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

July 15, 2004

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 05000395/2004003

Dear Mr. Byrne:

On June 26, 2004, the United States 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 July 1, 2004, 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 two self-revealing findings were identified. These findings were determined to involve violations of NRC requirements. However, because of their very low safety significance and because they were entered into your corrective action program, the NRC is treating these findings as non-cited violations (NCV) consistent with Section VI.A of the NRC Enforcement Policy. If you contest any NCV in this report, 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 2.390 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: Inspection Report 05000395/2004003
w/Attachment: Supplemental Information

cc w/encl.:
R. J. White
Nuclear Coordinator (Mail Code 802)
S.C. Public Service Authority
Virgil C. Summer Nuclear Station
Electronic Mail Distribution

Kathryn M. Sutton, Esq.
Winston and Strawn
Electronic Mail Distribution

Henry J. Porter, Assistant Director
Division of Waste Mgmt.
Dept. of Health and Environmental Control
Electronic Mail Distribution

R. Mike Gandy
Division of Radioactive Waste Mgmt.
S.C. Department of Health and Environmental Control
Electronic Mail Distribution

Jeffrey B. Archie, General Manager
Nuclear Plant Operations (Mail Code 303)
South Carolina Electric & Gas Company
Virgil C. Summer Nuclear Station
Electronic Mail Distribution

Ronald B. Clary, Manager
Nuclear Licensing & Operating Experience (Mail Code 830)
South Carolina Electric & Gas Company
Virgil C. Summer Nuclear Station
Electronic Mail Distribution

U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.:	50-395
License No.:	NPF-12
Report No.:	05000395/2004003
Licensee:	South Carolina Electric & Gas (SCE&G) Company
Facility:	Virgil C. Summer Nuclear Station
Location:	P. O. Box 88 Jenkinsville, SC 29065
Dates:	March 28, 2004 - June 26, 2004
Inspectors:	J. Reece, Acting Senior Resident Inspector (3/7/04 - 5/29/04) S. Sanchez, Acting Senior Resident Inspector (5/30/04 - 6/26/04) M. King, Resident Inspector L. Garner, Senior Project Engineer, RII (Sections 4OA1 and 4OA3)
Approved by:	K. D. Landis, Chief Reactor Projects Branch 5 Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000395/2004003; 3/28/2004 - 06/26/2004; Virgil C. Summer Nuclear Station; Routine Integrated Report.

The report covered a three month period of inspection by resident inspectors and an announced inspection by one regional senior reactor inspector. Two Green self-revealing 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. A self-revealing non-cited violation (NCV) regarding inadequate corrective action associated with weld repairs on the C reactor coolant pump seal injection line was identified.

  This finding was a violation of 10 CFR 50, Appendix B, Criterion XVI, Corrective Action. This finding is more than minor because it affected the initiating event cornerstone objective and the respective attribute of equipment performance. The finding is of very low safety significance because the axial orientation of the crack in the seal injection line did not contribute significantly to the likelihood of a primary loss of coolant accident and the likelihood of both a reactor trip and the loss of mitigating functions. (Section 4OA2)

Cornerstone: Mitigating Systems

- Green. A self-revealing non-cited violation (NCV) regarding inadequate control of quality related drawings resulting in the loss of reactor coolant system pressurizer heater control was identified.

  This finding was a violation 10 CFR Part 50, Appendix B, Criterion VI, Document Control. This finding is more than minor because if left uncorrected it would become a more significant safety concern due to the extensive use of quality related controlled drawings in the process of maintenance involving safety-related structures, systems and components. The finding is of very low safety significance due to the brief period pressurizer heater control was lost, the availability of an alternate pressurizer heater control circuit, and no actual loss of safety function occurred. (Section 1R20)

B. Licensee-Identified Violation

None.

