



Thomas D. Gatlin
Vice President, Nuclear Operations
803.345.4342

August 28, 2014

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

Dear Sir / Madam:

Subject: VIRGIL C. SUMMER NUCLEAR STATION (VCSNS), UNIT 1
DOCKET NO. 50-395
OPERATING LICENSE NO. NPF-12
LICENSEE EVENT REPORT (LER 2013-002-01)
COMPONENT COOLING SYSTEM EMERGENCY MAKEUP VALVE
FAILED TO STROKE OPEN RENDERING TRAIN OF COMPONENT
COOLING INOPERABLE

Attached is Licensee Event Report (LER) supplement No. 2013-002-01, for the Virgil C. Summer Nuclear Station (VCSNS). This report describes the surveillance test of a normally closed valve that failed to stroke open and was therefore unable to perform its design function. VCSNS is submitting this supplement to add the event cause and corrective action information. This report is submitted in accordance with 10CFR50.73(a)(2)(i)(B).

Should you have any questions, please call Mr. Bruce Thompson at (803) 931-5042.

Very truly yours,

Thomas D. Gatlin

WLT/TDG/ts

Attachment: Updated License Event Report (LER) 2013-002-01

c:	K. B. Marsh	S. A. Williams	INPO Records Center
	S. A. Byrne	NRC Resident Inspector	Marsh USA, Inc.
	J. B. Archie	L. W. Harris	Maintenance Rule Engineer
	N. S. Carns	Paulette Ledbetter	NSRC
	J. H. Hamilton	J. C. Mellette	RTS (CR-13-00930)
	J. W. Williams	EPIX Coordinator	File (818.07)
	W. M. Cherry	K. M. Sutton	PRSF (RC-14-0140)
	V. M. McCree		

IEZ2
NRR

**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 Infocollections.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

V. C. SUMMER NUCLEAR STATION, UNIT 1

2. DOCKET NUMBER

05000 395

3. PAGE

1 OF 3

4. TITLE

COMPONENT COOLING SYSTEM EMERGENCY MAKEUP VALVE FAILED TO STROKE OPEN RENDERING TRAIN OF COMPONENT COOLING INOPERABLE

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	
10	31	2012	2013	002	01	08	28	2014	FACILITY NAME	DOCKET NUMBER	
										05000	
9. OPERATING MODE			11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)								
6			<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)
10. POWER LEVEL 0%			<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

Bruce Thompson, Manager Nuclear Licensing

TELEPHONE NUMBER (Include Area Code)

(803) 931-5042

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

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
X	CC	V	A391	Y					

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

MONTH	DAY	YEAR

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

1.0 ABSTRACT

On April 22, 2013 the past operability determination identified that valve XVG09627B-CC was inoperable for a period of time greater than allowed by Technical Specification 3.7.3 for the Component Cooling Water System. On October 31, 2012, while performing a surveillance test, the normally closed Component Cooling (CC) System emergency makeup valve (XVG09627B-CC) failed to stroke open. The valve stroked open successfully on a subsequent test and was returned to service. On April 14, 2014, XVG09627B-CC failed to stroke open while performing the same surveillance test. The emergency makeup supply to the CC System is provided by the Service Water (SW) System. The SW System functions in the event of a complete loss of the normal makeup capability provided by the Demineralized Water System or if leakage exceeds the normal makeup capacity. The safety related function of XVG09627B-CC is to open to allow SW from the B Train to makeup to the B train CC system. By failing to open, this valve was unable to perform its design function without additional operator action.

The causes of this event are attributed to a low valve manipulation frequency, added frictional forces and possible spring degradation. XVG09627B-CC has been rebuilt with new closure and trip springs and new packing that has a lower friction resistance. The valve supports were adjusted to enhance the alignment of the operator and the pressure regulator closing force was reduced. The valve was stroke tested satisfactorily after being rebuilt. This report is submitted in accordance with 10CFR50.73(a)(2)(i)(B).

**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	6. LER NUMBER			3. PAGE
V. C. SUMMER NUCLEAR STATION, UNIT 1	05000 395	YEAR	SEQUENTIAL NUMBER	REV NO.	2 OF 3
		2013	- 002	- 01	

NARRATIVE**2.0 EVENT DESCRIPTION**

On October 31, 2012, during VCS Refueling Outage (RF) 20, surveillance test procedure (STP130.005M) was performed to verify the Component Cooling (CC) System emergency makeup valve (XVG09627B-CC) would stroke open on demand. The valve was actuated to the open position from the Main Control Board (MCB) but the valve remained closed as documented under surveillance test task sheet STTS 1113262-001. The valve was procedurally declared inoperable and action taken per Technical Specifications 4.0.5, 3.7.3, and 3.7.4. Operations dispatched personnel to investigate and manipulate the valve. The valve was retested successfully under STTS 1113262-002. The valve is tested on a R01 (every refueling outage) frequency when the systems are shutdown to prevent contaminating the systems.

