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April 5, 2007

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

Dear Sir / Madam:

Subject: VIRGIL C. SUMMER NUCLEAR STATION (VCSNS)
DOCKET NO. 50-395
OPERATING LICENSE NO. NPF-12
LICENSEE EVENT REPORT (LER 2007-001-00)
MANUAL REACTOR SHUTDOWN DUE TO STEAM LEAK AT FEEDWATER BOOSTER PUMP RECIRCULATION HEADER

Attached is Licensee Event Report (LER) No. 2007-001-00, for the Virgil C. Summer Nuclear Station (VCSNS). The report describes the sequence of actions that led to a manual reactor trip due to a steam/water leak in the VCSNS Feedwater system. This report is submitted in accordance with 10CFR50.73(a)(2)(iv).

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

Very truly yours,

Jeffrey B. Archie

JT/JBA/dr
Attachment

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IE22

NRC FORM 366 (6-2004) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 06/30/2007

Estimated burden per response to comply with this mandatory collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@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.

LICENSEE EVENT REPORT (LER)

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

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4. TITLE

Manual Reactor Shutdown Due to Steam Leak at Feedwater Booster Pump Recirculation Header

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
										05000
02	05	2007	2007	- 1 -	0	04	05	2007	FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE

Mode 1

10. POWER LEVEL

95%

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

☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)
☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☑ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ OTHER
☐ 20.2203(a)(2)(vi)	☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER *(Include Area Code)*
Virgil C. Summer Nuclear Station	(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
B	BJ	OR		N					

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)*

On February 5, 2007, while returning the "D" feedwater booster pump to service, a steam leak developed in the Turbine Building. Investigation revealed a steam leak had developed in the vicinity of the "D" feedwater booster pump recirculation header. Since the exact location could not be readily identifiable, the shift supervisor conservatively directed a manual reactor trip at 0307. All systems responded as expected on the reactor trip. The emergency feedwater pumps automatically started on Lo-Lo Steam Generator Level.

The cause of the steam leak was determined to be a failure of the gasket for the "D" feedwater booster pump recirculation header orifice. The cause of the gasket failure was attributed to normal aging and pipe movement during the startup of the "D" feedwater booster pump.

For corrective action, the gaskets and orifice plate were replaced, and the plant was returned to power operation on 2/06/2007.

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NARRATIVE

PLANT IDENTIFICATION

Westinghouse - Pressurized Water Reactor

EQUIPMENT IDENTIFICATION

XPP0028D Feedwater Booster Pump "D"
XPS0006D Feedwater Booster Pump "D" Recirculation Orifice

IDENTIFICATION OF EVENT

On February 5, 2007 at 0306, the reactor was manually tripped due to a steam leak in the vicinity of the "D" feedwater booster pump recirculation header orifice XPS0006D.

EVENT DATE

02/05/2007

REPORT DATE

04/05/2007

CONDITIONS PRIOR TO EVENT

Mode 1, 95% Power

DESCRIPTION OF EVENT

"D" Feedwater booster pump had been secured and isolated for maintenance on the pump's inboard mechanical seal. After repairs were complete the pump was filled, vented, unisolated, and warmed per system operating procedure SOP-210. During the initial start of the pump, two banging noises were heard in the vicinity of the Turbine Building (TB) 463' elevation. Water was noticed running back to the TB-412' elevation, and a large plume of steam was observed on the west side of the Deaerator Storage Tank on the TB-463' elevation. Since the actual location of the steam leak could not be readily determined, the Duty Shift Supervisor directed a manual reactor trip.

All systems operated as expected in response to the manual reactor trip. Emergency feedwater actuated on Lo-Lo steam generator water levels. Both motor driven and the turbine driven emergency feedwater pumps started. After review of steam generator parameters, the operating crew secured and reset the turbine driven emergency feedwater pump. Plant management was notified, and the Incident Response Team was activated. A four (4) hour notification to the NRC, as required by 10CFR50.73 (a)(2)(iv), was made at 0638.

CAUSE OF EVENT

Based on results of the Failure Modes Analysis, the failure of the gaskets at XPS0006D was the result of normal aging as well as accelerated aging due to the reduced gasket seating surface caused by an anomaly on the orifice plate seating surface and pipe movement during startup.

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NARRATIVE

ANALYSIS OF EVENT

All systems operated as expected during the event. The emergency feedwater actuated on lo-lo steam generator level. This actuation is expected on a reactor trip.

CORRECTIVE ACTIONS

The gaskets and orifice plate, in the "D" feedwater booster pump recirculation header were replaced. As part of the extent of condition, the maintenance history of the other feedwater booster pump recirculation line orifice connections were evaluated. As a result of this evaluation, the gasket and orifice plate for the "C" feedwater booster pump recirculation line orifice connections were replaced, and the gaskets for the "A" feedwater booster pump recirculation line orifice connections were replaced.

Corrective actions from root cause analysis RCA 07-0411, pending approval by the Corrective Action Review Board (CARB), to preclude recurrence are to 1) revise the feedwater system operating procedure (SOP-210) to direct operators to reduce plant power to a level that prevents waterhammer prior to starting the fourth feedwater booster pump, 2) redesign of recirculation line orifice plates, 3) make flanged joint configuration more robust, and 4) revise maintenance procedures to address use of special tools and surface inspections. Should the CARB make substantial changes to the planned corrective actions, a revised LER will be submitted.

PRIOR OCCURRENCES

There have been no prior occurrences of steam leaks in the secondary plant that required a manual reactor trip in the past several years.