

## REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 8706170504	DOC. DATE: 87/06/12	NOTARIZED: NO	DOCKET #
FACIL: 50-261	H. B. Robinson Plant, Unit 2,	Carolina Power & Light C	05000261
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RECIP. NAME	RECIPIENT AFFILIATION		

SUBJECT: LER 87-003-01: on 870414, environ qualification cable splice deficiencies identified. Caused by poor workmanship. Cable splice removed & replaced & installation procedure for heat shrinkable tubing revised. W/870612 ltr.

DISTRIBUTION CODE: IE22D COPIES RECEIVED: LTR 1 ENCL 1 SIZE:  
TITLE: 50.73 Licensee Event Report (LER), Incident Rpt, etc.

NOTES:

RECIPIENT		COPIES		RECIPIENT		COPIES	
ID CODE/NAME	LTTR	ENCL	ID CODE/NAME	LTTR	ENCL	ID CODE/NAME	LTTR
PD2-1 LA	1	1	PD2-1 PD	1	1		
ECCLESTON, K	1	1					
INTERNAL: ACRS MICHELSON	1	1	ACRS MOELLER	2	2		
AEOD/DOA	1	1	AEOD/DSP/ROAB	2	2		
AEOD/DSP/TPAB	1	1	DEDRO	1	1		
NRR/DEST/ADE	1	0	NRR/DEST/ADS	1	0		
NRR/DEST/CEB	1	1	NRR/DEST/ELB	1	1		
NRR/DEST/ICSB	1	1	NRR/DEST/MEB	1	1		
NRR/DEST/MTB	1	1	NRR/DEST/PSB	1	1		
NRR/DEST/RSB	1	1	NRR/DEST/SGB	1	1		
NRR/DLPQ/HFB	1	1	NRR/DLPQ/QAB	1	1		
NRR/DOEA/EAB	1	1	NRR/DREP/RAB	1	1		
NRR/DREP/RPB	2	2	NRR/PMAS/ILRB	1	1		
NRR/PMAS/PTSB	1	1	REG FILE	02	1		
RES DEPY GI	1	1	RGN2 FILE	01	1		
EXTERNAL: EG&G GROH, M	5	5	H ST LOBBY WARD	1	1		
LPDR	1	1	NRC PDR	1	1		
NSIC HARRIS, J	1	1	NSIC MAYS, G	1	1		

## LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) H. B. Robinson Steam Electric Plant, Unit 2	DOCKET NUMBER (2) 0 5 0 0 0 2 6 1	PAGE (3) 1 OF 0 3
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TITLE (4)  
EQ Cable Splice Deficiencies

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)
0 4	1 5	8 7	8 7	0 0 3	0 1						0 5 0 0 0
0 5 0 0 0											

OPERATING MODE (9) N		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)									
POWER LEVEL (10) 0 0 1 0	20.402(b)		20.406(c)		50.73(a)(2)(iv)		73.71(b)				
	20.406(a)(1)(i)		50.38(c)(1)		50.73(a)(2)(v)		73.71(c)				
	20.406(a)(1)(ii)		50.38(c)(2)		50.73(a)(2)(vi)		OTHER (Specify in Abstract below and in Text, NRC Form 366A)				
	20.406(a)(1)(iii)		50.73(a)(2)(i)		50.73(a)(2)(viii)(A)						
	20.406(a)(1)(iv)	X	50.73(a)(2)(ii)		50.73(a)(2)(vii)(B)						
	20.406(a)(1)(v)		50.73(a)(2)(iii)		50.73(a)(2)(ix)						

LICENSEE CONTACT FOR THIS LER (12)		TELEPHONE NUMBER	
NAME Don Sayre, Senior Specialist - Regulatory Compliance	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 NRC		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	
B	EIC	CIBL4		Y							

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> NO				

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

On April 14, 1987, while Unit 2 was in cold shutdown for a refueling outage, a questionable cable splice was identified by inspection. The following day, this heat shrinkable tubing splice configuration was determined not to satisfy the installation acceptance criteria and not to demonstrate proper environmental qualification. The splice was installed to connect a pigtail from an electrical penetration assembly in Containment and the 480V power lead to the motor on a cold leg Safety Injection valve.

The improper cable splice installation was due to failure to properly follow the procedure specified in the Plant modification which installed the splice.

The splice was removed and replaced with a satisfactory environmentally qualified configuration. In addition, the installation procedure was revised to require QC inspection of installations. As additional corrective action, an inspection program was initiated to verify proper cable splice configurations based on a representative sample of heat shrinkable tubing splices. As a result, other splices were removed and replaced with proper environmentally qualified configurations.

Unit 2 remained in cold shutdown for completion of the refueling outage.

Implementation of the inspection program was completed during the cold shutdown interval. Identification of three apparent causes of improper splice installation resulted: 1) Incorrect sleeve sizes; 2) Poor workmanship; and 3) Failure to follow installation instructions. A total of 120 splices were examined and 50, determined not to meet the acceptance criteria, were replaced. Another 56 splices were replaced based on generic installation problems also identified. QA verification of compliance with vendor installation recommendations was also required.

