



Thomas D. Gatlin  
Vice President, Nuclear Operations  
803.345.4342

August 21, 2013

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 2013-003-00)  
TRIP SETPOINT RENDERS CHILLER AND CONTROL ROOM EMERGENCY  
FILTRATION INOPERABLE

Attached is Licensee Event Report (LER) No. 2013-003-00, for the Virgil C. Summer Nuclear Station (VCSNS). This report describes the events which led to two consecutive trips of the "A" Chiller. This report is submitted in accordance with 10 CFR 50.73(a)(2)(i)(B).

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

Very truly yours,

Thomas D. Gatlin

WLT/TDG/ts  
Attachment

c: K. B. Marsh  
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File (818.07)  
PRSF (RC-13-0116)

<b>NRC FORM 366</b> (10-2010)	<b>U.S. NUCLEAR REGULATORY COMMISSION</b>	APPROVED BY OMB: NO. 3150-0104	EXPIRES: 10/31/2013
<b>LICENSEE EVENT REPORT (LER)</b> (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, 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.	

<b>1. FACILITY NAME</b> V. 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**  
 TRIP SETPOINT RENDERS CHILLER AND CONTROL ROOM EMERGENCY FILTRATION INOPERABLE

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	25	2013	2013	- 3	- 0	08	21	2013		05000
									FACILITY NAME	DOCKET NUMBER
										05000

<b>9. OPERATING MODE</b>  <b>MODE 1</b>	<b>11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §:</b> (Check all that apply)																																				
<b>10. POWER LEVEL</b>  <b>100%</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)	<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 <b>V. C. SUMMER NUCLEAR STATION, UNIT 1</b>	TELEPHONE NUMBER (Include Area Code) <b>(803) 931-5042</b>
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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

<b>14. SUPPLEMENTAL REPORT EXPECTED</b> <input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> NO	<b>15. EXPECTED SUBMISSION DATE</b>	MONTH DAY YEAR
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**ABSTRACT** (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On June 25, 2013 with the plant in Mode 1, the "A" Chiller (XHX0001A) shut down during a fast bus transfer of its 7.2 kV bus power supply due to the tripping of two molded case circuit breakers (MCCBs) located on the "A" Chiller skid. The "A" Chiller was running prior to a planned fast transfer of its 7.2 kV bus power supply from the normal power source (115kV) to the alternate source (230kV). Troubleshooting found both compressor motor MCCBs in the tripped condition. The instantaneous trip calibration of the MCCBs was designed to trip the breakers with an incoming current greater than the nominal value of 2000A, and a current greater than this magnitude was experienced during this event. Trips of the MCCBs require local operator action to restart the chiller. A subsequent restart attempt resulted in both compressor motors not starting. The "A" Chiller has been considered to be inoperable since being placed into service August 5, 2011 due to the inability of the chiller to respond to Engineered Safety Features (ESF) sequencer demand following a grid perturbation similar to the bus voltage transient that occurred with a "fast transfer" scenario. The Chilled Water System is an attendant cooling water system that supports the Control Room Emergency Filtration System (CREFS). VCSNS Technical Specifications (TS) 3.7.6 requires two trains of CREFS to be operable while in Mode one through four.

The MCCBs on the Chiller skid have been adjusted to trip at higher amperage. The instantaneous trip setting for the MCCBs has been changed from 2000A to an instantaneous trip range of 3063A to 3938A.

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**NARRATIVE**

**Event Date**  
June 25, 2013

**Report Date**  
August 21, 1013

**1.0 EVENT DESCRIPTION**

On June 25, 2013 with the plant in Mode 1 at 100% power, the "A" Chiller (XHX0001A) shut down during a fast bus transfer due to the tripping of two locally mounted molded case circuit breakers (MCCBs). The "A" Chiller was running prior to its 7.2 kV Bus power supply (SXWIDA) being "fast" transferred from the normal power source (115kV) to the alternate source (230kV). This transfer was performed per plant procedures to facilitate taking the 115kV line out of service for planned maintenance. The fast transfer resulted in an immediate trip of the "A" Chiller. Troubleshooting found both compressor motor MCCBs in the tripped condition. These breakers are the three-phase power supply to their respective chiller compressor motor. A subsequent restart attempt resulted in both compressor motors not starting.

