

V. C. Summer Nuclear Station  
Bradham Blvd & Hwy 215, Jenkinsville, SC 29065  
Mailing Address:  
P.O. Box 88, Jenkinsville, SC 29065  
DominionEnergy.com



October 23, 2019

Attn: Document Control Desk  
U. S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

Serial No.19-429  
VCS-LIC/BAB R0  
Docket No. 50-395  
License No. NPF-12

**SOUTH CAROLINA ELECTRIC & GAS COMPANY**  
**VIRGIL C. SUMMER NUCLEAR STATION (VCSNS) UNIT 1**  
**10 CFR 50.59 BIENNIAL REPORT**

Pursuant to 10 CFR 50.59(d)(2), a report containing a brief description of any changes, tests, and experiments, including a summary of the evaluation of each, must be submitted to the NRC at intervals not to exceed 24 months. South Carolina Electric & Gas Company<sup>1</sup> hereby submits the enclosed report, which covers the time frame from October 1, 2017 to September 30, 2019.

Should you have any questions, please call Michael S. Moore at (803) 345-4752.

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

Commitments contained in this letter: None

Enclosure

cc: G. J. Lindamood – Santee Cooper  
L. Dudes – NRC Region II  
S. A. Williams – NRC Project Manager  
NRC Resident Inspector

(1) In a letter dated July 30, 2019, South Carolina Electric & Gas Company (SCE&G) requested a License Amendment to amend the VC Summer operating license to reflect the name change from SCE&G to Dominion Energy South Carolina (DESC). The amendment request is currently under review by the NRC.

# ENCLOSURE

## 10 CFR 50.59 Summary of Changes and Evaluations

Virgil C. Summer Nuclear Station – Unit 1  
South Carolina Electric and Gas

## 10 CFR 50.59 Summary of Changes and Evaluations

50.59 Log #	Parent Doc.	Change Description	Evaluation Summary
2017-04	ECR 50883	The Vital AC System (EV) Safety Related Inverters (Uninterruptable Power Supplies) XIT5901, XIT5902, XIT5903, and XIT5904 are scheduled for replacement due to aging concerns, obsolescence, spare part unavailability, and lack of vendor support and knowledge of the existing equipment.	The evaluation of the proposed changes finds that this design activity may be implemented without prior NRC approval. There is no increase in the frequency of occurrence of FSAR evaluated events. There is less than a minimal increase in the likelihood of SSC malfunction(s) as evaluated in the FSAR. There is no increase in the consequences of FSAR evaluated events. The evaluation finds that there is no potential for creating a new type of event and/or accident. The evaluation finds that there is no impact on fission product barriers. Also, no new analytical methods were utilized in the design efforts for this proposed modification.
2017-05	ECR 50884E	The activities under this major Engineering Change Request (ECR) revision subject to this 50.59 EVALUATION are the trip time delay settings for the 46T relays and activation of the trip mode operation for the Open Phase Isolation Systems (OPIS's) installed by ECR50884 on XTF4, XTF5, and XTF31. In particular, the spurious actuation failure mode is evaluated here as all other attributes were screened out and not subject to evaluation.	This evaluation has determined that a license amendment is not required prior to implementation. This conclusion is reasonable because this evaluation has shown how a spurious actuation of the OPIS does not result in meeting any of the eight (8) criteria evaluated for a license amendment. Furthermore, NRG has been involved and has supported the industry in development of systems including those that are not Class 1 E that will detect open phase conditions, provide indication of open phase condition to plant operators, and be capable of separating the plant from GDC-17 offsite power sources that have an open phase condition fault. Ref. BTP 8-9, Rev. O (ADAMS Accession No. ML 15057A085) and NRG letter to NEI (ADAMS Accession No. ML 14120A203).

