



July 14, 2000  
RC-00-0266

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

Gentlemen:

Subject: VIRGIL C. SUMMER NUCLEAR STATION  
DOCKET NO. 50-395  
OPERATING LICENSE NO. NPF-12  
VOLUNTARY LICENSEE EVENT REPORT (LER 2000-005-00)  
PLANT SHUTDOWN DUE TO INOPERABLE FEEDWATER  
ISOLATION VALVE

Stephen A. Byrne  
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Attached is Licensee Event Report (LER) No. 2000-005-00, for the Virgil C. Summer Nuclear Station (VCSNS). The report describes conditions that resulted in VCSNS initiating a plant shutdown due to requirements of the facility Technical Specifications. Initial notification was made in accordance with 10 CFR 50.72(a)(2)(i)(A). This issue is being reported as a Voluntary LER because VCSNS was able to correct the condition prior to completion of the plant shutdown.

Should you have any questions, please call Mr. Mel Browne at (803) 345-4141.

Very truly yours,

Stephen A. Byrne

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Attachment

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**LICENSEE EVENT REPORT (LER)****FACILITY NAME**

Virgil C. Summer Nuclear Station

**DOCKET NUMBER**

05000395

**PAGE**

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**TITLE**

Voluntary Report: Initiation of Plant Shutdown due to Inoperable Feedwater Isolation Valve

EVENT DATE			LER NUMBER			REPORT DATE			OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
06	16	2000	2000	-- 005 --	00	07	14	00	FACILITY NAME	DOCKET NUMBER
										05000
									FACILITY NAME	DOCKET NUMBER
<b>OPERATING MODE</b>		1	<b>THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more)</b>							
			20.2201(b)			20.2203(a)(2)(v)			50.73(a)(2)(i)	
									50.73(a)(2)(viii)	
<b>POWER LEVEL</b>		100	20.2203(a)(1)			20.2203(a)(3)(i)			50.73(a)(2)(ii)	
			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)	
			20.2203(a)(2)(iii)			50.36(c)(1)			50.73(a)(2)(v)	
			20.2203(a)(2)(iv)			50.36(c)(2)			50.73(a)(2)(vii)	
									<input checked="" type="checkbox"/> OTHER Voluntary	
									Specify in Abstract below or in NRC FORM 366A	

**LICENSEE CONTACT FOR THIS LER****NAME**M. N. Browne  
Manager, Nuclear Licensing & Operating Experience**TELEPHONE NUMBER (Include Area Code)**

(803) 345-4141

**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	BJ	ISV	A391	Y					

**SUPPLEMENTAL REPORT EXPECTED**

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

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

This report is being submitted as a Voluntary Report because the condition was corrected before plant shutdown was completed.

A low accumulator air pressure alarm for "C" Feedwater Isolation Valve (FWIV), XVG01611C was received at 1459 hours on June 13, 2000. Plant personnel observed air escaping from the top exhaust port on the actuation air assembly for the valve. The valve was subsequently declared inoperable at 1545 hours and V. C. Summer Nuclear Station (VCSNS) entered the 72 hour action statement for Technical Specification (TS) 3.7.1.6, Feedwater Isolation Valves. When one feedwater isolation valve is inoperable, power operation may continue in Mode 1 provided that the inoperable valve is restored within 72 hours; otherwise be in Hot Standby within the next 6 hours and in Hot Shutdown within the following 6 hours.

The NRC was notified at 2210 hours on June 15 in accordance with the requirements of 10 CFR 50.72(b)(1)(i)(A) that VCSNS was initiating the plant shutdown. The plant was taken off line at 0503 hours on June 16 and maintained in Mode 2. With the plant in Mode 2 and the FWIV closed, TS 3.7.1.6 allows continued operation without going to Hot Standby (Mode 3).

The actuation assembly for XVG01611C was replaced and the valve verified to be operable at 1949 hours on June 16. A plant restart was then initiated with Mode 1 entry at 1220 hours on June 17. VCSNS returned to approximately 100% power at 1900 hours on June 19, 2000.

The cause of this event is attributed to a failure of the #7 poppet seal on the #3 poppet valve. A piece of the viton poppet seal was found missing.

No operability concerns currently exist, as post maintenance testing of the "C" Feedwater Isolation Valve actuator was satisfactory.

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

Westinghouse - Pressurized Water Reactor

**EQUIPMENT IDENTIFICATION**

Main Feedwater Isolation Valve

XVG01611C-FW

EIS Code     BJ

**IDENTIFICATION OF EVENT**

A low accumulator air pressure alarm for "C" Feedwater Isolation Valve (FWIV), XVG01611C, was received at 1459 hours on June 13, 2000. Following receipt of the alarm plant operations and maintenance personnel observed air escaping from the top exhaust port on the actuation air assembly for the valve. The valve was declared inoperable at 1545 hours and V. C. Summer Nuclear Station (VCSNS) entered the 72 hour action statement for Technical Specification 3.7.1.6, Feedwater Isolation Valves.

