

**LICENSEE EVENT REPORT (LER)**

FACILITY NAME (1)						DOCKET NUMBER (2) 0   5   0   0   0   2   8   7								PAGE (3) 1 OF 0   3							
Oconee Nuclear Station, Unit 3																					
TITLE (4) Unit 3 Shutdown for Steam Generator Tube Leak																					
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 NO.: 1B (15) 0   5   0   0   0   2   8   7						
1	1	0	6	8	4	8	4	0	0	6	0	0	1	2	0	6	8	4			
OPERATING MODE (9)				THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)																	
POWER LEVEL (10) 1   0   0				20.402(b)				20.405(c)				50.73(a)(2)(iv)				73.71(b)					
				20.405(a)(1)(i)				50.36(e)(1)				50.73(a)(2)(v)				73.71(c)					
				20.405(a)(1)(ii)				50.36(e)(2)				50.73(a)(2)(vi)				OTHER (Specify in Abstract below and in Text, NRC Form 365A)					
				20.405(a)(1)(iii)				X 50.73(a)(2)(i)				50.73(a)(2)(vii)(A)									
				20.405(a)(1)(iv)				50.73(a)(2)(ii)				50.73(a)(2)(vii)(B)									
				20.405(a)(1)(v)				50.73(a)(2)(iii)				50.73(a)(2)(x)									
LICENSEE CONTACT FOR THIS LER (12)																					
NAME Richard F. Haynes - Licensing												TELEPHONE NUMBER AREA CODE 7   0   4    3   7   3   -   7   1   2   9									
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																					
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS												
B	RIC	HIXI I	BIO I I 5	Y																	
SUPPLEMENTAL REPORT EXPECTED (14)																					
YES (If yes, complete EXPECTED SUBMISSION DATE)												NO		EXPECTED SUBMISSION DATE (15)		MONTH		DAY		YEAR	
												X									

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

On November 6, 1984, Unit 3 was operating at 100% full power. At approximately 0420 hours, the radiation-detecting instrument which monitors the off-gas from the condensate steam air ejectors (CSAEs) showed a rapid increase in count rate. This sudden increase was directly indicative of a significantly enlarged primary-to-secondary coolant leak in one of the Unit 3 Once Through Steam Generators (OTSGs). OTSG 3A was subsequently identified as containing the leaking tubes. Station personnel had been aware that a small tube leak existed within OTSG 3A since June 28, 1984; the leak had been monitored closely prior to November 6th, but its magnitude had remained below the detectable limits for precisely locating the leaking tube(s).

Unit 3 began proceeding toward shutdown at 0452 hours. The NRC Operations Center was notified at 0545 hours. An Unusual Event was declared on Unit 3 at 0610 hours, due to the indicated leakage from the primary to the secondary side exceeding one gallon per minute (gpm). The reactor was shut down at 0851 hours. OTSG 3A was isolated by 0915 hours, and the Unusual Event was terminated at 1125 hours.

The performance of the Nitrogen Bubble Test and the Eddy Current Test indicated five tubes that required plugging; of these, two were leakers. At 106 hours on November 19, 1984, Unit 3 was back on line.

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## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/85

FACILITY NAME (1)  Oconee Nuclear Station, Unit 3	DOCKET NUMBER (2)  0 5 0 0 0 2 8 7 8 4 -	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
			0 0 6	- 0 0	0 2	OF	0 3

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

Description of Occurrence:

On June 19, 1984, it was determined that a small tube leak had developed in one of the Unit 3 OTSGs; the determination was made by noting the increased count rate indication from a radiation-detecting instrument which monitors the off-gas release at the CSAEs. It was not immediately determinable which OTSG contained the tube leak. Monitoring of both main steam lines on June 28, 1984 revealed that the leaker(s) was/were in the OTSG 3A. The primary-to-secondary leak rate, which was initially calculated to be 0.013 gpm, was considered to be insufficient for determining which tubes were leaking. Also, the rate of reactor coolant system (RCS) leakage was not considered unsafe for continued operation of Unit 3.