REPORT DETAILS

Summary of Plant Status

The unit remained at or near full power operation during the inspection period with the exception of a forced outage due to reactor coolant system (RCS) pressure boundary leakage associated with a socket weld leak on the C reactor coolant pump (RCP) seal injection line. The unit initiated a shutdown on March 30, 2004, and returned to full power operation on April 12, 2004. Section 1R20 has details of the forced outage inspections.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection

a. Inspection Scope

The inspectors performed one adverse weather inspection for readiness of extreme hot weather. The inspectors evaluated implementation of adverse weather procedure Operations Administrative Procedure, OAP-109.1, "Guidelines for Severe Weather," for the service water system (SWS), control rod drive mechanism cooling system, and auxiliary building penetration access area ventilation system.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment

.1 Availability of Redundant Equipment

a. Inspection Scope

The inspectors conducted three partial equipment alignment walkdowns (listed below) to evaluate the operability of selected redundant trains or backup systems, with the other train or system inoperable or out of service (OOS). Correct alignment and operating conditions were determined from the applicable portions of drawings, system operating procedures (SOPs), Final Safety Analysis Report (FSAR), and Technical Specifications (TS). The inspections included review of outstanding maintenance work requests (MWRs) and related condition evaluation reports (CERs) to verify that the licensee had properly identified and resolved equipment alignment problems that could impact mitigating system availability. Specific procedures and documents reviewed are listed in the Attachment to this report.

- B emergency diesel generator (EDG) while A EDG was OOS for scheduled maintenance;
- A EDG while B EDG was OOS for scheduled maintenance; and,
- B SWS while A SWS was OOS for scheduled maintenance.

b. Findings

No findings of significance were identified.

.2 Semiannual Inspection

a. Inspection Scope

The inspectors performed a detailed review and walkdown of the emergency feedwater (EFW) system. The inspectors reviewed outstanding MWRs and related CERs to verify that the licensee had properly identified and resolved equipment problems that could affect the availability, reliability and operability of the EFW system components. Specific procedures and documents reviewed are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

1R05 Fire Protection

a. Inspection Scope

The inspectors reviewed recent CERs, MWRs, 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 nine areas (respective fire zones also noted):

- Control room (fire zone CB-17.1);
- Relay room solid state protection system instrumentation and inverter (fire zones CB-6, 10, and 12);
- Intermediate building 412' general area, component cooling water (CCW) pumps and heat exchangers and SWS booster pumps (fire zones IB-25.1.1, 1.2, 1.3, and 1.5);
- EDG rooms A and B (fire zones DG-1.1/1.2 and DG-2.1/2.2);
- Turbine driven emergency feedwater (TDEFW) pump room (fire zone IB-25.2);
- Charging pump rooms A, B, and C (fire zones AB-1.5, 1.6, and 1.7);
- Heating, ventilation, and air conditioning chilled water pump rooms A and B (fire zones IB-7.2, 9, and 23.1);
- Battery and battery charger rooms A and B (fire zones IB-2, 3, 4, 5 and 6); and,
- Control building 425' and 448' cable spreading rooms (fire zones CB-4 and CB-15).

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures

a. Inspection Scope

The inspectors reviewed the licensee's external flood mitigation plans to determine consistency with design requirements, FSAR Sections 2.4.2 through 2.4.10, flood analysis documents, and Emergency Plan Procedure (EPP)-015, "Natural Emergency (Earthquake, Tornado, Hurricane)." The inspectors performed walkdowns of the station to verify features remained as described in the FSAR. The inspectors also performed visual examination of the storm drain system inside and outside the protected area to verify that drains were not blocked and the ground was properly graded to channel water into the system. Walkdowns were conducted of the interior and/or exterior walls of the auxiliary and intermediate buildings, service water pump house and diesel generator building to assess seasonal susceptibilities. The inspectors also reviewed the following CERs to verify corrective actions taken or planned to address identified deficient conditions.

- CER 0-C-01-2345, Visual Inspection and Elevation Survey of North Berm, Revision 1;
- CER 0-C-04-1514, North Berm 438'-0" Elevation Less Than Design in FSAR.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program

a. Inspection Scope

On May 24, 2004, the inspectors observed performance of senior reactor operators and reactor operators on the plant simulator during licensed operator requalification training. The training scenario involved a loss of all power (LOR-ST-041). 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 evaluators' critique. The inspectors verified that any training issues were appropriately captured in the licensee's corrective action program (CAP).

