

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)
Fort Calhoun Station, Unit No. 1DOCKET NUMBER (2)
0 5 0 0 0 2 8 5 1 OF 0 4TITLE (4)
Steam Generator Tube Rupture, Supplement

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)			
MONTH	DAY	YEAR	YFAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES		DOCKET NUMBER(S)	
0	5	1	6	8	4	8	4	0	0	8	0	1
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											0 5 0 0 0	

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more of the following) (11)									
POWER LEVEL (10) 0 0 0	3	20.402(b)	20.405(e)	50.73(a)(2)(iv)	73.71(b)						
		20.405(a)(1)(i)	50.36(e)(1)	50.73(a)(2)(v)	73.71(e)						
		20.405(a)(1)(ii)	50.36(e)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 305A)						
		20.405(a)(1)(iii)	X 50.73(a)(2)(i)	50.73(a)(2)(viii)(A)							
		20.405(a)(1)(iv)	X 50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)							
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(ix)							

LICENSEE CONTACT FOR THIS LER (12)
NAME John J. Tesarek, Plant Engineer
Fort Calhoun Station, Unit No. 1
TELEPHONE NUMBER
AREA CODE 4 1 0 2 4 1 2 6 1 - 1 4 1 0 1 1

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		
X	A	B	S	I	G	I	C	4	9	10	Y

SUPPLEMENTAL REPORT EXPECTED (14)
☐ YES (If yes, complete EXPECTED SUBMISSION DATE) ☒ NO
EXPECTED SUBMISSION DATE (15)
MONTH DAY YEAR

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

This LER is being provided as a supplement to LER-84-008. Changes to the original LER are denoted by vertical black lines in the right hand margin.

During plant startup from a refueling outage, the reactor coolant system (RCS) was being pressurized for a leak test. At approximately 1,800 psia, RCS leakage approached 110 gpm with indication of a tube rupture in RC-2B ("B" steam generator). A depressurization and cooldown of the RCS was initiated. RC-2B was isolated. Notification of an unusual event was declared. The unusual event was terminated when the RCS was placed in cold shutdown. The damaged section of the steam generator tube has been removed and the failure mechanism identified as intergranular stress corrosion cracking.

Corrective actions relating to the event were contained in letters to Mr. J. T. Collins from Mr. W. C. Jones (LIC-84-160) and to Mr. J. R. Miller from Mr. W. C. Jones (LIC-84-159), both dated May 31, 1984. On June 19, 1984 a final report on the steam generator tube failure was submitted to Mr. J. T. Collins (LIC-84-196, signed by W. C. Jones) of Region IV. This report was supplemented in a letter dated September 20, 1984 from R. L. Andrews to Mr. J. T. Collins (LIC-84-276).

Reviews done in preparation of the final report showed that personnel performed during the event according to preplanned procedures, and these procedures were adequate.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/85

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		

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

Initial Conditions at the time of the Event

Plant was being taken from Mode 4 to Mode 3

RCS boren approximately 2100 ppm

 $T_c = 398^{\circ}\text{F}$

Pressurizer level = 70%

Pressurizer pressure = 880 psia

Steam generator RC-2B level = 72%, pressure approximately 200 psig

Pressurizer fill in progress for RCS leak test; one charging pump in operation taking suction off of SIRWT

RC pumps RC-3A, RC-3B and RC-3C in operation

Letdown on minimum

Both MSIV's, HCV-1041A and HCV-1042A, open

Steam generator blowdown secured

Feeding both steam generators with FW-6 aux. feed pump; FW bypass valves HCV-1105 and HCV-1106 in AUTO

Atmospheric steam dump valve, HCV-1040, open slightly

The following is the sequence of events for the steam generator tube rupture (SGTR) of May 16, 1984.

