UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
61 FORSYTH STREET SW SUITE 23T85
ATLANTA, GEORGIA 30303-8931

April 30, 2003

NOED 03-2-002

South Carolina Electric & Gas Company
ATTN: Mr. Stephen A. Byrne
Senior Vice President, Nuclear Operations
Virgil C. Summer Nuclear Station
P. O. Box 88
Jenkinsville, SC 29065

SUBJECT: VIRGIL C. SUMMER NUCLEAR STATION - NRC INTEGRATED INSPECTION REPORT NO. 50-395/03-02

Dear Mr. Byrne:

On April 5, 2003, the US Nuclear Regulatory Commission (NRC) completed an inspection at your Virgil C. Summer Nuclear Station. The enclosed integrated inspection report documents the inspection findings, which were discussed on April 9, 2003, with you and other members of your staff.

The inspections examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

Based on the results of this inspection, the inspectors identified four issues of very low safety significance (Green). Two of these issues were determined to involve violations of NRC requirements. However, because of their very low safety significance, and because they had been entered into your corrective action program, the NRC is treating these issues as non-cited violations in accordance with Section VI.A.1 of the NRC's Enforcement Policy. If you deny these non-cited violations you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the United States Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001, with copies to the Regional Administrator, Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Virgil C. Summer Nuclear Station.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of

NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at *http://www.nrc.gov/reading-rm/adams.html* (the Public Electronic Reading Room).

Sincerely,

/RA/

Kerry D. Landis, Chief
Reactor Projects Branch 5
Division of Reactor Projects

Docket No.: 50-395
License No.: NPF-12

Enclosure: Report No. 50-395/03-02
w/Attachment: Supplemental Information

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.:	50-395
License No.:	NPF-12
Report No.:	50-395/03-02
Licensee:	South Carolina Electric & Gas (SCE&G) Company
Facility:	Virgil C. Summer Nuclear Station
Location:	P. O. Box 88 Jenkinsville, SC 29065
Dates:	January 5 through April 5, 2003
Inspectors:	M. Widmann, Senior Resident Inspector M. King, Resident Inspector K. Van Doorn, Senior Reactor Inspector, RII (Sections 1R02 and 1R17) M. Scott, Senior Reactor Inspector, RII (Sections 1R02 and 1R17) C. Smith, Senior Reactor Inspector, RII (Sections 1R02 and 1R17)
Approved by:	K. D. Landis, Chief Reactor Projects Branch 5 Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000395/2003-002; South Carolina Electric & Gas Co.; 01/05/2003 - 04/05/2003; Virgil C. Summer Nuclear Station; Adverse Weather; Maintenance Effectiveness, Maintenance Risk Assessments and Emergent Work Controls.

The report covered a three month period of inspection by resident inspectors and an announced inspection by three regional reactor inspector in the areas of modifications and 10 CFR 50.59 safety evaluation reviews. Two Green non-cited violations (NCVs), and two Green findings were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using IMC 0609 "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Initiating Events

- Green. The licensee failed to assess and manage the increase in risk of high voltage switchyard activity on planned EDG maintenance.

  An inspector-identified non-cited violation of 10 CFR 50.65(a)(4) was identified. The finding is more than minor because the failure to properly manage the increase in risk could have had a credible impact on the initiating event cornerstone for challenges to critical safety functions. The finding was determined to be of very low safety significance because no actual loss of safety function occurred and the B train EDG was available for onsite power. (Section 1R13.2)

Cornerstone: Mitigating Systems

- Green. After January 23, 2003, the licensee failed to take adequate corrective actions to preclude repetition of a significant condition adverse to quality concerning cold weather protection of the condensate storage tank (CST) level instrumentation. As a result the same sensing line froze on February 17, 2003.

  An inspector-identified non-cited violation of 10 CFR 50, Appendix B, Criterion XVI was identified. The finding is more than minor, in that, the safety-related level transmitter affected a mitigating system cornerstone attribute and could affect the cornerstone objective to ensure availability, reliability and capability of safety-related instrumentation for the emergency feedwater system. The finding is of very low safety significance because the actual level of the CST was properly maintained and a redundant level indicator was available. (Section 1R01)

- Green. The licensee did not conduct a thorough problem identification and resolution effort in that an incorrect initial root cause and an inadequate troubleshooting effort resulted in unplanned unavailability of the B train EDG.

An inspector-identified finding was identified. The failure to properly conduct a thorough root cause effort was considered more than minor because of the finding is associated with the mitigating systems cornerstone and affected the cornerstone objective to ensure availability of the B train EDG. The finding was determined to be of very low safety significance due to the availability of A train EDG for onsite power. (Section 1R12)

- Green. The licensee failed to ensure that appropriate administrative controls, which were established in accordance with NRC Administrative Letter 98-10, "Dispositioning of Technical Specifications That Are Insufficient To Assure Plant Safety," were implemented. As a result, the licensee failed to recognize the need for more restrictive administrative controls when an emergency feedwater instrument was removed from service. The appropriate administrative controls were implemented after the issue was raised by the inspectors.

  An inspector-identified finding was identified. The finding is more than minor because if the issue was left uncorrected the finding would become a more significant safety concern, in that, the amount of time that the instruments were removed from service would increase the plant's susceptibility to a unit trip. The finding is of very low safety significance since the licensee took conservative actions and returned the instrumentation to service within the six-hour proposed action statement. (Section 1R13.1)

B. Licensee-Identified Violations

None.

