

November 2, 2006

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

SUBJECT: VIRGIL C. SUMMER NUCLEAR STATION, UNIT 1 — ISSUANCE OF  
AMENDMENT REGARDING ALTERNATE ALTERNATING CURRENT POWER  
SUPPLY (TAC NO. MC8798)

Dear Mr. Archie:

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 178 to Renewed Facility Operating License No. NPF-12 for the Virgil C. Summer Nuclear Station, Unit 1. The amendment changes the Technical Specifications (TSs) in response to your application dated October 28, 2005, as supplemented on April 2, June 15, and August 31, 2006.

This amendment revises the TSs and provides associated Bases to permit the implementation of an alternate alternating current power supply.

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  
Plant Licensing Branch II-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-395

Enclosures:

1. Amendment No.178 to NPF-12
2. Safety Evaluation

cc w/enclosures: See next page

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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. 178  
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 October 28, 2005, as supplemented on April 2, June 15, and August 31, 2006, 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. \_\_\_\_\_, 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 90 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

*/RA/ L. Olshan for*

Evangelos C. Marinos, Chief  
Plant Licensing Branch II-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical  
Specifications

Date of Issuance: November 2, 2006

ATTACHMENT TO LICENSE AMENDMENT NO. 178  
TO RENEWED FACILITY OPERATING LICENSE NO. NPF-12  
DOCKET NO. 50-395

Replace page 3 of Renewed Facility Operating License No. NPF-12 with the attached revised page 3.

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

<u>Remove Page</u>	<u>Insert Page</u>
XIV	XIV
3/4 8-2	3/4 8-2
3/4 8-4	3/4 8-4
B 3/4 8-1	B 3/4 8-1
B 3/4 8-2	B 3/4 8-2
B 3/4 8-3	B 3/4 8-3
B 3/4 8-4	B 3/4 8-4

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 178 TO

RENEWED FACILITY OPERATING LICENSE NO. NPF-12

SOUTH CAROLINA ELECTRIC & GAS COMPANY

SOUTH CAROLINA PUBLIC SERVICE AUTHORITY

VIRGIL C. SUMMER NUCLEAR STATION, UNIT 1

DOCKET NO. 50-395

1.0 INTRODUCTION

By application dated October 28, 2005, as supplemented on April 2, June 15, and August 31, 2006, South Carolina Electric & Gas Company (SCE&G, the licensee) requested changes to the Technical Specifications (TSs) for the Virgil C. Summer Nuclear Station, Unit 1 (VCSNS). The April 2, June 15 and August 31, 2006, letters provided information that did not change the initial proposed no significant hazards consideration determination.

This license amendment revises the TSs and provides associated Bases to permit the implementation of an alternate alternating current (AAC) power supply. This includes revision to TS 3.8.1, "Alternating Current (AC) Sources - Operating," to extend the allowed out of service time (AOT) for one inoperable emergency diesel generator (EDG) from 72 hours to 14 days. The amendment also permits extending the operability verification time for required systems, subsystems, trains, components, and devices that depend on the remaining operable EDG as a source of emergency power from 2 hours to 4 hours, and deletes the present requirement to perform the EDG 18-month manufacturer's inspection.

2.0 REGULATORY ANALYSIS

The regulatory requirements that the Nuclear Regulatory Commission (NRC) staff applied in its review of the application include:

Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Appendix A, General Design Criterion (GDC) 17 requires, in part, that nuclear power plants have an onsite and offsite electric power system to permit the functioning of structures, systems, and components important to safety. The onsite system is required to have sufficient independence, redundancy, and testability to perform its safety function, assuming a single failure, and the offsite system is required to be supplied by two independent circuits. In addition, this criterion requires provisions to minimize the probability of losing electric power from the remaining

electric power supplies as the result of loss of power from the unit, the offsite transmission network, or the onsite power supplies.

GDC 18, "Inspection and testing of electric power systems," requires that electric power systems that are important to safety must be designed to permit appropriate periodic inspection and testing.

10 CFR 50.36, "Technical Specification," requires a licensee's TS to establish limiting condition for operation (LCO) and surveillance requirements (SRs) for equipment that is required for safe operation of the facility. Specifically, Section 50.36(c)(3) stipulates the SRs.

The NRC staff's risk assessment-based evaluation has been performed consistent with the objectives of the NRC staff's Probabilistic Risk Assessment (PRA) Policy Statement, "Use of Probabilistic Risk Assessment Methods in Nuclear Activities, Final Policy Statement." The regulatory documentation on which the NRC staff based its acceptance are:

- a) NRC Regulatory Guide (RG) 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," which describes a risk-informed approach, acceptable to the NRC, for assessing the nature and impact of proposed licensing-basis changes by considering engineering issues and applying risk insights.
- b) RG 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications," which describes an acceptable risk-informed approach specifically for assessing TS changes in AOTs.

### 3.0 TECHNICAL EVALUATION

The NRC staff evaluated the licensee's request using both deterministic review methods, as discussed in section 3.2 below, and probabilistic risk analysis methods, as discussed in section 3.3 below.

#### 3.1 PROPOSED CHANGES

##### 3.1.1 TS 3.8.1.1, ACTION b.3

With one diesel generator (DG) inoperable, TS 3.8.1.1, Action b.3, currently specifies the time for verifying operability of required systems that depend on the remaining DG as 2 hours. The licensee's proposal would increase this to 4 hours. The NRC staff's evaluation, finding this proposal to be acceptable, is included in section 3.2 below.

##### 3.1.2 TS 3.8.1.1, ACTION b.4

With one DG inoperable, TS 3.8.1.1, ACTION b.4 currently reads:

4. Restore the EDG to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

The licensee's October 28, 2005 submittal proposed to change the TS as follows:

4. Restore the EDG to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours, unless the following condition exists:
  - a) The requirement for restoration of the EDG to OPERABLE status within 72 hours may be extended to 14 days if the Alternate AC (AAC) power source is or will be available within 1 hour, as specified in the Bases, and
  - b) If at any time the AAC availability cannot be met, either restore the AAC to available status within 72 hours (not to exceed 14 days from the time the EDG originally became inoperable), or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the next 30 hours."

As a result of the NRC staff's concern that the above TS potentially would allow two 72-hour periods without an AAC power source during the 14-day AOT, paragraph (b) of the TS was revised to read as follows:

- b) If at any time the AAC availability cannot be met, either restore the AAC to available status within the remainder of the 72 hours in 4.a (not to exceed 14 days from the time the EDG originally became inoperable), or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the next 30 hours."

