February 10, 2000

South Carolina Electric & Gas Company
ATTN: Mr. Gary J. Taylor
Vice President, Nuclear Operations
Virgil C. Summer Nuclear Station
P. O. Box 88
Jenkinsville, SC 29065

SUBJECT: NRC INTEGRATED INSPECTION REPORT NO. 50-395/1999009

Dear Mr. Taylor:

On January 15, 2000, the NRC completed an inspection at your Virgil C. Summer Nuclear Station. The enclosed report presents the results of that inspection.

During the six weeks covered by this inspection period, your conduct of activities at the Virgil C. Summer Nuclear Station was generally characterized by safe plant operations, conservative management decisions, good maintenance and radiological protection practices.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be placed in the NRC Public Document 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

cc w/encl: See page 2

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REGION II

Docket No.:	50-395
License No.:	NPF-12
Report No.:	50-395/1999009
Licensee:	South Carolina Electric & Gas (SCE&G)
Facility:	Virgil C. Summer Nuclear Station
Location:	P. O. Box 88 Jenkinsville, SC 29065
Dates:	December 5, 1999 through January 15, 2000
Inspectors:	M. Widmann, Senior Resident Inspector M. King, Resident Inspector L. Garner, Project Engineer, RII (Sections O7.1 and O8.1) S. Ninh, Reactor Inspector, RII (Section O7.1) M. Scott, Reactor Inspector, RII (Section O7.1)
Approved by:	R. C. Haag, Chief, Reactor Projects Branch 5 Division of Reactor Projects

Enclosure

EXECUTIVE SUMMARY

Virgil C. Summer Nuclear Station
NRC Inspection Report No. 50-395/1999009

This integrated inspection included aspects of licensee operations, maintenance, engineering, and plant support. The report covers a six-week period of resident inspection; in addition, it includes the results of an announced inspection of the licensee's corrective action program.

Operations

- Inspection and review of the residual heat removal system concluded that system readiness, including valve alignments, were consistent with approved procedures and system drawings. Material condition of the system was adequate (Section O2.1).

- The licensee's preparations for the year 2000 (Y2K) transition, including issuance of integrated contingency plans, were appropriate. Precautions taken to avoid unnecessary complications during the Y2K transition (i.e., setting back the integrated plant computer system date) demonstrated conservative management decision making. All systems continued to operate properly with no known Y2K induced errors (Section O2.2).

- In the areas of operations, maintenance, and engineering, the corrective action program was adequately addressing equipment, human performance, procedure and program problems. Corrective actions were properly analyzed, technically valid and effectively tracked through completion. The licensee was effective in utilizing quality assurance audits, internal self-assessments, operating experience, and other similar programs, to correct deficiencies (Section O7.1).

Maintenance

- The inspectors concluded that routine maintenance and surveillance activities were satisfactorily performed (Section M1.1).

Plant Support

- The ALARA (As Low As is Reasonably Achievable) meeting placed an appropriate emphasis and proper perspective on radiological safety and is making a conscience effort to reduce radiation exposure to plant personnel (Section R1.1).

- As compared to a 1998 drill, a marked improvement was observed in the performance of the 1999 post accident sampling system drill. The inspectors concluded that the licensee has in place the necessary equipment, procedures and trained chemistry personnel to collect and analyze post accident samples as required. The licensee appropriately captured in their critique and corrective action process areas for improvement to reduce the time for sampling and analysis (Section R1.2).

- The inspectors concluded that the licensee implementation of compensatory measures for one-hour Kaowool fire barriers was appropriate as an interim measure until a final resolution can be determined (Section F2.1).

Report Details

Summary of Plant Status

The unit operated at or near 100 percent power for the entire inspection period.

I. Operations

O1 Conduct of Operations

O1.1 General Comments (71707)

The inspectors conducted frequent reviews of ongoing plant operations. In general, the conduct of operations was professional and safety-conscious. Specific events and noteworthy observations are detailed in the sections below.