REPORT DETAILS

Summary of Plant Status

The unit began the inspection period at or near full power and remained there throughout the entire period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection
Specific weather related condition: Response to unusually cold weather

a. Inspection Scope

The inspectors evaluated implementation of adverse weather procedures, compensatory measures and licensee response for selected issues that occurred as a result of adverse weather. Specifically, the inspectors reviewed the licensee's actions taken for an unexpected snow fall and cold weather resulting in implementation of Abnormal Operating Procedure (AOP)-109.1 and licensee response to condensate storage tank level transmitter failures due to freezing on January 23 and February 17.

b. Findings

Introduction: The inspectors identified a Green non-cited violation (NCV) for the failure to take adequate corrective actions to preclude repetition of a significant condition adverse to quality concerning cold weather protection of the condensate storage tank (CST) level instrumentation. This violation resulted from a failure of the licensee to take timely and adequate corrective action for a sensing line freezing which resulted in a repetitive event of the CST level transmitter, ILT-3631, failing high.

Description: On January 23, during snow and icing conditions the control room operators received an alarm indicating CST level indication (ILT-3631) had failed high. Investigation determined the sensing line for the transmitter had frozen. The licensee entered the condition into the corrective action program under condition evaluation report (CER), 0-C-03-0223. Temporary corrective actions were taken to thaw the sensing line and return the level transmitter to service. However, the licensee failed to determine why the heat traced sensing line froze when the other train of CST level indication did not freeze. In addition, prior to onset of projected cold weather in mid-February, the licensee did not implement the temporary measures taken to prevent additional freezing during the January cold weather. Thus, the inspectors determined that the licensee's corrective actions were not effectively controlled and implemented to preclude repetition of freezing of the same sensing line for CST level transmitter (ILT-3631) on February 17.

Analysis: The failure to correct deficiencies regarding cold weather protection of the condensate storage tank level instrumentation and to preclude repetition was more than minor, in that, the safety-related level transmitter affected a mitigating system cornerstone attribute and could affect the cornerstone objective to ensure availability, reliability and capability of safety-related instrumentation for the emergency feedwater

system. Not implementing actions to preclude freezing can affect the availability and reliability of this safety-related CST level transmitter, thereby, reducing redundant equipment to a single failure vulnerability. Control Room operators use this CST level indication for initiation of manual actions during emergency operating procedure implementation. However, the finding was determined to be of very low safety significance (Green) because the actual level of the CST was properly maintained and a redundant level indicator was available and functional.

Enforcement: 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, requires, in part, that measures be established to assure that conditions adverse to quality are promptly identified and corrected. In addition, for significant conditions adverse to quality measures shall assure that the cause of the condition is determined and corrective actions be taken to preclude repetition. Contrary to this, the licensee failed to take adequate corrective actions and prevent repetition following a January 23 cold weather event of a sensing line freezing for CST tank level transmitter, ILT-3631. A repetitive condition occurred on February 17 with the same transmitter freezing. Because the finding is of very low safety significance and has been entered into the corrective action program (CERs 0-C-03-0223, 0-C-03-0226 and 0-C-03-0500), this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy: NCV 50-395/03-02-01, Failure to Take Adequate Corrective Actions to Preclude Repetitive Freezing of a Safety-Related CST Level Transmitter Sensing Line.

1R02 Evaluations of Changes, Tests or Experiments

a. Inspection Scope

The inspectors reviewed selected samples of evaluations to confirm that the licensee had appropriately considered the conditions under which changes to the facility, Final Safety Analysis Report (FSAR), or procedures may be made, and tests conducted, without prior NRC approval. The inspectors reviewed evaluations for seven changes and additional information, such as calculations, supporting analyses, the FSAR, and drawings to confirm that the licensee had appropriately concluded that the changes could be accomplished without obtaining a license amendment. The seven evaluations reviewed are listed in the List of Documents Reviewed.

The inspectors also reviewed samples of changes such as design changes, FSAR changes, commercial grade dedication packages, equipment problem issues, and like-for-like evaluations for which the licensee had determined that evaluations were not required, to confirm that the licensee's conclusions to "screen out" these changes were correct and consistent with 10 CFR 50.59. The sixteen "screened out" changes reviewed are listed in the List of Documents Reviewed.

The inspectors also reviewed an audit of the 10 CFR 50.59 process and selected CERs to confirm that problems were identified at an appropriate threshold, were entered into the corrective action process, and appropriate corrective actions had been initiated.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment

a. Inspection Scope

The inspectors verified through plant walkdowns that with a train of equipment removed from service that the opposite train of equipment was correctly aligned, available and operable. The following systems / components were verified:

- A emergency diesel generator (EDG) (while the B EDG was out of service due to planned maintenance and testing);
- Turbine driven emergency feedwater (TDEFW) pump, 1DB switchgear and B EDG (while the A EDG was out of service);
- A and B motor driven EFW pumps and associated valves and backup power supplies (with A EDG out of service).

Correct alignment and operating conditions were determined from the applicable portions of drawings, system operating procedures (SOPs), FSAR, and technical specifications (TSs). The documents reviewed during this inspection are listed in the Attachment to this report.

The inspection included review of outstanding maintenance work requests (MWRs) and related CERs to verify that the licensee had properly identified and resolved equipment alignment problems that could impact mitigating system availability.

b. Findings

No findings of significance were identified.

1R05 Fire Protection

a. Inspection Scope

The inspectors reviewed recent CERs, work orders (WO), and impairments associated with the fire suppression system. The inspectors reviewed surveillance activities to determine whether they supported the operability and availability of the fire protection system.