The licensee's basis for the proposed change is as follows:

The current 72-hour AOT is insufficient in duration to support extensive preventive maintenance. Such maintenance is required on a periodic basis, and is presently performed during refueling outages where both EDGs can be removed from service for an extended time period. This greatly lengthens and complicates outages, unnecessarily creates high risk evolutions, and typically means having to remove one or both EDGs from service during a refueling outage. Performing the work during an online maintenance evolution allows resources to be more focused on EDG maintenance, thus minimizing the potential for human error as a result of time pressures and resource allocation. The proposed 14-day AOT provides a work window which is long enough to accomplish all planned preventive and corrective maintenance activities.

This proposed AOT extension is based on the availability of offsite power to backup the EDGs, via an underground cable from the blackstart-capable hydro electric generating station (Parr Hydro or Parr), which has six generators, located approximately 3.5 miles from VCSNS. Should this AAC source not be available within one hour, the licensee will comply with the 72-hour EDG AOT and take actions required to protect the plant and the public.

The licensee further stated that current initiating event contributions to the VCSNS core damage frequency (CDF) have loss of offsite power (LOOP) as the significant contributor,

approximately 60 percent. Installation of the AAC source cuts this contribution by more than half and the CDF shows a 20 to 40 percent reduction.

### 3.1.3 TS surveillance 4.8.1.1.2.g.1

The 18-month manufacturer's inspection, is proposed to be deleted. The EDG inspection is a preventive maintenance activity that is aimed toward long-term EDG reliability and does not have a short-term impact on EDG operability. The licensee's basis for proposing the deletion is that plant programs implementing the maintenance rule require performance assessment.

## 3.2 TECHNICAL EVALUATION - DETERMINISTIC REVIEW

### 3.2.1 AAC Power Source

The AAC power source will be provided by the Parr Hydro station. There are six 3.0 MVA units at Parr Hydro and only three are required to supply power for starting of the engineered safeguards features (ESF) equipment (only two are required to support running loads). A blackstart diesel will be stationed at Parr to provide for operation of all generators at Parr, including the unit exciters and keep warm systems. This DG will be auto-starting and loading on a loss of AC power to Parr. All six units will be blackstart capable. Parr is located 3.5 miles from VCSNS and its elevation is greater than 150 feet below VCSNS grade. It is not susceptible to the same weather event that would disable the VCSNS switchyard. A new breaker will be added to the existing 13.8 kilovolt (kV) common switchgear at Parr. An underground cable will be installed between the Parr switchgear and a new weather-protected transformer at the VCSNS switchyard. From the transformer, a cable will be run into 1DX switchgear, which is the incoming bus for the 115 kV ESF power supply. This bus can be tied to either or both onsite ESF buses. Electrical separation from the ESF power distribution system will be maintained by a minimum of two circuit breakers in series, one of which will be a Class 1E breaker at the Class 1E ESF bus. The AAC source is normally on, as the line is connected not only to Parr Hydro but ultimately to the 115 kV grid. The AAC source will normally not be connected to the onsite power systems. Installation of the AAC source follows the guidelines from Nuclear Management and Resources Council, Inc. (NUMARC) 87-00, Appendix B.

### 3.2.2 Onsite Power System

VCSNS is a single unit site. The onsite ESF AC power source consists of two EDGs and their associated auxiliary systems: fuel oil, lubrication oil, cooling water, starting air, air intake and exhaust systems, and automatic control circuitry. Each EDG is a turbo-charged, four-cycle diesel engine directly coupled to a 7.2 kV, 3-phase, 4250 kilowatt (kW) (continuous rating) synchronous generator with a 7-day rating of 4676 kW and 30-minute rating of 5100 kW.

Upon loss of offsite power to the safety buses, power will be supplied to the safety buses from the two automatic, fast startup EDG units. These are sized so that either one can carry the required ESF loads. Each EDG will feed its designated 7.2 kV bus.

In a station blackout (SBO) event, both EDGs are assumed not to function. The increased EDG AOT is not expected to increase the overall EDG unavailability due to process inefficiencies and a reduction in corrective maintenance. Therefore, the probability of an SBO

event is not expected to be increased due to this proposed change. The licensee addressed the SBO Rule, 10 CFR 50.63, by demonstrating the ability to cope without any AC power for 4 hours. The licensee is not intending to revise the SBO coping analysis.

The licensee stated that VCSNS has one fully available SBO-capable means of supplying feedwater in the 100 percent capacity turbine driven emergency feedwater (TDEFW) pump. This pump can provide sufficient emergency feedwater flow to maintain natural circulation. In response to the NRC staff's request for additional information (RAI) regarding verification of the operability of the TDEFW pump, the licensee stated in its June 15, 2006, submittal that VCSNS TS Action 3.8.1.1.b.3 includes a requirement to verify operability of TDEFW pump in Modes 1, 2, and 3, within 2 hours (4 hours per proposed change) of declaring the EDG inoperable. If the pump cannot be verified operable at that time, there is a 6-hour shutdown requirement.

In regards to the current reliability and unavailability of the EDGs at VCSNS, the licensee on June 15, 2006, stated that the unavailability values for the EDGs at VCSNS through February 2006, are 115.2 hours for the A EDG and 125.3 hours for the B EDG. The reliability number for the EDG system is 96 percent. These values exceed the reliability target values committed to in the SBO response. As such, the licensee found the reliability of the EDGs at VCSNS continues to satisfy the regulatory requirements associated with SBO and the NRC staff finds the licensee's conclusion to be acceptable.

On the basis of information provided by the licensee, the NRC staff finds that with the provision of the Parr Hydro AAC power source, the VCSNS continues to meet the requirements of GDC 17, GDC 18 and the SBO Rule.

### 3.2.3 Offsite Power System

The licensee stated that two separate sources of offsite power are provided for the Class 1E electric system, which is in compliance with GDC 17 and Regulatory Guide 1.32. One source is the SCE&G transmission grid terminating at the VCSNS 230 kV switchyard bus, which feeds the plant through a step-down transformer. The second source is from the existing Parr Combustion Turbine Generating Complex over a 115 kV transmission line. This source is connected to the plant through onsite step down transformers and a separate regulating transformer. Each source is capable of supplying either or both trains of the ESF power. These two sources have sufficient separation and isolation so that loss of the VCSNS with the Fairfield Hydro Units offline will not degrade either of the sources below their acceptable voltage limit. The offsite power system is not designed to withstand tornados, exceptionally severe hurricanes or ice storms.