50.59 Log #	Parent Doc.	Change Description	Evaluation Summary
2013- 0001	ECR 50585W	<p>The following two portions of the B Chiller Replacement under ECR 50585W were screened IN as requiring Evaluation 10CFR50.59.</p> <p>A. The elimination of a manual action to throttle of Service Water to the chillers, which was previously performed manually to prevent the chillers from tripping under conditions of low Service Water temperature and low load, is made unnecessary by the design of the replacement chillers.</p> <p>B. The use of a Triconex digital Class 1 E control system on the replacement chillers.</p>	<p>The modifications made as a result of this activity conform fully to the current licensing basis for the plant. All functions described in FSAR section 9.4.7.2.4 will be performed identically by the replacement chillers.</p> <p>The redesign of the new chillers to operate down to a lower load eliminates the need for operator action to throttle Service Water. The elimination of this manual action to throttle is a slight change, but is an improvement, and is acceptable under the current licensing basis.</p> <p>The existing chiller controls use analog controllers and relay logics, whereas, following this modification, the control system for each of these chillers will be a Triconex PLC Class 1 E digital controller (Each chiller will be equipped with an independent, triple redundant Triconex digital control system, i.e. Tricon PLC.) The detailed evaluation in the following sections has been performed in accordance with the NRC-endorsed NEI 01-01 (TR-102348) guidelines, demonstrates that:</p> <p>a) the Triconex digital control system V10 Topical report 7286-545-1A has been accepted by NRC in its SER dated April 12, 2012 for safety-related use in nuclear power plants;</p> <p>b) all plant-specific conditions of approval specified in the NRC SER have been satisfied for the replacement chiller application, as discussed in detail in Appendix 2A;</p> <p>c) The potential for software common mode failure has been carefully considered. The Triconex plans, procedures, QA and V&amp;V for the Triconex operating system software are extensive and robust, and have been approved in the NRC SER. The application software has been developed by NLI under its plans, procedures, QA and V&amp;V, and tested extensively at the factory. The Triconex PLC hardware and software is assigned a Software Integrity Level (SIL) of 4 due to the PLC being used in a safety related application. NLI developed the user code per IEEE1012 guidance for the design, development, testing, and verification of safety related software to ensure the quality of the user generated software. On this basis, the potential for a software common mode failure that could disable all chillers is concluded to be highly unlikely, no more likely than the potential for common cause failures in the original chiller equipment.; and,</p> <p>d) This activity may be performed under 10CFR50.59.</p>

50.59 Log #	Parent Doc.	Change Description	Evaluation Summary
2014- 0006	ECR 71072A	<p>The iodine spike calculation DC00040-038 (Ref.4), which supplies input to the dose calculations for a postulated Steam Generator Tube Rupture (SGTR) and Steam Line Break (SLB), was revised to:</p> <ol style="list-style-type: none"> <li>1. Use worse case assumptions for reactor coolant (RC) mass (i.e., minimum versus maximum) when evaluating the iodine appearance rate and average RC activity concentrations.</li> <li>2. Use worse combination of iodine activities for plant operation with 60 or 120 gpm letdown and 1 % failed fuel.</li> <li>3. Explicitly account for an iodine appearance rate increase of 335 to support the SGTR dose calculation with a concurrent iodine spike.</li> <li>4. Remove spike multipliers on RC activities other than iodine when evaluating a pre-accident iodine spike. These four (4) changes were utilized in dose calculation revisions for SLB (Ref. 10) and SGTR (Ref. 8) and, for purposes of this SAP-107 evaluation, are considered Changes 1 - 4. In addition, the revision to DC00040-038 also included additional post accident time periods (i.e., for evaluating the buildup of reactor coolant iodine concentrations) during a concurrent iodine spike for use in a supplemental SGTR dose calculation [DC00040-109 (Ref. 11)], which was also revised. However, since DC00040-109 is not part of the plants licensing basis, it is being VOIDED under ECR-71072A. Given this, the results (i.e., average reactor coolant iodine concentrations) for the additional post accident time periods are not considered a change for purposes of this SAP-107 evaluation. In addition to the revised inputs resulting from the above changes, the updated SLB and SGTR dose calculations were also revised to include long term steam releases (8 - 24 hours) from the intact SGs. This change corrects an oversight in the computer code inputs in the previous revisions to the calculations. Therefore, for purposes of this SAP-107 evaluation, change 5 becomes:</li> <li>5. Inclusion of long term steam releases from the intact SG when evaluating dose.</li> </ol> <p>Collectively, these five (5) changes lead to small increases in predicted dose consequences for a SLB and SGTR that need to be reflected in the FSAR.</p>	<p>A full 10 CFR 50.59 Evaluation was performed for the proposed activity. Questions 1-8 were answered NO with explanation. Given the above determination, it is concluded that the proposed activity can be implemented without prior NRC approval.</p>