

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 8010070604 DOC. DATE: 80/10/02 NOTARIZED: NO DOCKET #
 FACIL: 50-261 H. B. Robinson Plant, Unit 2, Carolina Power and Light 05000261
 AUTH. NAME AUTHOR AFFILIATION
 STARKEY, R. B. Carolina Power & Light Co.
 RECIP. NAME RECIPIENT AFFILIATION
 Region 2, Atlanta, Office of the Director

SUBJECT: LER 80-022-01T: on 800918, during refueling outage, review of
 eddy current insp data revealed results in C-3 category
 defined by Tech Specs. Caused by defective tubes in A & B
 steam/generator inlets & outlets due to corrosion.

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 TITLE: Incident Reports

NOTES:

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ACTION:	VARGA, S. 04		3 3				
INTERNAL:	A/D COMP&STRU06	1	1		A/D ENV TECH 07	1	1
	A/D MATL & QU08	1	1		A/D OP REACT009	1	1
	A/D PLANT SYS10	1	1		A/D RAD PROT 11	1	1
	A/D SFTY ASSE12	1	1		A/D TECHNOLOG13	1	1
	ACC EVAL BR 14	1	1		AEOD	2	2
	ASLBP/J. HARD	1	1		AUX SYS BR 15	1	1
	CHEM ENG BR 16	1	1		CONT SYS BR 17	1	1
	CORE PERF BR 18	1	1		D/DIR, HUM FAC19	1	1
	DIR, ENGINEER120	1	1		DIR, HUM FAC1 S21	1	1
	DIR, SYS INTEG22	1	1		EFF TR SYS BR23	1	1
	EQUIP QUAL BR25	1	1		GEOSCIENCES 26	1	1
	I&C SYS BR 29	1	1		I&E 05	2	2
	JORDAN, E./IE	1	1		LIC GUID BR 30	1	1
	LIC QUAL BR 31	1	1		MATL ENG BR 32	1	1
	MECH ENG BR 33	1	1		MPA	3	3
	NRC PDR 02	1	1		OP EX EVAL BR34	3	3
	OR ASSESS BR 35	1	1		POWER SYS BR 36	1	1
	RAD ASSESS BR39	1	1		REACT SYS BR 40	1	1
	REC FILE 01	1	1		REL & RISK A 41	1	1
	SFTY PROG EVA42	1	1		STRUCT ENG BR44	1	1
	SYS INTERAC B45	1	1				
EXTERNAL:	ACRS 46	16	16		LPDR 03	1	1
	NSIC 05	1	1		TERA: DOUG MAY	1	1

OCT 9 1980

LICENSEE EVENT REPORT

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1 6

0	1	S	C	H	B	R	2	2	0	0	-	0	0	0	0	0	0	-	0	0	3	4	1	1	1	0	4			5	
7	8	LICENSEE CODE						14	15	LICENSE NUMBER											25	26	LICENSE TYPE					30	57	CAT 58	

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60	61									68	69						74	75						80

DOCKET NUMBER

EVENT DATE

REPORT DATE

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

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0 2 During refueling outage, review of eddy current inspection data on 9/18/80 revealed

0 3 that the B S/G results were in the C-3 category as defined by Technical Specification

0 4 section 4.2.5.1.2(b). After additional inspections had been performed, a similar

0 5 review revealed that the A S/G results were also in the C-3 category. This is

0 6 reportable under Technical Specification 6.9.2a in accordance with Technical

0 7 Specification 4.2.5.3.3. As the plant was in the cold shutdown condition, there was

0 8 no threat to public health or safety. (Reference: LER 80-09)

7 8 9 COMP VALVE

7 8 9		SYSTEM CODE		CAUSE CODE		CAUSE SUBCODE		COMPONENT CODE				COMP. SUBCODE		VALVE SUBCODE					
0 9		C	A	11	E	12	D	13	H	T	E	X	C	H	14	F	15	Z	16
7 8		9	10	11	12	13	14	15	16	17	18	19	20	21					
17 LER/RO REPORT NUMBER		EVENT YEAR		SEQUENTIAL REPORT NO.		OCCURRENCE CODE		REPORT TYPE		REVISION NO.									
8 0		8 0		0 2 2		0 1		T		0									
21 22		23		24 25 26		27		28 29		30 31 32									
ACTION TAKEN		FUTURE ACTION		EFFECT ON PLANT		SHUTDOWN METHOD		HOURS		ATTACHMENT SUBMITTED		NPRD-4 FORM SUB.		PRIME COMP. SUPPLIER		COMPONENT MANUFACTURER			
X	18	Z	19	Z	20	Z	21	0 0 0 0	22	Y	23	N	24	N	25	W 1 2 0	26		
23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40		

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

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1 0 The inspection of A and B S/G inlets and outlets revealed 37 and 53 defective tubes

1 1 respectively. Since, in each case, more than one percent of the total number of tubes

1 2 remaining in service (100% inspected) were found to be defective, the results were

1 3 categorized C-3. All defective tubes were mechanically plugged. The defective

1 4 tubing was the result of outside diameter tube wall corrosion. A complete report

will be submitted.