The licensee stated that a direct communication link is provided between the SCE&G Dispatch Office in Columbia, SC, and all SCE&G generating plants. Through this communications link, the plant operators receive the instructions from the dispatch office for setting the generator kilowatt, kilovar output, voltage level, and for controlling the volt ampere reactive (VAR) output on the Fairfield units when they are used for pumping.

On the basis of information provided by the licensee, the NRC staff finds that with the provision of the Parr Hydro AAC power source, the VCSNS continues to meet the requirements of GDC 17, and GDC 18.

### 3.2.4 Reliability and Performance Monitoring

The licensee stated that equipment relied upon for supplying electric power and mitigating the loss of power events is included in the VCSNS maintenance rule program and is monitored for equipment reliability and unavailability. The licensee does not expect to use the EDG AOT extension on a frequent basis. Frequent use of extended AOT would adversely impact the system availability and may cause the EDGs to become "(a)(1)" per the VCSNS maintenance rule program. If the pre-established reliability or availability goals are not met for the EDGs, plant procedures will require corrective actions and increased management attention to restore EDG performance. Additionally, excessive use of the extended AOT would become evident through the "Emergency AC Power" NRC performance indicator crossing the threshold from green to white.

VCSNS committed to an EDG reliability of 0.95 as part of compliance with the SBO Rule, 10 CFR 50.63. The licensee stated that a maintenance rule performance criterion was established that is currently more restrictive than the SBO commitment.

Regarding control of discretionary maintenance on the main and unit auxiliary transformer during EDG extended AOT, the licensee's submittal dated June 15, 2006, stated that 10 CFR 50.65(a)(4) requires that a risk assessment be performed prior to taking equipment in the scope of the maintenance rule out of service for maintenance or testing. The maintenance rule program established at VCSNS requires the plant's configuration risk monitoring program to assess the risk increase of taking equipment out of service. The main station generator step-up transformer is not used for any safeguards services. Only minor maintenance such as oil sampling and fan replacement can be performed while in service. For the emergency auxiliary transformer (XTF 31) and the ESF transformers (XTF 4, 5, and 6), being dedicated station feeds to the safeguards buses, anything beyond minor maintenance requires taking the transformer out of service which is addressed by the VCSNS TSs.

On the basis of information provided by the licensee, the NRC staff finds that provision of the Parr Hydro AAC power source will be reflected in the requirements for reliability and performance monitoring at the VCSNS.

The licensee also stated that it expects that the performance of significant online maintenance will provide a measurable improvement in EDG reliability for several reasons which are summarized below :

1. The activity will ensure an increased focus on EDG maintenance, which would not be treated as one of many outage activities.
2. With only one significant maintenance activity occurring during this time period, there would be an increased management oversight of this activity.
3. The EDG maintenance activity would not be competing for resources - additional resources could be assigned as needed and the best in-house resources would be involved in the activity. Additional training opportunities would be available.
4. Planning and scheduling would improve; with online maintenance, the details of each task could be better planned and activity feedback enhanced.

5. Scheduling of online maintenance would take account of the optimum work conditions, including temperature and availability of knowledgeable personnel, reducing the impact of human factors on risk.
6. Time pressures for a near-critical-path outage activity would be reduced. A 14-day AOT would allow sufficient time to perform the EDG maintenance activities without being driven by schedule constraints.
7. Online maintenance allows the use of all permanent station employees – better qualified personnel will be available to perform the activity.

### 3.2.5 Transmission System Operator (TSO) Communications

In response to the NRC staff's RAI regarding the communication protocol between the control room operator at VCSNS and the TSO, the licensee's submittal dated June 15, 2006, stated that;

As a response to Generic Letter 2006-02, "Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power," SCE&G stated that there is an Interface Agreement (IA) between VCSNS and the Transmission System Operator (TSO). This IA provides for responsibilities and interactions between VCSNS and the TSO. It also specifically calls out when notifications are to be made from one entity to the other. These include notifications from VCSNS to the TSO on a weekly and daily basis to discuss activities that could affect grid stability. Additionally, the IA requires communication immediately before performing maintenance on equipment that was discussed as grid-risk-sensitive or is required to mitigate the effects of a Loss of Offsite Power (LOOP). These discussions should include the expected length of time the equipment will be out of service and the need to assure the grid remains stable during this period. This equipment includes the EDG and the TDEFW pump.

In RAI 5, the NRC staff asked the licensee to discuss whether the TSO will notify the plant operators when degraded grid conditions could occur and what action will be taken if degraded grid conditions occur during the EDG extended AOT. In its response, the licensee on June 15, 2006, stated that the IA identifies specific notifications to VCSNS by the TSO for actual or predicted grid conditions. Should VCSNS receive such a notification during maintenance on equipment required to mitigate the effects of a LOOP event, an Abnormal Operating Procedure for grid issues would apply. In addition, a re-evaluation of the plant risk due to the emergent condition would occur. Depending on the amount of increased risk, actions taken may be anything from backing out of the maintenance to getting management approval to continue.

Regarding maintaining daily communication with the system dispatcher about the status of the EDG, the licensee on June 15, 2006, stated that VCSNS has an interface agreement with the system dispatcher. Per an existing commitment in procedure OAP-100.4, Communications, a daily and weekly phone call is initiated to discuss both planned maintenance as well as emergent maintenance. Additionally, since the EDG is a Grid Risk Sensitive component as discussed in Generic Letter 2006-02, VCSNS will contact the system dispatcher immediately prior to commencing maintenance on this component.

On the basis of information provided by the licensee, the NRC staff finds that reasonable provisions have been taken to ensure mutual communications between the VCSNS staff and the TSO regarding the status of Parr Hydro, and the VCSNS onsite and offsite power systems.

### 3.2.6 Confirmatory Measures

#### Licensee Regulatory Commitments

The following regulatory commitments were made in the licensee's October 28, 2005 submittal:

The AAC system Maintenance Rule scoping will be completed and approved by the [licensee's] expert panel prior to implementing the TS change.

In accordance with the provisions of 10 CFR 50.65(a)(4), the following compensatory measures will be implemented when utilizing the extended 14-day AOT:

VCSNS will not utilize the 14-day AOT unless the AAC will be available within 1 hour after the EDG is declared inoperable.

