

Exelon Generation Company, LLC      www.exeloncorp.com  
Braidwood Station  
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Braceville, IL 60407-9619  
Tel 815-458-2801

November 12, 2002  
BW020118

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

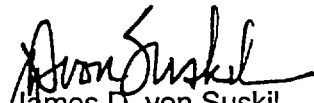
Braidwood Station, Units 1 and 2  
Facility Operating License Nos. NPF-72 and NPF-77  
NRC Docket Nos. STN 50-456 and STN 50-457

Subject:    Submittal of Licensee Event Report Number 2002-003-00, Isolated Loop Reactor  
Coolant System Boron Sample Outside of Technical Specification Frequency  
Requirement Due to Misapplication of the Implementing Procedure

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 12, 2002.

Should you have any questions concerning this letter, please contact Amy Ferko, Regulatory Assurance Manager, at (815) 417-2699.

Respectfully,

  
James D. von Suskil  
Site Vice President  
Braidwood Station

Enclosure:    LER Number 2002-003-00

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

IE22

BRAIDWOOD INDEPENDENT TECHNICAL REVIEW FORM

ITR Number: 02-041 Date: 11/7/02  
Subject Review: LER 2002-003-00, "Isolated Loop Reactor Coolant System Boron Sample Outside of Technical Specification Frequency Requirement Due to Misapplication of the Implementing Procedure."

Requested by: (Print) JEFF BAILEY Extension: 2859

- Disciplines Required:
- NPPT Nuclear Power Plant Technology
  - RO Reactor Operations
  - RE Reactor Engineering
  - CH Chemistry
  - RP Radiation Protection
  - I&C Instrumentation and Control
  - M&ES Mechanical and Electrical Systems
- Is PORC also required?  
 YES (ITR Approval by Station Manager)  
 NO

ITR Participants: OPS  
RA  
ITR Approval Position: RAM

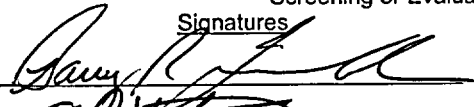
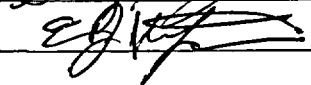
ITR Membership Assigned by: Tommy Cornwell 11-7-02  
Systems Engineering Supervisor / Date

10CFR50.59 Screening is Required:  YES  NO  
If yes, attach completed documentation.

10CFR50.59 Evaluation is Required:  YES  NO  
If yes, attach completed documentation.

Findings and Recommendations: Recommend approval of the LER 2002-003-00.

\*\*\*\*\*  
ITR Review Committee: Signature indicates concurrence with Findings and Recommendations including 10CFR50 59 Screening or Evaluation, if one was performed.

Signatures	Discipline(s)	Date
	<u>NPPT/RO/M&amp;ES</u>	<u>11/7/02</u>
	<u>NPPT/RO/M&amp;ES</u>	<u>11/7/02</u>

PORC Approved on N/A  
Approved by: Scott AD 11/8/02  
for A. Ferko

Return original ITR and a copy of Attachments to SED Clerk within 30 days.

(Final)

**LICENSEE EVENT REPORT (LER)**

<b>1. FACILITY NAME</b> Braidwood, Unit 1	<b>2. DOCKET NUMBER</b> STN 05000456	<b>3. PAGE</b> 1 of 4
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**4. TITLE**  
Isolated Loop Reactor Coolant System Boron Sample Outside of Technical Specification Frequency Requirement Due to Misapplication of the Implementing Procedure

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MO	DAY	YEAR	YEA	SEQUENTIAL NUMBER	REV NO	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
09	11	2002	2002-003-00			11	12	2002	Braidwood, Unit 2	STN 05000457
									FACILITY NAME	DOCKET NUMBER
									N/A	N/A

<b>9. OPERATING MODE</b>	1	<b>11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)</b>								
<b>10. POWER LEVEL</b>	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"/> 73.73(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"/> 73 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	Specify in Abstract below or in NRC Form 366A				
		<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)						

**12. LICENSEE CONTACT FOR THIS LER**

NAME Gary Dudek, Operations Manager	TELEPHONE NUMBER (Include Area Code) (815) 417-2200
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**13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT**

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO epix	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	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				15. EXPECTED SUBMISSION DATE		
Yes (If yes, complete EXPECTED SUBMISSION DATE).			X	NO		

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

Braidwood Station Technical Specification (TS) Surveillance Requirement (SR) 3.4.18.2 requires the isolated loop Reactor Coolant System (RCS) boron concentration to be verified to be greater than or equal to the required shutdown margin (SDM) boron concentration of the unisolated portion of the RCS within 4 hours prior to unisolating the loop. Braidwood has not always been in literal compliance with the SR time requirement. During refueling outages, isolated loop boron concentration is determined from samples of the water used to fill the RCS loop. However, these samples were often collected and analyzed greater than 4 hours before the loop isolation valves were opened.