7 8 9 FACILITY STATUS (30) METHOD OF DISCOVERY (32)
1 5 A (28) 0 0 0 (29) NA B (31) Annual Inspection 80
7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50
ACTIVITY CONTENT AMOUNT OF ACTIVITY (35) LOCATION OF RELEASE (36)
RELEASED OF RELEASE NA Z (33) Z (34) NA 80

PERSONNEL EXPOSURES									
NUMBER			TYPE	DESCRIPTION					
1	7	0	0	0	(37)	Z	(38)	NA	(39)

PERSONNEL INJURIES				DESCRIPTION	
1	8	0	0	0	40
1	8	0	0	0	40
					NA

7	8	9	11	12		
		LOSS OF OR DAMAGE TO FACILITY		(43)	8010070 604	
		TYPE DESCRIPTION			NA	
1	9	Z	(42)			

7 8 9 10 PUBLICITY (45)
ISSUED N (44) DESCRIPTION (45) NRC USE ONLY
2 0 7 8 9 10 68 69 8

NAME OF PREPARER

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SUPPLEMENTAL INFORMATION

FOR

LICENSEE EVENT REPORT 80-022

I. Cause Description and Analysis

During the 1980 refueling outage, a Steam Generator (S/G) Eddy Current Inspection was performed which met the requirements of Technical Specification (T.S.) sections 4.2.5.1.2 and 4.2.5.1.4. The inspection scope is shown below:

<u>S/G</u>	<u>Inlet (Original)</u>	<u>Outlet (Original Sample)</u>	<u>Outlet (Expanded)</u>
A	3032 (100%)	1587	2615
B	3106 (100%)	1859	2767
C	3075 (100%)	2132	NA

A review of E/C data on 9/18/80, after completion of the original inspection sample, revealed that 32 defective tubes had been identified by the B S/G inlet inspection. This placed B S/G results in the C-3 category as defined by Technical Specification section 4.2.5.1.2. On 9/23/80, as a result of additional defective tubes identified during the A S/G expanded outlet program, the results for this S/G placed it also in the C-3 category. The final number of defective tubes identified was 37 in A S/G and 53 in B S/G. In each case the number of defective tubes exceeded 1% of the initial inspection sample of 100% of the inlet tubes.

The defective tubes in A and B S/Gs were the result of phosphate thinning above the tubesheet on the inlet and outlet sides and local corrosion in the tubesheet crevice region on the inlet sides. The local corrosion is believed to be an intergranular attack and stress corrosion cracking phenomenon similar to that which has been observed at other plants.

Additional defective tubes in A S/G were the result of tube wall wastage at or above support plates in peripheral tubes and generalized tube wall corrosion in the U-bend regions. The U-bend corrosion has been demonstrated not to be a cracking phenomenon.

Since the unit was in the cold shutdown condition, there was never any threat to public health or safety as a result of this event.

II. Corrective Action

All tubes with eddy current indications greater than 47% (defective tubes) were taken out of service by mechanical plugging. This is consistent with the requirements of Technical Specification section 4.2.5.2.

III. Corrective Action to Prevent Further Occurrence

In order to determine the cause of U-bend tube degradation, two tube samples were removed from tubes in A S/G with known defects and subjected to destructive and non-destructive analyses. Preliminary examination results indicated a form of generalized corrosion. The non-destructive examination showed no evidence of cracking, and metallographically there was no evidence of a localized corrosion process accompanying the thinning process. Specifically, no intergranular attack or grain boundary penetration, such as might be associated with the actions of caustic on Inconel 600 was detected, and there was no intergranular attack of the kind that is attributable to stress assisted intergranular corrosion.

Evaluation of the samples and the data gathered to date is continuing in an attempt to identify the specific mechanism and/or contaminant responsible. Also sludge lancing was performed on each S/G this refueling outage, and this practice will be continued in order to minimize the phosphate thinning.

Continued close surveillance of the condition of the tube bundle via eddy current inspection will be continued. The scope of the inspection to be performed during the next refueling outage will be no less than the scope of the 1980 refueling outage inspection. In addition, continued close surveillance of S/G chemistry will be maintained.

The corrective actions described are considered adequate to ensure the continued safe condition of the H. B. Robinson Unit No. 2 steam generators for the next operating cycle. A complete report detailing this inspection, inspection results and justification for the existing plugging criteria will be submitted under separate cover.