The AAC will be declared available prior to being used as the AAC source.

Should the AAC become unavailable after the EDG is inoperable, the plant will revert back to the 72-hour AOT.

The AAC will not be connected to an ESF bus unless the EDG and the normal source for that bus are inoperable.

The design of the AAC meets the requirements of NUMARC 8700, Appendix B.

Preplanned EDG maintenance will not be scheduled when adverse weather is expected.

Elective maintenance will not be performed on the AAC system while it is considered available as the AAC source.

Elective maintenance will not be performed on the offsite sources normally supplying power to the ESF buses.

The system dispatcher will be contacted prior to removing an EDG from service and an extended AOT will not be entered to perform elective maintenance when grid stress conditions are considered high.

Maintenance of the AAC power source will not be scheduled to run concurrently with maintenance on either EDG.

The following additional commitments were made in the licensee's June 15, 2006 submittal:

A testing scheme that meets the requirements of NUMARC 87-00, Appendix B, will be developed and implemented prior to declaring the AAC source available for the first time.

Existing structures like the Turbine Building and Parr Hydro will not be modified.

Reverse power sensing relaying will be installed to preclude the possibility of power flowing from the 1E busses to the AAC (except for short periods during swapping of the AAC source to an EDG).

The AAC source will normally be energized and capable of having its breaker to the 1DX bus closed, but the breaker will remain open.

An Operations procedure will be developed to load the emergency core cooling system (ECCS) equipment onto the AAC fed Safeguards bus.

An Operations procedure will be developed to verify the operation of the AAC to supply the 1DA and 1DB busses each refueling outage. The AAC source will normally be energized and monitored at the VCSNS on a continuous basis and will be verified as an appropriate source at least weekly.

The AAC source voltage will be monitored by the plant computer and alarms generated if the voltage falls outside specified limits.

VCSNS will supply a work control document to Parr personnel to verify that the diesel is run a minimum of 1 hour every quarter.

All AAC system components will be in maintenance or monitoring program.

The AAC Source capability testing will be performed in simulation of a system wide blackout.

When Parr is being depended on as the AAC source due to extended maintenance on one of the EDGs, Parr will be staffed with sufficient personnel to assure power remains available to VCSNS 24 hours a day, 7 days a week. This requirement will be a central part of the agreement between VCSNS and the management over the Parr Hydro.

The capability of the AAC source will be verified by communicating with personnel at Parr to discuss which units are/will be supplying power as the AAC source.

The following additional commitments were made in the licensee's August 31, 2006 submittal:

The cable from Parr to VCSNS will be used at conductor temperatures not to exceed 105 [degrees Centigrade] °C. The emergency temperature rating will be

140 °C for periods which shall not exceed 100 hours per year. Such 100 hour overloads shall not exceed 5 over the lifetime of the plant.

Voltage and frequency will be manually adjusted at the generator during the manual loading process.

The licensee's administrative processes for its commitment management were addressed in its submittal of June 15, 2006, wherein the licensee stated that VCSNS has controls in place to manage commitments made to the NRC. A Station Administrative Procedure, SAP-630, Procedure/Commitment Accountability Program (PCAP), controls how commitments are added and deleted to plant procedures. Any time a procedure change is initiated, the originator is required to review the PCAP database to determine if a commitment is affected. In addition, specific reviews are performed to verify that the commitment is accurately captured in the procedure steps. The commitment is uniquely identified in the procedure and in the database. Should a change to the commitment be desired or required, SAP-630 requires a review of the database to provide understanding of the reasons behind the procedure steps. Additionally, the discipline supervisor and the Licensing Specialist must review and approve the commitment change before the procedure change can be approved.

#### Parr Hydro Diesel Program

Regarding a test program for the black start diesel at Parr Hydro, response 1.d of the licensee's submittal dated June 15, 2006, stated that testing and maintenance will be controlled by Parr Hydro staff with maintenance being performed by SCE&G personnel. VCSNS will track the testing and maintenance through its plant programs. The VCSNS Surveillance Test program will direct the performance of required testing (NUMARC 87-00, Appendix B), and monitor the results to assure acceptable availability and reliability of the Parr diesel.

The reliability statements for the Parr diesel centers around Institute of Electrical and Electronics Engineers standard 493, Appendix L, which documents that the average starting performance of maintained DGs is greater than 99 percent. SCE&G expects that its testing and maintenance practices will produce similar reliability results.

#### AAC System Initial Testing

Regarding the development and completion of a test to assure availability and capability prior to declaring the AAC system available the first time, response 1.e of the licensee's submittal dated June 15, 2006, stated that a testing scheme that meets the requirements of NUMARC 87-00, Appendix B will be developed and implemented prior to declaring the AAC source available for the first time. This testing will be developed to assure the AAC system has sufficient availability and capacity within one hour of a simulated LOOP. A licensee commitment, as noted above, also addresses this issue.

#### Dedication of Parr Hydro During 14-Day AOT

Regarding dedication of the Parr Hydro units as an AAC power source each time the 14-day AOT is entered, response 1.f of the licensee's submittal dated June 15, 2006, stated that the Parr Hydro units are dedicated as an AAC power source in the event of a loss of the grid.

However, the preferred configuration utilizes Parr Hydro connected to the grid as described below.

The Parr generating complex consists of the Parr Hydro and the Parr Combustion Turbines (Parr CT). These two facilities are electrically separated by a transformer and two switchyard breakers. As such, should the VCSNS GDC 17 source from the 115kV line (from the Parr CT substation) fail, the AAC source will not be connected (the breaker from the Parr Hydro to the Parr 115 kV CT substation will be opened which will isolate Parr Hydro from the grid) and can supply power to VCSNS within 1 hour.

For normal operations, during an extended EDG AOT, the breaker from Parr Hydro to VCSNS will be maintained closed (the breaker at switchgear 1DX will be maintained open), but staff at Parr will be available to open the breakers connecting Parr Hydro to Parr CT prior to supplying power to VCSNS as necessary (Parr Hydro will be staffed 24 hours a day, 7 days a week during all extended EDG AOTs).

