10CFR50.73

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

February 1, 2002

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D. C. 20555-0001

Serial No.: 02-002
NAPS: MPW
Docket No.: 50-339
License No.: NPF-7

Dear Sirs:

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

Report No. 50-339/2001-004-00

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
North Anna Power Station

Enclosure

Commitments contained in this letter: None

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

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

IE22

NRC FORM 366 (7-2001)

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104 **EXPIRES 7-31-2004**

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LICENSEE EVENT REPORT (LER)

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

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
NORTH ANNA POWER STATION , UNIT 2	05000 - 339	1 OF 6

TITLE (4)
TECHNICAL SPECIFICATION MISSED SURVEILLANCE DUE TO TEST PROCEDURE ERROR

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 NAME	DOCUMENT NUMBER
12	10	2001	2001	-- 004 --	00	02	01	2002		05000-
									FACILITY NAME	DOCUMENT NUMBER 05000-

OPERATING MODE (9)	5
POWER LEVEL (10)	0 %

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)		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)
D. A. Heacock, Site Vice President	(540) 894-2101

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
B	BP	ISV	A393	No					

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 December 10, 2001 with Unit 2 in Mode 5 cold shutdown, intersystem LOCA leakage testing of the reactor coolant system (RCS) pressure isolation valves was in progress. The "B" low head safety injection (LHSI) hot leg injection isolation valve failed to meet its required seat leakage criteria of 1 gallon per minute (gpm). A 3.0 gpm flow rate was measured. While investigating this problem it was noted that Type C testing had been conducted with an incorrect valve line-up configuration rendering the previous Technical Specification (TS) surveillance tests invalid. As such, a TS missed surveillance had occurred. Subsequently, a Type C test was performed with the correct valve line-up and did not achieve acceptable results. Following valve disc and seat repairs the Type C test was performed satisfactorily. The cause of the incorrect valve line-up configuration in the test procedure is attributed to inadequate reviews during procedure revision. Acceptable RCS pressure and Type C leakage testing of the check valves directly downstream of the LHSI hot leg injection isolation valves ensure there would be no leakage out of containment. Therefore, the health and safety of the public were not affected at any time during this event.

1.0 DESCRIPTION OF THE EVENT

On October 27, 2001, Unit 2 was ramped offline to perform reactor vessel head inspection activities in accordance with NRC Bulletin 2001-01. Technical Specifications (TS) 4.4.6.2.2.d requires specified reactor coolant system (RCS) pressure isolation valves be demonstrated operable within twenty four hours following valve actuation due to flow through the valve. On December 10, 2001, with Unit 2 in Mode 5 (cold shutdown), intersystem loss of coolant accident (LOCA) RCS pressure leakage testing of the "B" low head safety injection (LHSI) hot leg injection isolation valve (MOV) was in progress as a result of flowing water through the MOV to fill the reactor cavity. The "B" LHSI hot leg injection isolation MOV failed to meet its required seat leakage criteria of 1 gallon per minute (gpm). Actual leakage was measured at 3.0 gpm.

Following the initial failed intersystem LOCA RCS (EIIS System-AB) pressure leakage test the B LHSI hot leg injection isolation MOV (EIIS-BP, Component-ISV) was stroked electrically in an effort to clean any debris that may have accumulated on the MOV disc or seats. The MOV was torqued within specifications to try to further seat the valve. Subsequent intersystem LOCA RCS pressure leakage testing on December 10, 2001 still indicated unacceptable flow rates. Measured flow rates were 1.44 and 2.10 gpm.

