

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

April 8, 1997

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

NAPS:MPW
Docket Nos. 50-338
50-339
License Nos. NPF-4
NPF-7

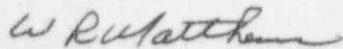
Dear Sirs:

Pursuant to North Anna Technical Specifications, Virginia Electric and Power Company hereby submits the following Licensee Event Report applicable to North Anna Units 1 & 2.

Report No. 50-338/97-001-00

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

Very truly yours,



W. R. Matthews
Station Manager

Enclosure:

Commitments contained in this report: None.

cc: U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

NRC Senior Resident Inspector
North Anna Power Station

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LICENSEE EVENT REPORT (LER)

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

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (1-6 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)

North Anna Power Station, Units 1 & 2

DOCKET NUMBER (2)

05000338

PAGE (3)

1 OF 4

TITLE (4)

Auxiliary Service Water Pump Bolts Exceed Design Basis Allowables Due to Personnel 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
03	12	97	97	001	00	04	08	97	North Anna Unit 2	05000339
									FACILITY NAME	DOCUMENT NUMBER
										05000

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)				
POWER LEVEL (10)	100 %	20.2201(b)	20.2203(a)(2)(v)	<input checked="" type="checkbox"/>	50.73(a)(2)(i)	50.73(a)(2)(viii)
		20.2203(a)(1)	20.2203(a)(3)(i)	<input type="checkbox"/>	50.73(a)(2)(ii)	50.73(a)(2)(x)
		20.2203(a)(2)(i)	20.2203(a)(3)(ii)	<input type="checkbox"/>	50.73(a)(2)(iii)	73.71
		20.2203(a)(2)(ii)	20.2203(a)(4)	<input type="checkbox"/>	50.73(a)(2)(iv)	OTHER
		20.2203(a)(2)(iii)	50.36(c)(1)	<input type="checkbox"/>	50.73(a)(2)(v)	Specify in Abstract below
		20.2203(a)(2)(iv)	50.36(c)(2)	<input type="checkbox"/>	50.73(a)(2)(vii)	or in NRC Form 386A

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (include Area Code)
W. R. Matthews, Station Manager	(540) 894-2101

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

SUPPLEMENTAL REPORT EXPECTED (14)

YES	NO	EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
(If yes, complete EXPECTED SUBMISSION DATE)					

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On March 12, 1997, with Units 1 & 2 in Mode 1, 100 percent power, it was determined that the Auxiliary Service Water (ASW) pump bolts connecting the top column flange to pedestal base plate exceeded the design basis allowables and the short term operability criteria established in NRC Generic Letter 91-18 during a Design Basis Earthquake. Technical Specification (TS) 3.7.4.1.d allows the 72 hour Action of TS 3.7.4.1.c to be extended to 168 hours provided 3 of 4 Service Water (SW) pumps and 2 of 2 ASW pumps have been operable since initial entry into the action and for the duration of same. The Action of TS 3.7.4.1.d had been entered in the past with the ASW pumps inoperable due to inadequate bolting. As such, this event is reportable pursuant to 10CFR50.73 (a)(2)(i)(B) for a condition prohibited by TS.

The cause of the event is attributed to personnel error during initial design and installation.

This event posed no significant safety implications since the ASW pumps are not taken credit for in the design basis accident as stipulated in the TS Bases. Therefore, the health and safety of the public were not affected at any time during this event.

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TEXT CONTINUATION

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		97	001	00	

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

1.0 Description of the Event

In October 1996, a discrepancy with the Main Service Water (SW) Pump (EIS System - BI, Component - P) column flange bolts was discovered concerning the actual installed flange bolts and the vendor's seismic analysis report. A review of the vendor's seismic analysis report identified that the properties of A325 bolting material were used for the analysis. However, this was not consistent with the A307 bolts the vendor identified on the bill of materials which were actually installed in the pump. Our evaluation of the structural adequacy of the A307 flange bolts of the SW pump column showed a calculated stress for the Design Basis Earthquake (DBE) condition of 28.6 ksi on the bolts compared to ANSI B31.7 allowable stress of 16.8 ksi. Generic Letter (GL) 91-18, allows the use of ASME Section III, Appendix F, which indicates that the pump would be operable if the stress did not exceed 0.7 times the Ultimate Tensile Strength or 42 ksi. Therefore, the SW pumps remained operable but the bolting would be replaced. This condition was discussed in NRC Integrated Inspection Report 50-338/96-12, 50-339/96-12.

As part of our corrective actions for this condition it was determined that evaluations of the Auxiliary Service Water (ASW) pump (EIS System - BI, Component - P) bolts were also necessary. Upon completing the evaluation it was noted the ASW pump bolts were more likely to be A307, the same as the SW pump bolts. However, the support configuration between the SW and ASW pumps is different and the ASW pumps are subjected to different seismic response spectra. As such, the ASW pump bolts connecting the top column flange to the pedestal base plate exceeded the design basis allowables and the short term operability criteria established in NRC GL 91-18 during a Design Basis Earthquake (DBE). On March 12, 1997, it was determined that this condition rendered the ASW pumps inoperable.