#### NUMARC 8700, Appendix B Criteria

The licensee addressed how NUMARC 87-00, Appendix B, criteria B1 through B13, are met in response to RAI 6 in its June 15, 2006, submittal. The licensee confirmed that Parr Hydro is of a non-safeguards design (B1), Parr Hydro is remotely located so as to not be subject to failures that would impact the VCSNS (B2), Parr Hydro structures meet the Uniform Building Code (B3), separation criteria will be met (B4, B5, and B6), alignment of Parr Hydro to the VCSNS and no automatic loading of SBO loads (B7), independence of Parr Hydro from VCSNS (B8), verification of operability of Parr Hydro (B10, B12), maintenance of the diesels at Parr Hydro (B11), and meeting the Parr Hydro availability goal (B13) .

NUMARC 8700, Criterion B9 states that "The AAC power system shall be sized to carry the required shutdown loads and be capable of maintaining voltage and frequency within limits consistent with established industry standards that will not degrade the performance of any shutdown system or component." On June 15, 2006, the licensee responded to the NRC staff's request for supporting calculations showing that this criterion will be met by providing calculation DC 08010-025, revision 0. These calculations showed that the most limiting case for voltage supply to VCSNS is when there is no Parr Hydro connection to the grid and Parr Hydro is supplying all of the power to VCSNS (using three generators). The calculation showed that voltage would remain above 80 percent of rated voltage at the largest pump motor (the safety injection pump motor) terminal during worst case starting analysis. The voltage at 7.2 kV buses will be more than 93.8 percent of rated voltage during running conditions. The NRC staff reviewed the assumptions and results for the supporting calculation and finds that the calculation demonstrates that adequate voltage (greater than or equal to 80 percent of rated voltage during starting and greater than or equal to 90 percent of rated voltage during running) and adequate frequency (60 Hertz  $\pm$  5 percent) will be available at the load terminals.

On the basis of its review, as discussed above, the NRC staff finds the licensee's responses to be responsive to and consistent with the NUMARC criteria and, therefore, finds them acceptable.

### Parr Hydro Staffing

The NRC staff asked the licensee to discuss its plans for staffing the Parr Hydro station. In its submittal dated June 15, 2006, the licensee provided a regulatory commitment that Parr Hydro will be staffed with sufficient personnel to assure power remains available to VCSNS 24 hours a day, 7 days a week when Parr is being depended on as the AAC source due to extended maintenance on one of the EDGs. The NRC staff finds this to be acceptable since it will provide additional assurance of reliable operation of the Parr Hydro facility when required.

### Location of Parr Hydro Equipment

In response to the question pertaining to the location of the AAC equipment at Parr Hydro, the licensee on August 31, 2006, stated that all equipment for the AAC system, with the exception of the keep-warm DG is located within the Parr Hydro generating building. The Parr Hydro generating building was built from concrete and brick. The DG has an integral enclosure which is International Building Code-rated and protects the DG and its fuel tanks.

### 3.2.7 Conclusion

The NRC staff reviewed the proposed amendment, as supplemented, to determine whether the applicable regulations continue to be met and concludes that extending the AOT for an inoperable EDG from the current 72 hours to 14 days is acceptable. The NRC staff's conclusion is based on (a) a revision to the TS that captures the AAC operability requirements for entry into the 14 day AOT, (b) the NRC staff's findings of acceptance regarding meeting NRC regulatory requirements and guidance, as discussed above in sections 3.2.2, 3.2.3, 3.2.4 and 3.2.5. In addition, the NRC staff has obtained clarifications and confirmations regarding other matters and the licensee has made commitments to take certain actions in which the NRC staff has a significant interest but which do not warrant legally binding requirements, as discussed above in section 3.2.6. The NRC staff finds that reasonable controls for the implementation and for subsequent evaluation of proposed changes pertaining to the above regulatory commitments are best provided by the licensee's administrative processes, including its commitment management program.

### 3.2.8 TS 3.8.1.1 ACTION Statement b.3

This ACTION Statement currently requires that if one EDG is inoperable the following action shall be taken:

Within 2 hours, verify that required systems, subsystems, trains, components, and devices that depend on the remaining EDG as a source of emergency power are also OPERABLE and in MODE 1, 2, or 3, that the Turbine-Driven Emergency Feed Pump is OPERABLE. If these conditions are not satisfied within 2 hours be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

The 2-hour verification time, included twice in the above TS, is changed to 4 hours. The licensee indicates that the 4-hour period will provide for a systematic verification, not rushed by time pressures. This change was incorporated into the Improved Standardized TS (NUREG-1431, Revision 0).

The NRC staff finds, on the basis of its review, that the proposed change is acceptable because it minimizes risk while allowing time for restoration before subjecting the unit to transients associated with shutdown.

### 3.2.9 TS Surveillance 4.8.1.1.2.g.1, Manufacturer's Inspection

This surveillance currently requires subjecting the diesel to an inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendations for this class of standby service. The licensee proposed to delete this requirement.

The licensee stated that this inspection is a preventive maintenance activity and is oriented toward long-term EDG reliability and does not have an immediate impact on equipment operability. EDG operability is verified by the TS SRs that continue to be maintained in TS section 3.8. The TS surveillances verify that the EDG and support systems have been maintained in an acceptable condition such that the LCO is met and the EDG is capable of performing its intended function. The effectiveness of the maintenance performed is verified through the surveillance testing. The maintenance strategy developed goes beyond the manufacturer recommendations and includes incorporation of industry operating experience and maintenance practices, owner group recommendations (which have been endorsed by the manufacturer) and site specific operating experience. The effectiveness of the maintenance program is monitored through implementation of 10 CFR 50.65 requirements. If the EDG fails to meet established performance criteria, the condition is evaluated and corrective actions are initiated to restore reliability. Since the TS SRs verify the adequacy of the maintenance performed, a specific manufacturer's inspection is not needed.

The deletion of SR 4.8.1.1.2.g.1 will facilitate future implementation of performance centered maintenance, which considers industry operating experience, site specific operating experience, accepted industry practices, and owner group maintenance recommendations. A comprehensive program entitled "Guidelines for the Performance of Maintenance on Pielstick Engines," Revision 0, December 1, 2003, was developed by the Fairbanks Morse Owners Group (FMOG) to establish a framework for expected maintenance activities required to assure consistent availability. This document was reviewed and approved by Coltec Industries/Fairbanks Morse Engine Division who is the original equipment manufacturer for the VCSNS EDGs. The licensee stated that the current procedures and practices at VCSNS were compared against this document and were determined to be closely aligned with the FMOG program. In addition to regular maintenance, engine and generator parameters are trended to assess the health of the EDG between maintenance intervals.

