10CFR50.73

Virginia Electric and Power Company
North Anna Power Station
P. O. Box 402
Mineral, Virginia 23117

March 12, 2001

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

Serial No.: 01-105
NAPS: JHL
Docket Nos.: 50-338
50-339
License Nos.: NPF-4
NPF-7

Dear Sirs:

Pursuant to 10CFR50.73, Virginia Electric and Power Company hereby submits the following Licensee Event Report applicable to North Anna Units 1 and 2.

Report No. 50-338, 339/2001-001-00

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

Very truly yours,

DAH

D. A. Heacock
Site Vice President

Commitments contained in this letter: None

Enclosure

cc: U. S. Nuclear Regulatory Commission
Region II
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW, Suite 23T85
Atlanta, Georgia 30303-8931

Mr. M. J. Morgan
NRC Senior Resident Inspector
North Anna Power Station

IE22

NRC FORM 366 (1-2001) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104 EXPIRES 6-30-2001

Estimated burden per response to comply with this mandatory information collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

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TITLE (4)

VENTILATION FLOW OUTSIDE TECHNICAL SPECIFICATION LIMITS DUE TO INADEQUATE TEST TECHNIQUES

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER 05000339
01	24	2001	2001	– 01	– 00	03	12	2001	FACILITY NAME	DOCKET NUMBER 05000

OPERATING MODE (9)	1
POWER LEVEL (10)	100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply) (11)

	20.2201(b)		20.2203(a)(3)(ii)		50.73(a)(2)(ii)(B)		50.73(a)(2)(ix)(A)
	20.2201(d)		20.2203(a)(4)		50.73(a)(2)(iii)		50.73(a)(2)(x)
	20.2203(a)(1)		50.36(c)(1)(i)(A)		50.73(a)(2)(iv)(A)		73.71(a)(4)
	20.2203(a)(2)(i)		50.36(c)(1)(ii)(A)		50.73(a)(2)(v)(A)		73.71(a)(5)
	20.2203(a)(2)(ii)		50.36(c)(2)		50.73(a)(2)(v)(B)		OTHER
	20.2203(a)(2)(iii)		50.46(a)(3)(ii)		50.73(a)(2)(v)(C)		Specify in Abstract below or in NRC Form 366A
	20.2203(a)(2)(iv)		50.73(a)(2)(i)(A)		50.73(a)(2)(v)(D)		
	20.2203(a)(2)(v)	x	50.73(a)(2)(i)(B)	x	50.73(a)(2)(vii)		
	20.2203(a)(2)(vi)		50.73(a)(2)(i)(C)		50.73(a)(2)(viii)(A)		
	20.2203(a)(3)(i)		50.73(a)(2)(ii)(A)		50.73(a)(2)(viii)(B)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
David A. Heacock	(540) 894-2101

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

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX

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 15 single-spaced typewritten lines) (16)

On January 24, 2001, with Units 1 and 2 operating at 100% and 96.5% power respectively, testing of the control room emergency ventilation system revealed that the flow rate from emergency ventilation supply fan 2-HV-F-42 was less than Technical Specification (TS) 4.7.7.1.b.3 limits. Technical Specification 4.7.7.1.b.3 requires a flow rate of 1000 +/- 10% cubic feet per minute (cfm) from each of the emergency ventilation supply fans. The measured flow rate was 834 cfm. This testing was performed as a corrective action from a November 2000 test where the flow rate from emergency ventilation supply fan 2-HV-F-41 was measured to be only 794 cfm. This event is being reported for Unit 2 pursuant to 10CFR50.73(a)(2)(i)(B), for a condition prohibited by TS and 10CFR50.73(a)(2)(vii), for a single cause that rendered two trains of a single system inoperable. Based on 2-HV-F-42 test results, the Unit 1 control room emergency ventilation supply fans were tested in an expeditious manner. Testing of emergency ventilation supply fan 1-HV-F-42 was satisfactory with a flow rate of 1046 cfm. Testing of emergency ventilation supply fan 1-HV-F-41 revealed a flow rate of 733 cfm which is less than TS requirements. Therefore, this event is also being reported for Unit 1 as a condition prohibited by TS per 10CFR50.73(a)(2)(i)(B). The cause of the ventilation flow rates not meeting TS requirements was due to previous inadequate test techniques. The ventilation flow rate for each of the fans that did not meet TS requirements (3 out of 4) was adjusted and testing was satisfactorily performed to verify as-left ventilation flow was within TS requirements.

