

## REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

SUBJECT: LER 88-024-00:on 881028,inoperable containment fan coolers  
due to lack of environ qualified splices on motor leads.  
W/8 ltr.

**NOTES:**

A 10-4

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NRC Form 366  
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/88

## LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) H.B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2										DOCKET NUMBER (2) 0 5 0 0 0 2 6 1 1				PAGE (3) 1 OF 4								
TITLE (4) INOPERABLE CONTAINMENT FAN COOLERS DUE TO LACK OF ENVIRONMENTALLY QUALIFIED SPLICES ON MOTOR LEADS																						
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 NAMES				DOCKET NUMBER(S)									
1	0	2	8	8	8	8	8	0	2	4	0	0	1	1	2	3	8	8	0 5 0 0 0 0			
OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)																				
N		20.402(b)				20.405(c)				50.73(a)(2)(iv)				73.71(b)								
POWER LEVEL (10)		1 0 0				20.405(a)(1)(i)				50.73(a)(2)(v)				73.71(c)								
		20.405(a)(1)(ii)				50.38(c)(1)				X 50.73(a)(2)(vii)				X OTHER (Specify in Abstract below and in Text, NRC Form 366A)								
		20.405(a)(1)(iii)				50.38(c)(2)				50.73(a)(2)(viii)(A)												
		20.405(a)(1)(iv)				50.73(a)(2)(i)				50.73(a)(2)(viii)(B)												
		20.405(a)(1)(v)				50.73(a)(2)(ii)				50.73(a)(2)(ix)				50.49								
		20.405(a)(1)(vi)				50.73(a)(2)(iii)																
LICENSEE CONTACT FOR THIS LER (12)																						
NAME Don Sayre, Senior Specialist - Regulatory Compliance										TELEPHONE NUMBER AREA CODE 8 0 3 3 8 3 - 1 2 4 2												
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																						
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDOS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDOS												
SUPPLEMENTAL REPORT EXPECTED (14)												EXPECTED SUBMISSION DATE (15)		MONTH	DAY	YEAR						
YES (If yes, complete EXPECTED SUBMISSION DATE)												X NO										

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

On October 27, 1988, the licensee determined that certain cable splice configurations inside Containment on the power cables to the motors of the four Reactor Containment Fan Coolers, HVH-1 through HVH-4, were neither environmentally qualified nor qualifiable. The licensee had discovered the questionable splices during an ongoing evaluation of the Plant Environmental Qualification program. The questionable splices had been installed prior to initial Plant startup before environmental qualification regulations were developed. The licensee declared the four HVH units inoperable, although they remained in service, and immediately initiated Plant shutdown to hot shutdown condition. The NRC Operations Center was notified of the shutdown in accordance with 10CFR50.72. Hot Shutdown was achieved at 0203 hours, October 28. The splices of concern were the pigtail-to-penetration motor lead splices inside Containment. These splices were replaced with known environmentally qualified splice configurations. The Plant was returned to power operation following the replacements, at 1746 hours, October 29, 1988. This LER is submitted pursuant to 10CFR50.49 and 10CFR50.73(a)(2)(vii).

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## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		8   8	—   0   2   4	—   0   0	0   2	OF 0	4

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

## I. Description of Event

On Thursday, October 27, 1988, the licensee determined that certain splice configurations on the power cables to the motors of the four Reactor Containment Fan Coolers were neither environmentally qualified nor qualifiable.<sup>1,2,3</sup> The licensee discovered the questionable splices during an ongoing evaluation of the Plant Environmental Qualification Program.<sup>4</sup> The splices of concern included the pigtail-to-penetration splices of the motor leads inside Containment. These splices utilized an unqualified heat shrink material.

The licensee's Plant Nuclear Safety Committee held a special session to assess the impact of the configurations on continued safe reactor operation.<sup>5</sup> The Committee determined that the four Reactor Containment Fan Coolers should be declared inoperable and the Plant must immediately proceed to hot shutdown conditions in accordance with Plant Technical Specifications.<sup>6</sup> The licensee notified the NRC Operations Center of Plant shutdown pursuant to the requirements of 10CFR50.72.

Hot shutdown was achieved at 0203 hours the following morning, October 28, 1988.

