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VIRGINIA ELECTRIC AND POWER COMPANY

NORTH ANNA POWER STATION

P. O. BOX 402

MINERAL, VIRGINIA 23117

10 CFR 50.73

March 14, 1991

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

Serial No. N-91-001
NAPS:WCH/wch
Docket Nos. 50-338
License Nos. NPF-4

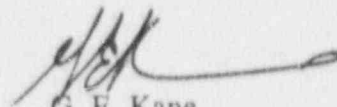
Dear Sirs:

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

Report No. 91-001-00

This Report has been reviewed by the Station Nuclear Safety and Operating Committee and will be forwarded to the Corporate Management Safety Review Committee for its review.

Very Truly Yours,



G. E. Kane
Station Manager

Enclosure:

cc: U.S. Nuclear Regulatory Commission
101 Marietta Street, N.W.
Suite 2900
Atlanta, Georgia 30323

Mr. M. S. Lesser
NRC Senior Resident Inspector
North Anna Power Station

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LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) NORTH ANNA POWER STATION UNIT 1										DOCKET NUMBER (2) 0 5 0 0 0 3 3 8 1										PAGE (3) 1 OF 3				
TITLE (4) HOT LEG SAFETY INJECTION BRANCH FLOW ABOVE TECHNICAL SPECIFICATION REQUIREMENTS DUE TO INHERENT ERRORS IN FLOW MEASUREMENT TECHNIQUES																								
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	2	2	4	9	1	9	1	0	0	1	0	0	0	3	1	4	9	1	0	5	0	0	0	
OPERATING MODE (9) 5			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			20.402(b)			20.405(e)			50.73(a)(2)(iv)			73.71(b)												
			20.405(a)(1)(i)			50.36(a)(1)			50.73(a)(2)(iv)			73.71(a)												
			20.405(a)(1)(ii)			50.36(a)(2)			50.73(a)(2)(iv)			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)(iii)(A)															
			20.405(a)(1)(iv)			50.73(a)(2)(ii)			50.73(a)(2)(iii)(B)															
			20.405(a)(1)(v)			50.73(a)(2)(iii)			50.73(a)(2)(x)															
LICENSEE CONTACT FOR THIS LER (12)																								
NAME G. E. Kane, Station Manager												TELEPHONE NUMBER 7 0 3 8 9 4 - 2 1 0 1												
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	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC
SUPPLEMENTAL REPORT EXPECTED (14)															EXPECTED SUBMISSION DATE (15)		MONTH	DAY	YEAR					
YES (If yes, complete EXPECTED SUBMISSION DATE)															X NO									

ABSTRACT (Limit to 7400 spaces, i.e., approximately fifteen single space typewritten lines) (16)

On February 24, 1991 with Unit 1 in Mode 5 (Cold Shutdown), it was discovered during the performance of the High Head Safety Injection (HHSI) flow balance test that one Safety Injection (SI) pump's total flow rate exceeded the maximum Technical Specification (TS) requirement for pump runout. Technical Specification surveillance 4.5.2.h requires SI pump flow to be less than or equal to 650 gallons per minute (gpm). While flowing 1-CH-P-1A to the hot leg branch lines through the normal header, the total pump flow was 657.3 gpm. This event is reportable pursuant to 10CFR50.73(a)(2)(i)(B).

The cause of the event was inherent errors in measurement techniques used to initially set the SI throttle valves along with the method of repositioning the throttle valves. In addition, the TS acceptance band is very narrow with no stated tolerances. When the excessive flow was discovered, the throttle valves were adjusted so that the total flow from 1-CH-P-1A to the hot leg branch lines through the normal header is now 618.9 gpm as indicated by the permanent total flow indicator.

No significant safety consequences resulted from this event because a previous Nuclear Safety Analysis has determined that the actual runout value of a HHSI pump is 705 gpm. The highest total flow rate recorded for 1-CH-P-1A was 657.3 gpm which is significantly less than the pump runout value. Therefore, the health and safety of the public were not affected at any time during this event.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)

DOCKET NUMBER (2)

LER NUMBER (6)

PAGE (3)

NORTH ANNA POWER STATION UNIT 1

0 15 | 0 10 | 0 3 | 3 8 | 9 1 | — 0 0 | 1 — 0 0 | 0 2 OF 0 3

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

1.0 Description of the Event

On February 24, 1991 with Unit 1 in Mode 5 (Cold Shutdown), it was discovered during the performance of a High Head Safety Injection (HHSI) (EIIIS System Identifier BQ) flow balance test that one HHSI pump's total flow rate exceeded the maximum Technical Specification (TS) requirement for pump runout. Technical Specification surveillance 4.5.2.h requires HHSI pump (EIIIS System Identifier CB/BQ, Component Identifier P) flow to be less than or equal to 650 gallons per minute (gpm). While flowing 1-CH-P-1A to the hot leg branch lines through the normal header, the total pump flow was 657.3 gpm. This event is reportable pursuant to 10CFR50.73(a)(2)(i)(B).

