

Virginia Electric and Power Company  
Surry Power Station  
5570 Hog Island Road  
Surry, Virginia 23883

February 6, 1998

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

Serial No.: 98-085  
SPS:BAG/RSH  
Docket No.: 50-280  
License No.: DPR-32

Dear Sirs:

Pursuant to 10 CFR 50.73, Virginia Electric and Power Company hereby submits the following Licensee Event Report applicable to Surry Power Station Unit 1.

**REPORT NUMBER**

50-280/98-001-00

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,



D. A. Christian  
Station Manager

Enclosure

Commitments contained in this letter:

1. A Category 2 Root Cause Evaluation of this event will be performed.

IE221

9802170112 980206  
PDR ADOCK 05000280  
S PDR



copy: U. S. Nuclear Regulatory Commission  
Region II  
Atlanta Federal Center  
61 Forsyth Street, SW, Suite 23T85  
Atlanta, Georgia 30303

Mr. R. A. Musser  
NRC Senior Resident Inspector  
Surry Power Station

## 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) <b>SURRY POWER STATION , Unit 1</b>	DOCKET NUMBER (2) <b>05000 - 280</b>	PAGE (3) <b>1 OF 4</b>
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TITLE (4) <b>Deficient Test Due to Faulty Test Equipment Results in Tech Spec Violation</b>
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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
01	08	98	98	-- 001 --	00	02	06	98	FACILITY NAME	DOCUMENT NUMBER 05000-

OPERATING MODE (9) <b>n</b>	POWER LEVEL (10) <b>100 %</b>	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)							
		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)			50.73(a)(2)(ii)		50.73(a)(2)(x)
		20.2203(a)(2)(i)		20.2203(a)(3)(ii)			50.73(a)(2)(iii)		73.71
		20.2203(a)(2)(ii)		20.2203(a)(4)			50.73(a)(2)(iv)		OTHER
		20.2203(a)(2)(iii)		50.36(c)(1)			50.73(a)(2)(v)		Specify in Abstract below or in NRC Form 366A
20.2203(a)(2)(iv)		50.36(c)(2)			50.73(a)(2)(vii)				

LICENSEE CONTACT FOR THIS LER (12)	
NAME <b>D. A. Christian, Station Manager</b>	TELEPHONE NUMBER (Include Area Code) <b>(757) 365-2000</b>

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)									
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS
				no					

SUPPLEMENTAL REPORT EXPECTED (14)				EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE).	<input checked="" type="checkbox"/>	NO					

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

On January 8, 1998, with Units 1 and 2 at 100% power, it was determined that vibration readings taken for the Unit 1 Motor Driven Auxiliary Feedwater Pump (MDAFWP) 3B on November 3, 1997, were not valid. The test was performed in accordance with ASME Section XI and conducted pursuant to Surry Technical Specification (TS) Surveillance Requirement 4.0.5. Upon discovery of the invalid data, the pump was declared inoperable, and the unit entered a 72 hour action statement at 1100 hours on January 8, 1998, in accordance with TS 4.0.3. The action statement was cleared at 1541 hours when the pump was returned to service following a test that reconfirmed acceptable vibration readings. The most probable cause of this event was a faulty vibration analyzer cable or a loose connection. A Root Cause Evaluation has been initiated. No conditions adverse to safety resulted from this event since the MDAFWP was capable of performing its safety function. This occurrence is a violation of TS 4.0.5.a and is therefore being reported pursuant to 10CFR50.73(a)(2)(i)(B).

**LICENSEE EVENT REPORT (LER)**  
TEXT CONTINUATION

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		YEAR <b>98</b>	SEQUENTIAL NUMBER <b>--001--</b>	REVISION NUMBER <b>00</b>	

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

**DESCRIPTION OF THE EVENT**

On November 3, 1997, the Unit 1 Motor Driven Auxiliary Feedwater Pump (MDAFWP) 3B [EIS-BA,P] quarterly surveillance test was performed. Vibration data was obtained using an accelerometer and a collector/analyzer. The post-test review of the vibration data concluded that the test was satisfactory because the overall vibration data for each measured point was within the procedure's specified acceptable range. A follow-up review by the Inservice Test (IST) Engineer did note that the vibration measurements were lower than those that had been previously recorded but he concluded that the data were within the test procedure's acceptable range for each point. Other parameters including pump flow and pressure were noted to be within range and comparable to previous values.

