



July 31, 2013

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) No. 2012-002-01
SEISMICALLY QUALIFIED RWST ALIGNED TO NON-SEISMIC PIPING

Attached is Licensee Event Report (LER) No. 2012-002-01 for the Virgil C. Summer Nuclear Station Unit 1. This revised 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

MK/TDG/wm
Attachment

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JE22
NRR

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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 -	1	07	31	2013		05000
									FACILITY NAME	DOCKET NUMBER
										05000

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

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

SF - Spent Fuel System

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 non-safety 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

Initial - August 7, 2012

Revision - July 31, 2013

CONDITIONS PRIOR TO EVENT

MODE 1, 100% Power

DESCRIPTION OF EVENT

On June 14, 2012, it was determined that opening the manual seismically qualified 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 suction from the RWST is isolated by the normally closed 3-inch safety related seismically qualified manual ASME code boundary valve XVT06701-SF. There are two return lines. One of the return lines goes to the top of the RWST through valve XVD06694-SF. This top connection is at the same elevation as the over flow line. The second return line is near the bottom of the RWST and isolated by normally closed 3-inch safety related code boundary valve XVT06691-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.

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NARRATIVE

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 operation of the plant, which under the interpretation provided by NRC Information Notice (IN) 2012-01 SEISMIC CONSIDERATIONS - PRINCIPALLY ISSUES INVOLVING TANKS, 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 an extent of condition evaluation, a similar alignment was identified in the procedure for increasing level in the Safety Injection accumulators. The procedure aligns the Nuclear Safety Related (NSR) RWST outlet pipe to the Non-Nuclear Safety (NNS) hydro test pump suction pipe via normally closed NSR valve XVT08932-SI (Hydro Pump Suction Valve). A Past Operability determination documents that the isolation valve was periodically opened in Modes 5 and 6, but only once for approximately 65 minutes in Mode 4 when TS 3.5.4 was applicable. This time period did not violate TS 3.5.4.

ANALYSIS OF EVENT

The consequences of this event were minimal since a seismic event did not occur 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. An additional past operability evaluation determined that in the case of the lower return line break, leakage from the SFP Purification Loop return line into the RWST pit area did not challenge RWST design basis over the past 3 years of operation. The overall impact to the Core Damage Frequency (CDF) from an operator failing to close the seismically qualified manual ASME code boundary valve (XVT06701-SF) that isolates the RWST from the SFP Purification Loop is less than the risk significance threshold of 1.0E-06. A conservative estimate of the change in 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, ML 121850005, 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.