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

July 24, 2000

South Carolina Electric & Gas Company
ATTN: Mr. Stephen A. Byrne
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. 50-395/00-04

Dear Mr. Byrne:

On June 24**,** 2000, the Nuclear Regulatory Commission (NRC) completed an inspection at your Virgil C. Summer reactor facility. The enclosed report presents the results of that inspection which were discussed on June 27 with you and other members of your staff.

The inspection was an examination of 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. Within these areas, the inspection consisted of a selective examination of procedures and representative records, observations of activities, and interviews with personnel.

Based on the results of this inspection, two issues of very low safety significance (Green) were identified. These issues have been entered into your corrective action program. Of the two issues, one was determined to involve an additional example of a previously issued non-cited violation. If you contest the non-cited violation, 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 facility.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure 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/NRC/ADAMS/index.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Robert C. Haag, Chief
Reactor Projects Branch 5
Division of Reactor Projects

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

Enclosure: NRC Integrated Inspection Report

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.:	50-395
License No.:	NPF-12
Report No.:	50-395/00-04
Licensee:	South Carolina Electric & Gas (SCE&G)
Facility:	Virgil C. Summer Nuclear Station
Location:	P. O. Box 88 Jenkinsville, SC 29065
Dates:	April 2 - June 24, 2000
Inspectors:	M. Widmann, Senior Resident Inspector M. King, Resident Inspector L. Garner, Senior Project Engineer, RII (Portion of Section 1R07) L. Hayes, Security Specialist, RII (Sections 3PP1, 3PP2 and 3PP3) J. Kreh, Emergency Preparedness Specialist, RII (Sections 1EP2, 1EP3, 1EP4, 1EP5, 4OA1.3, 4OA1.4 and 4OA1.5) G. Kuzo, Senior Radiation Specialist, RII (Sections 2PS1 and 2PS3) T. Morrissey, Project Engineer, RII (Portions of Sections 1R04, 1R15, R16 and 1R23 and Sections 4OA1.1, 4OA1.2, and 4OA5)
Approved by:	R. C. Haag, Chief, Reactor Projects Branch 5 Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000395-00-04, on 04/02-06/24/2000; South Carolina Electric and Gas; Virgil C. Summer Nuclear Station. Maintenance Risk Assessments and Emergent Work Evaluation, Radioactive Gaseous and Liquid Effluent Treatment Systems and Monitoring System, and TI 2515/144.

This inspection was conducted by resident inspectors, a regional security specialist, emergency preparedness inspector, senior radiation specialist, and two regional project engineers. The inspection identified two green issues. One of which was a second example of a previous non-cited violation. The significance of issues is indicated by their color (green, white, yellow, red) and was determined by the Significance Determination Process.

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

- GREEN. The licensee removed the B trains of Component Cooling Water (CCW) and charging from service during preventative maintenance on a CCW valve without recognizing that this placed the plant in an elevated risk level as defined in the licensee's safety function matrix. As a result, provisions of Operations Administrative Procedure (OAP)-102.1, "Conduct of Operations Scheduling Unit," Revision 3, concerning evaluating the configuration and obtaining the General Manager's approval were not met. Since there was no actual loss of safety function with A train CCW and charging available and operable, this issue was determined to be of very low safety significance. No violation occurred since the licensee complied within the time constraints of the applicable technical specification limiting conditions for operation and the procedure will not be required by regulations until the revised sections of the Maintenance Rule
(10 CFR 50.65) become effective in November 2000. (Section 1R13)

Cornerstone: Public Radiation Safety

- GREEN. As of April 10, 2000, selected atmospheric effluent process monitor calibrations did not meet 10 CFR Part 20.1501(b) requirements. Specifically, secondary calibration sources in-use since the early 1990's for the particulate and gaseous channel detectors were not traceable to the original primary detector calibrations. Evaluations of the effect of geometry and fabrication differences between the original, vendor-supplied sources and the current secondary calibration sources identified a potential 25 percent bias in expected detector response. Based on the identified bias, the current detector responses for monitoring radioactive material concentrations and for establishing set-point values were determined to be conservative. Since effluent releases did not result in doses exceeding Appendix I to10 CFR Part 50 design criteria nor 10 CFR 20.1301 concentration limits, this finding was considered to be of very low safety significance. An additional example of a previously issued non-cited violation (50-395/99006-03) was identified. (Section 2PS1)

Report Details

The unit began the inspection period at 100 percent power. On April 14, the unit commenced a planned power reduction to repair IFT00434, reactor coolant system C flow transmitter. The unit was stabilized at approximately 38 percent power on April 15 and later that same day commenced a power increase following successful replacement of IFT00434. The unit returned to 100 percent power on April 16. On June 15, the unit commenced a shutdown to Mode 2 to repair C steam generator feedwater isolation valve, XVG01611-C. Mode 2 was entered on June 16. Following repairs to the valve, the unit entered Mode 1 on June 17 and was returned to approximately 100 percent power on June 19. The unit remained at or near 100 percent power for the remainder of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection

a. Inspection Scope

The inspectors reviewed Operations Administrative Procedure (OAP)-109.1, "Guidelines for Severe Weather," Revision 1C, and Emergency Plan Procedure (EPP)-015, "Natural Emergency (Earthquake, Tornado, Hurricane), Revision 13. The review assessed the adequacy of the procedures to provide guidance for preparation and response to adverse weather conditions, including protecting and ensuring accessibility to accident mitigation systems and equipment. The inspectors also evaluated operation of the ultimate heat sink during prolonged periods of high ambient temperatures (90 degrees Fahrenheit or greater).

b. Issues and Findings

No findings were identified.