O2 Operational Status of Facilities and Equipment

O2.1 Engineered Safety Feature System Walkdown

a. Inspection Scope (61726, 71707)

The inspectors conducted a walk down of accessible portions of the residual heat removal (RHR) system.

b. Observations and Findings

The inspection included verification of system alignment per station system procedures, system component material condition, and accuracy of as-built drawings. No procedure discrepancies or improper valve alignments were identified. Component labels were consistent with system drawings. Although the general condition of the system components was adequate, some minor pump casing gasket leakage was evident (boron crystals) on the RHR pump casing bolts. The licensee has been aware of the issue and is continuing to monitor the leakage as part of a leakage assessment program. Periodically, the licensee cleans and removes the excess boron from the bolts and evaluates any deterioration of the bolts. To date, the evaluations have identified no operational impact as a result of the leakage. The inspectors reviewed the portions of the Final Safety Analysis Report (FSAR) and determined that operational practices, procedural requirements and system lineups were consistent with the FSAR descriptions.

c. Conclusions

Inspection and review of the residual heat removal system concluded that system readiness, including valve alignments, were consistent with approved procedures and system drawings. Material condition of the system was adequate.

O2.2 Year 2000 (Y2K) Preparations

a. Inspection Scope (71707)

The inspectors reviewed and observed licensee preparations and contingency plans in anticipation of the Y2K transition.

b. Observations and Findings

On New Year's eve, December 31, 1999, the inspectors observed the licensee's final preparations for the Y2K rollover, including staff briefings and operations shift turnover. No operation or maintenance activities were planned during this period other than to maintain 100 percent steady-state power operation. The licensee took the precaution of setting back the internal clock on the integrated plant computer system (IPCS) to December 30, 1999, to eliminate the possibility that the computer may contribute to a component or system failure. No other alterations were made to plant system configurations for the Y2K rollover.

In preparation for the Y2K transition, the licensee provided a minimum staff for the technical support center (TSC) to support emergent issues. The General Manager of Nuclear Plant Operations was in the TSC to fulfill the responsibilities of the Emergency Director, if necessary. Extra mechanics, electricians, and instrument & control technicians were also available onsite to support the Y2K activities. The inspectors reviewed the licensee's "Integrated Contingency Plan," Revision 1, and the "Millennium Staffing Plan," and concluded that both documents were adequate to address the needs of the plant during potential emergent issues. As requested, the licensee actively participated in the NRC's Y2K Early Warning System (YEWS) prior to, during, and after the Y2K transition. No issues identified in the YEWS database directly applied to the plant.

The Y2K transition occurred at the Virgil C. Summer station without incident. No equipment, component, or system failures were noted by the licensee. The inspectors' observations during the transition period and five hours afterwards also noted no abnormal plant conditions or equipment failures. On January 1, 2000, the licensee updated the IPCS to the actual time and day. No failures or equipment anomalies occurred as a result of the date change. All systems continued to operate with no known Y2K induced errors.

c. Conclusions

The licensee's preparations for the year 2000 (Y2K) transition, including issuance of integrated contingency plans, were appropriate. Precautions taken to avoid unnecessary complications during the Y2K transition (i.e., setting back the integrated plant computer system date) demonstrated conservative management decision making. All systems continued to operate properly with no known Y2K induced errors.

O7 Quality Assurance in Operations

O7.1 Corrective Action Program

a. Inspection Scope (40500)

The inspection included a review of procedures and various corrective action documents as discussed below. The inspection focused on corrective actions in the operations, maintenance and engineering areas. The effectiveness of the corrective action program to identify and resolve deficiencies was evaluated. Documents previously identified as condition evaluation reports (CERs) are now referred to as primary identification program (PIP) items or just PIPs.

b. Observations and Findings

Corrective Action Program and Processes

The inspectors reviewed the following procedures:

- Quality Systems Procedure (QSP)-106, "Conduct of Quality Assurance Activities," Revision 6A,
- Station Administrative Procedure (SAP) -1131, "Electronic Processing of Condition Evaluation Reports," Revision 1,
- SAP-1141, "Nonconformance Control System Program," Revision 7A,
- Engineering Services (ES)-508, "Evaluation of Abnormal Conditions or Events," Revision 4, and
- SAP-900, "Root Cause Analysis," Revision 4A.

These procedures provided an adequate overall frame work to define, structure and implement: quality assurance audits; PIP generation, processing, tracking and resolution; and evaluations of deficient equipment, human errors and significant events.

Quality Assurance (QA) Audits

The scope and identified items (findings, quality action items, recommendations, and enhancements) from ten QA audits issued between July 15, 1998, and January 5, 2000, were reviewed. The scope of each audit was considered sufficient to sample clearly defined program processes and areas. The scope also incorporated followup for items identified in previous QA audits. A sampling of identified items were verified to either have been properly addressed or entered into a tracking system while corrective actions are developed and implemented. For example, the inspectors determined that the March 1999 refueling QA audit was comprehensive. Audit findings were tracked and properly addressed, and associated corrective actions were implemented.

