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Michael J. Colomb
Site Executive Officer

September 22, 2000
JAFP-00-0216

United States Nuclear Regulatory Commission
Attn: Document Control Desk
Mail Station P1-137
Washington, D.C. 20555

Subject: **Docket No. 50-333**
LICENSEE EVENT REPORT: LER-00-009 (DER-00-03877)

**HPCI and A&B Core Spray Systems Inoperable Due to Lack of Proper
Environmental Qualification on Minimum Flow Valve Control Circuits**

Dear Sir:

This report is submitted in accordance with 10 CFR 50.73 (a) (2) (vii).

There are no commitments contained in this report.

Questions concerning this report may be addressed to Mr. Mark Abramski at (315) 349-6305.

Very truly yours,

A handwritten signature in black ink, appearing to read 'Michael J. Colomb'.

MICHAEL J. COLOMB

MJC:MA:las
Enclosure

cc: USNRC, Region 1
USNRC, Project Directorate
USNRC Resident Inspector
INPO Records Center

IE22

LICENSEE EVENT REPORT (LER)

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

Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the Records Management Branch (T-6 F33), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, and to the Paperwork Reduction Project (3150-0104), Office of Management and Budget, Washington, DC 20503. If 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.

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TITLE (4)
HPCI and A&B Core Spray Systems Inoperable Due to Lack of Proper Environmental Qualification on Minimum Flow Valve Control Circuits

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
08	23	00	00	009	00	09	22	00	N/A	05000
									N/A	05000

OPERATING MODE (9)	N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)								
POWER LEVEL (10)	100	20.2201(b)	20.2203(a)(2)(v)	50.73(a)(2)(i)	50.73(a)(2)(viii)					
		20.2203(a)(1)	20.2203(a)(3)(i)	50.73(a)(2)(ii)	50.73(a)(2)(x)					
		20.2203(a)(2)(i)	20.2203(a)(3)(ii)	50.73(a)(2)(iii)	73.71					
		20.2203(a)(2)(ii)	20.2203(a)(4)	50.73(a)(2)(iv)	OTHER					
		20.2203(a)(2)(iii)	50.36(c)(1)	50.73(a)(2)(v)	Specify in Abstract below or in NRC Form 366A					
		20.2203(a)(2)(iv)	50.36(c)(2)	X	50.73(a)(2)(vii)					

LICENSEE CONTACT FOR THIS LER (12)

NAME
Mr. Mark Abramski, Sr. Licensing Engineer

TELEPHONE NUMBER (Include Area Code)
315-349-6305

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE).

X NO

EXPECTED

MONTH DAY YEAR

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

On August 23, 2000 the plant was operating at 100% power. At 1615, both (A & B) divisions of the Core Spray (CSP) system and the High Pressure Coolant Injection (HPCI) system were declared inoperable when it was determined that certain wire and wire terminations of unknown environmental qualification (EQ) were installed in the control circuits for the minimum flow valves for the A & B CSP pumps as well as the HPCI pump.

The condition was corrected by replacing the unqualified wire and wire terminations in the effected circuits with properly qualified wire and wire terminations. The A & B CSP systems were declared operable at 0246 on August 24, 2000 and the HPCI system was declared operable at 1000 on August 26, 2000.

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

EIIS Codes in []

Event Description

On August 23, 2000 the plant was operating at 100% power. At 1615, both (A & B) divisions of the Core Spray (CSP) system [BM] and the High Pressure Coolant Injection (HPCI) [BJ] system were declared inoperable when it was determined that certain wire and wire terminations of unknown environmental qualification (EQ) were installed in the control circuits for the minimum flow valves for the A & B CSP pumps as well as the HPCI pump.

Prior to identifying this condition, plant engineering personnel were conducting an Operating Experience (OE) review of the April 18, 2000 NRC Headquarters Daily Report, which warned of equipment qualification deficiencies with Okonite taped splices. The JAF OE review process prompted a review of previous industry experience relevant to the issue under review. During this "previous OE review", it was determined that the JAF review of NRC IN 89-57 "Unqualified Electrical Splices in Vendor Supplied Environmentally Qualified Equipment" was inadequate.

Based on this conclusion, NRC IN 89-57 was re-reviewed in accordance with the station's OE review procedure. As a result of this re-review, a plant walkdown was conducted. This walkdown identified that certain wire and wire terminations of unknown environmental qualification were installed in the control circuits for the minimum flow valves for the A & B CSP pumps as well as the HPCI pump.

The condition was corrected by replacing the unqualified wire and wire terminations in the effected circuits with properly qualified wire and wire terminations. The A & B CSP systems were declared operable at 0246 on August 24, 2000 and the HPCI system was declared operable at 1000 on August 26, 2000

Cause

A review of plant maintenance history determined that the wire and wire terminations of unknown environmental qualification installed in the control circuits for the minimum flow valves for the A & B CSP pumps and the HPCI pump were part of the original instrument rack installation when the plant was constructed (Cause Code B). The cause of this condition is the same as that identified in NRC IN 89-57 (vendor supplied equipment).