CER 00-0728 and NCN 00-0745.

**EVENT DATE**

June 16, 2000

**REPORT DATE**

July 14, 2000

The event is documented in the VCSNS Corrective Action Program under CER 00-0728, CER 00-0746, and NCN 00-0745. This Licensee Event Report is considered to be a voluntary report since the equipment failure was corrected before the plant completed the shutdown that would have been required by TS 3.7.1.6.

**CONDITIONS PRIOR TO EVENT**

Mode 1 – Power Operation (100%)

**LICENSEE EVENT REPORT (LER)**

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

A low accumulator air pressure alarm for "C" Feedwater Isolation Valve (FWIV), XVG01611C was received at 1459 hours on June 13, 2000. Following receipt of the alarm, plant operations and maintenance personnel observed air escaping from the top exhaust port on the actuation air assembly for the valve. The valve was subsequently declared inoperable at 1545 hours and V. C. Summer Nuclear Station (VCSNS) entered the 72 hour action statement for Technical Specification (TS) 3.7.1.6, Feedwater Isolation Valves. When one feedwater isolation valve is inoperable, power operation may continue in Mode 1 provided that the inoperable valve is restored within 72 hours; otherwise be in Hot Standby within the next 6 hours and in Hot Shutdown within the following 6 hours.

Attempts to repair the valve, while at power, were unsuccessful and Plant Management made the decision on June 15 to initiate a plant shutdown to effect repairs. The NRC was notified at 2210 hours on June 15 in accordance with the requirements of 10 CFR 50.72(b)(1)(i)(A) that VCSNS was initiating the plant shutdown.

The plant was taken off line at 0503 hours on June 16 and maintained in Mode 2. With the plant in Mode 2 and the FWIV closed, TS 3.7.1.6 allows continued operation without going to Hot Standby (Mode 3).

The actuation assembly for XVG01611C was replaced and the valve verified to be operable at 1949 hours on June 16. A plant restart was then initiated with Mode 1 entry at 1220 hours on June 17. VCSNS returned to approximately 100% power at 1900 hours on June 19, 2000.

**CAUSE OF EVENT**

Inspection of XVG01611C indicated that the No.7 poppet seal on the No.3 poppet valve had broken and a small piece of Viton poppet seal was missing. The No.7 poppet is normally seated when XVG01611 is open to isolate the high pressure storage tank air from the top of the actuator piston and the open throttle valve (exhaust valve). The missing portion of the Viton poppet seal (approximately 1/8 inch X 5/8 inch) prevented the No.7 poppet seal from performing its function and pressure could not be maintained in the air storage tank without more frequent operation of the air compressor.

**ANALYSIS OF EVENT**

The No.7 poppet is normally seated when XVG01611 is open to isolate the high pressure storage tank air from the top of the actuator piston and the open throttle valve (exhaust valve). The missing portion of the Viton poppet seal (approximately 1/8 inch X 5/8 inch) allowed the No.7 poppet seal to leak causing the air compressor to more frequently charge the air storage tank. Inspection of the air valve assembly and the opening throttle valve did not reveal the missing piece of the poppet seal. It is most probable that the missing piece has been expelled from the actuator during valve cycling or during the removal and disassembly of the air valve assembly. An additional possibility is that the missing piece entered the actuator through the No.8 passage in the air valve assembly and is now resting on top of the actuator driving cylinder. Inspection of the air valve assembly and review of the design drawings indicate that the missing piece could not enter the actuator in such a manner that the missing piece would locate to the bottom of the driving cylinder.

**LICENSEE EVENT REPORT (LER)**

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**TEXT** (If more space is required, use additional copies of NRC Form 366A) (17)**ANALYSIS OF EVENT (Cont'd)**

Based on the high air pressure used to operate the valve (560 psi), the relatively large sizes of the components involved (14 inch diameter driving cylinder, 1 inch passage ways, etc.) and the possible locations of the missing piece, the valve should not experience any adverse effects from the missing piece of the poppet seal and that the safety function (closing) of XVG01611C would not be impaired even under the worst case scenario of the missing piece being at the top of the actuator cylinder. Cycling the valve and performing the air drop test as part of the post maintenance activity provides additional assurance of the valves performance.

There were no significant equipment response problems observed during the plant shutdown or restart.

**CORRECTIVE ACTIONS**

The actuator air valve assembly was replaced on XVG01611C while in Mode 2 on June 16, 2000.

Condition Evaluation Report CER-00-0728 and Nonconformance Notice NCN 00-0745 were initiated on discovery and will evaluate the subcomponent failure. Plant Support Engineering (PSE) continues to evaluate the failure mechanism for the poppet seal. VCSNS has sent the failed poppet seal for laboratory testing. Any additional corrective actions identified through the laboratory results will be performed as necessary. As the design of this poppet seal is specific to VCSNS, no generic issues should arise.

**PRIOR OCCURRENCES**

None