SAFETY EVALUATION BY THE OFFICE OF NEW REACTORS

RELATED TO AMENDMENT NOS. 71

TO THE COMBINED LICENSE NOS. NPF-93 AND NPF-94, RESPECTIVELY

SOUTH CAROLINA ELECTRIC & GAS COMPANY

SOUTH CAROLINA PUBLIC SERVICE AUTHORITY

VIRGIL C. SUMMER NUCLEAR STATION UNITS 2 AND 3

DOCKET NOS. 52-027 AND 52-028

1.0 INTRODUCTION

By letter dated September 15, 2016 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML16259A309), South Carolina Electric & Gas Company (SCE&G) on behalf of itself and the South Carolina Public Service Authority (both hereafter called the licensee) requested that the U.S. Nuclear Regulatory Commission (NRC/Commission) amend the combined licenses (COL) for Virgil C. Summer Nuclear Station (VCSNS), Units 2 and 3, COL Numbers NPF-93 and NPF-94, respectively.

In license amendment request (LAR) 16-12, the licensee asked the US Nuclear Regulatory Commission (NRC) to revise the Updated Final Safety Analysis Report (UFSAR) in the form of departures from the incorporated plant-specific Design Control Document (DCD) Tier 2* information. Specifically, the LAR proposed changes to revise the COLs to clarify information in the Tier 2* Technical Report WCAP-17179, Revision 2, "AP1000 Component Interface Module Technical Report," (ADAMS Accession No. ML102170265 – non-public) that shows design compliance with licensing bases requirements. A change to the ownership of two reference documents in Technical Report WCAP-17179, Revision 2, was also included in the LAR. In addition, the LAR proposed a change to the [

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The NRC staff issued an initial *Federal Register* notice of opportunity to request a hearing and to submit comments on the staff's proposed No Significant Hazards Determination on October 25, 2016 (81 FR 73437).

2.0 REGULATORY EVALUATION

2.1 System Description

The PMS is the reactor protection system for the certified AP1000 reactor design (ADAMS Accession No. ML11171A500). The PMS includes the reactor trip system (RTS) and the engineered safety features actuation system (ESFAS). The PMS initiates reactor trip and actuation of engineered safety features in response to plant conditions monitored by process instrumentation and provides safety-related displays.

The CIM is a subsystem of the PMS. The two main components of the CIM subsystem are the [ ] The CIM subsystem is designed to provide the interface between field components and the PMS and the plant control system (PLS).

The CIM subsystem communicates with the safety-related PMS using the SRNC assembly, and the CIM subsystem communicates with the non-safety-related PLS using a remote node controller (RNC). The CIM modules provide the interface between the PMS ESFAS functions and plant components.

2.2 Proposed Changes

In the LAR, the licensee proposed (1) to clarify the design process documentation and the associated licensing documents in the Tier 2* Technical Report WCAP-17179, (2) to revise the information concerning the ownership of SRNC and CIM intellectual property, and (3) to modify the [ ]

The changes proposed in this LAR are made to clarify information presented in Technical Report WCAP-17179, which is referenced in the UFSAR as a Tier 2* document. Therefore, a LAR must be submitted for approval in accordance with 10 CFR Part 52, Appendix D, Section VIII.B.6. The technical evaluations are provided below for these changes.

2.3. Applicable Regulations

The regulation in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 52, Appendix D, VIII.B.6 requires a licensee to obtain prior NRC approval for departure from Tier 2* information.

The regulation in 10 CFR Part 50, Appendix A, General Design Criterion (GDC) 20, “Protection system functions,” provides, in part, that the protection system shall be designed to initiate automatically the operation of appropriate systems including the reactivity control systems, to assure that specified acceptable fuel design limits are not exceeded as a result of anticipated operational occurrences.

