

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

May 27, 2014

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

Serial No.: 14-255  
SPS: JSA  
Docket No.: 50-280  
License No.: DPR-37

Dear Sirs:

Pursuant to 10CFR50.73, Virginia Electric and Power Company hereby submits the following Licensee Event Report applicable to Surry Power Station Unit 1.

Report No. 50-280/2014-001-00

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

Very truly yours,



N. L. Lane,  
Site Vice President  
Surry Power Station

Enclosure

Commitment contained in this letter: None

*TE22*  
*MRR*

cc: U.S. Nuclear Regulatory Commission, Region II  
Marquis One Tower, Suite 1200  
245 Peachtree Center Ave., NE  
Atlanta, GA 30303-1257

NRC Senior Resident Inspector  
Surry Power Station



**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.

<b>1. FACILITY NAME</b> Surry Power Station, Unit 1	<b>2. DOCKET NUMBER</b> 05000-280	<b>3. PAGE</b> 1 OF 4
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**4. TITLE**  
Closed Service Water Valve Results in Exceeding Technical Specifications

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	29	2014	2014	001	00	05	27	2014	Surry Power Station, Unit 2	05000-281
									FACILITY NAME	DOCKET NUMBER
										05000

**9. OPERATING MODE** N

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

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

**12. LICENSEE CONTACT FOR THIS LER**

LICENSEE CONTACT N. L. Lane, Site Vice President	TELEPHONE NUMBER (Include Area Code) (757) 365-2001
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**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
A	BI	ISV	F130	Y	A	BI	P	G200	Y

**14. SUPPLEMENTAL REPORT EXPECTED**  
 YES (If yes, complete 15. EXPECTED SUBMISSION DATE)  NO

**15. EXPECTED SUBMISSION DATE**

MONTH	DAY	YEAR

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

At 11:40 on March 29, 2014, with both Unit 1 and Unit 2 operating at 100% power, the Unit 1D service water header was declared inoperable as a result of indications received during testing. The direct cause of the indications was due to a mostly closed service water header isolation valve for the Unit 1D service water header. In October 2013, following valve replacement, the valve handwheel was re-oriented causing the valve to become mostly closed while indicating open. Therefore, the Unit 1D service water header was inoperable from October 21, 2013 until March 29, 2014 and Technical Specification limiting conditions of operation were exceeded twice during timeframes when one of two other operable service water headers was tagged out for maintenance. Also, as a result of the restricted flow condition, a service water pump that supplies cooling to a charging pump was also determined to be inoperable beyond its Technical Specification limiting conditions of operation. Therefore, this report is being submitted, pursuant to 10 CFR 50.73(a)(2)(i)(B), for operations prohibited by Technical Specifications. Based on the risk assessment of this event, the risk impact was determined to be very small and, as a result, the health and safety of the public were not affected.



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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](mailto: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.

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**NARRATIVE**

**1.0 DESCRIPTION OF THE EVENT**

At 11:40 on March 29, 2014, with both Unit 1 and Unit 2 operating at 100% power, the Unit 1D service water (SW) header was declared inoperable as a result of indications received during scheduled performance of the Control Room Air Conditioning System Pump and Valve In-service Testing. Based on Operations and Maintenance troubleshooting, it was determined on March 31, 2014 that the Unit 1D SW header isolation valve [EISS-BI-ISV] was either closed or partially closed while indicating full open. This condition existed since October 21, 2013 when, following valve replacement, the valve handwheel was re-oriented 90 degrees to eliminate interference with welding activity in the area. Therefore, during the time period from October 21, 2013 to March 29, 2014, the Unit 1D SW header was determined to have been inoperable due to the restricted flow of the mostly closed Unit 1D SW header isolation valve.

The Units 1 and 2 SW Systems supply cooling water through three common SW flow paths to the charging pump service water subsystems and the Main Control Room/Emergency Switchgear Room Air Conditioning subsystems. Technical Specification 3.14 requires two operable SW flow paths to these subsystems. During the period when the Unit 1D SW header was inoperable, one of the remaining two operable SW headers was tagged out for maintenance in two instances. The Unit 2A SW header was tagged out for circulating water system maintenance from January 6, 2014 at 04:28 to January 11, 2014 at 23:30 and the Unit 2C SW header was tagged out for circulating water system maintenance from March 16, 2014 at 01:30 to March 23, 2014 at 16:33. The tagged out durations of Unit 2A and 2C SW headers during the timeframe Unit 1D SW header was inoperable exceeded the Technical Specification 24 hour limiting condition of operation for two SW headers being inoperable. Therefore, this report is being submitted, pursuant to 10 CFR 50.73(a)(2)(i)(B) for operation prohibited by Technical Specifications.