The cause of the event was inherent errors in measurement techniques used to initially set the SI throttle valves (EIIIS System Identifier BQ, Component Identifier V) along with the method of repositioning the throttle valves. In addition, the TS acceptance band is much smaller than allowed by the Safety Analysis. When the excessive flow was discovered, the throttle valves were adjusted so that the total flow to the hot leg branch lines through the normal header is now equal to 618.9 gpm as indicated by the permanent total flow indicator.

2.0 Significant Safety Consequences and Implications

No significant safety consequences resulted from this event because the actual runout value for 1-CH-P-1A is 705 gpm. The highest total flow rate recorded for 1-CH-P-1A was 657.3 gpm which is significantly less than the actual pump runout value. Therefore, the health and safety of the public were not affected at any time during this event.

3.0 Cause of the Event

The cause of the event was inherent errors in measurement techniques used to initially set the SI throttle valves (EIIIS System Identifier BQ, Component Identifier V) along with the method of repositioning the throttle valves. In addition, the TS acceptance band is much smaller than allowed by the current Safety Analysis. The initial SI branch line throttle valve settings were determined using the permanently installed SI branch line flow instruments (EIIIS System Identifier BQ, Component Identifier FI) which introduced significant measurement uncertainties into the original flow balance. The vendor stated accuracy of the permanently installed branch flow instrumentation is plus or minus ten (10) percent. The valves were repositioned for this test in accordance with Operations Department Procedures which set the valve positions based on the number of turns the valve operator should be opened. As determined by the Test Engineer's observation during the performance of the flow balance, every 1/8 turn of valve operator results in a 5 to 10 gpm change in test flow rate. The sensitivity of the valve operator positioning results in poor repeatability in as found test flow rates. A previous Nuclear Safety Analysis has determined the actual tolerances for use in SI branch line testing which are much larger than the TS acceptance values. Despite the inaccuracies of the initial flow balance, the as found flow balance was well within safety analysis limits.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 800 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20545, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) NORTH ANNA POWER STATION UNIT 1	DOCKET NUMBER (2) 0 5 0 0 0 3 3 8 9 1	LSR NUMBER (6)			PAGE (3)		
		YEAR — 0 0 1	SEQUENTIAL NUMBER — 0 0 1	REVISION NUMBER — 0 0 3	OF 0 3		

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

4.0 Immediate Corrective Actions

When the excessive flow was discovered during the performance of this test, the throttle valves were adjusted using improved flow measurement techniques so that the sum of the flow measurements from more accurate flow indicators temporarily installed on the branch lines is now 610.5 gpm. After completing the flow balance, the indication from the permanent total flow meter was observed reading 618.9 gpm. With both indications within the TS band, the valves were locked into position.

5.0 Additional Corrective Actions

In order to more accurately set the SI branch line throttle valves, the stem heights were measured to an accuracy of 0.05 inches during this flow balancing test.

6.0 Actions to Prevent Recurrence

Valve positioning will be based on stem measurements determined by the latest flow balance rather than the number of turns open in the future. In addition, the improved highly accurate flow measurements similar to the ones used in the latest flow balance will be used in future flow balances. The current Technical Specifications, when all considerations are accounted for, require balancing within an absolute band of less than 4%. The current safety analysis requires balancing within an absolute 16% band. A TS change is being considered to make the TS more consistent with the Safety Analysis. This change would prevent small balancing errors well within analysis limits from causing a TS violation.

7.0 Similar Events

Licensee Event Report (LER) 90-008-00 for Unit 2 documents the sum of the branch flows, excluding the highest branch flow, being less than the TS minimum requirement on October 20, 1990. The cause of the event was attributed to mispositioning of the SI branch flow throttle valves.

8.0 Additional Information

No excessive flow was discovered for the SI cold leg branch lines which is the flow path automatically placed inservice during a Safety Injection.

The similar Unit 2 Operations Procedure was revised to use stem height in response to LER N2-90-008.

North Anna Unit 2 was in mode 1 at 100% throughout this event and was not affected.