The NRC staff finds, on the basis of its review, the licensee's proposed deletion of the TS for the 18-month EDG inspection to be acceptable on the basis that plant programs implementing the maintenance rule require EDG performance assessment. Additionally, standard technical specifications do not require the 18-month EDG inspection.

## 3.3 TECHNICAL EVALUATION - PROBABILISTIC EVALUATION

### 3.3.1 Tier 1-PRA Capability and Calculational Insights

The licensee has evaluated its proposed EDG AOT changes to determine that current regulations and guidelines continue to be met, that adequate defense-in-depth and safety

margin provisions are maintained, and that any increases in the “at-power” CDF and large early release frequency (LERF) are small and consistent with the NRC staff’s Safety Goal Policy Statement. The impact of the proposed 14-day EDG AOT on risk is evaluated according to the guidelines in RG 1.174 and RG 1.177.

The addition of the Parr Hydro AAC source will, according to the licensee’s analysis, decrease the plant CDF by about 31 percent with an assumed 14-day EDG AOT from the “4c” (current, pre-AAC source) baseline value of  $4.92\text{E-}05/\text{r-year}$ . The expected decrease in LERF is approximately 10 percent from the “4c” baseline value of  $1.12\text{E-}06/\text{r-year}$ . These decreases in plant risk are within the guideline values of RG 1.174, and the NRC staff finds them acceptable.

The at-power, internal events incremental conditional core damage probability (ICCDP) for the 14-day AOT (one EDG assumed to be out of service for maintenance) is  $4.46\text{E-}07$ . The corresponding at-power internal events incremental conditional large early release probability (ICLERP) is  $5.68\text{E-}09$ . These incremental conditional risk increases are within the RG 1.177 guideline values of  $5\text{E-}07$  for ICCDP and  $5\text{E-}08$  for ICLERP, respectively, and are acceptable.

With the proposed 14-day EDG AOT, routine EDG maintenance will, ordinarily, be removed from the refueling outage (RFO) schedule and will be performed outside of the RFO schedule. As such, the small calculated increase in ICCDP that would be attributable to performing EDG maintenance outside of the RFO schedule is expected to be offset by a decrease in ICCDP while shutdown during the RFO, due to the removal of the EDG maintenance activity. Also, certain, shutdown-related mode transition risks are limited by performing maintenance at power. The NRC staff finds these assessments of changes in risk to be acceptable. In addition, a low ICLERP is to be expected because the LERF at VCSNS is dominated by containment bypass events, such as steam generator tube rupture, that are not strongly influenced by the LOOP initiating event, whose risk impact is lessened by EDG availability.

### 3.3.2 Tier 2: Avoidance of Risk-Significant Plant Configurations

The following is a discussion of the licensee’s plans with respect to avoiding risk significant plant configurations.

The licensee employs the configuration risk threshold corresponding to the Nuclear Energy Institute -recommended “establish risk management actions” level in NEI/NUMARC 93-01 Revision 3, Chapter 11, which is equivalent to a configurational incremental core damage probability (ICDP) of  $1\text{E-}06$ . The licensee’s Plant Safety Review Committee must approve any scheduled configuration that would exceed the  $1\text{E-}06$  threshold in eight hours (the RED threshold). The general manager of nuclear plant operations or the management duty supervisor must approve configurations that result in an ICDP of  $1\text{E-}06$  in less than 24 hours (the ORANGE threshold). According to the licensee, the RED and ORANGE thresholds are avoided. The operations shift supervisor must approve of configurations at the YELLOW threshold. This threshold is set administratively below the risk level required to reach an ICDP of  $1\text{E-}06$  in 72 hours. The licensee administers similar thresholds for incremental large early release probability based upon a limiting value of  $1\text{E-}07$ . On the basis of the risk considerations of RG 1.174 and the licensee’s Maintenance Rule Program, and consistent with the guidance of RG 1.174, the NRC staff finds that the aforementioned approach to setting configuration risk thresholds is prudent and acceptable for this application.

In addition to the above, the licensee will apply the following compensatory measures:

- Maintenance of the AAC power source will not be scheduled simultaneously with maintenance on either EDG.
- Major maintenance outages of the EDGs typically will occur at times other than during plant outages.
- Switchyard maintenance will not be performed during the period of EDG maintenance.

The EDG AOT will revert back to the current 72-hour AOT should the AAC source be discovered inoperable. Even if work is underway on an EDG at the time of discovery, the AOT would immediately revert back to 72 hours from the time of discovery of the inoperable AAC source (Proposed TS Action 3.8.1.b.4).

Existing plant programs would prevent EDG maintenance from starting with knowledge of severe weather approaching. Due to the location of the plant, the most significant severe weather is from a hurricane. Icing is not a major concern as most winter weather outages occur due to tree limbs breaking under the weight of ice or snow and landing on the distribution lines. Therefore, the licensee typically will plan on performing online EDG maintenance between the months of December and March to eliminate the impact of hurricanes.

Additionally, the program established onsite to implement the 10 CFR 50.65(a)(4) requirements for the equipment out of service (EOOS) monitor would identify the increase in risk of planning to commence EDG maintenance with severe weather predicted to strike the vicinity of the plant. Plant procedure, Operations Administrative Procedure 102.1, Conduct of Operations Scheduling Unit, requires awareness of weather conditions and impact of the weather on planned or in-progress work activities.

There is no intention of utilizing fire-watches during the EDG maintenance specifically to prevent a fire from disabling multiple sources of power. The plant design has the EDGs each in its separate fire-rated room. The location of the AAC source (1DX switchgear) is on the other side of the plant, separated by the turbine building. At most, a fire in any of these areas would be limited to disabling the equipment in that immediate area, leaving the other sources undamaged.

The licensee has not prepared a specific analysis quantifying the increase in reliability of the Parr Hydro station due to the addition of the blackstart diesel at Parr Hydro. However, Parr Hydro will be considered as an unsupported startable station once the diesel is installed onsite. This diesel will provide the capability to start up the required units without any other source of electrical power as long as the minimum staffing is present. Since Parr Hydro is not typically staffed 24 hours a day or remotely operated, the station cannot be considered as a blackstart plant per Federal Energy Regulatory Commission requirements. For the purpose of supporting the needs of VCSNS in the AAC implementation, Parr Hydro can be considered as a blackstart plant due to the licensee's regulatory commitments related to the Parr station, as discussed in section 3.2 above.

The Parr Hydro dam is a concrete-on-rock dam. Although it was built long before seismic construction was common, the licensee identified no concerns with the seismic adequacy of the dam since it is robust and is in a low seismic activity region.

