



August 7, 2012

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 2012-002-00)  
SEISMICALLY QUALIFIED RWST ALIGNED TO NON-SEISMIC PIPING

Attached is Licensee Event Report (LER) No. 2012-002-00 for the Virgil C. Summer Nuclear Station Unit 1. This report describes the inoperability of the Refueling Water Storage Tank (RWST) resulting from its alignment to the non-seismically qualified non-safety related piping of the Spent Fuel Pool Purification Loop. This report is submitted in accordance with 10 CFR 50.73(a)(2)(i)(B).

This letter contains no regulatory commitments. Should you have any questions, please call Bruce Thompson at (803) 931-5042.

Very truly yours,

Thomas D. Gatlin

JMW/TDG/wm  
Attachment

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File (818.07)  
PRSF (RC-12-0100)

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**LICENSEE EVENT REPORT (LER)**  
(See reverse 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 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, NE08-10202, (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> Virgil C. Summer Nuclear Station Unit 1	<b>2. DOCKET NUMBER</b> 05000 395	<b>3. PAGE</b> 1 OF 3
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**4. TITLE**  
Seismically Qualified Refueling Water Storage Tank Aligned to Non-Seismic Piping

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
06	14	2012	2012	- 2 -	0	08	07	2012	FACILITY NAME	DOCKET NUMBER
										05000
										05000

<b>9. OPERATING MODE</b> 1	<b>11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)</b>										
	<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)							
<b>10. POWER LEVEL</b> 100%	<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**

FACILITY NAME Bruce Thompson, Manager Licensing, Virgil C. Summer Nuclear Station Unit 1	TELEPHONE NUMBER (Include Area Code) (803) 931-5042
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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
		N/A							

<b>14. SUPPLEMENTAL REPORT EXPECTED</b>	<b>15. EXPECTED SUBMISSION DATE</b>	MONTH	DAY	YEAR
<input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO				

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

On 06/14/2012, with the plant in Mode 1 at 100% power, it was determined that opening the code boundary valve between the safety related and seismically qualified Refueling Water Storage Tank (RWST) and the non-safety related and non-seismically qualified Spent Fuel Pool (SFP) Purification Loop in Modes 1-4 renders the RWST inoperable. This alignment was utilized for RWST water mixing in support of to weekly surveillance sampling and for filtration of the RWST water prior to refueling outages. As a result, on multiple occasions the RWST was inoperable for a period longer than allowed by Technical Specifications (TS) 3.5.4, Emergency Core Cooling Systems - Refueling Water Storage Tank, Limiting Conditions for Operation (LCO).

The cause of this event is a result of regulatory requirements for the separation of seismically qualified and non-qualified systems, structures and components not being adequately incorporated into the Design Basis Document (DBD) and Updated Final Safety Analysis Report (UFSAR).

Immediate actions consisted of implementation of a Station Order (11-22), which indefinitely suspended this alignment, and submittal of a license amendment request (LAR) to revise TS 3.5.4 such that the non-seismically qualified piping of the SFP Purification System may be aligned to the RWST by operation of a seismically qualified manual ASME code boundary valve under administrative controls for performance of RWST surveillance requirements and pre-outage filtration. This change will only be applicable through the next two fuel cycles.

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**NARRATIVE**

**PLANT IDENTIFICATION**

Westinghouse - Pressurized Water Reactor

**EQUIPMENT IDENTIFICATION**

RWST - Refueling Water Storage Tank

**IDENTIFICATION OF EVENT**

On 06/14/2012, it was determined that V. C. Summer Nuclear Station (VCSNS) Unit 1 was periodically operated with the safety-related Seismic Category I (SC-1) Refueling Water Storage Tank (RWST) aligned to the nonsafety-related non-seismic Spent Fuel Pool (SFP) Purification Loop piping, potentially resulting in loss of safety function.

**EVENT DATE**

June 14, 2012

Condition Report CR-12-02439 was generated to address this violation.

**REPORT DATE**

August 07, 2012

**CONDITIONS PRIOR TO EVENT**

MODE 1, 100% Power

**DESCRIPTION OF EVENT**

On June 14, 2012, it was determined that opening the manual ASME code boundary valve (XVT06701-SF) between the safety related and seismically qualified Refueling Water Storage Tank (RWST) and the non-safety related and non-seismically qualified Spent Fuel Pool (SFP) Purification Loop in Modes 1-4 renders the RWST inoperable. Historically, VCSNS Unit 1 has periodically used the SFP Purification Loop in Modes 1-4 for RWST water mixing prior to weekly surveillance sampling of the boron concentration as required by Technical Specifications (TS) surveillance requirement (SR) 4.5.4, and for filtration of the RWST water prior to refueling outages. This configuration rendered the RWST inoperable and, after one hour, created a condition prohibited by Technical Specifications.