Self-assessments

The December 1998 operations self-assessment identified areas of strengths, weaknesses, and recommendations for management consideration. The inspectors determined that the self-assessment was thorough and the conclusions were appropriate. However, the inspectors determined that no requirements existed to track or provide formal written responses to operation's self-assessment findings or recommendations. In discussions with operations management, the licensee indicated that a more formal system would be considered for use in the future.

The inspectors reviewed corrective actions initiated by a maintenance self-assessment. Identified items had been appropriately closed through the PIP process.

The inspectors reviewed the plant support engineering and design engineering internal self-assessments efforts. Internal self-assessments combined with benchmarking visits to other plants and by other plant staffs to Virgil C. Summer, and information from operating experience (OE) and the nuclear network were providing meaningful insights and feedback to management. The inspectors concluded that these efforts were effective in enhancing the engineering departments' overall performance and corrective action program performance.

Problem Identification and Resolution

The inspectors reviewed 16 open and closed operations-related PIPs submitted over the period October 1, 1998, through January 10, 2000, to evaluate the ability to identify, characterize, and resolve problems. The inspectors determined that the PIPs were properly screened for operability/reportability and classified in the appropriate action category level. The inspectors verified that, in accordance with procedural requirements, PIPs were reviewed in a timely manner, properly assigned to the responsible group for evaluation and resolution, and assessed if a root cause evaluation was needed.

The inspectors reviewed 15 maintenance-related PIPs that had been generated within the January 1, 1999, to January 1, 2000, period. The PIPs met program requirements, provided program required information, and, when required, properly provided corrective actions. Details of the PIPs were discussed with maintenance and system engineering personnel. Corrective actions were verified to be complete or the PIPs had open identified action pending.

The inspectors reviewed seven preventive and eight corrective completed work order (WO) packages performed during the last two years. The packages were selected from risk sensitive systems (safety injection, service water, nuclear instrumentation, and emergency feedwater) and were performed mainly during periods with potentially high human error rates, such as outages. These packages were properly completed with appropriate testing and administrative requirements performed.

The inspectors reviewed more than 25 PIPs resolved by design engineering and plant support engineering and reviewed all open and several closed Nonconformance Notices. All items reviewed reasonably addressed the issues with appropriate corrective

actions being implemented or scheduled for completion with deadlines commensurate with the safety and risk significance of the issues. In addition, review of numerous ES-508 reports dating back to October 1998 identified no significant issues. Specific observations on engineering-related PIPs, which were discussed with the licensee, included the following:

- PIP 0-C-99-1026 involved operator response times listed in the FSAR having not been verified. Multiple corrective actions were necessary to resolve the PIP; however, these actions were being tracked as one action item with one due date. The licensee was responsive to this observation and indicated that they would issue separate specific corrective action items and due dates to address the many issues involved with closure of this PIP. The inspectors were satisfied with the evaluations, the actions already implemented and the action plan development for resolution of the PIP.

- Recently, several PIPs have been generated concerning the completeness of closed engineering change request (ECR) packages. An independent contractor identified "potential additional document, drawings or database updates or Engineering Actions to support package closure" which were not identified by the licensee's engineering staff when the ECR packages were originally closed out. The inspectors verified that specific discrepancies were being appropriately entered into the corrective action program. The inspectors discussed with management if the generic aspects, i.e., the cause(s) of the discrepancies, were being addressed. The licensee indicated that they had already identified this as an issue and that it would be captured and addressed under the next quarterly trend report and PIP 0-C-99-1041. Design engineering representatives indicated that they were actively addressing the generic issue through training, procedure changes and providing improved reference document aids and database information.

Based upon the above reviews, the inspectors determined that the PIP was effective at identifying and resolving problems in operations, maintenance and engineering areas.

Root Cause Analysis (RCA)

Two RCAs were reviewed. The inspectors determined that RCA 99-06, "Seal Injection Flow Momentarily Isolated While Swapping Filters," properly analyzed the event and surrounding circumstances to determine the probable causes and corrective actions to prevent recurrence of the event. No new issues were identified during the review of RCA 99-09, "Part 21 - 60 Day Clock Exceeded," and the inspectors concluded that the RCA was adequately performed.