The unqualified cable splice configurations were removed and replaced with known qualified splices and the Plant was returned to power operation at 1746 hours, October 29, 1988.<sup>7</sup>

- 1/ H. B. Robinson Steam Electric Plant, Unit No. 2 is a Westinghouse Pressurized Water Reactor nuclear power plant, in commercial operation since March 1971.
- 2/ HVH-1 through HVH-4.
- 3/ EIIIS Codes: System - BK; Component - CLR; Manufacturer - W120.
- 4/ Letter, E. E. Utley, CP&L, to J. Lieberman, NRC, Serial: NLS-88-188, dated September 1, 1988.
- 5/ PNSC Meeting No. 1314.
- 6/ Technical Specification 3.3.2.1.c requires all four fan cooler units to be operable whenever the reactor is made critical, including all essential features associated. Specification 3.3.2.2.1 allows for one fan cooler unit or its flow path to become inoperable during normal reactor operation for a period not to exceed 24 hours, provided both Containment Spray pumps are demonstrated to be operable. Specification 3.3.2.3 applies both conditions to Hot Shutdown while extending the period of inoperability to 48 hours.
- 7/ Plant Maintenance Work Request No. 88-ALBM1 installed environmentally qualified splices on the power cable pigtail-to-penetration and pigtail-to-field-cable splices in accordance with Plant Corrective Maintenance procedure No. CM-309 and Engineering Evaluation No. 88-143.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/88

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
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TEXT (If more space is required, use additional NRC Form 366A's) (17)

## II. Cause of Event

The unqualified splice configurations were installed during original Plant construction.<sup>8</sup> At the time of installation, the requirements and regulations for the environmental qualification of electrical equipment were addressed by design and construction specifications, codes, and standards for safety-related equipment, prior to the existence of 10CFR50.49 and its precursors.

## III. Analysis of Event

The lack of environmental qualification documentation for the power cable splices for the four Reactor Containment Fan Coolers made the fan cooler units inoperable, a violation of Plant Technical Specifications during power operation and Hot Shutdown.<sup>6</sup> Upon discovery, the licensee immediately took action to place the Plant in a safe condition.

The lack of environmental qualification documentation for the splices of issue was identified by the licensee's ongoing evaluation of the Plant Environmental Qualification Program.<sup>4</sup>

In 1987, the NRC had questioned the environmental qualification of certain pigtail-to-penetration cable splices inside Containment.<sup>9</sup> The focus of the NRC inspection had been on electrical leakage from splices on instrumentation penetrations. The licensee had resolved these concerns and had shifted attention to cable splices on other cable, including power cable.<sup>4</sup>

## IV. Corrective Actions

The licensee initiated hot shutdown procedures upon discovery of the lack of environmental qualification documentation for the Reactor Containment Fan Cooler power cable splices.

The splices of issue were removed and replaced with known environmentally qualified splices.

Licensee evaluation of the Plant Environmental Qualification Program is continuing.

8/ Cause Code: B.

9/ NRC Inspection Report No. 50/261/87-10, dated July 23, 1987.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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

## V. Additional Information

## A. Failed Component Identification

The power cable splices of issue included the pigtail-to-penetration splices for the four Reactor Containment Fan Coolers.

HVH-1 Cable 2511A	Penetration D5	Six one-conductor	500MCM
HVH-2 Cable 2512A	Penetration D1	Six one-conductor	500MCM
HVH-3 Cable 2513A	Penetration C6	Six one-conductor	500MCM
HVH-4 Cable 2514A	Penetration C8	Six one-conductor	500MCM

HVH-1 and 2 are powered by Emergency Bus E1. HVH-3 and 4 are powered by Emergency Bus E2.

## B. Previous Similar Events

LER-87-003-01 reported the lack of environmental qualification documentation for a splice on the power lead to a Safety Injection System valve operator.<sup>9,10</sup> The splice in question was located at the pigtail-to-cable connection.

LER-87-007-01 reported the lack of environmental qualification documentation for various components due to inadequate program management.<sup>9,11</sup> The event report included the lack of demonstration of environmental testing of penetration pigtail splices for instrumentation and control cables.

LER-88-015-00 reported the lack of environmental qualification documentation for certain safety-related pump motors and power cables.<sup>12</sup>

<sup>10/</sup> Letter, R. E. Morgan, CP&L, to NRC, Serial: RNP/88-2732, dated June 12, 1987.

<sup>11/</sup> Letter, R. E. Morgan, CP&L, to NRC, Serial: RNP/88-4695, dated October 21, 1988.

<sup>12/</sup> Letter, R. E. Morgan, CP&L, to NRC, Serial: RNP/88-3255, dated July 21, 1988.[LER-88-S03-00]



Carolina Power & Light Company

ROBINSON NUCLEAR PROJECT DEPARTMENT  
POST OFFICE BOX 790  
HARTSVILLE, SOUTH CAROLINA 29550

NOV 23 1988

Robinson File No: 13510C

Serial: RNP/88-5722  
(10 CFR 50.73)

United States Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, D. C. 20555

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2  
DOCKET NO. 50-261  
LICENSE NO. DPR-23  
LICENSEE EVENT REPORT 88-024-00

Gentlemen:

The enclosed Licensee Event Report (LER) is submitted in accordance with 10 CFR 50.73 and NUREG-1022 including Supplements No. 1 and 2.

Very truly yours,

R. E. Morgan  
General Manager  
H. B. Robinson S. E. Plant

DAS:jch

Enclosure

cc: Mr. M. L. Ernst  
Mr. L. W. Garner  
INPO

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