The inspectors assessed the material condition of the active and passive fire protection systems and features and observed the control of transient combustibles and ignition sources. The inspectors conducted routine inspections of the following areas:

- Turbine Building (fire zone TB-1);
- Relay Room SSPS Instrumentation and Inverter (fire zones CB-6, 10, and CB-12);
- Service Water Pumphouse (fire zones SWPH-1, 3, 5.1 / 5.2);
- Charging Pump Rooms A, B and C (fire zones AB-1.5, 1.6 and AB-1.7);
- 1DA Switchgear Room (fire zone IB-20);
- Control Room (fire zone CB-17.1).

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program

a. Inspection Scope

On March 10, 2003, the inspectors observed senior reactor operators' and reactor operators' performance on the plant simulator during licensed operator requalification training. The training scenario involved a reactor coolant pump seal failure, a steam generator feed flow transmitter failing and a main steam line break resulting in a reactor trip and safety injection (LOR-SA-012). The inspectors verified that training included risk-significant operator actions, implementation of emergency classification and the emergency plan. The inspectors assessed overall crew performance, communication, oversight of supervision and the evaluator's critique.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

For the equipment issues described in the CERs and nonconformance notices (NCNs) listed below, the inspectors evaluated the licensee's effectiveness of the corresponding preventive and corrective maintenance associated with structures, systems or components (SSCs). Inspectors performed in-office reviews of procedures and evaluations and held discussions with system engineers as appropriate. Inspectors compared the licensee's actions with the requirements of the Maintenance Rule (MR), 10 CFR 50.65, using Engineering Services procedure ES-514, "Maintenance Rule Implementation," and the Virgil C. Summer "Important To Maintenance Rule System Function and Performance Criteria Analysis."

- CER 0-C-02-1923, IFV02096-MB condenser dump valve failed to fully close resulting in plant turbine load being reduced until the valve was returned to service;
- CER 0-C-03-0338, B train EDG generator trouble alarm and abnormal relay chatter that caused unplanned unavailability.

The inspectors' review also evaluated if maintenance preventable functional failures or other MR findings existed that the licensee did not capture in their program.

b. Findings

Introduction: The inspectors identified one finding evaluated as having very low safety significance (Green) that involved the licensee not conducting a thorough problem

identification and resolution effort. The initially inadequate root cause and troubleshooting effort resulted in incurring unnecessary unplanned unavailability of the B train EDG. The licensee's initial troubleshooting effort was inadequate because of a lack of organizational effectiveness, not maintaining management oversight, and an initially inadequate engineering failure modes analysis (FMA), all of which contributed to a significant delay in returning the EDG to an operable status.

Description: On February 3, 2003, with the B train EDG in standby an engine trouble alarm was received on the main control board. Investigations by the licensee discovered relay chatter, a field ground relay that had actuated and an engine tachometer oscillating approximately 100 rpm. The licensee initiated an FMA to determine the cause of the engine trouble. Because the FMA became too narrowly focused on the engine speed synchronization switch as the cause, without objective evidence to support that conclusion, the licensee inappropriately believed the cause of the tachometer oscillation to be from the engine speed synchronization switch. The maintenance activity to locate, install, and calibrate the speed switch took approximately 18 hours to complete. However after the activity was completed the engine exhibited the same conditions as it did prior to the switch replacement. The licensee subsequently conducted further troubleshooting which was not well organized or methodical and was complicated by the unknown impact of identified DC bus noise. However, the licensee did discover a ground in the cable between the engine speed sensor and the synchronization switch. The cable was repaired and to be conservative another speed switch was installed. Following these actions, the relay chatter stopped and the EDG tachometer oscillations were significantly reduced.

The inspectors noted two major contributors to the unnecessary delay in discovering the eventual root cause (i.e., the cable ground). First, efforts among engineering and maintenance personnel were not coordinated as demonstrated by different groups not working toward the same success path. In addition, proper management oversight of the entire process was diminished by over involvement in the details. For example, the managers of operations and maintenance actively participated in looking for the problem with the EDG. The inspectors were also concerned that the FMA process was not implemented in a rigorous and methodical manner to develop a logical troubleshooting plan after the initial effort failed to determine the cause. The initially ineffective troubleshooting effort and lessons learned were captured in the licensee's corrective action program as CER 0-C-03-0398.

Analysis: The failure to properly conduct a thorough root cause effort was considered more than minor because the finding is associated with the mitigating systems cornerstone and affected the cornerstone objective to ensure availability of the B train EDG. The root cause and misdirected troubleshooting effort contributed to an extended period of unavailability (approximately 18 hours) until the proper failure mechanism was determined and repairs completed. The finding was determined to be of very low safety significance (Green) due to the availability of A train EDG for onsite power.

Enforcement: No violation of regulatory requirements occurred. The licensee completed repair work and functional tests but were unable to declare the B EDG operable before entry into the 6-hour shutdown requirement portion of Technical Specification (TS) 3.8.1.1. They were unable to complete test results and modification

package documentation reviews which were necessary to declare the B EDG operable. The licensee requested and received a Notice of Enforcement Discretion (NOED) for extending the 6-hour TS shutdown requirement by an additional 12 hours (see Section 4OA5). However, the licensee was able to complete the reviews and declare the EDG operable without relying on the 12-hour extension.