Trend Report

The Virgil C. Summer Nuclear Station Trend Report 99-03 for the third quarter of 1999 was reviewed. The report, through text, tables and graphics, was adequate to provide a proper perspective of trends at the station and of the effectiveness of the corrective action program.

Corrective Actions for Maintenance Rule (MR), 10 CFR 50.65, Systems

For systems identified in the MR program, WO lists and associated performance details were sampled. In addition, the PIP database was independently cross-checked with MR determinations. As a system began to have problems, the number of investigative and corrective WO and PIPs increased. For example, the radiation monitoring system had a number of emergent WOs over the past three years and in accordance with the MR, the licensee had implemented increased monitoring and evaluation frequency for the system. Conversely, systems with a good operational record or performance trend such as the RHR system had few emergent WOs and relatively few PIPs. Results of the inspectors' reviews confirmed the licensee's conclusions as to the MR status of systems. Furthermore, the reviews indicated that there were few repetitious or rework items which was consistent with the licensee's trend information.

ES-508 reports are used to document MR equipment evaluations. The six MR ES-508 reports reviewed by the inspectors were clear and technically valid. The corrective actions associated with these reports were verified to have been implemented. The inspectors concluded that ES-508 reports coupled with system engineer's reviews provided sufficient information to support MR program decisions e.g., the re-classification of a system from MR a(1) to a(2) status. The inspectors observed that the completed reports were kept in a file cabinet in the engineering work area. The licensee issued PIP 0-C-00-0047 to consider placing the completed reports in the record control system.

OE Program

The inspectors assessed the effectiveness of the licensee's OE program in receiving, evaluating and dispersing information for use. The inspectors reviewed procedure Nuclear Licensing (NL)-102, "Distribution, Review, and Processing of Various Regulatory and Industry Documents," Revision 20, and eight open and closed OE issues in the PIP licensing database. The inspectors determined that OE issues were received in a timely manner, properly screened, and appropriately assigned a responsible group for evaluation in accordance with procedural requirements. The inspectors verified that OE action items were evaluated and being incorporated into plant procedures and activities as necessary. Through interviews, the inspectors determined that nuclear licensing operating experience personnel were knowledgeable of their responsibilities and OE requirements. The inspectors concluded that the licensee's OE program was effective.

c. Conclusions

In the areas of operations, maintenance, and engineering, the corrective action program was adequately addressing equipment, human performance, procedure and program problems. Corrective actions were properly analyzed, technically valid and effectively tracked through completion. The licensee was effective in utilizing quality assurance

audits, internal self-assessments, operating experience, and other similar programs, to correct deficiencies.

O8 Miscellaneous Operations Issues (92901)

O8.1 (Closed) Inspection Followup Item (IFI) 50-395/98005-01: Review implementation of the Primary Identification Program and resolution of QA-CAR-91-1. This item was opened to review if implementation of the PIP would address problems identified in Quality Assurance Corrective Action Request (QA-CAR)-91-1 with the tracking, dispositioning and failure to implement CERs corrective actions by the established due dates. On August 5, 1999, QA audit report QA-AUD-99008-0, "Nonconformance Control," closed QA-CAR-91-1. The inspectors reviewed this audit report and supporting documentation including SAP-1131 and concluded that sufficient controls were established to justify the licensee's closure of QA-CAR-91-1. Examination of the computerized database confirmed that no PIPs were overdue and a mechanism, although not procedurized, was in place and being used to identify PIPs with due dates which come due within the next week. The inspectors observed that some PIPs had two or more due date extensions. The extensions were acceptable based upon the significance of the issues. Documented in the October 1999 Nuclear Safety Review Committee minutes number 99-06, the committee directed that a review be conducted to determine if due date extensions were being overused. Additional information on the implementation effectiveness of the PIP is provided in Section O7.1.

II. Maintenance

M1 Conduct of Maintenance

M1.1 Observation of Work Activities

a. Inspection Scope (61726, 62707)

The inspectors observed or reviewed all or portions of maintenance and surveillance testing activities and associated documentation listed below.