The root cause of the TS SR noncompliance was a misapplication of a note that was added to the procedure that directs RCS loop restoration (BwOP RC-8). This procedure was relied upon as the implementing procedure to ensure the requirements of SR 3.4.18.2 were met. The SR was interpreted, in the context of the note, as being met when the RCS loop fill boron concentration was compared to the required SDM boron concentration within the SR time requirements before unisolating the isolated loop. The note was not properly reviewed in accordance with 10 CFR 50.59 to ensure literal compliance with the TS SR.

This event is applicable to both Braidwood Units.

This event is being reported pursuant to 10CFR50.73(a)(2)(i)(B).

**LICENSEE EVENT REPORT (LER)**

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Braidwood, Unit 1	STN 05000456				2 of 4
		2002 - 003 - 00			

**A. Plant Operating Conditions Before The Event:**

Unit: 1                      Event Date: 9/11/2002                      Event Time: 1450  
 MODE: 1                      Reactor Power: 100 percent

Unit 1 Reactor Coolant System (RCS) [AB] Temperature: 586 degrees F  
 Unit 1 RCS Pressure: 2235 psig

Unit: 2                      Event Date: 9/11/2002                      Event Time: 1450  
 MODE: 1                      Reactor Power: 100 percent

Unit 2 Reactor Coolant System (RCS) [AB] Temperature: 580 degrees F  
 Unit 2 RCS Pressure: 2225 psig

**B. Description of Event:**

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

The surveillance requirement (SR) for verifying that the isolated loop boron concentration is greater than or equal to the required shutdown margin (SDM) boron concentration of the unisolated portion of the reactor coolant system (RCS) within 4 hours prior to opening the hot or cold leg loop stop isolation valve (LSIV) in the isolated loop (SR 3.4.18.2) has not been complied with during refueling outages at Braidwood since approximately 1995. A specific surveillance procedure has not existed to ensure the requirements of SR 3.4.18.2 are followed. Instead, the operating procedure for restoring a RCS loop to service (BwOP RC-8, "Restoring a Reactor Coolant Loop to Service") has been relied upon as the implementing procedure to ensure compliance with SR 3.4.18.2. The key procedure step (F.3) states, "Determine that the Boron Concentration in the Isolated RCS Loop is greater than or equal to the Required Shutdown Margin boron concentration of the unisolated portion of the RCS. (This must be determined within 4 hours prior to opening the Loop Stop Valves.)" A note preceding this step states "Loop Boron Concentration can be inferred from samples of fill source during loop fill. As long as no actions to dilute the isolated loop occur between loop fill and opening of stop valves, these results equate to Loop Boron Concentration."

This note was added to BwOP RC-8 in 1995. Before the note was added to the procedure, the RCS loop boron concentration was controlled by a chemistry procedure and was required to be determined within the TS SR time requirement prior to opening the RCS loop isolation valves. The RCS loop boron samples were locally obtained from a pressure tap on the loop flow transmitters. The chemistry procedure was referenced in BwOP RC-8, but this reference was removed in the 1995 procedure revision.

The accompanying 10 CFR 50.59 screening for the procedure change determined that an evaluation in accordance with 10 CFR 50.59 was not required. A Station On-Site Review (OSR) of the change and the accompanying note was not performed. This note was essentially a TS interpretation inserted into the procedure. A 10 CFR 50.59 evaluation and an OSR should have been performed for the TS interpretation to ensure the appropriate reviews were performed before implementing the change. Station administrative procedures required a TS interpretation to have an Independent

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Technical Review, a Plant Operations Review Committee (PORC) review, NRC notification, and Station Manager approval.

Operating procedure BwOP RC-8 was changed for several reasons.