1R04 Equipment Alignments

.1 Availability of Redundant Equipment

a. Inspection Scope

Through document reviews and plant walkdowns, the inspectors verified that with equipment in one train removed from service, the opposite train of equipment was correctly aligned, available and operable for the following:

- A Emergency Diesel Generator (EDG) and Turbine Driven Emergency Feedwater (TDEFW) Pump (while the B EDG was out of service);
- TDEFW pump and A Motor Driven Emergency Feedwater Pump (MDEFW) (while the B MDEFW pump was out of service); and,
- A and B MDEFW pump (while the TDEFW pump was out of service).

The applicable portion of the following station operating procedures (SOPs), final safety

analysis report (FSAR) sections, technical specifications (TSs) and drawings were utilized:

- SOP-306, “Emergency Diesel Generator,” Revision 14B;
- SOP-307, “Diesel Generator Fuel Oil System,” Revision 9B;
- SOP-211, “Emergency Feedwater System,” Revision 11F;
- D-302-351, “Diesel Generator -Fuel Oil,” Revision 8;
- D-302-351, “Diesel Generator -Miscellaneous Services,” Revision 9;
- D-302-085, “Emergency Feedwater (Nuclear),” Revision 40;
- FSAR sections 8.3.1, 9.5.4, and 10.4.9; and,
- TS sections 3.8.1 and 3.7.1.2.

b. Issues and Findings

No findings were identified.

.2 Semiannual Inspection

a. Inspection Scope

The inspectors performed a detailed review and walkdown of the auxiliary and fuel handling building ventilation systems. The following documents were reviewed to determine the correct system lineup and system requirements:

- FSAR sections 9.4.2, “Auxiliary and Radwaste Area Ventilation System,” and 9.4.3, “Fuel Handling Building Ventilation”;
- TS sections 3/4.7.9, “Area Temperature Monitoring,” and 3/4.9.11, “Spent Fuel Pool Ventilation System;”
- Design Basis Document (VCSNS-DBD), “Heating, Ventilation, and Air Conditioning (HVAC),” Revision 8;
- Mechanical Maintenance Procedure (MMP) - 460.024, “Testing and Balancing of H.V.A.C. Systems and Components,” Revisions 4 and 5;
- SOP-502, “Auxiliary and Fuel Handling Building Ventilation System,” Revision 9F;
- Surveillance Test Procedure (STP) -126.002, “Spent Fuel Pool Ventilation Operability Test,” Revision 4;
- STP-455.002, “Spent Fuel Pool Ventilation System Performance Test,” Revision 1;
- drawings, D-912-130, “Auxiliary Building Main Exhaust System,” Revision 22, and D-912-131, “Fuel Handling Building Charcoal Exhaust System and Air Supply Distribution,” Revision 22: and,
- annunciator response procedures for applicable ventilation system annunciators.

In addition, the inspectors reviewed outstanding maintenance work requests on the systems and performed a walkdown to identify any discrepancies between the current operating system equipment lineups and the correct design lineups. The inspectors also reviewed related primary identification program (PIP) items to verify that the licensee had properly identified and resolved equipment problems that could cause initiating events or impact mitigating system availability.

b. Issues and Findings

During the detailed walkdown, the inspectors questioned the operability of fuel handling building exhaust fan XFN0023B based on reviews of the VCSNS-DBD section 4.4.5.2.6, TS 3/4.9.11, and PIP 0-C-00-630. The PIP was written to document indication that a low fuel handling building differential pressure was present after completion of STP-126.002. During performance of the surveillance on May 19, 2000, the control room operators noted that total main plant ventilation flow decreased approximately one percent compared to normal plant ventilation flow. The licensee issued a second PIP, PIP 0-C-00-0711, which documented troubleshooting efforts that measured flow at approximately 26,624 cubic feet per minute (cfm). This value is below the design flow value of 30,000 cfm, and TS 4.9.11.b.1 requirement of 30,000 cfm +/- 10 percent. The licensee declared XFN0023B inoperable and at the close of this inspection period is in the process of reviewing the design basis for the system to determine whether changes to the design basis document, TS or STP are warranted. Pending NRC review of the licensee's evaluation, this issue is identified as an Unresolved Item (URI) 50-395/00004-01.

1R05 Fire Protection

.1 Routine Inspection

a. Inspection Scope

The inspectors reviewed current PIPs, work orders, and impairments listed in the licensee's computer data base associated with the fire suppression system. The inspectors reviewed the status of ongoing surveillance activities to determine whether they were current to support the operability of the fire protection system. The inspectors assessed the material condition of the active and passive fire protection systems and features, and verified proper control of transient combustibles and ignition sources. Additionally, the inspectors assessed administrative controls (compensatory measures) in place, in particular due to Kaowool issues (reference NRC Inspection Report No. 50-395/99-09, Section F2.1).

The inspectors conducted routine inspection of the following risk significant areas:

- Main Control Board (fire zone CB-17.1);
- Engineered Safeguards Feature 1DA Switchgear (fire zone IB-20);
- Relay Room (fire zone CB-6);
- Turbine Building (fire zone TB-1);
- A and B Diesel Generator Rooms (fire zones DG-1.1, 1.2, 2.1, and 2.2); and,
- Component Cooling Water Pump Area (fire zones IB-25.1 and 25.2).