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NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)* **(17)**

1.0 DESCRIPTION OF THE EVENT

On January 24, 2001, at approximately 1346 hours, Unit 1 was operating in Mode 1 at 100% power and Unit 2 was operating in Mode 1 at 96.5% power (in an end of cycle TAVG power coastdown). During testing of the control room emergency ventilation system (System - VI) it was identified that the flow rate from emergency ventilation supply fan (Component - FAN) 2-HV-F-42 was less than Technical Specification (TS) 4.7.7.1.b.3 limits. Technical Specification 4.7.7.1.b.3 requires a flow rate of 1000 +/- 10% cubic feet per minute (cfm) from each of the emergency ventilation supply fans. The measured flow rate was 834 cfm. No other equipment in the control room emergency ventilation system was inoperable that contributed to the flow rate being less than TS requirements. This testing was performed as a corrective action from a November 2000 test where the flow rate from control room emergency ventilation supply fan 2-HV-F-41 was measured to be only 794 cfm. The out of specification ventilation flow rate for 2-HV-F-41 was discovered during post maintenance testing that was performed for cleaning the demister filter (Component - FLT), 2-HV-FL-18, located upstream of emergency ventilation fan/filter 2-HV-F-41/2-HV-FL-8. This event is being reported for Unit 2 pursuant to 10CFR50.73(a)(2)(i)(B), for a condition prohibited by TS and 10CFR50.73(a)(2)(vii), for a single cause that rendered two trains of a single system inoperable.

Based on 2-HV-F-42 test results, the Unit 1 control room emergency ventilation system supply fans were tested in an expeditious manner. On January 31, 2001, at approximately 1202 hours, testing of emergency ventilation supply fan 1-HV-F-42 was completed satisfactorily with a flow rate of 1046 cfm. At approximately 1444 hours, testing of emergency ventilation supply fan 1-HV-F-41 determined that the ventilation flow rate was less than the TS limit. The measured flow rate was 733 cfm. Therefore, this event is also being reported for Unit 1 as a condition prohibited by TS per 10CFR50.73(a)(2)(i)(B).

2.0 SIGNIFICANT SAFETY CONSEQUENCES AND IMPLICATIONS

The purpose of the Control Room Emergency Ventilation System is to maintain the control room habitable for Operations personnel during and following all credible accident conditions. The operability of the system in conjunction with the control room design is based on limiting the radiation exposure to control room personnel as required by General Design Criterion 19 of Appendix A to 10CFR50.

During each case where a control room emergency ventilation supply fan was found to be outside the TS required flow rate, it was determined that the fan was still capable of performing its emergency functions of main control room (MCR) pressurization and filtration.

The control room emergency ventilation system is required to produce 0.04 inches water gauge (wg) positive pressure within the MCR envelope. Since the MCR envelope is maintained above 0.05 inches wg with less than a net inflow of 340 cfm from the normal supply/exhaust fan balance, the emergency fan at each of the as-found ventilation flow rates will still produce a sufficiently high MCR differential pressure. In addition, the control room bottled air system is designed to pressurize the MCR envelope during the first hour following a design basis accident.

The control room emergency ventilation system is designed to provide an average residence time within the charcoal absorber of 1/4 second or more. With fan flow rate less than its 1000 cfm rating, residence time within the charcoal filter housing will be more than the 1/4 second. This is conservative, and ensures that adequate filtration is provided.

Based on the above, it has been determined that the control room emergency ventilation system was capable of performing its intended design basis function. Therefore, this event did not pose any significant safety implications.

3.0 CAUSE

The cause of the ventilation flow rates not meeting TS requirements was due to previous inadequate test techniques (i.e., use of previous test methodology and test locations). In March 2000, periodic test procedures 1 and 2-PT-76.12A and B, Control Room Emergency Ventilation System - Post Maintenance Test on the HEPA Filter of 1/2-HV-FL-8/9 were revised to incorporate industry lessons-learned. A new testing methodology for all four emergency ventilation supply fans and new test locations for 1-HV-F-41, 2-HV-F-41, and 2-HV-F-42 was implemented. Specifically, test procedures were revised to require the use of a pitot tube to measure ventilation flow rates. Previous testing allowed the use of a hot wire anemometer or velometer. The use of the pitot tube method of measurement is considered a more accurate measurement method.

