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September 27, 2011

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 2011-003-01)
INADVERTENT SAFETY INJECTION DURING REACTOR STARTUP
CAUSED BY EXCESSIVE STEAM LINE DIFFERENTIAL PRESSURE

Attached is a supplement to Licensee Event Report (LER) No. 2011-003-01 for the Virgil C. Summer Nuclear Station Unit 1. This report describes an inadvertent Safety Injection which occurred during reactor startup that was caused by a steam line differential pressure of greater than 97 psid. This report is submitted in accordance with 10 CFR 50.73(a)(2)(iv)(A). This communication contains no new or revised commitments.

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

Very truly yours,

Thomas D. Gatlin

JMW/TDG/wm
Attachment

c: K. B. Marsh
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File (818.07)
PRSF (RC-11-0147)

IE22
NRR

NRC FORM 366 (10-2010) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 10/31/2013

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 Section (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.

LICENSEE EVENT REPORT (LER)

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

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
Virgil C. Summer Nuclear Station Unit 1	05000 395	1 OF 3

4. TITLE

Inadvertent Safety Injection During Reactor Startup Due to Excessive Differential Steam Line Pressure

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
05	27	2011	2011	- 3 -	1	09	27	2011	FACILITY NAME	DOCKET NUMBER 05000

9. OPERATING MODE: 3

10. POWER LEVEL: 0

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)*
Bruce Thompson, Manager Licensing, Virgil C. Summer Nuclear Station Unit 1	(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

14. SUPPLEMENTAL REPORT EXPECTED	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☑ NO				

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

At 1201 hours on 05/27/2011 with the plant in Mode 3 at normal operating temperature and pressure, a Safety Injection (SI) occurred due to opening the 'C' Main Steam Isolation Valve (MSIV), with the downstream steam header depressurized. The resulting steam flow depressurized the 'C' Steam Line to greater than 97 psid below the 'A' and 'B' Steam Lines, which caused an SI on both Engineered Safety Feature (ESF) trains. Following the Safety Injection actuation, all plant systems functioned as designed.

Immediate actions consisted of securing the SI and stabilizing the plant in Mode 3 via Emergency Operating Procedures (EOPs). In addition, the MSIVs and Bypass valves were tagged closed to ensure proper controls were in place prior to operating the valves. Oncoming Operating Crews were briefed prior to taking the shift on the importance of maintaining cognizance of changing plant conditions and providing thorough turnover when relieving other crew members during the shift.

The root cause of this event was determined to be failure to follow procedures while manipulating a plant system.

NARRATIVE

PLANT IDENTIFICATION
Westinghouse - Pressurized Water Reactor

EQUIPMENT IDENTIFICATION
XVM02801C-MS, "C" Main Steam Isolation Valve (MSIV)

IDENTIFICATION OF EVENT
At 1201 hours on 5/27/2011, a Safety Injection (SI) occurred on High Steam Line Differential Pressure due to opening XVM02801C-MS ('C' Main Steam Isolation Valve) with the downstream header depressurized. The resulting steam flow caused 'C' Steam Line pressure to decrease to greater than 97 psid below the 'A' and 'B' Steam Lines, satisfying the condition for an SI on both Engineered Safety Feature (ESF) Trains.

EVENT DATE
May 27, 2011

Condition Report CR-11-03001 was generated to address this violation.

REPORT DATE
September 27, 2011

CONDITIONS PRIOR TO EVENT
MODE 3, 0% Power

DESCRIPTION OF EVENT
On May 25, 2011, at 1103 hours, the plant entered Mode 3 (HOT STANDBY) during plant start up from Refueling Outage 19. Operations began Main Steam header warming and made preparations for surveillance testing over the next two days. On May 27, 2011, at approximately 0740 hours, Operations commenced MSIV Full Stroke Testing. 'C' MSIV failed its stroke test due to an out-of-tolerance stroke time, and was subsequently closed pursuant to TS 3.7.1.5, "Main Steam Line Isolation Valves," Action Statement 'a.' Shortly after the stroke test the Main Steam header was isolated to restore RCS temperature. This action depressurized the Main Steam header downstream of the MSIVs. Prior to the event, the Control Room was requested to stroke the 'C' MSIV to allow the Instrument and Controls (I&C) technicians and the System Engineer investigating the 'C' MSIV failure to observe the valve locally. At 1201 hours, the 'C' MSIV was then opened. With the downstream header depressurized an SI actuation occurred due to 'C' Steam Line Pressure decreasing to greater than 97 psid below Main Steam Lines 'A' and 'B.'

CAUSE OF EVENT
A root cause analysis was conducted to determine the reason(s) for the inadvertent safety injection event of May 27, 2011. It was determined that the root cause of this event was the failure to follow procedures while manipulating a plant system.

After the stroke test failure of the "C" MSIV, the Control Room Supervisor (CRS) directed the Reactor Operator (RO) to leave the MSIVs closed and to close the three MSIV bypass valves. A Removal & Restoration Sheet (R&R) was issued due to "C" MSIV being closed as required by the Technical Specification Action Statement. The Operations crew did not discuss or recognize which procedure was maintaining configuration control of the MSIVs and bypass valves. Instrument and Controls (I&C) technicians called the RO requesting that "C" MSIV be stroked. The RO asked and received permission from the Shift Supervisor (SS) to stroke open the "C" MSIV. Operations stroked open the "C" MSIV resulting

NARRATIVE

in a Safety Injection due to excessive steam line differential pressure.

ANALYSIS OF EVENT

The consequences of this event were minimal. The Reactor Protection System responded to the Hi Steam Line Differential Pressure condition by initiating a Safety Injection. The RCS responded with a temperature decrease from 557.7°F to approximately 538.5°F, a pressure decrease from 2234 psig to approximately 2180 psig, followed by a pressure increase to 2243 psig following the SI actuation. The SI initiated 320 gpm of injection flow into the RCS, resulting in an increase in pressurizer level from 25.6 percent to 86.2 percent at SI termination.

CORRECTIVE ACTIONS

The following corrective actions to prevent recurrence were identified by the Root Cause Analysis and have been entered into the corrective action program:

Revise operating guidelines to address procedural guidance to control the manipulation of plant components to support maintenance activities.

Revise station administrative procedures to better describe procedural expectations when manipulating plant components, and require a stand down with Operations prior to entering Mode 4 to reinforce expectations of increased rigor for control of work activities during changing plant conditions.

Evaluate the feasibility of developing an engineering solution to prevent opening MSIVs under a high differential pressure.

PREVIOUS OCCURRENCES

LER 88-013, December 11, 1988
LER 88-006, May 12, 1988