As part of the investigation into the unacceptable leakage, previous test data was reviewed. The intersystem LOCA RCS pressure leakage testing of the B LHSI hot leg injection isolation MOV during the Unit 2 spring 2001 refueling outage (RFO) noted acceptable test results. Since no concerns were noted with the intersystem LOCA RCS pressure leakage testing, reviews of the Type C leak rate test data (10 CFR 50 Appendix J) were performed. During the reviews of the Type C test data the valve line-up configuration specified in the controlling Type C test procedure was noted to have been incorrect. There are two LHSI headers to the RCS hot legs; each header contains one normally closed, remotely controlled, motor operated isolation MOV outside containment and one check valve inside the containment. Each LHSI hot leg injection isolation MOV is a double-disc motor operated gate valve with an equalization line connected between the discs and to the upstream piping. Each equalization line is provided with a manual isolation valve. These equalizing valves are normally open to ensure there is no pressure build-up between the discs preventing the LHSI injection isolation MOVs from opening when required. By maintaining the equalizing lines open, the pressure between the discs will be the same as the upstream piping pressure; the downstream disc will be tested for leakage. The controlling test procedure for Unit 2 required the equalizing valves to be closed when performing the Type C testing of the each LHSI hot leg injection isolation MOV. This incorrect valve line-up rendered the test results invalid, and therefore, the previous TS surveillance tests were invalid. Subsequently, on December 10, 2001, Type C testing of the B LHSI hot leg injection isolation MOV with the equalizing line manual isolation valve open resulted in unacceptable leakage. The A LHSI hot leg injection isolation MOV (EIIS-BP, Component-ISV) had acceptable test results with the equalization valve open. The check valves for the A & B LHSI hot leg injection isolation

valves had tested satisfactory during the Unit 2 spring 2001 RFO Type C test performance.

Reviews of containment isolation valve Type C test configurations were performed. The Unit 1 and 2 LHSI hot leg injection isolation MOVs (four total) are the only Type C tested MOVs that have an equalization line with a manual isolation valve. The Unit 1 controlling test procedure required the equalizing valves to be open during Type C testing of each LHSI hot leg injection isolation MOV. Therefore, the invalid Type C tests are only applicable to the Unit 2 A and B LHSI hot leg injection isolation MOVs.

2.0 SIGNIFICANT SAFETY CONSEQUENCES AND IMPLICATIONS

The Safety Injection (SI) System operates in two distinct modes during a LOCA: the injection mode, and the recirculation mode. The LHSI pumps (EIIS-BP, Component-P) are designed to deliver large quantities of borated water to the reactor coolant system (RCS) from the refueling water storage tank (RWST) (EIIS-BP, Component-TK) or the containment sump depending on the mode of operation. The LHSI pumps start automatically on a SI signal and the pump discharge is recirculated back to the RWST (i.e., injection mode). When the RCS pressure drops below the LHSI pump discharge head pressure of approximately 175 psig, borated water is delivered to the RCS. During the recirculation mode, fluid exiting the RCS through the break collects in the containment sump. When sufficient fluid is available in the sump, and before the RWST is empty, the SI system is realigned to recirculate the containment sump water to the LHSI pumps to the suction of the HHSI pumps (EIIS-BQ, Component-P) to the RCS cold legs. After a specified period of time the cold leg recirculation mode is terminated and the hot leg recirculation mode is initiated. The SI system is alternated between the cold leg and hot leg recirculation paths at regular intervals. The shifting of the flow paths assists in terminating boiling, collapsing voids in the vessel head, and backflushing boron that may have plated out on the core.

Type C tests are performed to verify containment isolation valve leak tightness. Performance of invalid testing calls into question the ability of the B LHSI hot leg injection isolation MOVs to prevent leakage out of containment during normal plant operation and during a design basis accident (DBA). However, normal system integrity along with operable isolation devices (i.e., check valves) remained available for each LHSI hot leg injection isolation MOV.

During normal plant operations check valves in each of the hot leg loops and in the piping header inside containment would prevent backflow through the piping to the LHSI hot leg injection isolation valves. If leakage past the containment check valves (EIIS Component-VTV) and the LHSI hot leg injection isolation MOVs were to occur, system relief valves (EIIS Component-VTV) would prevent piping over pressurization. Any radioactive gases escaping the system would be detected in the safeguards building which has radiation

monitors and ventilation filtration.

During a DBA the check valve inside of containment would prevent backflow of radioactive gases to the LHSI hot leg injection isolation MOVs. If a line break were to occur between the check valves and the LHSI hot leg injection isolation MOVs the piping upstream of the LHSI hot leg injection isolation MOVs would be full of borated water as a result of the LHSI pumps automatically starting. Any leakage that might occur would be detected in the safeguards building.

Intersystem LOCA testing is performed every refueling outage at 300 pounds pressure on the RCS pressure isolation valves (e.g., MOVs and check valves). Although a direct correlation between intersystem LOCA RCS pressure isolation valve testing and Type C testing can not be made, completed intersystem LOCA tests for previous refueling outages noted acceptable leakage results since 1983 on the A and B LHSI hot leg injection isolation valves and their associated containment check valves.