In addition, the flow measurement point was changed to a point with more flow stability for three of four emergency ventilation supply fans. Previous testing measured airflow downstream of the heater (Component - EHTR) and immediately upstream of the filter housing entrance. This is considered an unsuitable point because the configuration of the ductwork (Component - DUCT) and short distances involved caused airflow disturbances. The measurement point was moved to upstream of the heater in a section of straight duct, several duct diameters downstream of any flow disturbance, to achieve

better airflow stability for all emergency ventilation supply fans except 1-HV-F-42. Although testing of emergency ventilation supply fan 1-HV-F-42 was completed satisfactory with a flow rate of 1046 cfm, it was not measured at a new test location. This is because there is not a straight duct section several diameters downstream of any flow disturbance. However, the measured flow rate was performed with the more accurate measurement method and the best available location at the time of testing. Therefore, the TS ventilation flow rate was met and 1-HV-F-42 is capable of performing its intended design basis function.

The observed low flow for 2-HV-F-41, in November 2000, was originally believed to be normal loading of the charcoal and HEPA filter that are part of 2-HV-FL-8. It was believed that the increased system resistance resulted in the flow being found less than the TS required flow rate. The basis for this conclusion is a review of the test data that was obtained in the last three years from completed versions of 2-PT-76.13A, Control Room Emergency Ventilation System - Post Maintenance Test on the Charcoal Filters of 2-HV-FL-8. Also, the fan curve for the Emergency Ventilation System fans (1/2-HV-F-41/42) is very flat. As a result, a small difference in differential pressure will result in a large difference in flow rate. Therefore, the HEPA and charcoal filters were initially believed to be loaded to the point that they reduced the flow rate to a value that was less than the required TS flow rate.

An additional contributing cause included in the original engineering response to 2-HV-F-41 not providing the TS ventilation flow rate was the fact that an inclined manometer was used for the past flow measurements, instead of the air data multimeter that is currently used for flow measurement. It was identified that the TS require the use of a pitot tube to measure flow, in accordance with ANSI/ASME N510-1975. The pitot tube can be used with either an inclined manometer or an air data multimeter (which is more accurate) as a readout device. Therefore, the use of the more accurate instrument may have contributed to the drop in real/apparent flow rate.

A corrective action from 2-HV-F-41 not meeting TS required flow rates was to test the other three emergency ventilation supply fans (1-HV-F-41, 1-HV-F-42, and 2-HV-F-42). Upon the failure of the second Unit 2 emergency ventilation supply fan to supply TS required flow, engineering determined that the new testing methodology and new test locations were the primary reasons for the low ventilation flow rates. Consequently, the Unit 1 emergency supply fans were scheduled for testing in an expeditious manner.

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NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)* (17)

4.0 IMMEDIATE CORRECTIVE ACTION(S)

The ventilation flow rate for each fan that did not meet TS requirements was adjusted. Testing was then performed to verify as-left ventilation flow was within TS requirements.

5.0 ADDITIONAL CORRECTIVE ACTIONS

A walkdown of the control room emergency ventilation system was performed to verify flow rate measurement locations. The walkdown confirmed that three of the four emergency air supply fans had acceptable test ports installed upstream of the heater on the inlet to the filter. However, the upstream test ports for 1-HV-F-42 require relocation due to interference with the disk for the suction motor operated valve (MOV) (Component - V), 1-HV-MOV-118-2.

6.0 ACTIONS TO PREVENT RECURRENCE

The upstream test ports for 1-HV-F-42 will be evaluated for relocation due to interference with the disk for the suction motor operated valve, 1-HV-MOV-118-2.

7.0 SIMILAR EVENTS

LER N1-86-019-00 dated January 9, 1987 documented that Control Room Emergency Ventilation System flow tests revealed that all four subsystems had flow rates greater than the flow rates specified by T.S. 3.7.7.1.

8.0 ADDITIONAL INFORMATION

None