•	ICP-180.002	"Emergency Diesel Generator," Revision 7A (for fill of IPI-05417)
•	ICP-240.128	"Fabrication of Flared Tubing and Installation of Flared Tubing Fittings," Revision 0C (for C Chiller)
•	MMP-451.002	"Maintenance of HVAC Mechanical Water Chillers," Revision 12
•	MWR 9901171	Grease line replacement for XFN0119D Aux Building Charcoal Exhaust Filter Fan Motor Bearings
•	MWR 9902049	C charging pump maintenance for ITS 09711A/B temperature switches (and associated scaffold request)
•	MWR 9904431	B RHR pump oil changeout per EMP-295.030, Revision 1

- MWR 9917831 Replace A EDG room A/B supply fans control transformer, ETBT-312
- MWR 9919389 Insulation repair on piping for Sodium Hydroxide Tank per CMP-600.001, Revision 8B
- MWR 9919465 Perform instructions per 20951 minor change notice for XPN-0139C Simplex Fire Panel (installing new Y2K compliant graphics card)
- MWR 9920294 Inspect C CCP outboard bearing slinger ring for wear per EMP-295.015, Revision 4, and CER 99-1506
- PMTS 9915815 A EDG quarterly maintenance checks per MMP-180.038, Revision 2
- PMTS 9916210 PM on A EDG meter XCP6117 V-S -DGA-R
- PMTS 9916264 PM on A EDG crankcase vacuum pump motor breaker per EMP-285.001, Revision 8B
- STP-112.003 "Reactor Building Spray System Valve Operability Test," Revision 7B
- STP-122.003 "Component Cooling Water Valve Operability Test," Revision 9, Section 6.2 (test of XVC09680B-CC, CC/SW Train B Cross-connect Check Valve)
- STP-125.013 "Diesel Generator Semiannual Operability Test," Revision 6B (for A EDG)
- STP-205.004 "RHR Pump and Valve Operability Test," Revision 5B (for B RHR pump)
- STP-220.001 "Motor Driven Emergency Feedwater Pump and Valve Test," Revision 5A (for B MDEFW pump)
- STP-302.002 "Delta T-TAVG Protection Loop B Operational Test," Revision 9G
- STP-345.074 "Solid State Protection Actuation Logic and Master Relay Test for Train B," Revision 9A
- STP-393.004 "Meteorological Tower Calibration," Revision 6

b. Observations and Findings

The inspectors observed that work was performed with the work package present and actively referenced. Activities observed were conducted in accordance with written procedure instructions. Procedures provided sufficient detail and guidance for the intended activities. Technicians demonstrated that they were experienced and knowledgeable of their assigned tasks. Quality control personnel were present whenever required by procedure. The inspectors noted that appropriate radiation control measures were in place when applicable.

c. Conclusions

The inspectors concluded that routine maintenance and surveillance activities were satisfactorily performed.

M8 Miscellaneous Maintenance Issues (62707, 92700)

M8.1 (Closed) Licensee Event Report (LER) 50-395/1998008-00: Missed surveillance test for ECCS subsystems - Tavg ≥ 350° Fahrenheit. This failure to vent RHR pump casings in accordance with TS surveillance requirement 4.5.2.b.2 had been previously documented in NRC Inspection Report Nos. 50-395/98-07, Section M1.3, and 50-395/99-03, Section M8.1 and dispositioned as Non-Cited Violation (NCV) 50-395/99003-02. The licensee had documented this discrepant condition in their corrective action program as CER 98-0754. The inspectors noted that the licensee is currently reconsidering their position on the long term corrective actions stated in this LER. The LER indicated that a TS change would be made to clarify venting requirements for ECCS pumps and associated piping. However, the licensee is now considering a modification to install piping to allow venting of the pump casings from a remote location. If the TS change is not requested, the licensee plans to submit a revised LER, if warranted.

III. Engineering

E8 Miscellaneous Engineering Issues (37551, 92700)

