

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Fort Calhoun Station, Unit No. 1	DOCKET NUMBER (2) 0 5 0 0 0 2 8 5	PAGE (3) 1 OF 0 4
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TITLE (4)  
Steam Generator Tube Rupture

EVENT DATE (5)			LSR 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)																																																																																																
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LICENSEE CONTACT FOR THIS LER (12)

NAME Lawrence T. Kusek, Supervisor - Operations Fort Calhoun Station	TELEPHONE NUMBER AREA CODE 4 0 2 4 2 6 1 - 4 0 1 1
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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
X	A/B	S/G	C 4 9 0	Y					

SUPPLEMENTAL REPORT EXPECTED (14)

<input checked="" type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE) <input type="checkbox"/> NO	EXPECTED SUBMISSION DATE (15) MONTH 0 6 DAY 3 0 YEAR 8 4
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ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

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. The District is in the process of completing those items identified in various communications with the NRC. Upon completion of those items, the District will submit a final report detailing the activities associated with the steam generator tube rupture. The District will submit a supplement to this LER after the final report has been submitted to the NRC.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)  Fort Calhoun Station Unit No. 1	DOCKET NUMBER (2)  0 5 0 0 0 2 8 5 8 4	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
			- 0 0 8	- 0 0	0 2	OF 0 4

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

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

Initial Conditions

Plant was being taken from Mode 4 to Mode 3

RCS boron 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 MCV'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-1041, open slightly

Time	Event
1618	Operator noted that pressurizer level was no longer increasing with single charging pump 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.
*1642	Operator isolated letdown.

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			

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Time	Event
*1642	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% 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.
(May 17, 1984)	
0005	Terminated unusual event at $210^\circ\text{F}$ .
*0730	Steam generator RC-2B solid.

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

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The damaged section of steam generator tube L29R84 has been 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 is scheduled to be submitted to the NRC on June 30, 1984 detailing the laboratory examinations and analyses. In letters to Mr. J. T. Collins from Mr. W. C. Jones (LIC-84-160) dated May 31, 1984 and to Mr. J. R. Miller from Mr. W. C. Jones (LIC-84-159) 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 that the District must complete prior to leaving refueling shutdown (Mode 5). The District is in the process of completing the items identified in the above communications. To specifically identify corrective actions taken, future actions planned, and the results achieved at this point would be premature and incomplete. The District intends to submit a complete report to the NRC during the week of June 17, 1984 detailing the activities associated with the steam generator tube rupture. The District will submit a supplement to this LER after the final report has been submitted to the NRC.

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

June 15, 1984  
EC-320-84  
LIC-84-194

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 dated June 15, 1984. This report is being submitted per requirements of 10 CFR 50.73.

Sincerely,



W. C. Jones  
Division Manager  
Production Operations

WCJ/JJP:jmm

Attachment

cc: Mr. Richard P. Denise, Director  
Division of Resident, Reactor Project  
& Engineering Programs  
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  
Port Calhoun File (2)

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