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REC: OREILLY J P NRC	ORG: PARKER W O DUKE PWR	DOCDATE: 06/05/78 DATE RCVD: 06/14/78
DOCTYPE: LETTER SUBJECT: FORWARDING LICENSE AFTER REACHING TEC UNIT WAS SHUTDOWN CRACK, ONE TUBE CF	NOTARIZED: NO E EVENT REPT (RO 50-269/78 H SPEC LEAKAGE LIMIT OF PO FOR INVESTIGATION AND REPA ACK & T	COPIES RECEIVED LTR 1 ENCL 1 -013) ON 04/21/78 CONCERNING SSIBLE PRIMARY-TO-SECONDARY LEAK, IR INVESTIGATION FOUND ONE WELD
PLANT NAME: OCONEE	- UNIT 1	REVIEWER INITIAL: XJM DISTRIBUTOR INITIAL: K
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NOTES: 1. M. CUNNINGHAM -	- ALL AMENDMENTS TO FSAR AN	D CHANGES TO TECH SPECS
INCIDENT REPOR [*] (DISTRIBUTION (TS CODE A002)	
FOR ACTION:	BR CHIEF ORB#4 BC**W/4 EN	CL
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EXTERNAL	LPDR'S WALHALLA, SC**W/ENCL TIC**W/ENCL NSIC**W/ENCL ACRS CAT B**W/16 ENCL	AOK
DISTRIBUTION: L SIZE: 1P+2P+5P ****	TR 45 ENCL 45 ****** THE EN	CONTROL NBR: 781650245

UNITED STATES NUCLEAR REGULATORY COMM DDC DAILY ACCESSION LIST

05/04/78

FILE LEVELS DOC. DATE

50-466 HOUSTON LIGHTING & 50 466 C	POWER COMPAN 04/25/78	NY ALLENS CREEK #1 ACCESSION NBR: 78121-0206 DOCUMENT TYPE: LETTER DOCUMENT SIZE: 2P DOCKET DATE: REPORT NBR.	TASK NBR: FICHE NBR NOTARIZED: LPDR:
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		REQUEST THAT ENCL COMM	ENTS BE PLA

NRC=3031305=006

DUKE POWER CENERATORY DUCKEF FILE COPY

Power Building 422 South Church Street, Charlotte, N. C. 28242

WILLIAM O. PARKER, JR. VICE PRESIDENT STEAM PRODUCTION

R sc'd 06/14/18

TELEPHONE: AREA 704 373-4083

June 5, 1978

Mr. James P. O'Reilly, Director U. S. Nuclear Regulatory Commission Suite 1217 230 Peachtree Street, Northwest Atlanta Georgia 30303

Re: Oconee Unit 1 Docket No. 50-269

Dear Mr. O'Reilly:

My letter of May 5, 1978 informed your staff of a suspected primary-to-secondary leak. Pursuant to Sections 6.2 and 6.6.2 of the Oconee Nuclear Station Technical Specifications, please find attached Reportable Occurrence Report RO-269/78-13.

Verx truly yours, Jac. c 1) autu Williom O. Parker, Jr(

KRW/dsc Attachments

cc: Director, Office of Management Information and Program Control

781650245

DUKE POWER COMPANY OCONEE UNIT 2

Report Number: RO-269/78-13

Report Date: June 5, 1978

Occurrence Date: April 27, 1978

Facility: Oconee Unit 2, Seneca, South Carolina

Identification of Occurrence: Primary-to-Secondary Leak in 1B Once Through Steam Generator (OTSG)

Conditions Prior to Occurrence: 100% FP

Description of Occurrence:

At 0346 on April 20, 1978, an alarm on RIA40 indicated a possible primary-tosecondary leak in Unit 1. At 0930 the leak rate was calculated to be 0.14 gpm. The leak rate gradually increased to 0.33 gpm on April 21, 1978. This exceeded Technical Specification 3.1.6.4 limits for leakage and a shutdown was commenced at 1205. The unit was in cold shutdown at 1600 on April 23, 1978. An initial hydrostatic test in OTSG B was performed on April 28, 1978. Pressure was held at 150 psi from 0000 on April 29 to 0800 on May 2, 1978. A possible tube leak, later identified as tube 69-1, was observed. On May 9, 1978, repair work was completed and OTSG was refilled and pressurized for a second hydrostatic test. At 0030 on May 10, 1978, a weld leak on 69-1 was verified. Tube 69-1 was repaired and OTSG was refilled for further inspection. Tubes 74-2 and 59-1 were also observed to be possibly leaking during the tests. Tube 74-2 was verified to be leaking near the Upper Tube Sheet (UTS) and Eddy Current (EC) tests verified a 45-90⁰ circumferential crack. Tubes 70-1 and 59-1 were thought to be leaking but EC indications showed no degradation in excess of 10% wall thinning. Repair work was completed and OTSG passed a final leak test on May 14, 1978.