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

The inspectors evaluated two equipment issues described in the CERs listed below to verify the licensee's effectiveness of the corresponding preventive or corrective maintenance associated with structures, systems or components (SSCs). The

inspectors reviewed maintenance rule (MR) implementation to verify that component and equipment failures were identified, entered, and scoped within the MR program. Selected SSCs were reviewed to verify proper categorization and classification in accordance with 10 CFR 50.65. The inspectors examined (a)(1) corrective action plans to determine if the licensee was identifying issues related to the MR at an appropriate threshold and that corrective actions were established and effective. The inspectors' review also evaluated if maintenance preventable functional failures (MPFF) or other MR findings existed that the licensee had not identified. Inspectors reviewed the licensee's controlling procedures Engineering Services Procedure (ES)-514, "Maintenance Rule Implementation," and the Virgil C. Summer "Important To Maintenance Rule System Function and Performance Criteria Analysis" to verify consistency with the MR requirements.

- CER 0-C-04-1039, failure of steam propagation door, DRIB/103 to close and latch; and,
- CERs 0-C-04-0790 and 0-C-04-0791, Evaluation of Leak Detection System Level Switch Failures.

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control

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 five selected SSCs and or emergent work 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 characterization to determine, as appropriate, whether necessary steps were properly planned, controlled, and executed for the planned and emergent work activities listed below:

- Removal and Restoration (R&R) 040152, Diesel driven fire pump OOS for preventative maintenance (PM) and testing with instrument air cooling water throttled and a reactor trip initiator involving RCS pressure boundary leakage;
- R&R 040198, A SWS booster pump OOS for PM with R&R 040193, A SWS pump OOS for PM;
- R&R 040217, A EDG OOS for quarterly maintenance;
- R&R 040233, B EDG OOS for quarterly maintenance; and,
- MWR 410578, Perform troubleshooting plan for RCS leakage.

b. Findings

No findings of significance were identified.

1R14 Operator Performance During Non-Routine Evolutions and Events

a. Inspection Scope

The inspectors evaluated operators' preparations and response to C RCP seal injection nozzle leakage, unit shutdown, manual turbine trip and automatic reactor trip, on March 30 (CER 0-C-04-0884), to ensure they were appropriate and in accordance with the required procedures. The inspectors also evaluated performance and equipment problems to ensure that they were entered into the CAP.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed three 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 limiting conditions for operations and the risk significance in accordance with the Significance Determination Process (SDP). The inspectors verified that the operability evaluations were performed in accordance with procedure SAP-1131, "Corrective Action Program."

- CER 0-C-04-1093, DRIB/103 found blocked slightly ajar by edge of protected equipment warning sign;
- CER 0-C-04-0728, monthly residual heat removal (RHR) system venting per procedure STP-105.006 identified a small amount of gas at RHR vent valve XVT0007B-RH;
- CER 0-C-04-1692, determine the affect racking-up of a dummy breaker on the C CCW pump has on B train CCW operability.

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing (PMT)

a. Inspection Scope

For the six PMTs listed below, the inspectors reviewed the test procedure and witnessed either the testing and/or reviewed test records to assess whether: (1) the effect of testing on the plant had been adequately addressed by control room and/or engineering personnel; (2) testing was adequate for the maintenance performed; (3) acceptance

criteria were clear and adequately demonstrated operational readiness consistent with design and licensing basis documents; (4) test instrumentation had current calibrations, range, and accuracy consistent with the application; (5) tests were performed as written with applicable prerequisites satisfied; (6) jumpers installed or leads lifted were properly controlled; (7) test equipment was removed following testing; and (8) equipment was returned to the status required to perform its safety function. The inspectors verified that these activities were performed in accordance with General Test Procedure (GTP)-214, "Post Maintenance Testing Guideline."

- MWR 407432, replace TDEFW lube oil relief valve with new valve per ETBT-70491;
- PMT Sheet 0316972, change A EDG rocker arm lube oil filters;
- MWR 407315, perform VT-2 leakage inspection on C RCP seal injection piping weld repairs;
- MWR 410644, repair oil leak at flange in oil header on B EDG;
- PMT Sheet 0304076, ten year motor inspection on C CCW pump; and
- MWR 411249, leak on discharge side of A EDG lube oil pump.

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activities

a. Inspection Scope

On March 30, 2004, the unit began a forced outage which was completed on April 11, 2004. During the outage, the inspectors reviewed the licensee's outage risk control plan to verify that the licensee had appropriately considered risk, industry experience and previous site specific problems, and to confirm that the licensee had mitigation/response strategies for losses of key safety functions. In the area of licensee control of outage activities, the inspectors reviewed equipment removed from service to verify that defense-in-depth was maintained commensurate with the outage risk control plan for key safety functions and applicable TS, and that configuration changes due to emergent work and unexpected conditions were controlled in accordance with the outage risk control plan.

