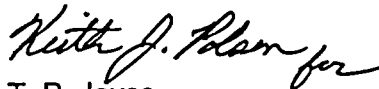
Braidwood Station, Unit 2
Facility Operating License No. NPF-77
NRC Docket No. STN 50-457

Subject: Submittal of Licensee Event Report Number 2004-001-00, "Unit 2 Pressurizer backup heater groups A and D identified to be inoperable greater than required Technical Specification Allowed Outage Time"

The enclosed Licensee Event Report (LER) is being submitted in accordance with 10 CFR 50.73, "Licensee event report system", paragraph (a)(2)(i)(B). 10 CFR 50.73(a) requires an LER to be submitted within 60 days after discovery of the event; therefore, this report is being submitted by November 24, 2004.

Should you have any questions concerning this submittal, please contact Dale Ambler, Regulatory Assurance Manager, at (815) 417-2800.

Respectfully,



T. P. Joyce
Site Vice President
Braidwood Station

Enclosure: LER Number 2004-001-00

cc: Regional Administrator - Region III
NRC Braidwood Senior Resident Inspector

TE22

LICENSEE EVENT REPORT (LER)

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

Estimated burden per response to comply with this mandatory collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by Internet e-mail to infocollects@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.

1. FACILITY NAME Braidwood, Unit 2	2. DOCKET NUMBER 05000457	3. PAGE 1 of 3
---------------------------------------	------------------------------	-------------------

4. TITLE
Unit 2 Pressurizer backup heater groups A and D identified to be inoperable greater than required Technical Specification Allowed Outage Time

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
09	25	2004	2004	- 001 -	00	11	24	2004	N/A	N/A
									FACILITY NAME	DOCKET NUMBER
									N/A	N/A

9. OPERATING MODE 1	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: (Check all that apply)									
10. POWER LEVEL 100	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)						
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)						
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)						
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)						
	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)						
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)						
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)						
	<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER						
<input type="checkbox"/> 20.2203(a)(2)(vi)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A							

12. LICENSEE CONTACT FOR THIS LER

NAME Ed Wrigley, Maintenance Director	TELEPHONE NUMBER (Include Area Code) (815) 417-2500
--	--

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

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

On September 25, 2004, in preparation for throttle valve and governor valve testing, the Unit 2 2D and 2A Pressurizer backup heater groups failed to energize when their control switches were placed in the "ON" manual position. At 2340 on September 25, 2004, Technical Specification (TS) Limiting Conditions for Operation (LCO) 3.4.9, Condition B was entered due to the heater groups being inoperable. The last time the heater groups were proven conclusively to be operable, based on the performance of post maintenance testing for coil replacements, was March 3, 2004 for the 2A backup heater group, and March 4, 2004, for the 2D backup heater group. This time period of inoperability exceeded the TS Allowed Outage Time (AOT).

The root cause was determined to be the lack of torque specifications for the armature mounting screws in the equipment vendor manual. This improper torquing caused the mounting screws to loosen during cycling of the contactor. The loose mounting screws together with the mechanical force applied when the contactor cycles allowed the armature to drift and cause mechanical binding of the contactor armature to the armature stop assembly-mounting bracket. The corrective action to prevent recurrence is to prepare a maintenance procedure with specific torque requirements for this type of contactor assembly.

The consequence of the mechanical binding of the 2A and 2D Pressurizer heater contactors is the inability to ensure adequate pressure control in response to plant transients. The overall risk significance associated with the failure of the Pressurizer heaters is low.

This event is being reported pursuant to 10 CFR 50.73(a)(2)(i)(B).

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISIO N NUMBE	
Braidwood, Unit 2	05000457	2004	- 001	- 00	2 OF 3

NARRATIVE (If more space is required, use additional copies of NRC Form 366A) (17)

A. Plant Operating Conditions Before The Event:

Event Date: September 25, 2004

Event Time: 2340

Unit: 2

MODE: 1

Reactor Power: 100 percent

Unit 2 Reactor Coolant System (RCS) [AB] Temperature: 581 degrees F, Pressure: 2233 psig

B. Description of Event:

There were no additional structures, systems or components inoperable at the beginning of the event that contributed to the severity of the event.

On September 25, 2004, the Unit 2 Pressurizer [AB] 2D backup heater group was being placed on line in accordance with procedure BwOP RY-13, "Pressurizer Backup Heater Operation," to prepare for a scheduled Unit 2 power reduction to support throttle valve and governor valve testing. After the attempt to energize the 2D backup heater group in the Main Control Room, there was no response. Pressurizer pressure, heater group 2C demand current, and spray valve position was unchanged over a 10-minute time frame. The 2A backup heater group was then placed "ON" in manual and again Pressurizer pressure, heater group 2C demand current, and spray valve position remained unchanged, indicating that the "2A" backup heater group also would not energize. On September 25, 2004, at 2340, unplanned LCO 3.4.9, Condition B was entered due to the Pressurizer backup heater groups 2A and 2D being inoperable.