These areas are risk significant based on the licensee's fire risk analysis (Individual Plant Examination For External Events (IPEEE) External Fires Request for Additional Information (RAI), dated January 1999). In addition, the inspectors observed the fire protection detection and suppression equipment in the cable spreading rooms to determine whether any conditions or deficiencies existed which would impair the

operability of that equipment.

b. Issues and Findings

No findings were identified.

.2 Annual Fire Drill Inspection

a. Inspection Scope

The inspectors observed performance of an annual fire drill that involved local offsite fire department support. The drill was conducted on the evening of June 8. The inspectors evaluated the readiness of the licensee's personnel to prevent and fight fires including the following aspects:

- Observe whether protective clothing and self-contained breathing apparatus (SCBA) equipment were properly worn;
- Determine whether fire hose lines were properly laid out and nozzle pattern simulated being tested prior to entering the fire area of concern;
- Verify that the fire area was entered in a controlled manner;
- Review if sufficient firefighting equipment was brought to the scene by the fire brigade to properly perform their firefighting duties;
- Verify that the fire brigade leader's fire fighting directions were thorough, clear and effective, and coordinated with off-site fire team assistance;
- Verify that radio communications with plant operators and between fire brigade members were efficient and effective;
- Confirm that fire brigade members checked for fire victims and fire propagation into other plant areas;
- Observe if effective smoke removal operations were simulated;
- Verify that the fire fighting pre-plans were properly utilized and were effective; and,
- Verify that the licensee pre-planned drill scenario was followed and the drill objectives met the acceptance criteria, and deficiencies were captured in post drill critiques.

The following documents were reviewed as part of this inspection:

- Fire Protection Procedure (FPP-026), "Fire / Hazmat Response," Revision 2;
- V.C. Summer Nuclear Station Critique FPD-00-10 (conducted 6-8-00); and
- Preventative Maintenance Tracking Sheet (PMTS) 0002090.

b. Issues and Findings

No findings were identified.

1R07 Heat Sink Performance

a. Inspection Scope

On May 25, 2000, the inspectors observed portions of heat exchanger performance test

ES-560.211, "Service Water System Heat Exchanger Performance," Revision 6, of the B component cooling water (CCW) heat exchanger (XHE0002B-CC) to verify data was accurately recorded and results met procedural acceptance criteria. To ensure that performance of the heat exchanger was not unacceptably degrading, data and results from this test were compared to test data taken on the B CCW heat exchanger on the following dates: February 28, 2000 and August 9, July 13, and May 26, 1999, and with test data taken on the A CCW heat exchanger on the following dates: March 13, 2000, and November 18, August 23, July 9, and June 2, 1999.

On May 15, 2000, the inspectors also observed and reviewed portions of the A train chill water heat exchanger (XHX0001A-VU) test to verify that any potential heat exchanger deficiencies which could mask degraded performance was identified. Results of test data was compared with pre-established engineered acceptance criteria and reviewed to ensure test instrument inaccuracies and test measurements met requirements between testing conditions and design conditions. The inspectors reviewed the licensee's corrective action program related to heat exchanger performance issues to ensure any issues were properly being addressed.

b. Issues and Findings

No findings were identified.

1R11 Licensed Operator Requalification

a. Inspection Scope

On May 2 and May 16, the inspectors observed senior reactor operators' and reactor operators' performance on the plant's simulator during annual licensed operator requalification examinations. In addition, the inspectors verified that the training program included risk-significant operator actions, implementation of the emergency plan, previous lessons learned items and plant operating experience issues. The inspectors assessed individual and crew performance and licensee training evaluator's critiques.

b. Issues and Findings

No findings were identified.

1R12 Maintenance Rule Implementation

a. Inspection Scope

The inspectors sampled the performance problems associated with selected structures, systems or components (SSCs) to assess the effectiveness of maintenance efforts that apply to those SSCs. Reviews focused, as appropriate, on: (1) maintenance rule scoping in accordance with 10 CFR 50.65; (2) characterization of failed SSCs; (3) safety significance classifications; (4) 10 CFR 50.65 (a)(1) or (a)(2) classifications; and, (5) the appropriateness of performance criteria for SSCs classified as (a)(2) or goals and corrective actions for SSCs classified as (a)(1). The selected SSCs were:

- Chilled Water System (currently in (a)(1) status);
- Instrument Air System;
- Diesel Generator Heating Ventilation and Air Conditioning (HVAC); and,
- Auxiliary and Fuel Handling Building Ventilation Systems.

For the equipment issues described in the PIPs listed below, the inspectors reviewed the licensee's implementation of the Maintenance Rule (10 CFR 50.65) to determine whether maintenance preventable functional failures may have occurred that the licensee did not capture in their program:

PIP Number	Description
0-C-00-0500	During historical review of circulating water pumps, motors and breakers, for newly scoped Maintenance Rule Criteria 2, plant support engineering personnel noted 2 functional failures
O-C-00-0562	LCV00115D (B charging pump suction header isolation valve) overloads tripped while stroking, this is a repeat occurrence, reference PIP 99-868
0-C-00-0576	XSW1BB-03 (circuit breaker for B emergency feedwater pump), the closing latch monitoring switch, a normally open switch, was found stuck in the closed position

b. Issues and Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation

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 maintenance risk assessments and 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 emergent work activities listed below:

- IFT-0434, Reactor Coolant System C Flow transmitter, replacement;
- ITM-499B, Core Subcooling Monitor, repair;
- RMG0018, Containment High Radiation Monitor, repair;
- TPP0008, Turbine Driven Emergency Feedwater Pump, repair;
- IFT-113, Boric Acid Blender Flow transmitter, replacement;

- XVT03010B, Reactor Building Spray Test Header Discharge Valve, repair;
- XVB09503B-CC, Residual Heat Exchanger B Component Cooling Inlet Valve, performed inspection and partial tear down; and,
- XVG01611-C, main feedwater isolation valve, poppet valve #3 seal failure, and air leak repair.

b. Issues and Findings

No findings were identified for the above listed work items except for the preventative maintenance work on XVB09503B-CC, the residual heat exchanger B component cooling inlet valve. On March 8, the licensee danger tagged the valve's breaker open to allow maintenance work to commence. Only the specific work to be performed on the CCW inlet valve with the CCW pump removed from service was reviewed for impact on the plant in accordance with the safety function matrix. Later in the day operations removed the B CCW pump from service. Due to the unavailability of CCW to the B Centrifugal Charging Pump (CCP), the B CCP was also removed from service. Operators failed to review the safety function matrix and thus failed to recognize that the removal of both the B trains of CCW and charging resulted in the plant being in an elevated risk level configuration. The pumps were returned to service 6 hours and 20 minutes later, which was within TS allowed outage times.

PIP 0-C-00-552 was generated on May 2 to review the event. Procedure OAP 102.1, "Conduct of Operations Scheduling Unit," Revision 3, states that: (1) entry into a condition that degrades multiple risk factors (i.e., systems) are to be avoided unless a clear operational necessity exists, and (2) elevated risk levels are to be evaluated through the safety function matrix and require General Manager approval prior to entry. These provisions were not followed. The work on XVB09503B-CC was elective preventative maintenance and did not constitute an operational necessity. However, no failure to follow procedure violation occurred. OAP 102.1 was developed to implement revised paragraphs (a)(3) and (a)(4) of 10 CFR 50.65 (Maintenance Rule) which are to become effective November 28, 2000. Thus, at this time OAP 102.1 is not a regulatory required procedure.

Under PIP 0-C-00-552, the licensee performed an analysis of the elevated risk configuration with both B trains of CCW and charging out of service. Based on the analysis, if no recovery actions are credited, the core damage frequency (CDF) for this configuration would be approximately 50 times the baseline CDF of 4 E-05. This analysis was consistent with the safety function matrix, in that, the configuration represented an elevated risk level. Crediting operator actions to recover the second train of CCW, the analysis showed that the CDF for the configuration would be approximately twice the baseline CDF.

The inspectors and an NRC senior reactor analyst determined that the licensee's analysis was adequate and that operator mitigation could be credited for restoration of one train of CCW. Since there was no actual loss of safety function with both A train CCW and charging available and operable and recovery of B train components were possible, the issue was determined to be of very low safety significance (GREEN). No violation occurred since the licensee complied within the time constraints of the TS action statements for the applicable Limiting Condition for Operation (LCO) and the

requirement to perform a risk analysis per 10 CFR 50.65 becomes effective November 28, 2000.

1R14 Personnel Performance During Nonroutine Plant Evolutions

a. Inspection Scope

The inspectors observed and reviewed the operating crew's performance following a boric acid flow transmitter (IFT0113) failure on the evening of May 10. This activity was conducted in accordance with restricted procedure change SOP-106, "Reactor Makeup Water System," Revision 8F, and Engineers Technical Work Record SS15583, "EIR 80237 Response RCS Makeup Data." This planned non-routine evolution required manual reactor makeup to the volume control tank by using changes in boric acid tank level, volume control tank level and boric acid flow rate to ensure proper reactivity management was maintained with the plant at or near 100 percent power. This inspection evaluated the licensee planning, briefings, procedures, contingency plans and operator response for a non-routine plant evolution to ensure they were appropriate and in accordance with the required procedures.

b. Issues and Findings

No findings were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed selected operability evaluations affecting risk significant mitigating systems, listed below, 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 as compensating measures; (4) where compensatory measures were involved, whether the compensatory measures were in place, would work as intended, and were appropriately controlled; and, (5) where continued operability was considered unjustified, the impact on TS LCOs and the risk significance in accordance with the SDP.

PIP Number	Title/Description
0-C-99-0056	B loop RHR pump suction 65 psig due to check valve leakage.
O-C-99-0456	XVC08974A/B (SI header A and B check valves, inside the RB) heavy boric acid residue from packing leaks
0-C-99-1261	B train 125 VDC battery bank not tested to bound worst case design load profile.
O-C-00-0057	Steam propagation barrier door DRAB/514 can be pulled off it's latch
O-C-00-0224	C chiller did not meet ES-560.211, "Service Water System Heat Exchanger Performance," acceptance criteria
O-C-00-0407	C CCW pump suction pipe over pressurization concern
O-C-00-0580	Emergency feedwater valve, XVK01020A, stem clamp not properly keyed to stem.

b. Issues and Findings

No findings were identified.

1R16 Operator Workarounds

a. Inspection Scope

The inspectors reviewed the licensee's list of operator workarounds. The inspectors selected two items for specific review. This review was to determine whether the functional capability of the related system or human reliability in responding to an initiating event was affected by the operator workaround. The inspectors specifically considered whether the workaround affected the operators' ability to implement abnormal or emergency operating procedures. The inspectors reviewed operator workarounds related to:

- Reactor makeup system intermittent boric acid flow deviation trips, and
- RHR System current-to-pressure (I/P) converters not qualified for harsh environment (danger tag out).

b. Issues and Findings

No findings were identified.

