

**Virginia Electric and Power Company
North Anna Power Station
1022 Haley Drive
Mineral, Virginia 23117**

May 5, 2016

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

Serial No.: 16-171
NAPS: DPM
Docket Nos.: 50-338, 50-339
License Nos.: NPF-4, NPF-7

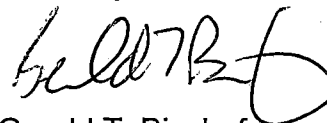
Dear Sirs:

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

Report No. 50-338/2016-002-00

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

Sincerely,



Gerald T. Bischof
Site Vice President
North Anna Power Station

Enclosure

Commitments contained in this letter: None

cc: United States Nuclear Regulatory Commission
Region II
Marquis One Tower
245 Peachtree Center Ave., NE, Suite 1200
Atlanta, Georgia 30303-1257

NRC Senior Resident Inspector
North Anna Power Station

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**LICENSEE EVENT REPORT (LER)**

(See Page 2 for required number of digits/characters for each block)

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to Infocollects.Resource@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 an 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.

1. FACILITY NAME North Anna Power Station, Unit 1	2. DOCKET NUMBER 05000338	3. PAGE 1 OF 4
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4. TITLE Chemical Addition System Outside of Technical Specification Due to Excessive Unseating Thrust on MOVs
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5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
03	09	2016	2016	- 002 - 00		05	05	2016	North Anna Power Station, Unit 2	05000339
									FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)			
1	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)
10. POWER LEVEL 100	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 73.77(a)(1)
	<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	<input type="checkbox"/> 73.77(a)(2)(i)
	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 73.77(a)(2)(ii)
	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> OTHER	Specify in Abstract below or in NRC Form 366A	

12. LICENSEE CONTACT FOR THIS LER	
LICENSEE CONTACT Gerald T. Bischof, Site Vice President	TELEPHONE NUMBER (Include Area Code) (540) 894-2101

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT									
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
X	BE	V	V085	Y					

14. SUPPLEMENTAL REPORT EXPECTED <input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO	15. EXPECTED SUBMISSION DATE MONTH DAY YEAR
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ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On March 9, 2016, at approximately 1034 hours, with Unit 1 at 100 percent power in Mode 1 and Unit 2 at 0 percent power in Mode 6 for a scheduled refueling outage, 2-QS-MOV-202B failed to stroke open when functionally tested due to excessive unseating thrust. An extent of condition review and engineering evaluation determined that 2-QS-MOV-202A maintained its function. An extent of condition review and engineering evaluation of the Unit 1 valves determined that 1-QS-MOV-102B maintained its function and 1-QS-MOV-102A did not. Design Changes (DC) (DC NA-16-00023 for Unit 1 and DC NA-16-00021 for Unit 2) were implemented to provide additional valve operating margin prior to returning the valves to service. Based on as-found testing and engineering evaluation, Sodium Hydroxide (NaOH) injection for both units would have been supplied in the event of a Design Basis Accident (DBA) and the safety function of the Chemical Addition System was maintained. The health and safety of the public were not affected by this event.

NRC FORM 366A
(11-2015)

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104

EXPIRES: 10/31/2018



LICENSEE EVENT REPORT (LER) CONTINUATION SHEET

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to Infocollects.Resource@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 an 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.

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
North Anna Power Station, Unit 1	05000338	YEAR	SEQUENTIAL NUMBER	REV NO.
		2016	-002	-00

NARRATIVE

1.0 DESCRIPTION OF THE EVENT

On March 9, 2016, with Unit 2 at 0 percent power in Mode 6, the Unit 2 Chemical Addition Tank Outlet Valve, 2-QS-MOV-202B (EIIS System-BE, Component-V) failed to open when functionally tested. The actuator was unable to unseat the disc under normal bus voltage. This resulted in tripping the thermal overload for breaker, 2-EE-BKR-2J1-2S-B3 (EIIS System-EE, Component-BKR), due to excessive unseating thrust. The actuator stall thrust was estimated to be approximately 25,000 lbs. The valve would not have been able to open if called upon in a Design Basis Accident (DBA). In support of continued troubleshooting of 2-QS-MOV-202B, an extent of condition review and an engineering evaluation was conducted on Unit 2 Chemical Addition Tank Outlet Valve, 2-QS-MOV-202A. Periodic Test, 2-PT-212.34H, "Valve Inservice Inspection (2-QS-MOV-202A)", had been performed prior to evaluation. Therefore, initial unseating thrust was unknown prior to testing. Based on 2-QS-MOV-202A successfully opening during the performance of 2-PT-212.34H, subsequent test data, and engineering evaluation it was determined that 2-QS-MOV-202A would have opened and performed its function if called upon in a DBA. Design Change (DC) NA-16-00021 was implemented to modify the gear ratio to increase the unseating thrust margin to the motor operated valves (MOVs) and valve stroke was changed to limit controlled seating, instead of torque controlled.