On September 26, 2004, an investigation was initiated to identify the cause of the heater failure. A visual examination revealed that the contactor armature stop bracket assemblies for the 2A and 2D heaters were misaligned and interfered with the rotation of the contactor armatures. The 2A and 2D contactor armature stop bracket assemblies were properly re-aligned and subsequently verified to be operable, and on September 26, 2004, at 1038, LCO 3.4.9 was exited.

It could not conclusively be determined when the 2A and 2D Pressurizer backup heater groups became inoperable. Post maintenance tests were performed on March 3, 2004 and March 4, 2004, which verified the operation of the heaters via a 60-amp increase on the feed to the heaters. A review of the historical SER data revealed several instances, after March 4, 2004, that a demand signal existed for the energization of the 2A or 2D Pressurizer heater groups. However, sufficient evidence could not be produced to conclusively prove that the heater groups energized upon the demand signals. Therefore, the conservative decision was made that the 2A and 2D heaters were last operable as of March 3, 2004 (2A) and March 4, 2004 (2D). The LCO AOT for inoperable heaters is 72 hours; therefore, the 2A and 2D Pressurizer backup heaters were determined to be inoperable for greater than the AOT for LCO 3.4.9.

C. Cause of Event

During this investigation the root cause was determined to be the lack of torque specifications for the armature mounting screws in the equipment vendor manual. Since no vendor instructions exist for assembly of the armature mounting assembly, torque specifications were not included in the March 2004 work instructions for coil replacements.

Additionally, when inspected, during troubleshooting, the 2D heater armature mounting screws had lock-washers, whereas the 2A heater armature mounting screws did not. The application of lock washers increases the rigidity of

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
Braidwood, Unit 2	05000457	YEAR	SEQUENTIAL NUMBER	REVISIO N NUMBE	3 OF 3
		2004	- 001 -	00	

NARRATIVE (If more space is required, use additional copies of NRC Form 366A) (17)

the armature in relation to the operating shaft and reduces axial movement. The absence of the lock washers on the 2A occurred, once again, because of the lack of instructions for this maintenance activity. There is no detail on either local or vendor drawings that provide the details for installation of lock washers.

The corrective action to prevent recurrence is to develop a maintenance procedure for this type contactor assembly. This procedure will provide the appropriate torque requirements for the armature mounting screws, and instructions for washer installation and armature centering.

D. Safety Consequences:

In Modes 1, 2, and 3, the LCO requirement for a steam bubble is reflected implicitly in the accident analyses. Safety analyses performed for lower Modes are not limiting. All analyses performed from a critical reactor condition assume the existence of a steam bubble and saturated conditions in the pressurizer. In making this assumption, the analyses neglect the small fraction of non-condensable gases normally present.

Safety analyses presented in the Updated Final Safety Analysis Report does not take credit for pressurizer heater operation; however, an implicit initial condition assumption of the safety analyses is that the RCS is operating at normal pressure.

The maximum pressurizer water level limit, which ensures that a steam bubble exists in the pressurizer, satisfies Criterion 2 of 10 CFR 50.36(c)(2)(ii). Although the heaters are not specifically used in accident analysis, they provide the capability to maintain sub-cooling in the long term during loss of offsite power, as indicated in NUREG-0737, reference 2, and thus, satisfy Criterion 4 of 10 CFR 50.36(c)(2)(ii).

A risk assessment classified this event as being of very low risk significance. The primary purpose of the pressurizer heaters is to maintain the assumption in the safety analysis and probabilistic risk assessment that all accidents start with a steam bubble and saturated conditions in the pressurizer. As these conditions were maintained during the event, there was no impact on either the safety analysis or probabilistic risk assessment.

This event did not result in a safety system functional failure.

E. Corrective Actions:

Develop a maintenance procedure to standardize and provide an additional level of detail for the replacement of the coils and/or inspection/maintenance of the contactor assembly. These instructions will include torque specification requirements for the armature mounting fasteners, the clearance (gap) for the armature to side-plates, and inspection for, or installation of, locking washer onto the armature mounting fasteners.

F. Previous Occurrences:

There have been no similar Licensee Event Report events at Braidwood Station.

In 1988, the Braidwood 2D back-up heaters failed to operate due to armature misalignment, and repairs completed on 2/4/1988.

G. Component Failure Data:

<u>Manufacturer</u>	<u>Nomenclature</u>	<u>Model</u>	<u>Mfg. Part Number</u>
N/A	N/A	N/A	N/A