1R19 Post-Maintenance Testing (PMT)

a. Inspection Scope

For the post-maintenance tests listed below, the inspectors reviewed the test procedures and either witnessed 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:

Test Procedure/Work Order (WO)		
Number	Title	Related Maintenance Task
MMP-451.002, Revision 12; WO 007118	Maintenance of HVAC Mechanical Chillers; leak check of XHX0001B chiller following troubleshooting and repair	XHX0001B, B chiller following troubleshooting and repair of excessive purging, not cooling, fitting replacement
SOP-106, Revision 8F; WO 0007033	Reactor Makeup Water System; leak check of boric acid blending system flow transmitter IFT-113A following replacement	Transducer for boric acid blending flow transmitter IFT-113A replaced, leak check and verification of proper reactor makeup, ref. PIP 0-C-00-582
STP-106.001, Revision 4	Movable Rod Insertion Test	Rod step counter battery replacement under main control board, rods stepped for PMT
STP-223.002A, Revision 7	Service Water Pump Test	SWP B, XPT039B, motor cooling line repair post maintenance test
STP-342.002, Revision 4	Condensate Storage Tank Level Instrument ILT03631 Calibration	ILT03631 CST level instrument calibration following setpoint change per ECR50149 / MWR000121
STP-375.004, Revision 6	Refueling Water Storage Tank Level Instrument ILT00993 Calibration	ILT00993 RWST level instrument calibration following rack card replacement
WO 0008222	Post maintenance test for B EDG annunciator panel	PMT for B EDG annunciator panel per WO 0008222 following high voltage power supply replacement

b. Issues and Findings

No findings were identified.

1R22 Surveillance Testing

a. Inspection Scope

For the surveillance tests listed below, the inspectors examined the test procedures 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:

Number	Rev.	Title
EMP-135.004	0D	Reactor Trip Breaker Testing (for XSW0001-RT3 breaker)
STP-205.003	5	Charging / Safety Injection Pump and Valve Operability Test (for C Chg/SI pump)
STP-205.004	5	Residual Heat Removal Pump and Valve Operability Test (for B RHR pump)
STP-220.002	2	Turbine Driven Emergency Feedwater Pump and Valve Test
STP-342.002	4	Condensate Storage Tank Level Instrument (ILT03631) Calibration (18 month)
STP-345.037	15A	Solid State Protection System Actuation Logic and Master Relay Test for Train A
STP-345.074	10A	Solid State Protection System Actuation Logic and Master Relay Test for Train B

b. Issues and Findings

No findings were identified.

1R23 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed the following temporary modifications to assess the impact on risk-significant SSC parameters, such as, availability, reliability and functional capability. The inspectors verified that the temporary modifications have not affected the safety functions of the following systems:

- Current-to-Pressure (I/P) converter for the turbine driven emergency feedwater pump governor (ref. Nonconformance Notice (NCN) 98-0823). The licensee plans to make this a permanent modification by removing the remote speed controller during the next refueling outage, RF-12.
- Diesel generator fuel oil strainer differential pressure indicator erroneous readings (ref. NCN 99-1184, and 99-1216). NCN requires temporary equipment

to be installed to fill and vent the indicator prior to each diesel surveillance performance. Licensee plans to implement a design change to alter the sensing line arrangement during RF-12.

- Mechanical device installed on XVG01611-C, main feedwater isolation valve, to prevent closure during maintenance per Engineering Information Request 80253.

b. Issues and Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP2 Alert and Notification System (ANS) Testing

a. Inspection Scope

The inspector reviewed the ANS design and associated testing commitments and procedures, and evaluated the adequacy of the testing program. Reviews were conducted of the ANS (sirens) testing results and related corrective action documentation. The inspector observed the licensee's implementation of the annual full-volume ANS test conducted on May 2, 2000.

b. Issues and Findings

No findings were identified.

1EP3 Emergency Response Organization Augmentation

a. Inspection Scope

The inspector reviewed the design of the emergency response organization (ERO) augmentation system and the licensee's capability to staff emergency response facilities within stated timeliness goals. Records of the annual ERO augmentation drill (unannounced, off-hours, actual travel to plant) and the semiannual off-hour pager tests were reviewed. Follow-up activities for problems identified through augmentation testing were reviewed to determine whether appropriate corrective actions had been implemented.

b. Issues and Findings

No findings were identified.

1EP4 Emergency Action Level and Emergency Plan Changes

a. Inspection Scope

The inspector reviewed changes to the Radiological Emergency Plan (REP) as contained in Revision 42, dated December 22, 1999, to determine whether any of the changes decreased the effectiveness of the REP. No changes to the emergency action levels were made in this revision. The inspector reviewed the Plan changes against the requirements of 10 CFR 50.54(q).

b. Issues and Findings

No findings were identified.

1EP5 Correction of Emergency Preparedness Weaknesses and Deficiencies

a. Inspection Scope

The inspector evaluated the efficacy of licensee programs that addressed weaknesses and deficiencies in emergency preparedness. Documents reviewed included exercise and drill critique reports, Condition Evaluation Reports, and Quality Assurance Report QA-AUD-200002-0, issued March 24, 2000. No emergency declarations had been made since the last NRC inspection of the emergency preparedness program (May 1999).

b. Issues and Findings

No findings were identified.

