

V.C. Summer Nuclear Station
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February 8, 2022

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

Serial No.: 21-258A
VCS-LIC/JB R0
Docket No. 50-395
License No. NPF-12

DOMINION ENERGY SOUTH CAROLINA (DESC)
VIRGIL C. SUMMER NUCLEAR STATION (VCSNS) UNIT 1
LICENSEE EVENT REPORT 2021-001-01
CONDITION PROHIBITED BY TECHNICAL SPECIFICATIONS

Dominion Energy South Carolina hereby submits Licensee Event Report (LER) 2021-001-01 for VCSNS. This report provides updated details concerning an operation or condition prohibited by Technical Specifications and is submitted in accordance with 10 CFR 50.73(a)(2)(i)(B). The attached LER also fulfills "Reporting of Defects and Noncompliance" requirements under 10 CFR 21.2(c).

Should you have any questions, please call Mr. Justin Bouknight at (803) 941-9828.

Sincerely,

A handwritten signature in black ink, appearing to read "George A. Lippard", written in a cursive style.

George A. Lippard
Site Vice President
V.C. Summer Nuclear Station

Enclosure

Commitments contained in this letter: None

cc:

G. J. Lindamood – Santee Cooper
L. Dudes – NRC Region II
G. Miller – NRC Project Mgr.
NRC Resident Inspector
J. N. Bassett – INPO
Marsh USA, Inc.



LICENSEE EVENT REPORT (LER)

(See Page 3 for required number of digits/characters for each block)

(See NUREG-1022, R.3 for instruction and guidance for completing this form
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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, Library, and Information Collections Branch (T-6 A10M), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollections.Resource@nrc.gov, and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0104), Attn: Desk alt: oir_submission@omb.eop.gov. The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.

1. Facility Name

V.C. Summer Nuclear Station, Unit 1

2. Docket Number

05000

395

3. Page

1 OF 4

4. Title

Condition Prohibited by Technical Specifications

5. Event Date			6. LER Number			7. Report Date			8. Other Facilities Involved	
Month	Day	Year	Year	Sequential Number	Revision No.	Month	Day	Year	Facility Name	Docket Number
06	28	2021	2021	- 001	01	2	8	2022	Facility Name	05000
									Facility Name	05000

9. Operating Mode

1

10. Power Level

100%

11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: (Check all that apply)

10 CFR Part 20	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)
<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	10 CFR Part 73
<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.69(g)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(4)
<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 73.71(a)(5)
<input type="checkbox"/> 20.2203(a)(2)(i)	10 CFR Part 21	<input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	<input type="checkbox"/> 73.77(a)(1)(i)
<input type="checkbox"/> 20.2203(a)(2)(ii)	<input checked="" type="checkbox"/> 21.2(c)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 73.77(a)(2)(i)
<input type="checkbox"/> 20.2203(a)(2)(iii)	10 CFR Part 50	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	<input type="checkbox"/> 73.77(a)(2)(ii)
<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<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)(v)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)	
<input type="checkbox"/> OTHER (Specify here, in abstract, or NRC 366A).				

12. Licensee Contact for this LER

Licensee Contact

Justin Bouknight

Phone Number (Include area code)

803-941-9828

13. Complete One Line for each Component Failure Described in this Report

Cause	System	Component	Manufacturer	Reportable to IRIS	Cause	System	Component	Manufacturer	Reportable to IRIS
B	KM	CHU	N418	Y					

14. Supplemental Report Expected

15. Expected Submission Date

☒ No ☐ Yes (If yes, complete 15. Expected Submission Date)

Month Day Year

16. Abstract (Limit to 1560 spaces, i.e., approximately 15 single-spaced typewritten lines)

In 2010, Nuclear Logistics (NLI) was contracted by V.C. Summer Nuclear Station (VCSNS) to replace its 3 safety-related chillers. On June 28, 2021, V.C. Summer Nuclear Station (VCSNS) was notified that the bolted diagonal supports for the NLI safety related chillers (XHX0001A/1B/1C) have a bolt (the pin) which would not withstand the combined design seismic and thermal loads. The vendor conclusion was confirmed by VCSNS personnel. As a result, the previous NLI chiller support frame design does not meet required seismic qualification under VCSNS procurement specification for compliance with 10 CFR 50 Appendix A, Criterion 2. At the time of discovery, only the 'A' Chiller had been replaced. Additional support bracing was designed, fabricated, and installed for the affected in-service 'A' Chiller. The enhanced bracing installation has corrected the issue and restored compliance with Technical Specifications (TS). There were no seismic events of consequence to the 'A' Chiller functionality during the time of the deficient seismic restraint (August 5, 2011 until June 29, 2021). However, there were times when the 'A' Chiller was credited as a TS support component, resulting in the plant operating in a condition prohibited by TS.

**LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET**

(See NUREG-1022, R.3 for instruction and guidance for completing this form
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1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
V.C. Summer Nuclear Station Unit 1	05000- 395	2021	001	01

NARRATIVE**1.0 DESCRIPTION OF THE EVENT**

In 2010, NLI (now a part of Paragon Energy Solutions) was contracted by V.C. Summer Nuclear Station (VCSNS) to provide 3 replacement safety-related chillers. On June 28, 2021, Paragon Energy Solutions notified V.C. Summer Nuclear Station (VCSNS) that the bolted diagonal supports for the NLI safety-related chillers (XHX0001A/1B/1C) have a bolt (the pin) which cannot withstand the combined seismic and thermal loads. The deficiency was confirmed by VCSNS personnel, following review of the vendor documentation. As a result, the NLI chiller support frame design did not meet required seismic qualification under VCSNS procurement specification for compliance with 10 CFR 50 Appendix A, Criterion 2. At the time of discovery, only the 'A' Chiller had been replaced. The 'B' Chiller was in the process of being replaced. The 'C' Chiller (design unaffected by the defective seismic restraint) was operable, with its replacement being fabricated by the vendor. This condition had existed for the 'A' Chiller since its seismic restraint was installed August 5, 2011. The 'A' Train of Chilled Water was declared non-functional at 1435 hrs on June 28, 2021 and the station entered Technical Specification (TS) Action Statement 3.5.2.a.