The fast transfer time is approximately five electrical cycles between the opening of the normal feeder breaker to XSWIDA and the closing of the alternate feeder breaker. During this time the frequency of the bus voltage drops and the motors slow down. The "A" Train bus voltages also decrease. When the bus is re-energized, the on-coming source and the bus are slightly out of phase. A large current transient can occur for a very brief time and result in an instantaneous (magnetic) trip of the MCCBs.

**2.0 EVENT ANALYSIS**

The "A" Chiller is one of three chillers that provide chilled water to the Chilled Water (VU) System. The VU System has two trains ("A" and "B") and is designed to provide cooling to various critical areas and equipment. Usually, one chiller is running on each train. The "C" Chiller is a swing component and can be powered from either train of Safeguards Power. During this event, the "B" Chiller was running on the "B" Train, the "C" Chiller was secured, and the "A" Chiller was running on the "A" Train.

TS 3/4.7.6, "Control Room Emergency Filtration Systems (CREFS)," states that two CREFS trains shall be operable. The surveillance requirements under TS 3/4.7.6 require each CREFS train to be demonstrated operable through verification that the control room air temperature is less than or equal to 85 degrees Fahrenheit.

TS 3/4.7.9, "Area Temperature Monitoring," and associated Table 3.7-7 describe the area temperature limits during normal operation due to cooling provided by the VU System. If the chiller is not running, the room temperature will rise over time. If the temperature in a given area exceeds the limit shown in TS Table 3.7-7 for eight hours, a Special Report detailing past basis for continued operability must be submitted to the NRC. If the technical specifications limit for a given area is exceeded by thirty degrees for four hours, the equipment in the associated area must be declared inoperable.

The Chilled Water System consists of two independent and redundant trains that provide cooling to various critical areas including the Control Room. The Chilled Water System is a necessary attendant cooling system that supports the CREFS operability. As such, a single active failure of a component, with a loss of offsite power, should not impair the ability of the system to perform its design function.



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**NARRATIVE**

With the skid mounted MCCB's instantaneous trip set at 2000 amps, the "A" Chiller may trip on a grid perturbation that causes an electrical transient similar to the one that occurred during the fast transfer. If an event requiring an Engineered Safety Features (ESF) actuation were to occur after the electrical transient, the "A" Chiller may not have started when demanded by the ESF loading sequencer.

**3.0 SAFETY SIGNIFICANCE**

The "A" Chiller has essentially been inoperable since it was installed and declared operable on August 5, 2011. With the redundant design of the VU system, Control Room habitability was not challenged during this time. The design features of the new "A" Chiller which contributed to this event are not part of the design of the "B" and "C" chiller.

The safety significance of this event was minimal. The VU system is not modeled in the Probabilistic Risk Analysis (PRA) model. The VU backup functions for alternate cooling to Charging pump seals are also not credited in the PRA model.

The Final Safety Analysis Report (FSAR) 9.4.7.2.4 describes the Safety Class Chilled Water System. This section states that continuous operation of one of the three chillers and chilled water pumps is required during normal and emergency periods. Use of three chillers and three chilled water pumps permits one unit to undergo extended maintenance. When all three chiller and pump sets are available, one is designated as a spare and its breaker(s) is racked out. All chillers may also be started locally.

Should the "A" Chiller trip, and the "B" Chiller not be available, the "A" Chiller can be locally reset or the "C" Chiller can be aligned to the "A" train before the control room temperature becomes excessive.

**4.0 CORRECTIVE ACTIONS**

The MCCBs on the "A" Chiller skid have been adjusted to trip at higher amperage. The instantaneous trip setting for the MCCBs has been changed from 5 times to 8.75 times the breaker's nominal 400 amperage. The new instantaneous trip range is now 3063A to 3938A. Also, the short time trip setting for the chiller main supply breaker (XSW1DA1 07B) has been changed from the 6x tap to the 8x tap.

The design calculations have been revised to change breaker settings under NCN CR-13-02694.

**5.0 PREVIOUS OCCURRENCE**

On October 13, 2011 a grid transient caused the "A" Chiller to trip due to an apparent lightning strike. The apparent cause evaluation determined that "A" Chiller tripped on an over-current fault sensed by the over-current trip setting of 250 amperes designed into the chiller's software logic. This 250A setting was determined to be conservative in relation to the 400A protection limit provided by the chiller's local MCCBs. The actual cause of the grid perturbation was not determined. Engineering Change Request 50585T was issued to remove the 250A over-current trip setpoint from the software to prevent further trips of this nature. No other corrective actions were determined to be required. At the time of this event, the sensitivity of these settings was not known and therefore the corrective actions taken did not prevent this occurrence.