On March 25, 2016, at approximately 0805 hours, with Unit 1 at 100 percent power in Mode 1, the 72 hour Required Action for Technical Specification (TS) 3.6.8 was entered to perform an extent of condition review and as-found diagnostic testing on the Unit 1 Chemical Addition Tank Outlet Valves. While both valves exhibited higher than expected unseating thrust, they both opened on demand. Based on functional testing and engineering evaluation, it was determined that 1-QS-MOV-102B would have performed its function. Engineering could not definitively determine that 1-QS-MOV-102A would have performed its function if called upon in a DBA; therefore, it is considered not capable of performing its function. DC NA-16-00023 was implemented to modify the gear ratios to increase the unseating thrust margin for the valves and valve stroke was changed to limit controlled seating, instead of torque controlled. The Required Action for Unit 1 was cleared on March 26, 2016, at approximately 0055 hours.

NRC FORM 366A
(11-2015)

U.S. NUCLEAR REGULATORY COMMISSION

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The Quench Spray (QS) system is used to depressurize and remove heat from containment following a DBA. Sodium Hydroxide (NaOH) is added to the QS system by way of the Chemical Addition Tank (CAT) (EHS Component-TK) through two parallel redundant MOVs, 1-QS-MOV-102A and B for Unit 1 and 2-QS-MOV-202A and B for Unit 2, in order to enhance the removal of airborne iodine within containment and control sump pH resulting from a DBA. While only one of the valves is needed in order for the system to perform its function, Technical Specification (TS) 3.6.8 requires both valves to function in order to be considered operable.

The function of the Chemical Addition System was maintained for both Units 1 and 2. Because 1-QS-MOV-102A and 2-QS-MOV-202B were unable to perform their function, the requirements of TS 3.6.8 were not met. Therefore, this event is reportable in accordance with 10 CFR 50.73(a)(2)(i)(B), as a condition prohibited by TS.

2.0 SIGNIFICANT SAFETY CONSEQUENCES AND IMPLICATIONS

There is assurance that the function of chemical addition was maintained. The CAT MOVs are parallel full flow trains. Only one valve is required to open for chemical addition to occur. Based on as-found testing and engineering evaluation of the design calculations, NaOH injection would have been supplied in the event of a DBA.

3.0 CAUSE

The apparent cause of 2-QS-MOV-202B exhibiting excessive unseating thrust, resulting in a failure to open during functional testing, was due to mechanical binding internal to the valve body and/or actuator. This is considered to be the cause for the excessive unseating thrust exhibited in 2-QS-MOV-202A, 1-QS-MOV-102A, and 1-QS-MOV-102B.

4.0 IMMEDIATE CORRECTIVE ACTION(S)

Troubleshooting was performed, an extent of condition review was conducted, and prior operability review performed on Unit 1 and Unit 2 Chemical Addition System valves 1-QS-MOV-102A, 1-QS-MOV-102B, 2-QS-MOV-202A and 2-QS-MOV-202B.

5.0 ADDITIONAL CORRECTIVE ACTIONS

Design Changes (DC) (DC NA-16-00023 for Unit 1 and DC NA-16-00021 for Unit 2) were implemented to change the actuator gear set to provide more unseating capability for the valves. In addition, the valve stroke was changed to limit controlled versus torque controlled seating, allowing valve seating to be adjusted to lighter loads providing even more margin.

NRC FORM 366A
(11-2015)LICENSEE EVENT REPORT (LER)
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As an interim compensatory measure the valves will be stroked with Quiklook data collection more frequently, every 6 months of operation (plus grace). This is to ensure that the valve design with the new gearing is acceptable for long term operation following implementation of DCs NA 16-00021 and NA 16-00023.

6.0 ACTIONS TO PREVENT RECURRENCE

DCs were implemented to increase overall gear ratio in order to provide additional valve operating margin and allow greater unseating capacity.

7.0 SIMILAR EVENTS

None

8.0 MANUFACTURER/MODEL NUMBER

Component: 1-QS-MOV-102A, 1-QS-MOV-102B, 2-QS-MOV-202A, and 2-QS-MOV-202B
 Manufacturer: Velan Valve Corp.
 Model: B14-0054B-13PSN

9.0 ADDITIONAL INFORMATION

None