1R13 Maintenance Risk Assessments and Emergent Work Control

.1 Improper Administrative Controls of EFW Low Suction Pressure Instrumentation

a. Inspection Scope

The inspectors reviewed the licensee's assessments of the risk impacts of removing from service those components associated with emergent work items. The inspectors evaluated the selected SSCs listed below for, (1) the effectiveness of the risk assessments performed before maintenance activities were conducted; (2) the management of risk; (3) that, upon identification of an unforseen situation, necessary steps were taken to plan and control the resulting emergent work activities; and (4) that emergent work problems were adequately identified and resolved. The inspectors evaluated the licensee's work prioritization and risk determination to determine, as appropriate, whether necessary steps were properly planned, controlled, and executed for the planned and emergent work activities listed below:

- Charging / SI pump test with service water valve XVC03162A-SW being tested per Surveillance Test Procedure (STP)-123.003A and CCW booster pump A train internals being inspected;
- TDEFW pump out of service with molded case circuit breakers and main steam snubbers testing in progress;
- A train EDG maintenance and surveillance testing with high voltage switchyard breaker realignment ongoing increasing likelihood of loss of offsite power (LOSP) due to human error;
- B train EDG relay and automatic synchronization switch failure causing delay in TDEFW and SI operability valve testing;
- TDEFW pump surveillance testing per STP-220.002 results in Equipment Out of Service (EOOS) program elevated "yellow." Reviewed switchyard / grid stability licensee assessments.

b. Findings

Introduction: The inspectors identified one finding evaluated as having very low safety significance (Green) concerning the licensee failing to ensure that appropriate administrative controls, which were established in accordance with NRC Administrative Letter 98-10, "Dispositioning of Technical Specifications That Are Insufficient To Assure Plant Safety," were implemented.

Description: On February 4, 2003, instrument IPT03632, EFW Pump Suction Pressure Channel I, was removed from service for a planned calibration. Control room personnel entered the applicable action of TS 3.3.2, "Engineered Safety Feature Actuation System Instrumentation," Table 3.3-3, Functional Unit 6h, "Suction Transfer on Low Pressure."

Action 16 stated that with the number of operable channels one less than the total number of channels, operation may proceed indefinitely provided the inoperable channel is placed in the bypassed condition. The licensee had issued a TS interpretation that conservatively limited that time to 72-hours to be consistent with other similar instrumentation TS LCOs. However, the inspectors were aware of a TS amendment request that was submitted on February 25, 2003, in which the licensee recognized a vulnerability to the plant while the channel was placed in bypass and that a more restrictive TS LCO action of six-hours was needed. The inspectors, after questioning control room supervision and operators of the applicable action time, learned that the operations staff was unaware of the TS amendment request. Upon being informed by the NRC of the document, the control room supervisor immediately implemented measures to ensure that the maintenance activity concluded within six hours.

The inspectors determined that a breakdown in communications and controls occurred between licensing and the operations staffs. As a result the operations staff was not notified of the TS amendment request and they were not managing operations within the more restrictive controls. The TS amendment and associated administrative controls also included more restrictive limitations on instrumentation associated with reactor water storage tank switch over to the containment sump and automatic actions on high-3 containment pressure. NRC Administrative Letter 98-10, "Dispositioning of Technical Specifications That Are Insufficient To Assure Plant Safety," provides guidance for establishing administrative controls when TSs are determined to be less restrictive than necessary. A finding was identified for the licensee's failure to ensure that appropriate administrative controls, which were established in accordance with NRC Administrative Letter 98-10, were implemented by operations.

Analysis: The failure to properly implement administrative controls when TS were determined to be less restrictive than necessary is more than minor because if the issue was left uncorrected, the finding would become a more significant safety concern, in that, the amount of time that equipment could be removed from service for periods could exceed the desired times as determined by evaluations supporting TS amendment request. For the EFW instrument discussed above, the protection logic was reduced from a two out of four to a two out of three logic which rendered the circuit susceptible to a single failure. The finding is of very low safety significance (Green) since the licensee took conservative actions and returned the instrumentation to service within the six-hour proposed action statement. This finding affects the mitigating system cornerstone.

Enforcement: No violation of regulatory requirements occurred. The licensee complied with the more restrictive TS action of six-hours for the low pressure channel consistent with the TS amendment request and administrative controls. The licensee generated CER 0-C-03-0718 to address the license submittal vulnerability.

.2 Switchyard Activities Not Assessed for Preplanned Maintenance

a. Inspection Scope

The inspectors reviewed the licensee plant risk evaluation involving switching orders evolutions in the high voltage switchyard while the A train EDG was removed from service due to planned maintenance.

b. Findings

Introduction: The inspectors identified a Green NCV of 10 CFR 50.65(a)(4) related to the management of the increase in risk during maintenance activities. Specifically, the licensee failed to assess and manage the increase in risk of high voltage switchyard activity on planned EDG maintenance.

Description: On January 21, 2003, the licensee was performing maintenance activities on the A train EDG. The licensee had entered this activity into its online EOOS risk monitoring program. The associated risk level for this activity placed the plant in a moderate risk level (Yellow condition). Later in the day, with the EDG still out of service, the shift supervisor authorized a switchyard switching order (tagout) to support offsite electrical maintenance activities. The inspectors were concerned that activities in the switchyard increased the probability of a loss of offsite power (LOSP) due to human error. Specifically, the work included operators opening breaker disconnects. Through discussions with operations personnel, the inspectors determined that no increase in risk assessment was performed for the EDG maintenance work based upon the subsequently approved switchyard work. An assessment of the increase in risk was necessary to determine if the licensee needed to place additional restrictions on plant equipment or operations or take compensatory measures to reduce plant risk based upon the EDG being out of service.

