

May 9, 2005

Mr. Jeffery Archie
Vice President, Nuclear Operations
South Carolina Electric & Gas Company
Virgil C. Summer Nuclear Station
Post Office Box 88
Jenkinsville, South Carolina 29065

SUBJECT: VIRGIL C. SUMMER NUCLEAR STATION, UNIT NO. 1 - ISSUANCE OF
AMENDMENT RE: EXTENDING THE INSPECTION INTERVAL FOR REACTOR
COOLANT PUMP FLYWHEELS (TAC NO. MC3308)

Dear Mr. Archie:

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 172 to Renewed Facility Operating License No. NPF-12 for the Virgil C. Summer Nuclear Station, Unit No. 1. The amendment changes the Technical Specifications (TS) in response to your application dated May 21, 2004.

This amendment revises TSs related to the reactor coolant pump flywheel inspection program by relocating the requirements from the limiting conditions for operation to the administrative controls section and increasing the inspection interval to 20 years. A notice of availability for this TS improvement using the Consolidated Line Item Improvement Process was published in the *Federal Register* on October 22, 2003 (68 FR 60422).

A copy of the related Safety Evaluation is enclosed. Notice of Issuance will be included in the Commission's Biweekly *Federal Register* notice.

Sincerely,

/RA/

Robert E. Martin, Senior Project Manager, Section 1
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-395

Enclosures:

1. Amendment No. 172 to NPF-12
2. Safety Evaluation

cc w/enclosures: See next page

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by relocating the requirements from the limiting conditions for operation to the administrative
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SOUTH CAROLINA ELECTRIC & GAS COMPANY

SOUTH CAROLINA PUBLIC SERVICE AUTHORITY

DOCKET NO. 50-395

VIRGIL C. SUMMER NUCLEAR STATION, UNIT NO. 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 172
Renewed License No. NPF-12

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by South Carolina Electric & Gas Company (the licensee), dated May 21, 2004, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications, as indicated in the attachment to this license amendment; and paragraph 2.C.(2) of Renewed Facility Operating License No. NPF-12 is hereby amended to read as follows:

- (2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 172, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the license. South Carolina Electric & Gas Company shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This amendment is effective as of its date of issuance and shall be implemented within 60 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA by L. Olshan for/

John A. Nakoski, Chief, Section 1
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical
Specifications

Date of Issuance: May 9, 2005

ATTACHMENT TO LICENSE AMENDMENT NO. 172

TO RENEWED FACILITY OPERATING LICENSE NO. NPF-12

DOCKET NO. 50-395

Replace the following pages of the Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove Pages

3/4 4-36
6-12d

Insert Pages

3/4 4-36
6-12d

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 172 TO

RENEWED FACILITY OPERATING LICENSE NO. NPF-12

SOUTH CAROLINA ELECTRIC & GAS COMPANY

SOUTH CAROLINA PUBLIC SERVICE AUTHORITY

VIRGIL C. SUMMER NUCLEAR STATION, UNIT NO. 1

DOCKET NO. 50-395

1.0 INTRODUCTION

By application dated May 21, 2004, South Carolina Electric & Gas Company (the licensee) requested changes to the Technical Specifications (TSs) for the Virgil C. Summer Nuclear Station (VCSNS).

The proposed changes would extend the reactor coolant pump (RCP) motor flywheel examination frequency to an interval not to exceed 20 years. These changes are based on TS Task Force (TSTF) change traveler TSTF-421 (Revision 0) that has been approved generically for the Westinghouse Standard TSs (STSs), NUREG-1431. A notice announcing the availability of this proposed TS change using the Consolidated Line Item Improvement Process (CLIIP) was published in the *Federal Register* on October 22, 2003 (68 FR 60422). The licensee also proposes to adopt the STS format related to the flywheel inspection by moving the TS requirement from TS 3/4.4.10, "Structural Integrity," to a new TS 6.8.4.j, "Reactor Coolant Pump Flywheel Inspection Program."

2.0 REGULATORY EVALUATION

The function of the RCP in the reactor coolant system (RCS) of a pressurized-water reactor plant is to maintain an adequate cooling flow rate by circulating a large volume of primary coolant water at high temperature and pressure through the RCS. Following an assumed loss of power to the RCP motor, the flywheel, in conjunction with the impeller and motor assembly, provides sufficient rotational inertia to assure adequate primary coolant flow during RCP coastdown, thus resulting in adequate core cooling. A concern regarding the overspeed of the RCP and its potential for failure led to the issuance of Regulatory Guide (RG) 1.14, "Reactor Coolant Pump Flywheel Integrity," Revision 1, dated August 1975. RG 1.14 describes a method acceptable to the Nuclear Regulatory Commission (NRC) staff on addressing concerns related to RCP vibration and the possible effects of missiles that might result from the failure of the RCP flywheel. The need to protect components important to safety from such missiles are included in General Design Criterion 4, "Environmental and Dynamic Effects Design Basis," of Appendix A, "General Design Criteria for Nuclear Power Plants," to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Licensing of Production and Utilization Facilities," which is applicable to plants that obtained their construction permits after May 21, 1971.