The health and safety of the public were not affected at any time during this event. This event is reportable pursuant to 10 CFR 50.73 (a)(2)(I)(B) for a condition prohibited by the plant TS as a result of missed surveillance's due to the invalid testing.

3.0 CAUSE

The cause of the invalid surveillance tests is attributed to an incorrect valve line-up of the equalization line manual isolation valve designated in the test procedure. A review of the Type C test procedure used in 1983 and 1984 noted the diagram depicting the normal position of the equalization line manual isolation valve as open for the Unit 2 B LHSI hot leg injection isolation MOV and closed for the Unit 2 A LHSI hot leg injection isolation MOV. In 1986 the position of the equalization line manual isolation valve for the Unit 2 B LHSI hot leg injection isolation MOV was changed from open to closed commensurate with the A LHSI hot leg injection isolation MOV. The cause for the incorrect valve line-up is attributed to incorrect procedure change. The test procedure for Unit 1 depicted the normal position for the equalization line manual isolation valves as open.

The cause of leakage past the B LHSI hot leg injection isolation MOV is attributed to normal valve wear over time. Maintenance work history reviews noted no maintenance to the valve discs and seats since original installation.

4.0 IMMEDIATE CORRECTIVE ACTION(S)

Following the initial failed intersystem LOCA RCS pressure leakage test the B LHSI hot leg injection isolation MOV was stroked electrically in an effort to clean any debris that may have accumulated on the valve disc or seats. The valve was torqued within specifications to try to further seat the valve. Subsequent intersystem LOCA RCS

pressure leakage testing still indicated unacceptable flow rates. The MOV was removed from service for repair. A review of historical leakage data for the subject MOV was initiated.

5.0 ADDITIONAL CORRECTIVE ACTIONS

Following the failed Type C test with the manual equalization valve in the correct position the B LHSI hot leg injection isolation MOV was disassembled and the valve seats and discs were inspected. The downstream disc face was scored in multiple centroidal patterns, including several minor gouges. Minor high spots were also noted in the valve guides. Due to the design of the valve, the disc is free to rotate on the disc carrier. The disc appeared to be rotating whenever the valve seats and unseats. Both valve discs were machined and the valve seats were lapped. The valve was re-assembled and installed in the system.

The A LHSI hot leg injection isolation MOV had acceptable Type C test results with the equalization valve open. The Type C leakage test procedure was revised to perform testing with the equalizing line open ensuring the pressure between the discs will be the same as the upstream piping pressure, and the downstream disc will be tested for leakage.

Following maintenance activities on the B LHSI hot leg injection isolation MOV, Type C testing was performed with 0 leakage. Reviews of containment isolation valve Type C test configurations were performed. Only the Unit 1 and 2 LHSI hot leg injection isolation MOVs (four total) have an equalization line with a manual isolation valve.

6.0 ACTIONS TO PREVENT RECURRENCE

Revision of the Unit 2 Type C leakage test procedure will ensure the equalizing line manual isolation valve is open during testing to prevent a similar condition.

The technical procedure change process currently in place has evolved significantly since 1986. Technical reviews are more rigorous and are performed by multiple disciplines, with specified guidelines. Validation reviews are also performed to ensure quality procedures.

7.0 SIMILAR EVENTS

LER 50-339/87-012-00 documents the failure of three containment isolation valves to achieve acceptable Type C leakage limits. The LHSI hot leg injection isolation MOVs were not among the three failures.

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

LER 50-338/89-004-00 documents the failure of ten containment isolation valves to achieve acceptable Type C leakage limits. The LHSI hot leg injection isolation MOVs were not among the ten failures.

8.0 MANUFACTURER/MODEL NUMBER

Mark No.	02-SI-MOV-2890B
Manufacturer	Anchor Darling Industries
Component	10" Darling OS&Y Motor Operated Gate Valve SO-E5071

9.0 ADDITIONAL INFORMATION

North Anna Unit 1 was operating in Mode 1 at 100 percent power and was not affected by this condition since the Unit 1 controlling test procedure required the equalizing valves to be open during Type C testing of each LHSI hot leg injection isolation MOV.