1EP6 Drill Evaluation

a. Inspection Scope

On April 6, the inspectors observed the performance of an emergency drill conducted to train on the integrated capabilities of the associated emergency response organizations and a major portion of the Virgil C. Summer Nuclear Station Radiation Emergency Plan. This drill was also considered as one of the required health physics drills. Participation of the state and local governments was limited to receiving emergency notification and the associated forms per their request. The inspectors observed various aspects of the drill in the simulator control room, operations support center and technical support center. The inspectors assessed emergency procedure usage, including proper emergency plan classification, notifications and protective area recommendations to ensure the licensee was properly identifying and entering any problems into its corrective action program. This inspection evaluated the adequacy of the licensee's conduct of the drill, critique performance and determined whether the drill was of appropriate scope to be included in the performance indicator statistics.

b. Issues and Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstones: Public Radiation Safety

2PS1 Radioactive Gaseous and Liquid Effluent Treatment Systems and Monitoring Systems

a. Inspection Scope

The licensee's performance to ensure that the gaseous and liquid effluent processing systems are maintained, calibrated, and operated to adequately monitor, evaluate and mitigate radiological releases to members of the public in accordance with TSs, Offsite Dose Calculation Manual (ODCM), and 10 CFR Part 20 requirements was evaluated. During the week of April 10, 2000, the inspectors observed and evaluated activities associated with liquid waste monitor tank processing, sampling, and release; counting room laboratory operations and quality controls; gaseous effluent process equipment and detector installation, operation, and calibrations; and calendar year 1999 effluent release results.

b. Issues and Findings

As of April 10, 2000, the licensee failed to properly calibrate selected atmospheric effluent process monitors. In addition, the inspectors noted the licensee's lack of timeliness in assessing, documenting, and completing corrective actions for a similar issue regarding liquid process monitor calibrations identified during a previous NRC inspection.

During review and discussion of atmospheric process monitor calibrations, the inspectors noted that the current secondary calibration sources for the particulate and gaseous channel detectors were not traceable to the original primary calibrations. The original vendor-supplied secondary sources, traceable to the primary monitor calibrations, were replaced with the current secondary calibration sources in the early 1990's. However, no documentation was available demonstrating the relationship of the monitor response between the original, vendor-supplied, and the current secondary calibration sources. Although traceable to the National Institute of Standards and Technology, documentation or empirical studies relating the current secondary calibration sources' responses to the primary detector calibrations were not available. During the week of April 10, 2000, specific differences in geometries and fabrication methods were identified for the original and current secondary calibration sources. Preliminary evaluations indicated that the source differences could have resulted in a 25 percent bias in the detectors' responses to radioactive material. The identified response bias was determined to be conservative and atmospheric effluent releases would not have resulted in any doses to members of the public in excess of Appendix I to 10 CFR Part 50 design criteria limits or effluent radionuclide concentrations exceeding 10 CFR Part 20.1301 limits. Therefore, in accordance with Public Radiation Safety Significance Determination Process, this finding was considered to be of very low safety significance and within the licensee response band.

The inspectors noted that the failure to properly calibrate the atmospheric particulate and gaseous effluent process monitors was similar to a previously identified non-cited violation (NCV) for liquid process monitor calibrations documented in Inspection Report 50-395/1999-06, issued October 9, 1999. The inspectors observed that licensee evaluations of the extent of condition and corrective actions for the previously identified liquid process monitor calibration issues documented in Condition Evaluation Report (CER) O-C-99-1170 were not prioritized properly nor completed in a timely manner. The subject CER documented that the licensee identified the need to expand the scope of review for secondary calibration source adequacy to all process effluent monitors in September 1999. At that time, an action sequence item was initiated to evaluate all process effluent monitor calibrations for geometry changes but was assigned a "due date" of May 1, 2000. The assigned date for completion of the evaluation of calibration effects was not considered timely. Although not documented, licensee representatives stated that on January 26, 2000, a qualitative review of the effect of the current calibration sources on the atmospheric monitors responses was conducted and the current calibrations were accepted as adequate. The inspectors noted that prior to April 10, 2000, the specific details of observed geometry and fabrication differences between the vendor-provided and current secondary calibration sources and their quantitative effect on monitor responses were not known and could have significantly affected effluent releases activities. Further, the 25 percent conservative detector response bias calculated during the week of April 10, 2000, was identified as resulting from unplanned differences between the original and current secondary source design specifications rather than as a result of a planned detector response.

10 CFR Part 20.1501(b) requires that instruments and equipment used for quantitative radiation measurements (e.g., dose rate and effluent monitoring) are calibrated periodically for the radiation measured. Contrary to the above, as of April 10, 2000, atmospheric process particulate and gaseous monitors were not calibrated properly in that the secondary calibration sources in use since 1990 were not traceable to the original detector calibration response. The inspectors noted that licensee corrective actions for the previously identified NCV (50-395/99006-03) for improper liquid process monitor calibrations were not complete at the time of the inspection and would have included the atmospheric process monitors. Therefore, this failure to properly calibrate the atmospheric particulate and gaseous process monitors is identified and will be tracked as a second example of NCV 50-395/99006-03, issued on October 9, 1999. This second example is in the licensee's corrective action program as CERs 99-1170 and 99-1172.

2PS3 Radiological Environmental Monitoring Program

a. Inspection Scope

The inspectors evaluated the licensee's performance in implementing the Radiological Environmental Monitoring Program (REMP), required by TSs and the ODCM. Reviewed program areas included air sampling equipment calibrations, field sampling station equipment material condition and placement, 1999 REMP results, and inter-laboratory comparison results.

b. Issues and Findings

No findings were identified.