Specific requirements to have an RCP flywheel inspection program consistent with RG 1.14, or previously issued relaxations from the RG, are included in the Administrative Controls Section of the STSs. The purpose of the testing and inspection programs defined in the TSs is to ensure that the probability of a flywheel failure is sufficiently small such that additional safety features are not needed to protect against a flywheel failure. The RG provides criteria in terms of critical speeds that could result in the failure of an RCP flywheel during normal or accident conditions. In addition to the guidance in RG 1.14, the NRC has more recently issued RG 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," which provides guidance and criteria for evaluating proposed changes that use risk-informed justifications.

A proposed justification for extending the RCP flywheel inspections from a 10-year inspection interval to an interval not to exceed 20 years was provided by the Westinghouse Owners Group (WOG) in Westinghouse Commercial Atomic Power (WCAP) Topical Report (TR), WCAP-15666, "Extension of Reactor Coolant Pump Motor Flywheel Examination," transmitted by letter dated August 24, 2001. The TR addressed the proposed extension for all domestic WOG plants. The NRC accepted the TR for referencing in license applications in a letter and safety evaluation (SE) dated May 5, 2003 (Agencywide Document Access and Management System Accession No. ML031250595).

For VCSNS, TS 3/4.4.10, "Structural Integrity," defines the current requirements for the flywheels to be inspected per the recommendations of Regulatory Position C.4.b of RG 1.14. The inspections are defined in RG 1.14 as follows:

- (1) An in-place ultrasonic volumetric examination of the areas of higher stress concentration at the bore and keyway at approximately 3-year intervals, during the refueling or maintenance shutdown coincident with the inservice inspection schedule as required by Section XI of the ASME [American Society of Mechanical Engineers] Code.
- (2) A surface examination of all exposed surfaces and complete ultrasonic volumetric examination at approximately 10-year intervals, during the plant shutdown coinciding with the inservice inspection schedule as required by Section XI of the ASME Code.

The licensee had not revised the TS to adopt a previously issued TS improvement related to the flywheel inspections. That change, as reflected in the STS, states that:

In lieu of Position C.4.b(1) and C.4.b(2), a qualified in-place UT [ultrasonic test] examination over the volume from the inner bore of the flywheel to the circle one-half of the outer radius or a surface examination (MT [magnetic particle testing] and/or PT [liquid penetrant testing]) of the exposed surfaces of the removed flywheels may be conducted at approximately 10-year intervals coinciding with the Inservice Inspection schedule as required by the ASME Code.

3.0 TECHNICAL EVALUATION

The justification for the proposed change was provided in the TR, which the staff accepted for referencing in license applications by a letter and SE dated May 5, 2003. The TR addresses the three critical speeds defined in RG 1.14: (a) the critical speed for ductile failure, (b) the critical speed for non-ductile failure, and (c) the critical speed for excessive deformation of the flywheel. The staff found that the TR adequately addressed these issues and demonstrated that acceptance criteria, for normal and accident conditions defined in RG 1.14, would continue to be met for all domestic WOG plants following an extension of the inspection interval. The TR also provided a risk assessment for extending the RCP flywheel inspection interval. The NRC staff's review, documented in the SE for the TR, determined that the analysis methods and risk estimates are acceptable when compared to the guidance in RG 1.174.

In conclusion, the NRC staff finds that the regulatory positions in RG 1.14 concerning the three critical speeds are satisfied, and that the evaluation indicating that critical crack sizes are not expected to be attained during a 20-year inspection interval is reasonable and acceptable. The potential for failure of the RCP flywheel is, and will continue to be, negligible during normal and accident conditions. The change is, therefore, acceptable.

As part of this application, the licensee proposed to relocate the TS requirement from the section defining limiting conditions for operation and surveillance requirements to the section defining programs under administrative controls. The licensee's proposal effectively moves the specification while maintaining the RCP flywheel inspection requirements and has the benefit of aligning the format of the VCSNS TSs with the STSs. The added TS 6.8.4.j is consistent with TSTF-421 and the previous notices regarding using CLIP to adopt this change. The change is, therefore, acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the State of South Carolina official was notified of the proposed issuance of the amendment. 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 and changes surveillance requirements. 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, and there has been no public comment on such finding (70 FR 9995, March 1, 2005). 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 operation in the proposed manner, (2) 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.

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Date: May 9, 2005

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