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Cause (cont'd.)

NRC IN 89-57 identified unqualified EQ splices in conduits within vendor supplied instrument racks. The racks contained wire junction boxes and differential pressure indicating switches (DPISS) manufactured by Barton. The wire and wire terminations of unknown environmental qualification identified at JAF were also in circuits for Barton DPISSs.

Analysis

The safety significance of this event was low. Given the nature of the nonconforming wiring and terminations, the principal accident scenario, which presented a challenge to the CSP and HPCI systems due to harsh environmental conditions, is the High Energy Line Break (HELB). The HPCI system is not credited with mitigating the effects of the HELB therefore considering HPCI inoperable due to this nonconforming condition is of little safety significance.

The description for the Design Basis HELB (Main Steam Line Break) in the JAF Updated Final Safety Analysis Report (UFSAR) was reviewed. The UFSAR indicates that after the break is automatically isolated, the reactor can be cooled by operation of any of the normal or Emergency Core Cooling Systems (ECCS).

Based on this description, the CSP system can be considered to be credited with mitigating the effects of the HELB. A Failure Modes Effects Analysis (FMEA) was conducted to identify the relevant system failure modes due to the nonconforming condition described in this LER. This analysis determined that if simultaneous conductor to conductor short circuits are postulated, the minimum flow valves on both CSP pumps could close with the pump in operation. In order for this failure mode to challenge the ability of the CSP system to effectively mitigate a HELB all of the following conditions would have to be satisfied:

- High CSP discharge pressure
- Conductor to conductor short circuits on the minimum flow valve control circuits for both CSP divisions
- Prolonged operation of the CSP pumps with the minimum flow valve in the closed position (unnoticed by operators) with high discharge pressure.

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Analysis (cont'd.)

It is highly unlikely that all of the above conditions would be satisfied while mitigating the effects of an actual HELB. The CSP system would be manually initiated. It is reasonable to assume that the CSP pump would not be started until reactor pressure had dropped to near the low pressure injection permissive. This would minimize the amount of time the CSP pump would be required to run on minimum flow.

Based on these factors, it is reasonable to conclude that one of the two divisions of CSP would remain available to mitigate the effects of a postulated HELB given the nonconforming condition described in this LER. This condition therefore does not constitute a Safety System Functional Failure in the context of NEI 99-02 Rev. 0.

Extent of Condition

NRC IN 89-57 identified unqualified EQ splices in conduits within vendor supplied instrument racks. The racks contained wire junction boxes and differential pressure indicating switches (DPISs) manufactured by Barton. An extent of condition review was therefore conducted which identified all instrument racks, which contained environmentally qualified Barton switches (DPIS and other types). It was also assumed that unqualified wire or wire terminations might exist in other environmentally qualified instrument racks supplied by the vendor that supplied the racks containing the Barton switches.

This review identified six-instrument rack mounted Barton switches. The junction box for each rack-mounted switch was inspected and an inspection was conducted for Okonite tape splices as well. This inspection did not identify any additional instances of the use of unqualified wire or wire terminations.

The review also identified 23 additional environmentally qualified components mounted in vendor supplied instrument racks. All of these components are pressure switches manufactured by SOR.

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Extent of Condition (cont'd.)

The inspection and work history evaluation of the SOR pressure switches revealed they were all replaced since the instrument rack was initially installed. The replacement SOR pressure switches are sealed units supplied with 17-foot pigtails. These pigtails are landed directly on a conformal-coated terminal block in the local junction box (typically a few feet away). An inspection of 13 of 23 switches confirmed that pull boxes contained only the switch pigtails. There were no splices of any type.

It is concluded that the extent of condition is limited to EQ devices in vendor supplied instrument racks. EQ equipment mounted in vendor supplied instrument racks was either replaced and re-wired by JAFNPP personnel, and/or inspected and found to not contain splices or wire of unknown qualification.

Corrective Action

1. Unqualified wire and wire terminations for the control circuits for the minimum flow valves for the A & B CSP pumps and the HPCI pump were replaced.
(Complete)
2. The EQ equipment Qualification Document Reports (QDR) are being upgraded in accordance with an EQ Improvement Plan which predated this event. During the QDR upgrade process, the corrective actions from the previous review of Generic Letters, Information Notices, Bulletins and Circulars are reviewed for adequacy. If a corrective action is determined to be inadequate, the operating experience document is reopened for review.

The QDR upgrade process will therefore evaluate the response to NRC generated operating experience documents relevant to environmental qualification. (The QDR upgrade process is scheduled to be complete July 1, 2002)

Additional Information

Previous Similar Events: None