Due to the failure of XVG09627B-CC to stroke open on October 31, 2012, VCSNS performed STP130.005M during a mid-cycle outage on March 30, 2013 to increase confidence in the valve's reliability. The valve tested satisfactory during the stroke test.

On April 14, 2014, during the performance of surveillance test procedure STP130.005M in VCS RF 21, XVG09627B-CC failed to stroke open. This failure is documented in LER 2014-001-00.

3.0 EVENT ANALYSIS

In the event of a large CC system leak or a loss of the normal makeup capability of the Demineralized Water System, each CC System train has a service water emergency makeup supply valve. Detection of excessive CC system leakage is monitored by pressure changes, flow rate changes, increase in the frequency and/or duration of surge tank water makeup cycles, or visual inspection of the system. The emergency makeup supply valves are designed to open automatically at one foot below the Low-Low surge tank level alarm setpoint to supply makeup water to the affected loop.

XVG09627B-CC is a normally closed, fail open, energize to open, four (4) inch air operated gate valve located between the SW supply lines and the CC system. The valve has an air accumulator to maintain the valve closed for approximately three (3) hours on a loss of instrument air. The valve fails open on loss of accumulator air, but fails close on loss of control signal, if sufficient accumulator air is available. Valve XVG09627B-CC must open in 10 seconds or less to maintain required CC Pump Net Positive Suction Head (NPSH) and to provide makeup flow for a system break or through wall crack.

4.0 SAFETY SIGNIFICANCE

The significance of the XVG09627B-CC failure was determined to be low. Small leaks in the CC system are addressed by normal system makeup. Large leaks are low probability occurrences. Conservatively, the Individual Plant Examination (IPE) Initiating Event failure rate for large leaks in the CC system is 9.9E-04 failures per year.

The Conditional Core Damage Probability (CCDP) is conservatively approximated by solving the CAFTA model with one train of CCW out of service (A-train Heat Exchanger failure rate set to 1). The resulting value is 2.26E-05. This is a conservative approximation, and is used as a simplified, bounding condition for the XVG09627B-CC failure.

LICENSEE EVENT REPORT (LER) CONTINUATION SHEET

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
V. C. SUMMER NUCLEAR STATION, UNIT 1	05000 395	YEAR	SEQUENTIAL NUMBER	REV NO.	3 OF 3
		2013	- 002	- 01	

NARRATIVE

The change in Core Damage Frequency (CDF) is determined by multiplying the Initiating Event Failure rate by the CCDP and subtracting zero (which conservatively assumes the baseline risk is zero). Using this method, the Delta-CDF for the failure configuration was determined to be 2.24E-08/yr. Since this is less than 1E-06/yr, the failure of XVG09627B-CC is considered low significance. This result is consistent with the IPE decision to screen the valve from the model.

During RF 21, while XVG09627B-CC was unavailable, it was discovered that XVG09627A-CC was also inoperable. The failures of XVG09627B-CC and XVG09627A-CC are documented in LER 2014-001-00 and LER 2014-003-00 respectively.

5.0 PREVIOUS OCCURRENCE

There had been no previous occurrences in the three years prior to October 31, 2012.

6.0 CORRECTIVE ACTIONS

The initial corrective action, due to the October 31, 2012 failure, was to manually adjust the valve then retest in accordance with the surveillance test procedure. The valve passed the surveillance requirements and was declared operable. The valve was subsequently stroke tested three additional times during the outage to flush the seat in support of troubleshooting efforts to determine if the valve was the source of in-leakage to the CC system. The redundant train component was also successfully tested during the outage.

With the successive failure of XVG09627B-CC on April 14, 2014, the valve was disassembled, inspected and rebuilt using a new closure spring, trip spring, stem bushing, throttle assembly, pilot valve, stem, and body to bonnet gasket. The graphite packing was replaced with Teflon packing. All points on the valve linkage were lubricated. Valve supports were adjusted to enhance the alignment of the operator. The pressure regulator closing force was also reduced.