Since the loop could not be circulated to mix the contents of the loop, the sample results were not accurate or representative of actual boron concentration.

The time from when the sample was collected from the local RCS loop drain tap until it was analyzed often challenged the TS time requirement. The sample had to be drawn locally from the isolated RCS loop, transported to the Chemistry lab, and then analyzed. A RCS sample also had to be collected and analyzed for boron concentration for comparison.

The boron concentration of the loop fill source was sampled during the loop fill to ensure the boron concentration was greater than or equal to the required SDM boron concentration. The only other sources of water into the isolated RCS loop are RCS seat leakage past the LSIVs and RCP seal injection. The boron concentration of both of these water sources is greater than or equal to the required SDM boron concentration. As long as no RCS dilutions had been performed since the RCS loop was filled, the valid conclusion is that the isolated RCS loop boron concentration is the same or greater than RCS loop fill boron concentration measured during the loop fill.

The common practice at Braidwood was to fill the isolated RCS loop and record the boron concentration of the fill source for each loop. Before opening the RCS LSIVs, the boron concentration of the unisolated portion of the RCS was determined. Within 30 minutes of opening the RCS LSIVs, the RCS loop temperatures were checked to be within the TS limit and the boron concentration of the unisolated portion of the RCS was compared to the fill source boron concentration. If the temperatures and boron concentrations were within the TS limits, the RCS LSIVs were opened. Comparing the fill source boron concentration to the TS required boron concentration within 30 minutes, regardless of when that boron concentration was actually determined, was believed to meet the TS SR time requirement.

**C. Cause of Event**

The root cause of the TS SR noncompliance was the misapplication of a note that was added to the procedure that directs RCS loop restoration. The note was not properly reviewed in accordance with 10 CFR 50.59 to ensure literal compliance with the TS SR. This procedure was relied upon as the implementing procedure to ensure the requirements of SR 3.4.18.2 were met. The sample frequency was interpreted, in the context of the note, as being met by comparing the RCS loop fill boron concentration to the required SDM boron concentration within the SR time requirements before opening the isolated loop isolation valves.

**D. Safety Consequences:**

The isolated RCS loops are filled with borated water of a known concentration. The concentration is maintained greater than the required SDM boron concentration. The only sources of water into the isolated RCS Loop are from the loop fill system, leakage past the LSIVs, and RCP seal injection. Any leakage past the LSIVs would be the same concentration as the unisolated RCS system (i.e. greater than the required

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SDM boron concentration). The RCP seal injection water boron concentration is the same as the RCS loop fill boron concentration or the unisolated RCS boron concentration.

Any dilution of the isolated loop would necessarily occur also in the unisolated RCS. Since a RCS SDM boron concentration determination is required prior to opening the RCS LSIVs per BwOP RC-8, the potential to open the RCS LSIVs with diluted water from the isolated RCS loop is small. The LSIVs have been opened several times without incident (i.e. no unplanned reactivity changes have occurred). In addition, the requirements of the SDM TS ensure adequate SDM in the unisolated RCS.

Due to the above considerations, the safety consequences of this event are insignificant.

**E. Corrective Actions:**

Operating procedure BwOP RC-8 will be revised to correctly implement the requirements of SR 3.4.18.2 by sampling the isolated RCS loop within 4 hours of opening the isolated RCS LSIVs. This action is due to be completed by January 10, 2003.

A license amendment request will be submitted to incorporate the note from BwOP RC-8 (i.e. "Loop Boron Concentration can be inferred from samples of fill source during loop fill. As long as no actions to dilute the isolated loop occur between loop fill and opening of stop valves, these results equate to Loop Boron Concentration.") as a note in TS SR 3.4.18.2. This action is due to be completed in 2003.

**F. Previous Occurrences:**

Licensee Event Report Number 2001-002-00, "Main Steam Isolation Valves Not Stroke Timed in Mode 3 as Required" was submitted on November 21, 2001 to report that Unit 2 Main Steam Isolation Valves were not stroked in Mode 3 as required by the Technical Specifications. This was due to a misinterpretation of a TS SR Note during the conversion to improved TS. The root cause for this event is unknown since the responsible individual could not be interviewed. However, procedure changes were made to clarify the TS SR implementation. The current event was not related to the TS conversion process.

**G. Component Failure Data:**

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