3.0 TECHNICAL EVALUATION

3.1 Clarification of Design Process Documentation and Associated Licensing Documents

The licensee proposed to revise the COLs to clarify information in the Tier 2* Technical Report WCAP-17179, Revision 2, which demonstrates design compliance with licensing bases requirements. Technical Report WCAP-17179, Revision 2, is incorporated by reference into the UFSAR to provide additional details regarding the CIM subsystem design. Specifically, this

proposed change will revise the titles of the two CIM FPGA and SRNC FPGA specification documents to designate them as CIM FPGA and SRNC FPGA software requirements specifications. Two additional software design description documents are also added as references in the proposed change.

The NRC staff found that this proposed change of documentation results in an improved description of the licensee's compliance with the code requirements endorsed by Regulatory Guide (RG) 1.172, "Software Requirements Specifications for Digital Computer Software Used in Safety Systems of Nuclear Power Plants," (ADAMS Accession No. ML13007A173). The NRC staff found that there is no change to the design of the CIM subsystem from the proposed change of documentation. The proposed change of documentation does not impact the safety functional design and performance of the CIM subsystem and does not affect protection system independence. Therefore, based on the foregoing evaluation, the NRC staff concludes that the proposed change is acceptable.

3.2 Ownership of CIM and SRNC Intellectual Property

The FPGA specification documents for the CIM, 6105-10004 "SRNC FPGA Specification" and 6105-20004 "CIM FPGA Specification," which are referenced in the Tier 2* Technical Report WCAP-17179, Revision 2, were originally developed by a company named CS Innovations. Westinghouse Electric Company (WEC) now owns the CIM and SRNC intellectual property previously held by CS Innovations. The licensee proposed to remove the reference to CS Innovations' intellectual property to reflect the acquisition of the CIM and SRNC intellectual property by WEC.

This proposed change to the ownership of CIM and SRNC intellectual property does not affect protection system independence nor does it impact the certified safety functional design for the CIM subsystem. Therefore, based on the foregoing, the NRC staff concludes that the proposed change is acceptable.

3.3 [ ]

The licensee proposed to change the [ ] The NRC staff reviewed the proposed [ ] against GDC 20 to ensure that the protection system will automatically initiate the operation of the reactivity control systems during anticipated operational occurrences. A [ ] is included in Technical Report WCAP-17179, Revision 2, only as a general technical specification for the FPGA component in the CIM, providing flexibility for the specific licensee (in this case, SCE&G) to choose a specific FPGA. The proposed change is being made to identify the specific [ ] selected for the VCSNS CIM subsystem. The proposed change enables the FPGA used in the actual design to function properly and the output actuation relays to drive outputs as required. [ ] no other technical change to the design of the CIM subsystem was proposed. With the change to the [ ] The proposed change also will have a negligible effect on the 24 Vdc supplies and ultimately the plant electrical system load. The [

] The proposed change does not affect protection system functions nor does it revise the safety functional design of the CIM subsystem; therefore, the CIM subsystem will continue to ensure the protection system will automatically initiate the operation of the reactivity control systems during anticipated operational occurrences. The NRC staff finds that the change continues to meet the requirements of GDC 20; therefore, the NRC staff concludes that the proposed change is acceptable.

3.4 Summary

The NRC staff concludes that the three proposed changes ensure that the PMS and CIM subsystem operate as designed and that the CIM subsystem design and specifications is properly documented in the UFSAR. Additionally, the change of the [ ] continues to meet the requirements of GDC 20. Therefore, based on the above technical evaluations, the NRC staff concludes that the proposed changes are acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations in 10 CFR 50.91(b)(3), the South Carolina State official was notified of the proposed issuance of the amendment on February 8, 2017. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20, "Standards for Protection Against Radiation." The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration (81 FR 73437; published on October 25, 2016). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by construction activities and plant operation in the proposed manner; (2) there is reasonable assurance that such activities will be conducted in compliance with the Commission's regulations; and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public. Therefore, the staff concludes the changes proposed in this license amendment to be acceptable.