Analysis: The finding is more than minor because the failure to properly manage the increase in risk could have had a credible impact on the initiating event cornerstone for challenges to critical safety functions. Managing the risk of initiating events include protecting against external factors like switchyard activities. Due to the A train EDG being removed from service for maintenance, the licensee was required to evaluate activities that have the potential to impact the reliability and availability of onsite power sources. The high voltage switchyard tagout represented an activity that potentially affected the LOSP initiator frequency and, therefore, the activity needed to be assessed for its impact on EDG maintenance.

Using the significance determination process (SDP), the inspectors determined that the finding degraded the initiating event cornerstone, in that, it increased the likelihood of a reactor trip (due to LOSP potential). The finding was determined to be of very low safety significance (Green) because no actual loss of safety function occurred and the B train EDG was available for onsite power to mitigate a LOSP.

Enforcement: 10 CFR 50.65(a)(4) requires, in part, that “Before performing maintenance activities (including but not limited to surveillance, post-maintenance testing, and corrective and preventive maintenance), the licensee shall assess and manage the increase in risk that may result from the proposed maintenance activities.” On January 21, 2003, the licensee failed to properly assess and manage the increase in risk associated with the maintenance activities involving the A train EDG and a high voltage switchyard switching order. Because the finding is of very low safety significance and has been entered in the licensee's corrective action program as CER 0-C-03-0225, this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy, and is identified as NCV 50-395/03-02-02, Failure to Assess and

Manage the Increase in Risk of High Voltage Switchyard Activity on Planned EDG Maintenance.

1R14 Personnel Performance During Non-Routine Plant Evolutions

a. Inspection Scope

This inspection evaluated operator response for non-routine plant evolutions to ensure they were appropriate and in accordance with the required procedures. The inspectors also evaluated performance problems to ensure that they were entered into the corrective action program. The following events or evolutions were reviewed:

- Failed B train reactor trip breaker during surveillance testing and subsequent unit down power activities; and
- Operational response to divers entering the spent fuel pool (SFP) for sparger modifications, plasma arc cutting. Operator response included temperature and level control, installation of tagouts, securing of SFP cooling and additional contingency and emergency planning.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed selected operability evaluations affecting risk significant mitigating systems to assess, as appropriate, (1) the technical adequacy of the evaluations; (2) whether operability was properly justified and the subject component or system remained available, such that no unrecognized increase in risk occurred; (3) whether other existing degraded conditions were considered; (4) where compensatory measures were involved, whether the compensatory measures were in place, would work as intended, and were appropriately controlled; and (5) the impact on TS LCOs and the risk significance in accordance with the SDP. The inspectors reviewed the following CERs, issues and evaluations:

- 0-C-03-0085, STP-123.003 had to be stopped to throttle service water through the diesel engine coolers;
- 0-C-03-0223, condensate storage tank transmitter failed high due to excessive cold temperatures;
- 0-C-03-0338, B train EDG inoperability due to failed signal generator circuit and “Not Ready for Auto Start” alarm;
- Link seal removal around the A service water pipe per Engineering Information Request (EIR) 80714, “Engineering Review of Proposed Link Seal Removal,” in 400 foot elevation of the diesel generator building.

b. Findings

No findings of significance were identified.

1R16 Operator Workarounds

a. Inspection Scope

During this inspection period, the inspectors reviewed the licensee's list of identified operator workarounds and challenges, dated March 27, 2003, to determine whether any identified workarounds or challenges had a cumulative effect on the functional capability, reliability or availability of any related mitigating system. The inspectors also reviewed the human reliability aspect of the operator workarounds and challenges to determine the impact on the operator's ability to respond in a correct and timely manner to an initiating event. During the review, the inspectors specifically considered whether any identified workaround or challenges affected the operators' ability to implement abnormal or emergency operating procedures.

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications

a. Inspection Scope

The inspectors evaluated design change packages for five modifications engineering change requests (ECRs), in the Barrier Integrity and Mitigating Systems cornerstone areas, to evaluate the modifications for adverse affects on system availability, reliability, and functional capability. The modifications and the associated attributes reviewed are as follows:

ECR 50464/A thru D, Instrument Air Moisture Removal Improvement [Also see NRC Report 50-395/2002-004 for additional inspections performed] (Initiating Events, Mitigating Systems)

- Materials/components compatibility and functionality
- Field installation
- Post modification performance
- Plant procedure, critical drawing, design basis information, FSAR updating

ECR 50176, Diesel Generator Fuel Oil Strainer Differential Pressure Sensing Line Redesign (Mitigating Systems)

- Replacement materials and components Code requirements and consistency with design bases
- Control signals under accident/event conditions
- 10 CFR 50.59 Screening

ECR 50335D, ILS05412 and ILS05422 Spacers (Mitigating Systems)

- Replacement materials and components Code/classification requirements and consistent with design bases
- Seismic qualification
- Control signals under accident/event conditions
- 10 CFR 50.59 Screening

ECR 50183, Spent Fuel Pool Reracking [Also see NRC Report 50-395/2002-004, Section 1R17.2] (Barrier Integrity)

- Replacement materials and components compatible with physical interfaces
- Seismic qualification
- Fuel pressure boundary maintained
- Structural integrity under accident/event conditions

ECR 70317, Diesel Generator Electronic Speed Switch Equivalency Evaluation, (Mitigating Systems)

- Critical design characteristics including weight, supply voltage, relay elements and relay set points were consistent with design bases.
- Installation instructions were consistent with vendor recommendations.
- Electrical connections were consistent with approved vendor drawings.
- Quality of control signal was acceptable for determining engine speed using tachometer.
- Seismic qualification of installed filter capacitor satisfies design requirements.
- 10 CFR 50.59 screening

For selected modification packages, the inspectors observed the as-built configuration. Documents reviewed included procedures, engineering calculations, modifications design and implementation packages, work orders, site drawings, corrective action documents, applicable sections of the living FSAR, supporting analyses, TSs, and design basis information.

