

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)
NORTH ANNA POWER STATION, UNIT 1

DOCKET NUMBER (2)
0 5 0 0 0 3 3 8 1 OF 0 3

TITLE (4)
REACTOR/TURBINE TRIP - TURBINE CONTROL SYSTEM MALFUNCTION

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)
02	23	86	86	002	00	03	17	86			05000338

OPERATING MODE (9) **I**

POWER LEVEL (10) **11010**

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following) (11)

20.402(b)	20.406(c)	<input checked="" type="checkbox"/>	50.73(a)(2)(iv)	73.71(b)
20.405(a)(1)(i)	50.36(c)(1)	<input type="checkbox"/>	50.73(a)(2)(v)	73.71(c)
20.405(a)(1)(ii)	50.36(c)(2)	<input type="checkbox"/>	50.73(a)(2)(vi)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
20.405(a)(1)(iii)	50.73(a)(2)(i)	<input type="checkbox"/>	50.73(a)(2)(vii)(A)	
20.405(a)(1)(iv)	50.73(a)(2)(ii)	<input type="checkbox"/>	50.73(a)(2)(vii)(B)	
20.405(a)(1)(v)	50.73(a)(2)(iii)	<input type="checkbox"/>	50.73(a)(2)(viii)	
20.405(a)(1)(vi)	50.73(a)(2)(iv)	<input type="checkbox"/>	50.73(a)(2)(ix)	

LICENSEE CONTACT FOR THIS LER (12)

NAME: E. WAYNE HARRELL, STATION MANAGER

TELEPHONE NUMBER: 703 894-5151

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS
X	I, G, D, E, T	W, 1, 2, 0		Y					
X	J, J, J, X	L, 0, 4, 5		N					

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE) NO

EXPECTED SUBMISSION DATE (15)

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

At 1537 hours on February 23, 1986, a Unit 1 reactor/turbine trip occurred from 100% power. The reactor trip signal was generated by a low-low level in "B" steam generator (18% narrow range, 2/3 channels), caused by the closure of the turbine governor valves. This caused levels to shrink in all steam generators with "B" generator level reaching the reactor trip setpoint first. A turbine trip signal was generated by the reactor trip. Plant parameters and equipment responded normally with the exception of undercompensation of the intermediate range neutron flux detectors, requiring manual reinstatement of the source range detectors. Upon energization, source range detector N-31 failed to indicate and the detector was declared inoperable.

The closure of the turbine governor valves was attributed to problems associated with the control system. Subsequent troubleshooting did not reveal any specific conditions which would have lead to the event. The exact cause was not determined but is believed to have been a sporadic occurrence.

Extensive testing of the turbine control system yielded satisfactory results and the decision was made to restart. This event, actuation of the Reactor Protection System, is reportable pursuant to the requirements of 10CFR50.73(a)(2)(iv).

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
NORTH ANNA POWER STATION, UNIT 1	0500033886	-	002	-	0002	OF 03

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

At 1537 hours on February 23, 1986, a Unit 1 reactor/turbine trip occurred from 100% power. The reactor trip signal was generated by a low-low level in "B" steam generator (EIIIS Component Identifier SG) (18% narrow range, 2/3 channels) caused by the closure of the turbine governor valves (EIIIS Component Identifier FCV), resulting in reduced steam flow from the steam generators and a subsequent increase in steam pressure. This caused the voids in the steam generators to be condensed, reducing the levels in the generators with "B" steam generator level reaching the reactor trip setpoint first. An automatic turbine trip was initiated in response to the reactor trip. All three auxiliary feed water pumps (EIIIS Component Identifier P) started in response to an automatic start signal from a low-low steam generator level.

Following the trip, indication from intermediate range neutron flux detectors (EIIIS System Identifier IG, Component Identifier DET) N-35 and N-36 trended down as expected but leveled off, due to undercompensation, above the point where source range detectors N-31 and N-32 would energize (5E-11 amps). This required manual reinstatement of the source range detectors. Upon energization, N-31 failed to indicate and the detector was declared inoperable. Additionally, approximately 10 minutes after the trip, turbine control (EIIIS System Identifier JJ) indication became erratic due to back-up power supplies (EIIIS Component Identifier JX) for the system being inoperable. This condition was known to have existed prior to the event, but was not corrected due to the element of risk associated with troubleshooting in the electro-hydraulic control (EHC) cabinet with the unit at power. Neither condition contributed to the trip nor affected plant recovery. All other necessary equipment responded satisfactorily.

The plant was stabilized at normal no load conditions in a controlled, orderly manner. Primary plant parameters responded normally for a load rejection transient. Pressurizer pressure spiked to approximately 2320 psig, followed by a decrease to approximately 1840 psig, and stabilizing at 2235 psig. Average primary temperature (Tavg) spiked to approximately 591°F, then stabilized at its programmed no load value of 547°F. Pressurizer level momentarily increased to approximately 72%, returning to its programmed no load value of 20% where it stabilized. Secondary system parameters also responded normally.

The closure of the turbine governor valves was attributed to problems associated with the turbine control system (EIIIS System Identifier JJ). Subsequent troubleshooting did not reveal any specific conditions which would have lead to the event. The exact cause was not determined, but it is believed to have been a sporadic occurrence. Prior to the transient, Unit 1 had experienced problems with the turbine EHC system. Governor valve 4 (GV#4) had displayed erratic behavior and was closed with EHC fluid isolated at the time of the transient. The turbine had experienced load rejections of 150 MWe and 60 MWe on February 22, due to GV#4 failing closed. Troubleshooting of GV#4 control system had taken place prior to the event but was not in progress during the trip.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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

Several components were replaced in the turbine control system to improve system performance, none of which are directly attributable to the event. The inoperable power supplies, Lambda (EIIS Manufacturer Identifier L045) models LMCC-48Y-3822-1 and LMEE-15Y-3820-1, for the turbine control system were replaced. Source range detector N-31, Westinghouse (EIIS Manufacturer Identifier W120) type WL 23741, was replaced and the compensation voltage from both intermediate range detectors adjusted. Extensive testing of the turbine control system yielded satisfactory results and the decision was made to restart. The reactor was returned to criticality at 2135 hours on February 24, 1986, and the unit was placed on line at 2305 hours on February 25, 1986.

The failure of the turbine control system has been determined to be an isolated occurrence. Extensive troubleshooting and testing has resulted in a high level of confidence that the turbine control system is fully operable and will perform as designed; therefore, no additional analysis of the event is required. This event, actuation of the Reactor Protection System, is reportable pursuant to the requirements of 10CFR50.73(a)(2)(iv).

Vepco

VIRGINIA ELECTRIC AND POWER COMPANY

NORTH ANNA POWER STATION

P. O. BOX 402

MINERAL, VIRGINIA 23117

March 17, 1986

U. S. Nuclear Regulatory Commission
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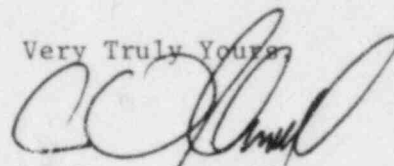
Dear Sirs:

The Virginia Electric and Power Company hereby submits the following Licensee Event Report applicable to North Anna Unit 1.

Report No. LER 86-002-00

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



E. Wayne Harrell
Station Manager

Enclosures (3 copies)

cc: Dr. J. Nelson Grace, Regional Administrator
U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street, Suite 2900
Atlanta, Georgia 30323

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