The inspectors reviewed selected components which were removed from service to verify that tags were properly installed and that associated equipment was appropriately configured to support the function of the clearance.

During the outage, the inspectors:

- Reviewed RCS pressure, level, and temperature instruments to verify that those instruments were installed and configured to provide accurate indication; and that instrumentation error was accounted for;

- Reviewed the status and configuration of electrical systems to verify that those systems met TS requirements and the licensee's outage risk control plan. The

inspectors also evaluated if switchyard activities were controlled commensurate with their safety and if they were consistent with the licensee's outage risk control plan assumptions;

- Observed licensee control of containment penetrations to verify that the licensee controlled those penetrations in accordance with the appropriate TS and could achieve containment closure for required conditions;

- The inspectors examined the spaces and cubicles inside the reactor building prior to reactor startup to verify that debris had not been left which could affect performance of the containment sumps.

The inspectors also reviewed the following activities for conformance to applicable procedural and TS requirements:

- monitoring of shutdown activities;
- decay heat system operations;
- inventory control and measures to provide alternative means for inventory addition;
- reactivity controls;
- reactor heatup, startup and power ascension activities.

The inspectors reviewed various problems that arose during the outage to verify that the licensee was identifying problems related to outage activities at an appropriate threshold and entering them in the CAP. The more significant CERs that were specifically reviewed by the inspectors are listed below.

- CER 0-C-04-0879, C RCP seal injection pressure boundary leakage;
- CER 0-C-04-0866, main turbine vibration results in manual turbine trip;
- CER 0-C-04-0884, C Steam Generator (SG) control valve failure results in automatic reactor trip;
- CER 0-C-04-0952, RCS level difference between pressurizer and reactor vessel on Mansell instrumentation;
- CER 0-C-04-0953, damaged snubber on RCS piping;
- CER 0-C-04-1101, shutdown risk management procedures are not quality related;
- CER 0-C-04-1070, during extended use of SG Power Operated Relief Valves, the respective tailpipe drains allowed steam accumulation in the 463' west penetration room with a resultant failure of a safety-related containment pressure transmitter; and
- CER 0-C-04-1069, pressurizer level transmitter ILT00459 failed low while attempting to electrically isolate containment pressure transmitter IPT00950 on Work Order 0407763.

b. Findings

A corrective action violation associated with the C RCP seal injection pressure boundary leakage is discussed in Section 4OA2.

Introduction: A self-revealing, Green, NCV regarding inadequate control of quality related drawings resulting in loss of RCS pressurizer heater control was identified.

Description: On April 11, 2004, during a maintenance troubleshooting evolution, technicians used a controlled drawing, VCS-IPT00959-SI, to determine which wiring leads to lift in order to isolate a failed containment pressure transmitter, IPT00950. The size of this controlled drawing along with other controlled drawings contained in a binder was 11 inches by 17 inches and resulted in illegible wiring lead labels. As a result, the technicians identified the incorrect wiring leads and subsequently isolated the controlling transmitter for RCS pressurizer level, ILT00459. This resulted in the loss of letdown flow and the loss of pressurizer heaters due to the erroneous low pressurizer level indication. Control room personnel entered the appropriate abnormal operating instruction to respond to the event and return the plant to a stable condition by selecting an alternate pressurizer level transmitter for control and subsequent restoration of letdown flow.

Analysis: This finding adversely impacted RCS pressurizer pressure control which is used for enhancement of RCS natural circulation to support decay heat removal during a loss of offsite power event. This finding is more than minor because if left uncorrected it would become a more significant safety concern due to the extensive use of quality related controlled drawings in the process of maintenance involving safety-related SSCs. An analysis using the SDP determined that the finding was of very low safety significance (Green) due to the brief period pressurizer heater control was lost, the availability of an alternate pressurizer heater control circuit, and no actual loss of safety function occurred.