Time	Event
1618	Operator noted that pressurizer level was no longer increasing with single charging pump in operation; pressurizer pressure decreasing slowly; started other two charging pumps.
1636	Pressurizer pressure and level slowly increasing; however, charging flow rate only approximately 50 gpm versus expected flow rate of 120 gpm (probably due to inadequate NPSH with existing SIRWT level and three charging pumps); operator switched charging to VCT, flow rate increased to 120 gpm.
1639	PPLS reset at 1700 psia (automatic).
1641	Pressurizer solid; pressurizer pressure = 1800 psia and slowly increasing

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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

Time	Event
*1642	Operator isolated letdown. Operator noted level increasing above setpoint in RC-2B, thought to be leakage through HCV-1106, operator closed block valve HCV-1385.
1645	VCT level approaching 0% despite blended makeup in progress; operator secured two charging pumps; pressurizer pressure = 1850 psia.
1646	PPLS blocked at 1700 psia (operator action).
1648	Pressurizer pressure decreasing.
*1650	Operator noted continuing increase in RC-2B level; auxiliary FW pump FW-6 secured.
1654	Pressurizer pressure = 560 psia; RCS solid; operator opened letdown valve to draw pressurizer bubble.
1658	MSIV from RC-2B, HCV-1042A, closed by operator.
1659	Cooldown of RCS initiated using steam generator RC-2A and atmospheric dump valve HCV-1040.
1700	Reactor coolant pump RC-3C secured.
1701	Reactor coolant pump RC-3B secured.
1711	Notification of unusual event declared.
1717	NRC notified via red phone.
1718	RC-2B level off-scale high; secondary pressure approximately 200 psig.
1720	Steam generator blowdown sample lined up to radioactive waste system; blowdown monitor pegged high.
1730	Cooldown and depressurization of pressurizer initiated using auxiliary spray.
1830	Pressurizer pressure = 220 psia; $T_c = 330^\circ\text{F}$; pressurizer level = 70%.
1841	VCT backfilled with N_2 .
2005	Shutdown cooling initiated.

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APPROVED OMB NO. 3150-0104

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TEXT (If more space is required, use additional NRC Form 368A's) (17)

Time	Event
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(May 17, 1984)

0005 Terminated unusual event at 210°F.

*0730 Steam generator RC-2B solid.

* Time approximate based on interviews with operators; precise data unavailable.

Various emergency procedures were used by plant personnel during the incident. Plant personnel performed appropriately and safely placed the plant in a refueling shutdown condition (Mode 5). Actions taken were performed as described and dictated in preplanned procedures for this type of incident. Operator's responses and the written procedures used for mitigation of the incident were found to be adequate.

The damaged section of steam generator tube L29R84 was sent to Combustion Engineering's laboratory for examination and analysis. The laboratory examinations and analyses indicate the failure mechanism to be intergranular stress corrosion cracking (IGSCC). A final report was submitted July 17, 1984, (LIC-84-228) detailing the laboratory examinations and analyses. In letters to Mr. J. T. Collins from W. C. Jones (LIC-84-160) dated May 31, 1984, the District provided its corrective action plans relating to the steam generator tube failure. On June 5, 1984, the District received a letter from Mr. J. T. Collins, Region IV Administrator, which identified additional items the District was required to complete prior to leaving refueling shutdown (Mode 5). The District completed those actions and submitted a final Steam Generator Tube Failure Report in a letter from W. C. Jones to Mr. J. T. Collins dated June 19, 1984 (LIC-84-196). This letter detailed District activities associated with the steam generator tube rupture. This report was supplemented by a letter dated September 20, 1984, from R. L. Andrews to Mr. J. T. Collins (LIC-84-276).

Omaha Public Power District
1623 Harney Omaha, Nebraska 68102
402/536-4000

October 1, 1984
FC-753-84
LIC-84-328

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

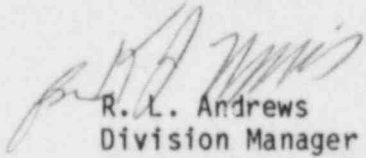
Reference: Docket No. 50-285

Gentlemen:

Licensee Event Report for the
Fort Calhoun Station

Please find attached Licensee Event Report 84-008-01 dated October 1, 1984. This report is being provided as a supplement to LER-84-008. Those portions which have been changed are denoted by a vertical black line in the right hand margin. This report is being submitted per requirements of 10 CFR 50.73.

Sincerely,


R. L. Andrews
Division Manager
Nuclear Production

RLA/DJM/rh-W

Attachment

cc: Mr. Dorwin R. Hunter, Chief
Reactor Project Branch 2
U.S. Nuclear Regulatory Commission
Region IV
611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76011

INPO Records Center
Mr. E. G. Tourigny, Project Manager

SARC Chairman
PRC Chairman
Mr. L. A. Yandell, Senior Resident Inspector
Fort Calhoun File (2)

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