After the November 3, 1997 test of the MDAFWP 3B, Operations personnel noted that the cable connecting the accelerometer to the collector/analyzer was worn. The Predictive Analysis Group (PAG) verified that the cable continued to function, but replaced the cable because it was worn. After replacement of the cable, no concerns were noted with the collector/analyzer until the January 5, 1998, test of Unit 1 Emergency Service Water Pump (ESWP) 1C (EIS-BI,P).

On January 5, 1998, a station IST Engineer noted that during the testing of the Unit 1 ESWP 1C the pump vibration measurements were erratic. Test personnel suspected that the test equipment, an accelerometer attached to a collector/analyzer, was not functioning properly. A review of other tests performed using the suspected test equipment was conducted. On January 8, 1998, with Units 1 and 2 at 100% power, it was discovered that the vibration measurements taken during the November 3, 1997 test of the Unit 1 MDAFWP 3B were not valid. Since the overall values for the vibration data recorded for the November 3 test were lower than previous values, spectral data for the test were reviewed. This review concluded that the collector/analyzer had not recorded anything other than an initial spike, suspected to be electronic noise. Further analysis of the vibration spectra was performed by a vendor technical support representative who confirmed that the data obtained were not valid pump vibration data. Further review confirmed that, with the exception of the November 3 test, other tests involving the use of this test equipment were fully acceptable.

Although all other parameters measured during the November 3 test (flow rate, suction and discharge pressure, oil pressure, and bearing housing temperatures) showed the pump to be operating normally and acceptably, in the absence of valid vibration data, the requirements of ASME Section XI were not fully met. Upon notification of this issue by the IST Engineer, the Operations Shift Supervisor declared the pump inoperable because the surveillance was not fully met and entered a 72 hour TS action statement at 1100 hours on January 8, 1998. The action statement was exited at 1541 hours after a fully acceptable pump test was performed.

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

This occurrence is a violation of Technical Specification 4.0.5.a and is therefore being reported pursuant to 10CFR50.73(a)(2)(i)(B).

**SIGNIFICANT SAFETY CONSEQUENCES AND IMPLICATIONS**

No conditions adverse to safety resulted from this event since the MDAFWP was capable of performing its intended function. Retest of the MDAFWP verified that the pump was fully operable.

**CAUSE OF THE EVENT**

The most probable cause of the event was a faulty cable or a loose connection.

The November 3, 1997 test of the MDAFWP 3B resulted in invalid vibration data. Subsequent to the November 3 test, the only change made to the vibration analysis equipment until January 5 was the replacement of the cable connecting the collector/analyzer to the accelerometer. The cable was replaced because it showed signs of wear. Following the January 5 test, the accelerometer was found to be out of tolerance, and it was replaced.

The accelerometer manufacturer was contacted to determine if an intermittent short in the accelerometer could have been responsible for the results of the November 3 test. The manufacturer stated that accelerometers do not display intermittent grounds, and therefore, had the accelerometer been the cause of the invalid data on November 3, subsequent tests should have had the same results.

Since the review of the tests performed prior to and after the November 3 test did not identify any other invalid vibration data, and since the analyzer cable was replaced soon after the November 3 test, the most probable cause of the invalid data is either that the cable was faulty or that the cable was not properly made up to the equipment.

The worn cable was sent back to the manufacturer for testing. However, subsequent to receiving the cable, it was misplaced by the manufacturer.

**IMMEDIATE CORRECTIVE ACTION(S)**

Upon discovery that the vibration data was not valid, a station deviation report was submitted, and the pump was declared inoperable because the surveillance was not fully met. A 72 hour action statement was entered at 1100 hours on January 8, 1998, and the action statement was exited at 1541 hours after a fully acceptable test of the pump.

**LICENSEE EVENT REPORT (LER)**  
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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

**ADDITIONAL CORRECTIVE ACTION(S)**

A review of those tests performed since the initial calibration of the collector/analyzer and accelerometer was performed.

The Superintendent of Operations issued a memorandum to all Operations personnel stressing the need to use caution when taking vibration data and to ensure that the data is valid prior to recording it.

IST personnel were coached on the need to review new data for adverse trends or questionable data.

A Root Cause Evaluation (RCE) has been initiated.

**ACTIONS TO PREVENT RECURRENCE**

As an enhancement, a Calibration Exciter will be purchased for use by the Operations Department. This device will enhance the ability of Operations' personnel to quickly determine if the vibration analysis equipment is recording valid vibration data.

Recommendations from the RCE will be implemented when the evaluation is complete.

**SIMILAR EVENTS**

None