The inspectors also reviewed an audit and a surveillance of the design process and selected CERs associated with modifications to confirm that problems were identified at an appropriate threshold, were entered into the corrective action process, and appropriate corrective actions had been initiated.

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing (PMT)

a. Inspection Scope

For the post-maintenance tests listed below, the inspectors reviewed the test procedure and witnessed either the testing and/or reviewed test records to determine whether the

scope of testing adequately verified that the work performed was correctly completed and demonstrated that the affected equipment was functional and operable:

- MWR 0218166, drain oil in rocker arm lube oil reservoir, adjust float and test per STP-125.002, “Diesel Generator B Operability Test;”
- MWR 0218838, PMT to test station battery room ventilation exhaust fan and dampers per SOP-503, “Intermediate Building HVAC,” Section 2.2;
- MWR 0219522, slave A test pushbutton replacement in XPN7020 per STP-354.074, “SSPS Actuation Logic and Master Relay Test Train B,” Section 7.7;
- MWR 0300303, replace relays 59T and 59DG1A on EDG A and test per Instrumentation Control Procedure (ICP)-180.003, “EDG B Instrumentation;”
- MWR 0301834, diesel generator A exciter inspection for loose voltage regulator connections retest per General Test Procedure (GTP)-215, Electrical Maintenance Procedure (EMP)-100.005 and A EDG maintenance run;
- MWR 0304593, replace pressurizer level transmitter ILT0459A due to failed channel check and calibrate per STP-345.051.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing

a. Inspection Scope

For the surveillance tests listed below, the inspectors examined the test procedure and either witnessed the testing and/or reviewed test records to determine whether the scope of testing adequately demonstrated that the affected equipment was functional and operable:

- STP-125.002B, “Diesel Generator B Operability Test;”
- STP-212.002, “Reactor Building Spray Pump Test,” B Train;
- STP-220.001A, “Motor Driven Emergency Feedwater Pump and Valve Test,” combined with STP-120.004, “Emergency Feedwater Valve Operability Test;” Section 6.7 Actuation per K633 Train B SG Low-Low Relay Go Test)
- STP-396.007, “Emergency Feed Pump Suction Pressure Instrument IPT03632 Calibration and Channel Check;”
- STP-454.002, “Control Room Emergency Air Cleanup System Performance Test,” Section 7.3.6 and Mechanical Maintenance Procedure (MMP)- 460.024, “Testing and Balancing of HVAC System and Components;”
- STP-506.001, “Pressurizer Heater Capacity Test.”

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed the following temporary modification to assess the impact on risk-significant SSC parameters, such as, availability, reliability and functional capability. The inspectors verified the temporary modification had not adversely affected safety function of the required system:

- B train EDG installation of electrolytic capacitor to reduce tachometer noise per work order (WO) 0301917, including review of 10 CFR 50.59 evaluation (CER 0-C-03-0371).

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation

On January 29, 2003, the inspectors reviewed and observed the performance of a simulator drill that involved pressurizer steam space leak and main generator control valve failure which required a site area emergency to be declared (LOR-ST-034). The inspectors assessed emergency procedure usage, emergency plan classification, notifications and the licensee's identification and entrance of any problems into their correction action program. This inspection evaluated the adequacy of the licensee's conduct of the drill and critique performance. Drill issues were captured by the licensee in CER 0-C-03-0289.

On February 25, the inspectors reviewed and observed the performance of an emergency planning drill that involved a simulated fire in a charging pump room, reactor trip due to SSPS power supply failure, a rod ejection and a containment breach (EPP-01-001A). The inspectors assessed emergency procedure usage, emergency plan classification, notifications and the licensee's identification and entrance of any drill problems into their corrective action program. This inspection evaluated the adequacy of the licensee's conduct of the drill and critique performance. Drill issues were captured by the licensee in CER 0-C-03-0655.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification

a. Inspection Scope

The inspectors sampled licensee submittals for the performance indicators (PIs) listed below for the period from January through December 2002. To verify the accuracy of the PI data reported during that period, PI definitions and guidance contained in NEI 99-

02, “Regulatory Assessment Indicator Guideline,” Revision 1, were used to verify the basis in reporting for each data element.

Reactor Safety Cornerstone

- Unplanned Scrams per 7,000 Critical Hours
- Scrams with a Loss of Normal Heat Removal

The inspectors reviewed a selection of licensee event reports (LERs), portions of station operator log entries, corrective action program database, the monthly operating reports, and PI data sheets to verify that the licensee had adequately identified the number of scrams and unplanned power changes greater than 20 percent that occurred during the previous four quarters. This number was compared to the number reported for the PI during the current quarter. The inspectors also reviewed the accuracy of the number of critical hours reported and the licensee’s basis for crediting normal heat removal capability for each of the reported reactor scrams. In addition, the inspectors also interviewed licensee personnel associated with the PI data collection, evaluation and distribution.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems

a. Inspection Scope

For CERs 0-C-03-0223, 0-C-03-0226 and 0-C-03-0500, on CST level transmitter 1LT3631 being frozen twice, the inspectors conducted an in-depth review of the licensee’s problem identification and resolution activities to ensure they included:

- Complete and accurate identification of the problem in a timely manner commensurate with its significance;
- Evaluation and disposition of performance issues associated with maintenance effectiveness, including maintenance practices, work controls, and risk assessment;
- Evaluation and disposition of operability / reportability issues;
- Consideration of extent of condition, generic implications, common cause, and previous occurrences;
- Classification and prioritization of the resolution of the problem commensurate with its safety significance;
- Identification of root and contributing causes of the problem;
- Identification of corrective actions which are appropriately focused to correct the problem;
- Completion of corrective actions in a timely manner commensurate with the safety significance of the issue.