Also, at 07:40 on April 3, 2014, during swapping of the Unit 1 charging SW pumps (which supply SW flow to the charging pump intermediate seal coolers and lube oil coolers), the Unit 1B charging SW pump [EISS-BI-P] experienced low discharge pressure. The pump was subsequently declared inoperable and a 72 hour limiting condition of operation was entered for Unit 1 in accordance with Technical Specifications 3.2 and 3.3. The SW suction strainer basket for the Unit 1B charging SW pump was vented for 25 seconds to evacuate air and the limiting condition of operation was exited at 10:49 on April 3, 2014. An apparent cause evaluation determined that as a consequence of performing the Control Room Air Conditioning System Pump and Valve In-service Testing on March 29, 2014, with the Unit 1D SW header isolation valve mostly closed and restricting flow, air in the SW system migrated to the suction of the Unit 1B charging SW pump causing it to become air bound. Therefore, the Unit 1B charging SW pump was inoperable from March 29, 2014 until it was vented on

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April 3, 2014. This timeframe exceeded the Technical Specification 72 hour limiting condition of operation. Therefore, this event is also reportable pursuant to 10 CFR 50.73(a)(2)(i)(B) for operation prohibited by Technical Specifications.

**2.0 SIGNIFICANT SAFETY CONSEQUENCES AND IMPLICATIONS**

The Unit 1D SW header supports charging pump operability as a source of SW (heat sink) for the charging pump lube oil coolers and MCR/emergency switchgear room air conditioning subsystems. With 1D SW header unavailable, multiple equipment/human failures are required to result in a core damage scenario. This includes a failure of one of the other available SW headers (2A,2C), of which at least one remained available during this event and was fully capable of servicing all charging pump subsystem and Main Control Room/Emergency Switchgear Room Air Conditioning subsystem SW loads.

Similarly, the Unit 1A charging SW pump remained available during the period the Unit 1B charging SW pump was inoperable. The Unit 2 charging SW pumps can also be cross-connected to those of Unit 1.

Therefore, based on the assessment of this event, the risk impact was determined to be very small and, as a result, the health and safety of the public were not affected.

**3.0 CAUSE**

The root cause evaluation (RCE) team determined that the direct cause was the re-orientation of the valve handwheel, resulting in the Unit 1D SW header isolation valve being mostly closed while indicating open and in service. The root cause was failure to adhere to maintenance standards which requires work activities to be performed IAW controlled procedures or instructions. No procedures or written instructions were used for the evolution of re-orienting the valve handwheel.

An apparent cause evaluation determined that during the performance of the Control Room Air Conditioning System Pump and Valve In-service Testing on March 29, 2014, with the Unit 1D SW header isolation valve mostly closed and restricting flow, the SW supply strainer lined up to the Unit 1D SW header was operated in a vacuum and allowed air to enter the system (most likely at the strainer packing) which migrated to the suction of the Unit 1B charging SW pump causing it to become air bound.

**4.0 IMMEDIATE CORRECTIVE ACTION(S)**

The Unit 1D SW header was declared inoperable and tagged out until the cause of the inoperability was determined and corrected. SW header 2C was placed in service along with 2A, which was already in service, and both were established as protected equipment.

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The SW suction strainer basket for the Unit 1B charging SW pump was vented to evacuate the air, returned to service and the limiting condition of operation was exited.

**5.0 ADDITIONAL CORRECTIVE ACTIONS**

The handwheel on the Unit 1D SW header isolation valve was correctly oriented, proper valve operation was verified and the entire 1D SW header was restored to operable flowing condition. A RCE team was assembled to determine the cause of this event and to recommend corrective actions.

An apparent cause evaluation was performed for inoperability of the Unit 1B charging SW pump caused during the Unit 1D SW header troubleshooting.

**6.0 ACTIONS TO PREVENT RECURRENCE**

The personnel responsible for re-orienting the Unit 1D SW header isolation valve handwheel will be evaluated in accordance with the provisions of the performance management process. A procedure will be developed for maintenance of Fisher butterfly valves and actuators to be used in work orders for these valves and actuators, including verification of proper valve installation and operation.

Corrective actions from the apparent cause evaluation for the inoperability of the Unit 1B charging SW pump will be implemented.

**7.0 SIMILAR EVENTS**

None

**8.0 MANUFACTURER/MODEL NUMBER**

Fisher Controls Int'l (Emerson Proc Ctls)/43556-01, 8"  
Goulds Pumps, Inc./3996ST/1.5X2-6

**9.0 ADDITIONAL INFORMATION**

None