During the interval between June 28th and November 6th, Unit 3 stayed at 100% full power. The indicated count rate fluctuated somewhat, but in general slowly increased, so that primary-to-secondary coolant leak rate was estimated at 0.51 gpm on November 6th prior to the event. At 0420 hours on November 6th, a rapid increase in count rate was noted, and by 0430 hours the instrument was reading off-scale on the high side. Unit 3 shutdown was begun at 0452 hours at an initial rate of 10% per hour. Estimates of the primary-to-secondary leak rate were approximately 0.80 gpm at 0507 hours and 1.51 gpm at 0600 hours. Because the leak rate had exceeded 1.0 gpm, an Unusual Event was declared at 0610 hours. The appropriate organizations and agencies were kept apprised of the situation during the Unusual Event. Another estimate of the leak rate at 0640 hours showed that it had increased to about 1.94 gpm. At 0811 hours, the turbine was taken off-line and the Unit 3 reactor was shut down at 0851 hours. At 0915 hours, OTSG 3A was isolated and the Unusual Event was terminated at 1125 hours on November 6th.

Cause of Occurrence:

The apparent cause of the tube leaks was circumferential cracking propagated by low stress high cycle fatigue. This is based on experience with similar tube failures in the Lane Region that have occurred in the past at the 15th Tube Support Plate.

Analysis of Occurrence:

As soon as the increased primary-to-secondary leak rate was noted, the unit was shut down as quickly and as safely as possible. The leakage was of a controlled nature and the unplanned offsite releases of fission gases in general and radioiodine in particular were well within limits set by the Oconee Technical Specifications. The total gas released was 125 curies and the total radioiodine released was 0.005 curies. These limits were set to assure the safety of the public for each unplanned offsite release. The health and safety of the public were not affected by this event.

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Corrective Actions:

The immediate corrective action taken was to shut down Unit 3 and isolate OTSG 3A so as to minimize primary-to-secondary system contamination.

Beginning the following day, on November 7th, efforts were directed to locating and plugging the leaking tube(s). The Nitrogen Bubble Test indicated that Tube Nos. 77-4 and 65-4 were both leaking at the 15th Tube Support Plate. These tubes were plugged. The Eddy Current Test (ECT) was performed to additionally inspect approximately 300 tubes. Of these, Tube Nos. 80-3 and 80-7 exhibited through-wall indications of 46% and 40%, respectively, and were plugged. This was done in accordance with the plugging criteria limit of 40% through-wall indication. For Tube No. 77-6, the through wall indication of 36% had been identified in a previous inspection, and the current ECT check indicated that no change had occurred. However, the 36% degradation was measured at the 15th Tube Support Plate and 77-6 was near one of the leaking tubes (77-4); on this basis, 77-6 was plugged. The testing, inspection, and plugging procedures were concluded by November 18th with a total of five tubes plugged. Unit 3 was returned to service at 1706 hours on November 19, 1984.

**DUKE POWER COMPANY**

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VICE PRESIDENT  
NUCLEAR PRODUCTION

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December 6, 1984

Document Control Desk  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Subject: Oconee Nuclear Station, Unit 3  
Docket No. 50-287  
LER 287/84-06

Dear Sir:

Pursuant to 10 CFR 50.73 Sections (a)(1) and (d), attached is Licensee Event Report 287/84-06 concerning an incident in which a tube leak developed in the Unit 3 "A" steam generator, requiring shutdown of the unit. The report is submitted in accordance with §50.73 (a)(2)(i). This event was considered to be of no significance with respect to the health and safety of the public.

Very truly yours,

*H.B. Tucker*

Hal B. Tucker

RFH:slb

Attachment

cc: Mr. James P. O'Reilly, Regional Administrator  
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