Enforcement: Title 10, Code of Federal Regulations (CFR), Part 50, Appendix B, Criterion VI, Document Control, requires in part that measures shall be established to control the issuance of documents such as drawings which prescribe all activities affecting quality, and that measures shall assure that documents are reviewed for adequacy. Contrary to the above on April 11, 2004, inadequate quality related controlled drawings were used during the performance of a maintenance activity resulting in the isolation of an incorrect component leading to the brief loss of RCS pressurizer heater control. Because the finding is of very low safety significance and because it has been entered into the CAP as CER 0-C-04-1069, this violation is being treated as a NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 50-395/2004003-01, Inadequate Control of Quality Related Drawings Results in Loss of RCS Pressurizer Heater Control.

1R22 Surveillance Testing

a. Inspection Scope

For the six 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-220.002, “Turbine Driven Emergency Feedwater Pump and Valve Test”;
- STP-223.002A, “Service Water Pump B and Valve Test” (IST);
- STP-125.002A, “Diesel Generator A Operability Test”;
- STP-205.003, “Charging/Safety Injection Pump and Valve Test”;
- STP-125.002A, “Diesel Generator A Operability Test” (re-test after repair of lube oil leak); and,
- STP-501.002, “Battery Quarterly Surveillance Test.”

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed MWR 410005, Temporarily Revise A SG Level Setpoints to Evaluate Feedwater Flow Transients, to verify that the temporary modification did not affect system operability or availability as described by the TS and FSAR. In addition, the inspectors verified that the installation of the temporary modification was in accordance with the work package, that adequate configuration control was in place, procedures and drawings were updated, and post-installation tests verified operability of the affected systems.

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation

a. Inspection Scope

On May 26, 2004, the inspectors reviewed and observed the performance of one simulator drill that involved a loss of secondary heat sink (LOR-SA-015) which required the declaration of a site area emergency. The inspectors assessed emergency procedure usage, emergency plan classification, notifications, and the licensee’s identification and entrance of any problems into their CAP. This inspection evaluated the adequacy of the licensee’s conduct of the drill and critique performance.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification

Reactor Safety: Mitigating Systems Cornerstone

a. Inspection Scope

To verify the accuracy of the data reported from April 1, 2003, to March 31, 2004, for the three PIs listed below, the inspectors used PI definitions and guidance contained in Nuclear Energy Institute (NEI) 99-02, “Regulatory Assessment Performance Indicator Guideline,” Revision 2, and reviewed data from a selection of station logs, corrective action program documents, and PI data sheets. The inspectors also utilized responses contained in the NRC's PI frequently asked question database, licensee surveillance and operating procedures, Technical Specifications, and Operations Department Pre-job Brief sheets to verify that the licensee was appropriately applying the "a few simple steps" exclusion on page 27 of NEI 99-02. In addition, the inspectors interviewed licensee personnel associated with the PI data collection, evaluation and distribution. The inspectors verified data for the following three PIs:

- Safety System Unavailability, High Pressure Injection System;
- Safety System Unavailability, Emergency AC Power;
- Safety System Unavailability, Residual Heat Removal System.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems

.1 Annual Sample Review

a. Inspection Scope

The inspectors selected CER 0-C-04-0879 for detailed review. This CER was associated with RCS pressure boundary leakage on the C RCP seal injection socket weld. The CER was reviewed to ensure that the full extent of the issues was identified, an appropriate evaluation was performed, and appropriate corrective actions were specified and prioritized. The inspectors evaluated the CER against the requirements of the licensee’s CAP as delineated in Station Administrative Procedure (SAP)-1131, Corrective Action Program, and 10 CFR 50, Appendix B.

b. Findings and Observations

Introduction: A self-revealing, Green, NCV regarding inadequate corrective action for a weld repair on C RCP seal injection line was identified.

Description: On March 30, 2004, in response to increasing unidentified RCS leakage, the licensee identified leakage at the socket to nozzle weld on the C RCP seal injection