Additional support bracing was designed, fabricated, and installed for the affected in-service 'A' Chiller. The action statement was exited within the allowable 72-hour outage time on June 29, 2021 at 1030 hrs. The enhanced design was applied to the 'B' Chiller, prior to its return to service, and will be applied to the replacement 'C' Chiller at the vendor facility prior to its delivery and installation. The enhanced bracing installation has corrected the issue and brought the issue in line with VCSNS seismic design specifications. There were no seismic events of consequence to the 'A' Chiller functionality during the time of the deficient seismic restraint.

2.0 SIGNIFICANT SAFETY CONSEQUENCES AND IMPLICATIONS

Although not specifically addressed in TS, Safety Related Chilled Water is required for operability of TS-required equipment. The 'A' Chiller seismic restraint was installed August 5, 2011 and subsequently credited as a TS support component. A past functionality evaluation performed on the 'A' Chiller determined the 'A' Chiller was non-functional, as a result of inadequate seismic restraints, from August 5, 2011 to June 29, 2021. During this period, there were occasions when 'A' Chiller was one of two chillers credited for support of the Emergency Core Cooling System (ECCS) equipment, required per TS 3.5.2. The most-limiting ECCS component supported by the Safety Related Chilled Water are the charging pumps. The non-functional 'A' Chiller could have also impacted availability of the Control Room Emergency Filtration System (CREFS) (TS 3.7.6) and potentially other safety-related equipment for some scenarios. These past condition(s) prohibited by TS were not known until Paragon submitted the Part 21 information on June 28, 2021. There were no seismic events of consequence to the 'A' Chiller functionality during the time of the deficient seismic restraint (August 5, 2011 until June 29, 2021).

The Chilled Water System provides cooling to safety-related areas (TS Table 3.7-7) as an attendant cooling system and supports the comfort requirements for the Control Room Emergency Filtration Systems (CREFS). The Chilled Water System is necessary to ensure equipment located within these areas can withstand the environmental effects of a postulated FSAR chapter 15 event.

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V.C. Summer Nuclear Station Unit 1	05000- 395	YEAR	SEQUENTIAL NUMBER	REV NO.
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NARRATIVE

The 'A' Chiller (XHX0001A) is designed to provide a continuous flow of 45 deg F chilled water to various safety-related cooling coils in the plant during both normal and emergency conditions. All TS areas in Table 3.7-7, with the exception of Areas 23-30 (cooled by outside air ventilation), are cooled by chilled water air handling units. If the temperature limits for any room listed in TS Table 3.7-7 are exceeded for more than eight hours, a Special Report demonstrating operability of the pertinent equipment is required per TS 3.7.9.a. If those values are exceeded by more than 30 deg F for more than 4 hours the equipment in the room is considered inoperable per TS 3.7.9.b.

In order for the 'A' Chiller to continuously deliver 45 deg F water, all heat loads generated in the areas served by the Chilled Water System must be transferred to the chilled water fluid, and absorbed by the refrigeration system, which is then rejected to the Service Water System. The 'A' Chiller is designed to provide this function under all operating scenarios.

Therefore, it is required to operate continuously, when started on demand, and the total heat removal rate (cooling capacity) must meet or exceed the total steady-state heat load rates for the Chilled Water System supported areas. This is required during both normal and accident heat load conditions, provided the system is Seismic Category I components.

3.0 CAUSE OF THE EVENT

The cause of the non-functionality was the inadequate seismic design for bracing on the installed 'A' Chiller, as well as for the 'B' was in the process of being installed. Specifically, the issue was the bolts (pins) utilized in the seismic bracing design were not adequate for the design load.

4.0 CORRECTIVE ACTIONS

Additional support bracing was designed, fabricated, and installed for the affected in-service 'A' Chiller. This modification was completed on the installed 'A' Chiller on June 29, 2021. The same design modification was applied to the 'B' Chiller prior to its return to service and will be applied to the enhanced 'C' Chiller prior to its installation. The enhanced seismic restraint has corrected the issue, restoring compliance with the VCSNS seismic design and TS.

VCSNS personnel have engaged with Paragon regarding the design and fabrication of its chillers and continue to provide oversight in accordance with procurement and quality assurance program requirements.



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V.C. Summer Nuclear Station Unit 1	05000-395	YEAR 2021	SEQUENTIAL NUMBER 001	REV NO. 01

NARRATIVE

5.0 SIMILAR EVENTS

A review of Licensee Event Reports (LERs) and condition reports (CRs) at VCSNS for the three previous years did not identify any similar events.

6.0 MANUFACTURER / MODEL INFORMATION

Paragon/Nuclear Logistics (NLI) 280-ton Custom Chillers, Serial Numbers XHX-0001A, XHX-0001B, and XHX-0001C. The Chillers were originally supplied to VC Summer Nuclear Station by Nuclear Logistics under purchase order NU-02SR726683 in 2010.

7.0 ADDITIONAL INFORMATION

While this LER describes a condition that could have had adverse impacts to equipment qualification following a seismic event, there was no such event. As a result, the chilled water system and the equipment it supports were not impacted by the design vulnerability that has now been corrected.