In addition, the inspectors reviewed the licensee's corrective actions for CER 0-C-03-0338 that dealt with troubleshooting efforts to address a electrical ground and a speed switch issue.

b. Findings

The inspectors identified a Green NCV (reference Section 1R01 of this report) associated with the adverse weather protection issue. The inspectors also identified a Green finding (reference Section 1R12 of this report) associated with the EDG root cause effort.

4OA3 Event Followup

.1 (Closed) LER 50-395/03-S01-00: Access to Protected Area By An Individual With An Expired Badge. This LER documents a failure of the licensee to properly update training data in training files for a contract employee whose training had expired in October 2002. This data entry error was discovered on February 25, 2003, and it was determined that it had allowed protected area entry with a badge after expiration of training. This is a violation of 10 CFR 73.71, Appendix G(3)(b), "an actual entry of an unauthorized person into a protected area," which was reported to the NRC as required on March 20, 2003.

This finding is considered minor as it did not represent an actual or credible impact on safety since the individual involved would have completed his training requirements and been granted access had he been notified of his training expiration. It does not appear to be a reasonable precursor to a significant event or a more significant safety concern because there were only limited cases where this error could occur. The finding does not relate to any performance indicators and would not affect the physical protection safeguards cornerstone objective. There were no willful aspects to this violation as this event occurred unintentionally as a result of human error. The individual never accessed any vital area of the plant. The involved individual did not have vital area authorization. The licensee reviewed all training records to verify that all other personnel were currently trained.

Although this issue should be corrected to prevent recurrence, it constitutes a violation of minor safety significance and is not subject to enforcement action in accordance with Section IV of the Enforcement Policy. This item is documented in the licensee' s corrective action program under CER 0-C-03-0635.

4OA5 Other

(Closed) Notice of Enforcement Discretion (NOED) for South Carolina Electric & Gas Company Regarding Virgil C. Summer Unit 1, No. 03-2-002, dated February 11, 2003

On February 11, 2003, NRC granted the Virgil C. Summer Station Unit 1 an NOED to extend TS 3.8.1, "A.C. Sources - Operating," LCO action statement allowable time. The NOED granted a 12-hour extension of the B EDG from the original 72 hours as licensed. The time was needed by the licensee to complete reviews of a capacitor modification on a speed sensing circuit prior to declaring the B EDG operable. There was no increase

in risk to the public since the B EDG was functional and capable of performing its safety functions.

The basis for discretion considered: 1) the testing performed adequately verified that the B EDG was fully functional, 2) sufficient reviews had been accomplished to ensure that the licensee's actions adequately addressed the speed circuitry issues and 3) the implementation of compensatory measures were adequate and appropriate. Based on these considerations, the NRC staff concluded that criterion B.2.1.1.a and applicable criteria in Section C.4 of NRC Manual Chapter 9900, "Technical Guidance, Operations - Notice of Enforcement Discretion," were met. On the basis of the staff's evaluation of the SCE&G request, the NRC concluded that issuance of the NOED was consistent with the Enforcement Policy and staff guidance. Therefore the NRC granted discretion not to enforce compliance with TS 3.8.1.1.1.b.

The inspectors reviewed the licensee's root causes leading to the need for the NOED. No violations were identified. However, a finding documented in Section 1R12 of this report discusses an issue concerning the licensee's root cause and troubleshooting efforts.

4OA6 Meetings

.1 Exit Meeting Summary

The inspectors presented the inspection results to Mr. S. Byrne and other members of the licensee's staff on April 9, 2003.

The inspectors asked the licensee whether any of the material examined during the inspection should be considered proprietary. No proprietary information was identified.

.2 Annual Assessment Meeting Summary

On March 31, 2003, the NRC's Chief of Reactor Project's Branch 5 and the Senior Resident Inspector assigned to the Virgil C. Summer Station (VCS) met with SCE&G Company to discuss the NRC's Reactor Oversight Process (ROP) and the VCS annual assessment of safety performance for the period of January 1, 2002 - December 31, 2002. The major topics addressed were: the NRC's assessment program, the results of the VCS assessment, and NRC security activities. Attendees included VCS station management and staff members, and two members of the Department of Health and Environmental Control.

This meeting was open to the public. The presentation material used for the discussion is available from the NRC's document system (ADAMS) as accession number ML030980590. ADAMS is accessible from the NRC Web site at *http://www.nrc.gov/reading-rm/adams.html* (the Public Electronic Reading Room).