Apparent Cause of Occurrence:

Several instances of tube leaks have occurred during the operation of the Oconee Nuclear Station (see attachment). Various failure mechanisms have been postulated and researched. This matter is the subject of continued investigation by both Duke and Babcock & Wilcox (Oconee NSSS vendor). Several submittals and discussions have been made with regard to this subject.

The initial leakage may have been caused by one or more of the tubes plugged. Tube 69-1 had a weld crack on the Lower Tube Sheet (LTS). The circumferential crack on 74-2 was a fatigue-failure type crack of very small magnitude. Tubes 70-1 and 59-1 were observed to be possibly leaking but no evidence of degradation through Eddy Current investigations was verified. Lane tube 77-27 was to be removed for analysis but extraction was unsuccessful, so the tube was stabilized and plugged. DUKE POWER COMPANY OCONEE UNIT 2 (Cont'd)

Analysis of Occurrence:

Primary-to-secondary leakage constitutes degradation of the reactor coolant boundary. The leak test following the repair operations verified the reestablishment of the boundary. The leakage was well within the capacity of one HPI train so that no significant loss of coolant to the primary system could have resulted from the incident. The investigation and repair operations verified the integrity of the RC boundary. The investigation and repair operations resulted in 130 individuals receiving a cumulative radiation dose of 51.7 man-rem. The gaseous activity released during the incident was calculated to be 2.83 Ci which is insignificant when compared to normal release limits. The effect of additional activity in the secondary system was negligible with regard to offsite releases. This occurrence did not endanger the health and safety of the general public.

Corrective Action:

The accepted manner of correcting OTSG tube leakage or in preventing leaks in degraded tubes is explosive plugging. Five tubes in the 1B OTSG were plugged: 69-1, 70-1, 74-2, 59-1 and 74-27.

Tube 69-1 was plugged and the tube/LTS weld was repaired.

Tube 74-2 was plugged due to crack near UTS.

Tubes 70-1, and 59-1 were plugged as a preventative measure.

Tube 74-27 was plugged and stabilized after attempts to remove it were unsuccessful.

Investigation of a generic nature is continuing by both Duke and Babcock & Wilcox.

NRC FORM 366

NRC FORM 36 (7-77)	U.S. NUCLEAR REGULATORY CO	MMISSION
	LICENSEE EVENT REPORT EX	HIBIT A
CO	TROL BLOCK:	
	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	5
	AEPORT SOURCE 50 61 DOCKET NUMBER 58 69 EVENT DATE 74 75 REPORT DATE 8])
	T DESCRIPTION AND PROBABLE CONSEQUENCES (1) uring normal operations on April 20, RIA 40 alarmed indicating a possib	ole (
	rimary-to-secondary leak. On April 21, after reaching TS leakage limit	-,
04 Lt	he unit was shutdown for investigation and repair. Initial hydro tests	were
05 Li	nconclusive. Continued investigation verified one weld crack, one tube	<u>}</u>
	rack, and two other suspect tubes. Attempts to remove another tube fai	led.
	he event did not affect public health and safety.	
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	$\begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} $	80
	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	N. DNENT DCTURER 1 5 3
	ne leakage originated in one or more of the four plugged tubes (not inc	lud- I
	ng 'removed' tube). Only two 69-1 (weld) and 74-2 (crack) had	
	rified failures. All five tubes were plugged. Investigations by Duke	and
	& W are continuing.	
]
	x POWER OTHER STATUS Image: Stat	50
RELEASE	OF RELEASE AMOUNT OF ACTIVITY (35) LOCATION OF RELEASE (36) 33 M (34) 2.83 Ci total Vent to atmosphere 10 11 44 46	
1 7 1 3 7 8 9 PER	ABER TYPE DESCRIPTION (39) 0 37 E 38 51.7 man-rem total exposure SONNEL INJURIES	
	$\begin{array}{c} \text{Her} & \text{Description} (41) \\ 0 & 0 & 1 \\ 11 & 12 \\ \end{array}$	1
	OR DAMAGE TO FACILITY (1) DESCRIPTION 2) NA	80
	DESCRIPTION (45) NRC USE ONLY • explanation of unscheduled outage • I I I I I I I I	80 Y
. 8 3	NAME OF PREPARER K. R. Wilson PHONE (704) 373-8197	80