The licensee indicated that, although it does not have a data base for the failure rate of transmission system insulators, based on 35 years of the licensee's continuous experience, the licensee does not recall failures of insulators due to ice loading or water ingress. The licensee indicated that there were insulator failures due to salt spray in the past, although all of those were in Atlantic coastal areas of SCE&Gs service area and greater than 75 miles from VCSNS.

The insulators on the 115KV line from Parr Hydro to the VCSNS site were designed for 1/4 inch radial ice, and are 7500 pound working load insulators. The insulators on the 230KV line are 10,000 pound working load insulators. In either case, the ultimate failure load is a minimum factor of two times the working load.

With respect to the likelihood of having salt spray driven by hurricane winds impact the switchyard, the licensee stated that salt spray related to severe weather (hurricanes) is not a concern at VCSNS. The plant is a minimum of 120 miles away from the coastline.

Based on the above, the NRC staff finds that the licensee's Tier 2 analysis supports the implementation of the 14 day AOT for the EDG maintenance at VCSNS.

### 3.3.3 Tier 3: Risk-Informed Configuration Management

The licensee satisfies the Tier 3 and Title 10 of the *Code of Federal Regulations*, Part 50.65(a)(4) requirements for an online maintenance risk evaluation tool with its EOOS model. Proper use of EOOS assures that risk-significant plant configurations will not be entered, and that appropriate actions will be taken when unforeseen events put the plant in a risk-significant configuration. The staff considers the EOOS usage by the licensee to constitute adequate configuration risk management.

### 3.3.4 PRA Quality

The licensee maintains a living PRA with an internal review process and procedures that establish the programmatic requirements for PRA update and review. The current PRA model of record, "4c" is based, in part, on plant data through December 2001, and plant modifications through March 2004.

A Westinghouse Owners' Group (WOG) peer review of the licensee's PRA was begun in July 2002 as part of the WOG industry PRA review process; it was completed in August 2002. All "A" and "B" level facts and observations (F&O) resulting from the 2002 peer review have been addressed except for one "B" level comment concerning the internal flooding analysis. The outstanding F&O is being addressed by a detailed internal analysis that is not yet completed or incorporated into the PRA. The licensee does not expect this F&O to impact the PRA analysis for Parr Hydro in this application.

The NRC staff finds that the licensee acceptably addressed the above peer review comment and that the PRA is supportive of the proposed EDG AOT, reflects the as-built, as operated plant, and is, therefore, acceptable to the NRC staff for this application.

### 3.3.5 LOOP/SBO

On a LOOP, power is supplied from two automatic, fast-start EDGs. These are sized so that either one can carry the engineered safety feature load. Each EDG will feed its designated 7.2 kilovolt bus.

In an SBO event, neither EDG is assumed to be functional. The licensee does not expect an increase in EDG unavailability if the 14-day requested EDG AOT is approved – this is due to the reduction of maintenance process inefficiencies and a reduction in corrective maintenance.

Thus, NRC staff finds that the probability of an SBO event is not expected to substantially increase due to the proposed relaxed EDG AOT.

### 3.3.6 External Event Considerations

#### Seismic

VCSNS did not develop a seismic PRA, but rather employed a seismic margins assessment (SMA) for the independent plant evaluation of external events (IPEEE) submittal. Therefore, no quantitative estimate of the seismic contribution to plant CDF was provided. Four plant walkdowns were performed on the safe shutdown equipment list (SSEL), using the review level earthquake (RLE) of 0.3g peak ground acceleration (PGA). The high confidence of a low probability of failure (HCLPF) was found to be greater than 0.3g PGA for all equipment and structures, with the exception of the service water pond dams that have a HCLPF of 0.22g PGA. The VCSNS IPEEE did not identify any significant seismic concerns. The VCSNS IPEEE resulted in no outliers that involve operability issues at VCSNS. Issues identified during the IPEEE included a missing pipe support, cabinet seismic interactions, and the seismic qualification of a neutral grounding resistor. These items were corrected by the licensee subsequent to the IPEEE. There were no replacements or corrective actions necessary for relays. The IPEEE did not identify any seismic issues or vulnerabilities associated with the electrical and instrumentation and control logic areas.

As a result of using the SMA approach, the licensee did not quantify a seismic CDF. To confirm that the total seismic risk at VCSNS is sufficiently small, the NRC staff performed an independent simplistic calculation to estimate the magnitude of the seismic risk. The NRC staff used the approximation method provided in a paper by Robert P. Kennedy entitled "Overview of Methods for Seismic PRA and Margin Analysis Including Recent Innovations." This approach uses the plant's HCLPF value that is determined by the licensee's SMA and the site's seismic hazard curve that is based on NUREG-1488, "Revised Livermore Seismic Hazard Estimate for Sixty-Nine Nuclear Power Plant Sites East of the Rocky Mountains," to derive an approximation of the magnitude of the risk associated with seismic events. The NRC staff's independent simplistic calculation, using a plant HCLPF value of 0.22g PGA, estimated a seismic CDF of about 4E-5/year.

To provide additional perspective on the licensee's assessment that the seismic contribution for this application is negligible, the NRC staff performed an additional simplistic calculation assuming a non-recoverable LOOP occurs at a HCLPF of 0.1g PGA, which is the traditional HCLPF value used for the failure of the switchyard transformer ceramic insulators. Based on the information in the licensee's submittal, this earthquake is assumed to also fail the

transformer associated with the Parr Hydro AAC source. At this magnitude of earthquake, no other seismic-related failures are expected (i.e., to lead to core damage would require additional non-seismic failures of other equipment, such as the EDGs and emergency feedwater pumps). Using the methodology described above, and the HCLPF value of 0.1g PGA, the frequency of a seismically-induced non-recoverable LOOP is estimated to be about  $2E-4$ /year. Based on the information provided in the licensee's submittal, the NRC staff estimated that the plant may be in the proposed extended AOT for no more than about 8 percent of the year (less than 14 days per year for each EDG). Thus, the probability of a seismically-induced LOOP while in the proposed extended AOT is less than  $2E-5$ /year. For core damage to occur would require the failure of the operable EDG, which has a seismic capacity much greater than 0.1g PGA. Thus, the potential for core damage during the extended AOT would require a random failure of the operable EDG. The consideration of this random failure probability would result in a core damage probability of less than  $1E-6$ , which confirms that the impact of the AAC proposal on seismic risk is negligibly small.