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

J. Archie, General Manager, Engineering Services
F. Bacon, Manager, Chemistry Services
L. Blue, Manager, Health Physics Services
M. Browne, Manager, Nuclear Licensing and Operating Experience
G. Douglass, Acting Manager, Nuclear Protection Services
D. Gatlin, Manager, Operations
G. Halnon, General Manager, Nuclear Plant Operations
D. Lavigne, General Manager, Organization Effectiveness
G. Moffatt, Manager, Design Engineering
K. Nettles, General Manager, Nuclear Support Services
W. Stuart, Manager, Plant Support Engineering
A. Torres, Manager, Planning / Scheduling and Project Management
R. White, Nuclear Coordinator, South Carolina Public Service Authority
S. Zarandi, Manager, Maintenance Services

NRC

K. Landis, Branch Chief, Division of Reactor Projects
M. Lesser, Branch Chief, Division of Reactor Safety

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

50-395/03-02-01	NCV	Failure to Take Adequate Corrective Actions to Preclude Repetitive Freezing of a Safety-Related CST Level Transmitter Sensing Line (Section 1R01)
50-395/03-02-02	NCV	Failure to Assess and Manage the Increase in Risk of High Voltage Switchyard Activity on Planned EDG Maintenance. (Section 1R13.2)

Closed

50-395/03-S01-00	LER	Access to Protected Area by an individual with an expired badge (Section 4OA3.1)
50-395/03-2-002	NOED	12-hour extension of the B EDG from the original 72 hours as licensed (Section 4OA5)

LIST OF DOCUMENTS REVIEWED

Section1R02 - Evaluation of Changes, Test and Experiments (71111.02)

Evaluations

- Engineering Change Request (ECR) 50308, Design Basis Information for RWST with Regard to Switchover from Cold Leg (CL) Injection to CL Recirculation Following LOCA, Rev. 12;
- ECR 50328, Reactor Building Pressure and Temperature-LOCA, Rev. 0;
- ECR 70096, Replacement of Pressurizer Safety Valve Flow Monitor Power Supplies, Rev. 0;
- Engineering Information Request (EIR) 80540, Throttling Component Cooling Water to the Seal Water Heat Exchanger, Rev. A;
- Revision Notice (RN) 99-180, Revised Service Water Make Up Flow to CCW, Rev. 2;
- RN 01-001, Gas Bottle Discussions in the FSAR, Rev. 0;
- RN 02-016, Remove specific differences and alternate approaches with regard to MEB 3-1 from FSAR Section 3.6.2.1.1.1, Rev. 0;

Screened Out Items

- Commercial Grade PO 619037, Chemical Fuel Oil Additive Biofor, Rev. 0;
- ECR 50176, Diesel Generator Fuel Oil Strainer Differential Pressure Sensing Line Redesign, Rev. 2;
- ECR 50297, Revise Emergency Feedwater Design Basis Document, Rev. 0
- ECR 50356, Revise calculations for liner plate bulges and thickness for CER 00-1386, Rev. 0;
- ECR 50335B, Revision of DG Day Tank Set Points, Rev. 4;
- ECR 50335C, Fuel Oil Storage Tank Level Change, Rev. 0;
- ECR 50335D, [Instruments] ILS05412 and ILS05422 Spacers, Rev. 3;
- ECR 70124 [Equal to/Better Than], Replacement of Diesel Generator Air Start Tank Set Point Change, Rev. 0;
- NCN 01-0756, Service Water pump coupling broken and diffuser corroded, Rev. 0;
- NCN 01-2181, Breaker which feeds XVB0316C was found tripped, dated 02/04/02;
- NCN 02-0365, A combination of factors on ABB 480 V K-Line breakers results in the possibility that the breaker will not trip on a real fault, dated 02/19/02;
- NCN 02-1305, Free span in excess of assumptions on Service Water System, Rev. 3;
- NCN 02-1667, Breaker for XVB3106A Installed with the trip setpoint outside of specified tolerance, dated 05/20/02;
- NCN 03-0371, Output of TR relay to indicator degraded by a ground on the signal cable, dated 02/05/03;
- OSC 1765, Elevating Mechanism (LH, and RH), for 1200 Amp Magna-Blast Breaker, Rev. 0;
- OSC 1775, 15 Amp 1 pole, Circuit Breaker for Westinghouse Power Supply, Rev. 0;
- RN 02-036, Reactor purge supply and exhaust isolation valves stroke time change, Rev. 0;

- RN 02-048, Update of FSAR for Ventilation System Values, Rev. 0.

Sections 1R02 and 1R17 - Permanent Plant Modification (71111.02 and 71111.17)

Self Assessment Documents

- Audit QA-AUD-200201, Nuclear Licensing and Operating Experience-50.59;
- Audit QA-AUD-200209-0, Design Control;
- QA-SUR-200309-0, Station Design Activities.

Condition Evaluation Reports

- 0-C-01-0989, FSAR Discrepancies;
- 0-C-02-0249, 10 CFR 50.59 evaluation for CER misplaced;
- 0-C-02-0773, Applicability determination for SAP-119 did not determining that a 10 CFR 50.59 screen was needed;
- 0-C-02-0780, Procedures inconsistent for 10CFR50.59 evaluations;
- 0-C-02-0856, Inappropriate closure of CER for 10CFR50.59 corrective actions;
- 0-C-02-0898, Inappropriate closure of CER for 10CFR50.59 corrective actions;
- 0-C-02-1170, Used incorrect procedure revision for 10CFR50.59 evaluation;
- 0-C-02-1745, Procedure clarified without using proper change process with 10 CFR 50.59 review;
- 0-C-02-1746, Recommended enhancements to 10 CFR 50.59 review process;
- 0-C-02-2313, Return to Service forms for the modification process dose not appear to serve a useful purpose;
- 0-C-02-2587, ECRs have not been closed in a timely manner;
- 0-C-02-2958, Audit found that 10 CFR 50.59 documentation was missing;
- 0-C-02-3306, Procedural requirements in the area of providing design input information not being adhered to;
- 0-C-02-3307, Disconnect between Design Engineering and Plant Support Engineering with respect to equipment reliability;
- 0-C-02-3478, ECR 50464B did not specify appropriate DHEC reviews.