Technical Specification (TS) 3.7.4.1.d allows the 72 hour Action of TS 3.7.4.1.c to be extended to 168 hours provided 3 of 4 SW pumps and 2 of 2 ASW pumps are operable. However, the extended action had previously been entered with inoperable ASW pumps. As a result a condition prohibited by TS existed.

Additionally, following a DBE, other pump bolting (e.g. column flanges, column to bowl flanges, and bowl to bowl flanges) exceeds the design basis allowables for the ASW pumps, but are within the allowable stresses characterized by ASME Section III, Appendix F and are considered operable but degraded.

2.0 Significant Safety Consequences and Implications

In the event all four SW pumps fail, the ASW pumps provide a backup system by supplying water from a separate water source (i.e. North Anna reservoir). The TS Bases stipulates that the ASW pumps are strictly a backup subsystem, and are not taken credit for in a

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		97	001	00	

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design basis accident. However, when a unit is in an extended action, 168 hours for SW system upgrades, 3 of 4 SW pumps and 2 of 2 ASW pumps are required to be operable. The design basis for the SW system notes that three of four SW pumps are capable of supplying both the normal and backup loads for both units, with sufficient reserve capacity to support a containment depressurization accident on the one unit with the loss of off-site power on both units. Two SW pumps are also capable of supporting the design basis accident, if the SW system is throttled to ensure that adequate flow will be delivered to the recirculation spray heat exchangers. Since the TS requires at least 3 of 4 SW pumps to be operable during extended actions, the inoperability of the ASW pumps is not safety significant.

The ASW pump pedestal base bolts were sent to an offsite laboratory for testing. Preliminary results indicate adequate strength was available for the Unit 2 ASW pumps to withstand a DBE and thus be considered operable.

The ASW pumps are also taken credit for in the Appendix R analysis and are maintained operable in Modes 1-4. When the ASW pumps are inoperable, compensatory measures are provided and as such, there are no significant safety implications. Therefore, the health and safety of the public were not affected at any time during this event.

This event is reportable pursuant to 10CFR50.73 (a)(2)(i)(B) for a condition prohibited by TS.

3.0 Cause of the Event

The cause of this event is attributed to personnel error during initial design and installation.

4.0 Immediate Corrective Actions

The ASW pumps were declared inoperable. An information action was entered to preclude entering the 168 hour Action of TS 3.7.4.1.c. In addition, the Action of Technical Requirements Manual 7.5 for an inoperable ASW pump was entered to establish a fire watch in the SW Pump House.

5.0 Additional Corrective Actions

The Unit 1 and 2 ASW pump bolts, A307 material, connecting the top column flange to pedestal base were replaced with ASTM A193 Grade B7 high strength bolts on March 14 and 15, 1997, respectively. Although the remainder of the affected pump bolting does not meet design basis allowables, when subjected to DBE loading, restoration to operable status is allowed per Generic Letter 91-18 through use of ASME Section III, Appendix F, requirements for elevated stress levels.

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TEXT CONTINUATION

FACILITY NAME (1) North Anna Power Station Units 1 & 2	DOCKET 05000338	LER NUMBER (6) <table border="1"> <tr> <td data-bbox="1058 246 1133 278">YEAR</td> <td data-bbox="1144 246 1279 278">SEQUENTIAL NUMBER</td> <td data-bbox="1291 246 1365 278">REVISION NUMBER</td> </tr> <tr> <td data-bbox="1058 285 1133 317">97</td> <td data-bbox="1144 285 1279 317">001</td> <td data-bbox="1291 285 1365 317">00</td> </tr> </table>	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	97	001	00	PAGE (3) 4 OF 4
YEAR	SEQUENTIAL NUMBER	REVISION NUMBER							
97	001	00							

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

The ASW pumps were determined to meet these requirements and are considered operable but degraded. Restoration of non-conforming conditions is expected in a prompt manner, based on safety significance, but allows interim operation using the GL criteria. As such, both units ASW pumps were declared operable and the actions of TS and the TRM were exited.

6.0 Actions to Prevent Recurrence

Since the cause of this event occurred during original design and installation of the ASW pumps there are no actions to prevent recurrence. However, for design changes occurring now and in the future the current Design Change Program has requirements established to ensure vendor products and supporting documentation are reviewed prior to use. Personnel in the design engineering organization have been alerted to this issue and advised to provide more attention to detail when reviewing critical technical information supplied by equipment vendors.

7.0 Similar Events

None

8.0 Additional Information

None