line. This leakage was characterized as RCS pressure boundary leakage and therefore required a plant shutdown as delineated by TS 3.4.6.2. During the plant shutdown, operators performed a manual turbine trip due to high vibration on the main turbine which was followed by an automatic reactor trip due to low steam generator water level. The licensee initiated CERs 0-C-04-0879 and 0-C-04-0988, respectively, to document the nonconforming condition associated with the weld leak and the root cause evaluation with related corrective actions. The licensee's root cause evaluation determined that the leak was due to an axial crack in the weld resulting from a hot tear crack initiator and subsequent propagation from high cycle, low amplitude fatigue stress. During the previous refueling outage (October 2003), the licensee cut out and replaced the seal injection nozzle due to seepage discovered during the outage. However, due to improper welding techniques of the initial weld root pass during that evolution, a crack initiator or hot tear was created. The licensee also determined that previous removal of a spring-can hanger during support / restraint reduction modifications contributed to elevated vibration of the seal injection piping. During subsequent plant operation this vibration or low amplitude, high cycle fatigue propagated the axial crack through the weld resulting in approximately 0.2 gallons per minute of seal injection leakage. Therefore, the licensee's inadequate corrective action involving improper weld repair that created a crack initiator and improper pipe support resulted in an axial crack with subsequent leakage that forced a unit shutdown. The March 2004 leak is discussed in Licensee Event Report (LER) 05000395/2004-001-00. The leak found during the last refueling outage is discussed in LERs 05000395/2003-004-00 and -01.

Analysis: This finding adversely impacted the initiating events cornerstone and respective attribute of equipment performance because the weld leak necessitated a plant shutdown that also involved a manual turbine trip and automatic reactor trip. Therefore, this finding is more than minor. An analysis using the SDP determined that the finding was of very low safety significance (Green). The inspectors' review of the failure analysis verified that the axial crack was confined to one location and the remainder of the weld had no flaws. Thus, the finding did not contribute significantly to the likelihood of a primary or secondary system LOCA initiator, did not contribute to a loss of mitigation equipment functions, and did not increase the likelihood of a fire or internal/external flood. The cause of the finding involved the cross-cutting areas of human performance and problem identification and resolution.

Enforcement: 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, requires in part that in the case of significant conditions adverse to quality, measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition. Contrary to the above, on March 30, 2004, the licensee identified leakage on the C RCP seal injection line socket weld which was attributed to an improper weld performed during the previous refueling outage and improper seal injection line support which resulted in high vibrations, low amplitude fatigue stress. Similarly, fatigue stress or overloading of the seal injection line resulted in the nozzle and weldment being replaced in 2003. Because the finding is of very low safety significance and because it has been entered into the CAP as CERs 0-C-04-0879 and 0-C-04-0988, this violation is being treated as a NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 50-395/2004003-02, Inadequate Corrective Action Results in Recurring Leakage on C RCP Seal Injection Weld.

.2 Daily Reviews

a. Inspection Scope

As required by Inspection Procedure 71152, "Identification and Resolution of Problems," and in order to help identify repetitive equipment failures or specific human performance issues for followup, the inspectors performed a daily screening of items entered into the licensee's CAP. This review was accomplished by reviewing daily CER summary reports and attending daily CER review meetings.

b. Findings and Observations

There were no findings of significance identified.

.3 Semi-Annual Trend Review

a. Inspection Scope

As required by Inspection Procedure 71152, "Identification and Resolution of Problems," the inspectors performed a review of the licensee's CAP and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors' review was focused on repetitive equipment issues, but also considered the results of daily inspector CAP item screening discussed in Section 4OA2.2, licensee trending efforts, and licensee human performance results. The inspectors' review nominally considered the six month period of January 2004 through June 2004. The review also included issues documented outside the normal CAP in system health reports, quality assurance audit/surveillance reports, self assessment reports, and maintenance rule assessments.

b. Findings and Observations

There were no findings of significance identified. The biennial baseline inspection of the problem identification and resolution program, was recently completed on May 14, 2004, and was documented in IR 05000395/2004-006. Subsequent to completion of the biennial baseline inspection the inspector observed that the licensee routinely reviewed cause codes, involved organizations, and system links to identify potential trends in their CAP data. The inspectors compared the licensee process results with the results of the inspectors' daily screening and did not identify any discrepancies or potential trends in the CAP data that the licensee had failed to identify.

4OA3 Event Followup

.1 (Closed) LER 05000395/2003-004-01: Reactor Coolant Pump Seal Injection Nozzle Leakage

This supplemental LER was issued to document the metallurgical analysis results on the seal injection line nozzle failure. However, the exact cause of the failure could not be determined since the flaw was not in sample sent to the laboratory for testing. However, pump vibration data and the weld sample surface features suggested conditions were

favorable for fatigue cracking. The licensee's preliminary assessment indicated that overloading or mechanical vibration was the probable failure cause. The original LER was closed and a licensee-identified violation was identified in NRC Integrated Inspection Report 05000395/2003005.