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GENERATOR	ROW	TUBE	ELEVATION	DATE	LANE TUBE	LEAKER	CONDITION	ACTION	RO#	<pre># TUBES EXAMINED (excludes leakers)</pre>
1-A	77	17	UTS	10/31/76	Yes	No	Crack	Plugged	RO-269/76-17	15
1-A	77	18	UTS	10/31/76	Yes	No	Distorted Eddy Current Signal	Plugged		
1-В	114	109	l4th Plate	12/8/76	No	Yes	No Visual Inspection	Nailed	RO-269/76-19	139
1-B	113	115	14th Plate	12/8/76	No	No	Distorted Eddy Current Signal	Plugged		
1-B	113	110	14th Plate	12/8/76	No	No	Similar to 114/109	Nailed		
1-B	75	18	UTS	12/8/76	Yes	No	300 ⁰ Crack	Nailed		
1-B	75	12	UT S	1/15/77	Yes	Yes	350 ⁰ Crack	Nailed	RO-269/77-2	140
1-B	81	128	UT S	1/15/77	No	No	Eddy Current Indication	Nailed		
1-B	32	13	l4th Plate	2/28/77	No	Yes	Eddy Current Indication	Nailed	RO-269/77-8	3%
1-B	33	14	14th Plate	2/28/77	No	No	Eddy Current Indication	Nailed		•
1-B	77	25	14th Plate	2/28/77	Yes	No	Eddy Current Indication	Removed		
1-B	2	7	13th Plate	2/28/77	No	No	Eddy Current Indication	Plugged		
1-B	2	8	13th Plate	2/28/77	No	No	Eddy Current Indication	Plugged		

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GENERATOR	ROW	TUBE	ELEVATION	DATE	LANE TUBE	LEAKER	CONDITION	ACTION	RO#	<pre># TUBES EXAMINED (excludes leakers)</pre>
1-B	101	40	4th Plate	2/28/77	No	No	Eddy Current Indication	Plugged		
1-B	77	25	UT S	3/22/77	Yes	Yes	Weld Crack	Replugged	RO-269/77-11	100
1-B	77	3,5,8		3/22/77	Yes	No	Distorted Eddy Current Signal	Plugged		
1-B	77	15	UTS	5/7/77	Yes	Yes	Crack	Plugged	RO-269/77-16	507
1-B	77	18		5/7/77	Yes	No		Removed		
1-В	17	5		5/7/77	No	No	Distorted Eddy Current Signal	Plugged		
2-в	77	23	UT S	12/4/76	Yes	Yes	270 ⁰ Crack, Hole	Removed	RO-270/76-15	133
2-В	77	27	15th Plate	12/4/76	Yes	No	Wear Appearance	Removed		
2-в	124	42	l2th Plate	12/4/76	No	No	Eddy Current Indication, 40-60%	Plugged		
2-В	118	52	l2th Plate	12/4/76	No	No	Similar to 124/42, 15%	Left		
3-в	77	11	15th Plate	7/21/76	Yes	Yes	No Visual Inspection	Plugged	RO-287/76-10	9
3-B	77	19	15th Plate	2/14/77	Yes	Yes	Eddy Current 45 [°] Crack	Nailed	RO-287/77-2	142

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GENERATOR	ROW	TUBE	ELEVATION	DATE	LANE TUBE	LEAKER	CONDITION	ACTION	RO#	<pre># TUBES EXAMINED (excludes leakers)</pre>
3-B	77	12,13, 16,17, 21	14,15 18,20,	2/14/77	Yes	No	Eddy Current	Nailed		
3 - B	75	2		2/14/77	Yes	No	Eddy Current	Nailed		
3-B	78	1	15th Plate	6/10/77	No	Yes	90 ⁰ Crack & 1/8" longitudinal	Nailed	RO-287/77-8	133
3-B	77	2	UTS	7/14/77	Yes	Yes	60 [°] -90 [°] Crack	Nailed	RO-287/77-10	120
3-B	77	1		7/14/77	Yes	No			Nailed	
2-B	77	25	UTS	1/14/78	Yes	Yes	90 ⁰ Crack	Nailed	RO-270/77 - 12	
2-B	75	21		1/14/78	Yes	No	Eddy Current Indication, SOAK	Plugged		
2-B	77	4		1/14/78	Yes	No	Eddy Current Indication, SOAK	Plugged		
2 - B	77	18		1/14/78	Yes	No	Eddy Current Indication, SOAK	Plugged		
2-B.	77	19		1/14/78	Yes	No	Eddy Current Indication, SOAK	Plugged		
2-B	77	21		1/14/78	Yes	No	Eddy Current Indication, SOAK	Plugged		
2 - B	78	4		1/14/78	Yes	No	Eddy Current Indication, SOAK	Plugged		

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GENERATOR	ROW	TUBE	ELEVATION	DATE	LANE TUBE	LEAKER	CONDITION	ACTION	RO#	<pre># TUBES EXAMINED (excludes leakers)</pre>
1-B	69	1	LTS	4/21/78	No	Yes	Weld Leak	Plugged Rewelded	RO-269/78-13	478
1-B	70	1		4/21/78	No	No	Visibly leaking (possibly)	Plugged		
1-B	59	1		4/21/78	No	Yes	Visibly leaking (possibly)	Plugged		
1-B	74	2	UTS	4/21/78	No	Yes	45-90 ⁰ Crack	Plugged		
1-B	77	27		4/21/78	Yes	No	Removal Attempt	Nailed		

UTS - Upper tubesheet LTS - Lower tubesheet SOAK - "Second-of-a-kind" instrumentation