At VCSNS, the RWST is seismically qualified safety related and within the scope of the plant TS. The plant design includes the capability to align the SFP Purification Loop for purification of the RWST. The SFP Purification Loop is a non-safety non-seismic system that is isolated from the RWST by a normally closed safety related manually operated code boundary valve XVT06701-SF. System operating procedures allowed the RWST code boundary valve to be opened while the unit was operating in Modes 1-4 without declaring the RWST inoperable per TS 3.5.4 Limiting Conditions for Operation (LCO). This LCO requires that the RWST be returned to operable status within one hour. If the RWST is not returned to operable status within one hour, the LCO requires that the unit be placed in at least Hot Standby within 6 hours and in Cold Shutdown within the following 30 hours. VCSNS had a practice of aligning the seismically qualified RWST to the non-seismic SFP Purification Loop during routine weekly recirculation of the RWST contents in support of TS required boron concentration verification, and continuously for approximately 30 days for pre-outage filtration/cleanup of the RWST. This alignment was deemed acceptable on the premise that the station was within its design and licensing bases by periodically opening a normally closed valve for weekly surveillance activities and pre-outage RWST contents filtration. Since the RWST was not declared inoperable during these periods, TS LCO actions were not entered. This resulted in

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**NARRATIVE**

operation of the plant, which under the interpretation provided by NRC Information Notice (IN) 2012-01, is considered to be a condition prohibited by TS, and is reportable pursuant to 10 CFR 50.73(a)(2)(i)(B) requiring a 60 day Licensee Event Report (LER) notification to the NRC.

**CAUSE OF EVENT**

The cause of this event was that the Design Basis Documents (DBDs) describing the RWST and the SFP Purification Loop do not describe RWST cleanup/recirculation during operation. The Updated Final Safety Analysis Report (UFSAR) Section 9.1.3 states that the SFP Purification pump can take suction from and return to the RWST; however, no operational limitations are discussed. Based on this, personnel did not question the extended use of the SFP Purification Loop aligned to the RWST during normal operation. This condition was not reconciled during original procedure development. Subsequent technical and safety reviews also failed to identify that the conditions were outside the plant design basis.

Upon issuance of IN 2012-01, VCSNS discovered that this alignment was in fact outside its licensing and design bases, rendering the RWST inoperable during operation for a period longer than allowed by TS. The lack of stated operational limitations regarding RWST/SFP Purification alignment created a human-error-likely situation whereby the integrity of the RWST's seismic classification was compromised when it was aligned to the SFP Purification Loop.

During the apparent cause evaluation for this event, the extent of condition evaluation revealed that a similar condition exists in the procedure for increasing the level in the accumulators. The evolution involves aligning the RWST to the hydro test pump via a normally closed safety related valve XVT08932-SI (Hydro Pump Suction Valve). This valve isolates the RWST from a section of 2-inch non-safety non-seismic piping leading to a connection for the hydro test pump. A past operability evaluation is in process to determine if the RWST was unisolated from non-seismic piping for longer than permitted by TS 3.5.4 LCO.

**ANALYSIS OF EVENT**

The consequences of this event were minimal since a seismic event had not occurred while the SFP Purification System was servicing the RWST. An engineering past operability evaluation was performed and determined that the potential outflow from the RWST due to leakage from the SFP Purification Loop did not challenge the RWST design basis over the past three years. The overall impact to the Core Damage Frequency (CDF) from an operator failing to close the manual code boundary valve (XVT06701-SF) that isolates the RWST from the SFP Purification Loop is less than the significance threshold of 1.0E-06. The estimated overall impact to the CDF is approximately 3.43E-07; a small increase of less than 3%.

**CORRECTIVE ACTIONS**

Station Orders 11-06 and 11-22 were imposed to prevent alignment of the RWST to the non safety-related SFP Purification Loop. LAR 10-03912 was submitted to the NRC on 6/29/2012 to periodically open the seismically qualified manual ASME code boundary valve (XVT06701-SF) during Modes 1-4 under administrative controls. The LAR provides time (two fuel cycles following LAR approval) for VCSNS to complete a plant modification to address the issue.