NRC Form 386A  
(9-83)

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO 3150-0104

EXPIRES 8/31 85

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
H. B. Robinson S. E. Plant, Unit No. 2	05000261	87	-003	-01	02	OF 03	

TEXT (If more space is required, use additional NRC Form 386A's) (17)

EVENT DESCRIPTION

On April 14, 1987, while Unit 2 was in cold shutdown for a refueling outage, a questionable environmentally qualified cable splice was identified by inspection. The following day, at 1030 hours, this heat shrinkable tubing splice, connecting an electrical penetration assembly pigtail to the 480V power lead to the motor on cold leg Safety Injection (SI) Valve SI-866A, was determined to be in a configuration that did not satisfy the installation acceptance criteria. Later that day, at 1230 hours, the configuration was evaluated to be unable to demonstrate proper environmental qualification.

The splice in question was a Raychem WCSF-200-12N splice installed between the 3-conductor pigtail from plug number 7 of Containment electrical penetration assembly number D-8 and 3-conductor 480V power lead to the SI-866A motor, cable number C2241A. The as-found configuration involved a sleeve with an overall jacket length of about 12 1/4 inches. The seal at one end was about 5 1/4 inches, but there was no apparent seal at the other end as indicated by an overlap of about 1/2 inch and no sign of internal adhesive flow. Also, the application required a Raychem WCSF-500-12N splice instead of the undersized type used.

The NRC was notified of a nonemergency event (four-hour notification), in accordance with 10 CFR 50.72(b)(2)(i).

CAUSE

The improper cable splice installation was due to poor workmanship under Plant Modification 521 in 1980. The incorrect size splice material was specified in the modification, and the installation instructions for an environmentally qualified seal were not properly followed.

CORRECTIVE ACTION

The original cable splice was removed and replaced with a Raychem WCSF-500-12N splice. QA inspection of the completed configuration was accomplished May 9, 1987.

The installation procedure for heat shrinkable tubing was revised to require QC inspection of installation to assure proper application of Raychem sleeves at locations where required for environmental qualification.

As additional corrective action, a special inspection program was initiated to verify proper environmentally qualified cable splice configurations based on a representative sample of heat shrinkable tubing splices. As a result, a follow-up notification was made April 18, 1987, in accordance with 10 CFR 50.72(c), to identify additional splices requiring replacement.

Unit 2 remained in cold shutdown for completion of the refueling outage.

Supplemental information on the full scope of the Raychem splice inspection and evaluation program is attached.

NRC Form 388A  
(9-83)

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO 3150-0104  
EXPIRES 8/31 85

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (8)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
H. B. Robinson S. E. Plant, Unit No. 2	05000261	87	01	03	01	03	OF 03

TEXT (If more space is required, use additional NRC Form 388A's) (17)

SUPPLEMENT

The inspection program was designed to identify improperly installed cable splices and to determine any generic installation deficiencies. The selection of items for inspection was based on a random sample of splices installed under all of the splice installation procedures used. As a result, three apparent problem areas were identified:

1. Improperly sized splice sleeving material.
2. Poor workmanship.
3. Failure to follow installation instructions.

A total of 120 splices was inspected: 70 were found acceptable and 50 were found not to meet the acceptance criteria and, therefore, were determined unqualifiable under 10 CFR 50.49.

Based on the inspection results from each of the installation procedure samples, a determination was made whether to expand the scope of the inspection program, replace Raychem splices, or discontinue inspection. Where improper sleeve sizes were specified in the Plant installation modification package, all affected splices were replaced with the correct size for the application. Where poor workmanship and failure to follow installation instructions were apparent, all of the splices installed in environmentally qualified electrical circuits under the applicable installation procedure were replaced. Where good workmanship was found and the inspection acceptance criteria were met by at least twenty-five percent of the splices installed under a given procedure, all splices applied by the procedure were considered acceptable. Where random problems were identified, the inspection scope was expanded to include all of the splices installed under the specific procedure.

To prevent the recurrence of unacceptable splice replacement installation, QC verification of compliance with the Raychem splice installation recommendations was required. A total of 106 splices was replaced, including 50 found unacceptable by inspection and 56 additional splices of questionable quality based on generic problems identified by inspection.

As of this writing, Unit 2 is progressing with heatup to return to normal power operation in accordance with the Plant start-up schedule.



Carolina Power & Light Company

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

JUN 12 1987

Robinson File No: 13510C

Serial: RNP/87-2732  
(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 87-003, REVISION 1

Dear Sir:

The enclosed supplemental Licensee Event Report (LER) is submitted in accordance with the Licensee Event Report System of 10 CFR 50.73. The original LER of May 15, 1987, described a questionable environmentally qualified heat shrinkable tubing cable splice. This supplement to the LER provides additional information on the corrective action inspection and evaluation program implemented to resolve the specific splice issue and to assure continued compliance with environmental qualification regulations.

This supplemental LER, Revision 1, should replace all existing copies of the original report.

The format of the supplement follows the recommendations of NUREG-1022 of September 1983.

Very truly yours,

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

DAS:sdm

Enclosure

cc: J. N. Grace  
H. E. P. Krug  
INPO

IE22  
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