### Fire

In lieu of a fire PRA, the VCSNS IPEEE fire analysis used Revision 1 of the NUMARC/EPRI Fire Induced Vulnerability Evaluation (FIVE) Methodology and performed plant walkdowns, fire area screening, and quantification of fire sequences for fires in unscreened fire areas. The IPEEE estimated the fire contribution to plant CDF to be about  $8.5E-5$ /year. The licensee did not identify any potential vulnerabilities associated with fire events in the IPEEE. The IPEEE identified the 1DA and 1DB switchgear rooms, control room, relay room, and turbine building as not meeting the screening value of  $1E-6$ .

Fire is not explicitly included in the VCSNS PRA. However, the only new on-site source of combustible material associated with the AAC is a new transformer in the switchyard. The transformer is a type that has a very low incidence of fire. Also, the switchyard was not identified as an important fire area in the individual plant examination of external events. The AAC source will be able to supply power if needed to recover from a fire elsewhere in the plant, thus reducing fire risk somewhat at VCSNS. The EDGs are each located in their separate fire-rated room. The location of the AAC source connection (1DX switchgear) is on the other side of the plant, separated by the turbine building. Thus, a fire in any of these areas will disable, at most, the equipment in that immediate area.

The NRC staff finds, based on the above, that the proposed extended AOT is expected to have a negligible impact on the plant fire risk.

### High Winds, Floods, and Other (HFO) External Events

The IPEEE for HFO external events were screened according to the 1975 SRP (NUREG 75/087) screening criteria. The licensee did not identify any plant vulnerabilities and did not identify improvements associated with HFO events. The IPEEE submittal states that the plant's licensing basis for high winds, tornado loads, and tornado missiles, conforms to the 1975 SRP criteria. The IPEEE noted that, per NUREG-1407, if a plant meets the 1975 SRP criteria, HFO external events can be screened out as a significant contributor to total CDF. A plant outdoor walkdown was conducted by the licensee and its contractors to identify those structures that are vulnerable to high winds and tornado missiles, including systems interactions. The licensee confirmed that failure of non-safety equipment was not an issue at the VCSNS facility. In

addition, the licensee made use of the tornado data for 38 years (1953 through 1990) and performed a probabilistic hazard evaluation using exceedance frequency methods. The tornado hazard exceedance frequency for the VCSNS site was found to be lower than the NUREG-1407 screening criterion of  $1E-06$  per year. Thus, the NRC staff finds that the licensee's high winds, tornado wind loads, and tornado missiles assessment is reasonable and conforms to the guidance of NUREG-1407, and is acceptable for this application.

### 3.3.7 Total Risk Contribution

The NRC staff was concerned that the estimated fire and seismic risk, in conjunction with the VCSNS internal event risk, would exceed the RG 1.174 base CDF of  $1E-4$ /year. The combined total CDF is estimated to be about  $1.7E-4$ /year ( $4.9E-5$ /year +  $8.5E-5$ /year +  $4E-5$ /year). However, RG 1.174 further states that while there is no requirement to calculate the total CDF, if there is an indication that the CDF may be considerably higher than  $1E-4$ /year, the focus should be on finding ways to decrease, rather than increase, risk. However, the NRC staff finds that, given the typically conservative nature of the FIVE analysis methodology used by the licensee in this case, and the simplistic estimation of the seismic risk, that the total CDF is not expected to be considerably higher than the RG 1.174  $1E-4$ /year criterion and is, therefore, acceptable for this application.

### 3.3.8 Licensee Commitments - Probabilistic Evaluation

Licensee commitments considered in the NRC staff's probabilistic evaluation were provided in the licensee's October 28, 2005 submittal and are also listed above in section 3.2.

### 3.3.9 Conclusion - Probabilistic Safety Evaluation

The NRC staff's acceptance of the licensee-proposed 14-day EDG AOT is based on a risk-informed assessment, subject to the successful installation and testing of the cable to the Parr Hydro facility and the DG at Parr Hydro. The NRC staff also accepts, on the same basis, the licensee-proposed 4-hour operability verification time in modes for required systems, subsystems, components, and devices that depend on the in-service EDG, and that in Modes 1, 2, and 3, the TDEFW pump is operable.

Additionally, the NRC staff accepts the licensee-proposed deletion of the 18-month EDG inspection on the basis that plant programs implementing the maintenance rule require EDG performance assessment.

The licensee's risk assessment concluded that the changes in plant CDF and LERF, as well as the ICCDP and ICLERP magnitudes are small, including compensatory measures, and are consistent with the NRC staff's guidance as stated in RGs 1.174 and 1.177. Based on the NRC staff's review, as discussed above in section 3.2, the NRC staff finds the licensee's conclusion to be 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 SRs. 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 (71 FR 13176, March 14, 2006). 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.

Principal Contributor: A. Pal  
M. Wohl  
D. Harrison  
C. Douth

Date: November 2, 2006

Mr. Jeffrey B. Archie  
South Carolina Electric & Gas Company

**VIRGIL C. SUMMER NUCLEAR STATION**

cc:  
Mr. R. J. White  
Nuclear Coordinator  
S.C. Public Service Authority  
c/o Virgil C. Summer Nuclear Station  
Post Office Box 88, Mail Code 802  
Jenkinsville, South Carolina 29065

Resident Inspector/Summer NPS  
c/o U.S. Nuclear Regulatory Commission  
576 Stairway Road  
Jenkinsville, South Carolina 29065

Chairman, Fairfield County Council  
Drawer 60  
Winnsboro, South Carolina 29180

Mr. Henry Porter, Assistant Director  
Division of Waste Management  
Bureau of Land & Waste Management  
Dept. of Health & Environmental Control  
2600 Bull Street  
Columbia, South Carolina 29201

Mr. Thomas D. Gatlin, General Manager  
Nuclear Plant Operations  
South Carolina Electric & Gas Company  
Virgil C. Summer Nuclear Station  
Post Office Box 88, Mail Code 300  
Jenkinsville, South Carolina 29065

Mr. Robert G. Sweet, Manager  
Nuclear Licensing  
South Carolina Electric & Gas Company  
Virgil C. Summer Nuclear Station  
Post Office Box 88, Mail Code 830  
Jenkinsville, South Carolina 29065

Ms. Kathryn M. Sutton  
Morgan, Lewis & Bockius LLP  
111 Pennsylvania Avenue, NW.  
Washington, DC 20004