Furthermore, a weld associated with the replaced nozzle experienced a leak in March 2004. This latter event is discussed in Section 4OA2.1 of this report.

.2 (Closed) LER 05000395/2004001-00: Reactor Trip Due to Valve Failure During Forced Shutdown.

The inspectors reviewed the corrective actions, taken and proposed, to address the three reportable events discussed in this LER. The three reportable events were, pressure boundary leakage, the resulting forced shutdown and the automatic reactor trip on low steam generator level. A violation for failure to take adequate corrective action to preclude the pressure boundary leakage is discussed in Section 4OA2.1 of this report. The inspectors determined that the licensee's actions described in the LER were sufficient to address the other two events.

4OA5 Other Activities

(Open) NRC Temporary Instruction (TI) 2515/156, "Offsite Power System Operational Readiness."

a. Scope

The inspectors collected data from licensee maintenance records, event reports, corrective action documents and procedures and through interviews of station engineering, maintenance, and operations staff, as required by the Temporary Instruction (TI) 2515/156. The data was gathered to assess the operational readiness of the offsite power systems in accordance with NRC requirements such as Appendix A to 10 CFR Part 50, General Design Criterion (GDC) 17; Criterion XVI of Appendix B to10 CFR Part 50, Plant Technical Specifications (TS) for offsite power systems; 10 CFR 50.63; 10 CFR 50.65 (a)(4), and licensee procedures.

b. Findings

No findings of significance were identified. Based on the inspection, no immediate operability issues were identified. In accordance with TI 2515/156 reporting requirements, the inspectors provided the required data to the headquarters staff for further analysis. This TI will remain open pending completion of that analysis.

4OA6 Meetings, Including Exit

Exit Meeting Summary

The inspectors presented the inspection results to Mr. S. Byrne and other members of the licensee staff on July 1, 2004. The inspectors asked the licensee whether any of the

material examined during the inspection should be considered proprietary. No proprietary information was identified.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

J. Archie, General Manager, Nuclear Plant Operations
F. Bacon, Manager, Chemistry Services
L. Blue, Manager, Health Physics Services
M. Browne, Manager, Quality Systems
R. Clary, Manager, Nuclear Licensing and Operating Experience
M. Findlay, Manager, Nuclear Protection Services
M. Fowlkes, General Manager, Engineering Services
T. Franchuk, Supervisor, Quality Assurance
S. Furstenberg, Manager, Nuclear Operations Training
D. Gatlin, Manager, Operations
D. Goldston, Operations Superintendent
D. Lavigne, General Manager, Organization Effectiveness
T. Matlosz, Manager, Organization Development and Performance
J. Nesbitt, Manager, Materials and Procurement
K. Nettles, General Manager, Nuclear Support Services
W. Stuart, Manager, Plant Support Engineering
R. Sweet, Supervisor, Nuclear Licensing and Operating Experience
A. Torres, Manager, Planning / Scheduling and Project Management
R. White, Nuclear Coordinator, South Carolina Public Service Authority
S. Zarandi, Manager, Maintenance Services

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed		
50-395/2004003-01	NCV	Inadequate Control of Quality Related Drawings Results in Loss of RCS Pressurizer Heater Control (Section 1R20)
50-395/2004003-02	NCV	Inadequate Corrective Action Associated with Weld Repairs on C RCP Seal Injection Line (Section 4OA2.1)
Closed		
05000395/2003-004-01	LER	Reactor Coolant Pump Seal Injection Nozzle Leakage (Section 4OA3.1)
05000395/2004-001-00	LER	Reactor Trip Due to Valve Failure During Forced Shutdown (Section 4OA3.2)
Discussed		
2515/156	TI	Offsite Power System Operational Readiness (Section 4OA5)

LIST OF DOCUMENTS REVIEWED

Section 1R04: Equipment Alignment

FSAR Sections 8.3 and 10.4.9
SOP-306, “Emergency Diesel Generator”
SOP-211, “Emergency Feedwater System”
SOP-117, “Service Water System”
TS 3/4.7.1.2, Emergency Feedwater System
TS 3/4.8.1, A.C. Sources
Design Basis Documents for SW, EDG, and EFW systems
List of open CER’s for EFW system
List of open MWR’s for EFW system
CER 0-C-04-1642, NRC-identified problem of high oil level in the A EDG turbocharger