3. SAFEGUARDS

Cornerstone: Physical Protection

3PP1 Access Authorization

a. Inspection Scope

The inspectors reviewed licensee procedures, Fitness For Duty (FFD) reports, and licensee audits. Additionally, the inspectors interviewed representatives of licensee management and escort personnel concerning their understanding of the behavior observation portion of the personnel screening and FFD program. In interviewing these personnel, the inspectors reviewed the effectiveness of their training and abilities to recognize aberrant behavioral traits.

b. Issues and Findings

As of May 2000, the licensee failed to have an adequate procedure that would require for cause chemical testing after accidents that involved a failure in individual performance resulting in personal injury, radiation exposure, or a release of radioactivity in excess of regulatory limits as required by 10 CFR 26.24(a)(3).

Procedure FFD-100, “Chemical Test Requirements,” Revision 5, implements the licensee’s chemical testing program. Upon review, the inspectors determined that Section 5.3, “For Cause Testing,” required the licensee to administer a chemical test for an event that occurred which resulted in radiation exposure or release of radioactivity in excess of regulatory limits and was a result of personnel error due to impairment. This is contrary to the provisions of 10 CFR 26.24(a)(3) which does not require impairment to be observed in order to for cause test.

Additionally, Section 5.3 also required mandatory consideration of chemical testing for violation of industrial safety practices or procedures that result in an injury. Upon further discussion with licensee representatives, the inspector determined that the licensee would consider mandatory for cause testing upon reasonable suspicion or their discretion. This is contrary to the requirements specified in 10 CFR 26.24(a)(3) which requires for cause testing after accidents which involve a personal failure and result in an injury.

The provisions of 10 CFR 26.20 require the licensee to establish and implement written policies and procedures designed to meet the general performance objective and specific requirements of this part. Pending further NRC review to determine the potential generic applicability, this finding is identified as an Unresolved Item (URI): URI 50-395/00004-02: inadequate FFD procedure which fails to require for cause testing after accidents involving a failure in individual performance resulting in personal injury, radiation exposure, or release of radioactivity in excess of regulatory limits.

3PP2 Access Control

a. Inspection Scope

The inspectors observed access control activities and equipment testing conducted during the course of the inspection. In observing the access control activities, the inspectors assessed whether officers could detect contraband prior to being introduced into the protected area. Additionally, the inspectors assessed whether the officers were conducting access control equipment testing in accordance with regulatory requirements through observation, review of procedures, and log entries. The inspector also observed access control activities associated with a licensee conducted annual fire drill.

b. Issues and Findings

There were no findings identified.

3PP3 Response to Contingency Events

a. Inspection Scope

The inspectors observed two licensee force-on-force drills to determine if the provisions of the Physical Security Plan (PSP) were met.

b. Issues and Findings

There were no findings identified and documented during this inspection.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification

.1 Auxiliary Feedwater System (AFW) Performance Indicator (PI)

a. Inspection Scope

The inspectors verified the accuracy of the 1ST quarter 2000 PI for Safety System Unavailability for the AFW system. The inspectors reviewed selective samples of station logs, the licensee's 10 CFR 50.65 maintenance rule database, corrective action program database and restoration and removal logs for the period of January 1999 through March 2000.

b. Issues and Findings

No findings were identified.

.2 High Head Injection System PI

a. Inspection Scope

The inspectors verified the accuracy of the 1ST quarter 2000 PI for Safety System Unavailability for the high head injection system. The inspectors reviewed selective samples of station logs, the licensee's 10 CFR 50.65 maintenance rule database, corrective action program database and restoration and removal logs for the period of January 1999 through March 2000.

b. Issues and Findings

On April 26, 2000, the licensee determined that the PI data for first quarter 2000 did not include approximately 12 unavailability hours for the B train high head injection system. The licensee stated that the correction for the 12 unavailability hours would be contained in the second quarter 2000 PI report submitted to the NRC. The inspectors verified that the performance rating for the first quarter PI would remain in the licensee response (Green) band when the additional unavailability hours are counted. This item is in the licensee's corrective action program as PIP 0-C-00-0535. No other problems associated with the PI accuracy and completeness were found.

.3 ERO Drill/Exercise Performance PI

a. Inspection Scope

The inspector assessed the accuracy of the performance indicator for ERO drill and exercise performance (DEP) through review of documentation. In addition, the inspector reviewed and discussed the licensee's methodology for calculating the DEP PI.

b. Issues and Findings

No findings were identified.

.4 ERO Drill Participation PI

a. Inspection Scope

The inspector assessed the accuracy of the PI for ERO drill participation through review of source records for selected individuals.

b. Issues and Findings

No findings were identified.

.5 Alert and Notification System Reliability PI

a. Inspection Scope

The inspector assessed the accuracy of the PI for ANS reliability through review of the licensee's records of annual full-cycle tests, monthly growl tests, and weekly silent tests.

b. Issues and Findings

No findings were identified.

