NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/85

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
North Anna Unit 2	0 5 0 0 0 3 3 9	1 OF 0 3

TITLE (4)

Main Feedwater Control Valve Failure Causes Reactor Trip

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 NUMBER(S)
0 6	2 5	8 4	8 4	— 0 0 5	— 0 0	0 7	1 2	8 4		0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9)	1	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)	X 50.73(a)(2)(iv)	73.71(b)
		20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		20.405(a)(1)(iv)	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)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER	
	AREA CODE	
E. Wayne Harrell	7 0 3	8 9 4 - 5 1 5 1

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	
X	A A	B K R	W 1 2 0	Y							
X	J B	F C V	C 6 3 5	Y							

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

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

On June 25, 1984, at 1328 with Unit 2 at 100 percent power an air supply line to the "A" steam generator main feedwater control valve failed causing the valve to fail shut. Thirteen seconds later a Unit 2 reactor trip occurred in response to an "A" steam generator low level coincident with steam flow feed flow mismatch signal. Immediately after the trip an automatic station service load shed initiation stripped all nonessential large station service loads including the main feedwater and condensate pumps. The auxiliary feedwater pumps continued to supply the steam generators. The load shed was enabled although plant conditions did not require it to be enabled. Procedures will be revised to prevent recurrence. Although load shed complicated trip recovery, it did not significantly affect trip recovery.

The air lines to all Main Feedwater Control Valves were replaced. The "B" reactor trip breaker failed to close during startup preparations. A breaker relay arm, which affected closing action only, was adjusted and the breaker closed. Unit 2 was placed on line at 1702 on June 26, 1984 and was operating at 100 percent power by 0410 on June 27, 1984.

IE22
1/1

NRC Form 366
(9-83)

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
North Anna Unit 2	0 5 0 0 0 3 3 9	8 4	— 0 0 5	— 0 0	0 2 OF 0 3

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

On June 25, 1984, Unit 2 was operating at 100 percent power. At 1328 an air line supplying air to the "A" Steam Generator Main Feedwater Control Valve (identifier, FCV) failed, causing the feedwater control valve to shut. Approximately thirteen seconds later a low "A" steam generator level coincident with feedwater flow less than steam flow signal generated a reactor trip signal. Both reactor trip breakers open simultaneously 0.067 seconds after the reactor trip signal was generated. Opening of the reactor trip breakers (BKR) generated a turbine trip signal; 0.1 seconds after this signal was generated the turbine trip was in progress (low auto stop oil pressure or turbine stop valves closed confirmation signal received). The reactor protection system operated as designed.

When the Unit 2 station service busses switched from their normal source (main Unit 2 generator) to reserve station power approximately 30 seconds after the reactor trip, automatic load shed, a design feature intended to prevent overloading of the reserve station transformers, initiated. The automatic initiation of the load shed feature stripped all Unit 2 nonessential large station service loads including the main feedwater and condensate pumps. The steam generators continued to receive feedwater flow from three auxiliary feedwater pumps which started automatically approximately 1.5 seconds after the reactor tripped in response to a steam generator low low level signal.

Although the initiation of load shed complicated trip recovery operations, it did not significantly affect trip recovery. Load shed was not required for this event. Load shed must be enabled at all times for the following conditions.

1) One unit is on line and the other unit is in startup.

2) Both units are on line.

3) Both units are in startup.

When the Unit 2 reactor trip occurred, Unit 1 was defueled; thus, load shed was not required.

When Unit 1 was shutdown on May 11, 1984, for a refueling outage, the load shed key lock could have been placed in the "DEFEAT" position. Although a control room alarm annunciates and remains lit when load shed is defeated, it fails to serve as an adequate reminder that load shed is enabled when it is not required. Unit 1 shutdown procedures did not direct the mode of load shed operation; specifically, they did not require load shed to be defeated. Unit 1 and 2 startup and shutdown procedures are being revised to incorporate load shed requirements. The turbine building operators log will be revised to note status of the load shed key switches to ensure a mispositioned key switch is detected. The above procedural changes will prevent recurrence of an unnecessary load shed actuation.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
North Anna	0 5 0 0 0 3 3 9	8 4	— 0 0 5	— 0 0	0 3 OF 0 3

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

At 1512 the reactor trip breakers were cycled in preparation for unit startup. The "B" reactor trip breaker failed to close. The breaker control relay release arm was opening the control relay contacts prematurely. Early opening of the control relay contacts interrupted current to the breaker closing solenoid before the breaker could latch. The control relay release arm was adjusted and the breaker tested satisfactorily. The closing failure did not affect the opening capability of the breaker. The breaker is a Westinghouse type DB-50 breaker.

At 1908 the reactor was taken critical; however, power operation was delayed while secondary chemistry was restored within administrative limits. During this delay, the air tubing section that had broken on "A" main feedwater control valve was replaced on all three main feedwater control valves with flexible tubing. The tubing section that vailed was in a vibration area and it appears that the failure was a fatigue failure; therefore, replacement with flexible tubing should prevent recurrence.

At 1702 on June 26, 1984, Unit 2 was placed back on line. At 0410 on June 27, 1984, Unit 2 reached 100 percent power.

Vepco

VIRGINIA ELECTRIC AND POWER COMPANY
NORTH ANNA POWER STATION
P. O. BOX 402
MINERAL, VIRGINIA 23117

July 12, 1984

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

Serial No. N-84-012
NO/RCS: 11
Docket No. 50-339

License No. NPF-7

Dear Sirs:

Pursuant to North Anna Power Station Technical Specifications, the Virginia Electric and Power Company hereby submits the following License Event Report applicable to North Anna Unit No. 2.

Report No. LER 84-005-00

This report has been reviewed by the Station Nuclear Safety and Operating Committee and will be forwarded to Safety Evaluation and Control for their review.

Very Truly Yours,

for B. Wayne Harrell
Station Manager

Enclosures (3 copies)

cc: Mr. James P. O'Reilly, Regional Administrator
U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street, Suite 2900
Atlanta, Georgia 30303

IE22
1/1