4OA5 Other

.1 Temporary Instruction 2515/144, "Performance Indicator Data Collecting and Reporting Process Review"

a. Inspection Scope

The inspectors reviewed the licensee's performance indicator data collecting and reporting process to ensure it was appropriately implemented in accordance with Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 0. Station Administrative Procedure (SAP) -1167, "NRC Performance indicators," Revision 0, was reviewed to verify indicator definitions, data reporting elements, calculational methods, definitions of terms and clarifying notes are consistent with NEI 99-02 guidance. The inspectors held discussions with several designated cornerstone managers who are responsible for collecting and verifying performance indicator data, nuclear licensing personnel, the maintenance rule engineer and the system engineer for AFW to ensure they were aware of PI requirements. In conjunction with this inspection, the inspectors verified PI data for the high head injection system and AFW system. The results of that inspection are documented in section 4OA1 of this report

b. Issues and Findings

The nuclear licensing organization's performance indicator worksheets used performance indicator threshold values specified in NEI 99-02, draft Revision D. The licensee promptly corrected the worksheets to reflect the thresholds specified in NEI 99-02, Revision 0. There were no findings identified.

4OA6 Management Meetings

Exit Meeting Summary

The inspectors presented the inspection results to Mr. Steve Byrne, Vice President Nuclear Operations, Bruce Williams, General Manager, Nuclear Plant Operations, and other members of licensee management at the conclusion of the inspection on June 27, 2000. The licensee acknowledged the findings presented.

The inspectors inquired as to whether any of the material examined during the inspection should be considered proprietary. The licensee stated that no proprietary

information was identified.

PARTIAL LIST OF PERSONS CONTACTED

Licensee
J. Archie, Manager, Planning & Scheduling
F. Bacon, Manager, Chemistry Services
L. Blue, Manager, Health Physics and Radwaste
M. Browne, Manager, Nuclear Licensing and Operating Experience
R. Clary, Manager, Plant Life Extension
C. Fields, Manager, Quality Systems
M. Fowlkes, Manager, Operations
L. Hipp, Manager, Nuclear Protection Services
T. Keckeisen, Supervisor, Fire Protection
G. Moffatt, Manager, Design Engineering
K. Nettles, General Manager, Nuclear Support Services
A. Rice, Manager, Plant Support Engineering
B. Waselus, General Manager, Engineering Services (Interim)
R. White, Nuclear Coordinator, South Carolina Public Service Authority
B. Williams, General Manager, Nuclear Plant Operations
G. Williams, Manager, Maintenance Services

NRC
Walt Rogers, Senior Reactor Analyst

ITEMS OPENED AND CLOSED

Opened

50-395/00004-01	URI	review licensee's evaluation of discrepancies between the spent fuel pool ventilation design basis document, technical specifications and surveillance test procedure (Section 1R04.2).
50-395/00004-02	URI	inadequate FFD procedure which fails to require for cause testing after accidents involving a failure in individual performance resulting in personal injury, radiation exposure, or release of radioactivity in excess of regulatory limits (Section 3PP1).

Open and Closed

50-395/99006-03	NCV	second example: failure to properly calibrate particulate and gaseous effluent discharge monitoring equipment in accordance with 10 CFR Part 20.1501(b) requirements (Section 2PS1)
2515/144	TI	Performance Indicator Data Collecting and Reporting Process Review (Section 4OA5.1).

NRC'S REVISED REACTOR OVERSIGHT PROCESS

The federal Nuclear Regulatory Commission (NRC) recently revamped its inspection, assessment, and enforcement programs for commercial nuclear power plants. The new process takes into account improvements in the performance of the nuclear industry over the past 25 years and improved approaches of inspecting and assessing safety performance at NRC licensed plants.

The new process monitors licensee performance in three broad areas (called strategic performance areas): reactor safety (avoiding accidents and reducing the consequences of accidents if they occur), radiation safety (protecting plant employees and the public during routine operations), and safeguards (protecting the plant against sabotage or other security threats). The process focuses on licensee performance within each of seven cornerstones of safety in the three areas:

Reactor Safety	Radiation Safety	Safeguards
● Initiating Events	● Occupational	● Physical Protection
● Mitigating Systems	● Public	
● Barrier Integrity		
● Emergency Preparedness		

To monitor these seven cornerstones of safety, the NRC uses two processes that generate information about the safety significance of plant operations: inspections and performance indicators. Inspection findings will be evaluated according to their potential significance for safety, using the Significance Determination Process, and assigned colors of GREEN, WHITE, YELLOW or RED. GREEN findings are indicative of issues that, while they may not be desirable, represent very low safety significance. WHITE findings indicate issues that are of low to moderate safety significance. YELLOW findings are issues that are of substantial safety significance. RED findings represent issues that are of high safety significance with a significant reduction in safety margin.

Performance indicator data will be compared to established criteria for measuring licensee performance in terms of potential safety. Based on prescribed thresholds, the indicators will be classified by color representing varying levels of performance and incremental degradation in safety: GREEN, WHITE, YELLOW, and RED. GREEN indicators represent performance at a level requiring no additional NRC oversight beyond the baseline inspections. WHITE corresponds to performance that may result in increased NRC oversight. YELLOW represents performance that minimally reduces safety margin and requires even more NRC oversight. And RED indicates performance that represents a significant reduction in safety margin but still provides adequate protection to public health and safety.

The assessment process integrates performance indicators and inspection so the agency can reach objective conclusions regarding overall plant performance. The agency will use an Action Matrix to determine in a systematic, predictable manner which regulatory actions should be taken based on a licensee's performance. The NRC's actions in response to the significance (as represented by the color) of issues will be the same for performance indicators as for inspection findings. As a licensee's safety performance degrades, the NRC will take more and increasingly significant action, which can include shutting down a plant, as described in the Action Matrix.

More information can be found at: http://www.nrc.gov/NRR/OVERSIGHT/index.html.