E8.1 (Closed) LER 50-395/1999004-00, 01, 02: Fuel assembly top nozzle holddown spring failure. This LER documented the failure of the holddown spring attaching screws on the top nozzle in Region 12/M-series fuel assemblies. This issue was reviewed in NRC Inspection Report No. 50-395/99-03, Section E1.1. The subject LER was issued on May 6, 1999, describing the condition, Supplement 1 was issued on August 24, 1999, extending the date for root cause determination, and Supplement 2 to the subject LER was issued on January 20, 2000, providing the Westinghouse determination of the root cause. Westinghouse, in a letter to the licensee, dated December 3, 1999, “Top Nozzle Holddown Spring Screw Fracture Root Cause,” indicated that the primary causal factor for the fractured spring screws is the variability of Inconel 600, a material susceptible to primary water stress corrosion cracking. The lack of sufficient controls in the material specification contributed to the variability. Variations in assembly practice, notably the uncontrolled use of neolube for the more difficult nozzle designs to assemble, may have contributed to the failures. The Westinghouse analysis letter also stated that given the root cause, it is likely that different heat lots will experience different fracture rates. Based on a safety assessment conducted by Westinghouse of the current core loading of 28 refurbished fuel assemblies and the twice burned “N” assemblies in the core, it was determined that startup and safe plant operation could proceed during Cycle 12. However, Westinghouse recommended in the letter that fuel which had been in the reactor for two cycles or more and with certain heat lots continue to be examined and, if necessary, repaired. Westinghouse plans to keep licensees informed of inspection results for use in planning future examinations.

IV. Plant Support

R1 Radiological Protection and Chemistry (RP&C) Controls

R1.1 General Comments (71750)

The inspectors observed radiological controls during conduct of routine inspections and observation of operation and maintenance activities and found them to be acceptable.

On December 9, the inspectors observed the loading of a radioactive waste shipment (six containers of class A, blowdown resin) and noted that the loading activity was well conducted with the driver being provided the proper paperwork including emergency response information (24-hour contact telephone numbers) and the carrier procedure for transportation accidents. Also, the inspectors observed that security personnel properly escorted the truck and driver while inside the protected area.

The inspectors attended the fourth quarter 1999 ALARA (As Low As is Reasonably Achievable) committee meeting, on December 14, which reviewed the plant radiological status, 1999 exposure status, semiannual condition evaluation report trends, radioactive waste subcommittee report, 1999 ALARA suggestions, and the site goals for 2000. The goals for 1999 overall exposure and outage specific exposures were established as 100 Rem and 90 Rem, respectively. However, the licensee exceeded those goals, but still reasonably controlled the exposures to a level of 130.654 Rem and 115.8 Rem, respectively, based on electronic dosimeter readings. The inspectors concluded based on the discussions held at the ALARA meeting that the licensee placed an appropriate emphasis and proper perspective on radiological safety and is making a conscience effort to reduce radiation exposure to plant personnel.

R1.2 Post Accident Sampling System (PASS) Drill and Operation

a. Inspection Scope (71750)

On December 9, 1999, the inspectors observed a PASS training drill.

b. Observations and Findings

The drill was performed to satisfy Emergency Preparedness (EP)-100, “Radiation Emergency Plan,” Revision 41, requirement for a semiannual health physics drill including analysis of in-plant liquid samples with simulated elevated radiation levels using the PASS. The PASS program is required by TS 6.8.4.d, “Postaccident Sampling,” and Section II.B 3 of NUREG-0737, “Clarification of TMI (Three Mile Island) Action Plan Requirements.” Section II.B 3 requires that “The licensee shall have the capability to promptly obtain reactor coolant samples and containment atmosphere samples. The combined time allotted for sampling and analysis should be 3 hours or less from the time a decision is made to take a sample.”

NRC Inspection Report No. 50-395/98-10, Section R1.2 contains the inspectors' observations of a chemistry PASS drill conducted on December 16, 1998. In 1998 the drill scenario and problems encountered during the drill made it difficult to evaluate whether the sampling and analysis could be accomplished within three hours. However, the time criterion was not a specific objective of the 1998 drill. The 1999 drill scope and objectives did include the objective "to collect and analyze a post accident sample within three hours of being directed by the Interim Emergency Director (IED) under simulated accident conditions." The inspectors noted that the licensee determined that the time to sample and analyze the results was one hour and 59 minutes. The inspectors observed that this time was measured from when the IED requested the sample. In anticipation of needing a sample, the IED directed that actions be taken to prepare the PASS for sampling and waited until the preparations were completed prior to requesting a sample. The preparations were steps of the sampling procedure which would be required for a sample to be taken and analyzed. Since the preparation time was nearly an hour, the inspectors concluded that the actual time for the sample and analysis was approximately three hours. Waiting until preparatory actions were completed before requesting a sample was an artificiality of the drill which was complicated by the IED participation in the drill as a player and controller. He was also a partial writer of the drill scenario.

The inspectors attended the drill critiques and reviewed the licensee critique summaries. Areas for improvement were identified and entered into the corrective action program under PIP 0-C-00-0027. The licensee concluded that the overall drill performance was "GOOD." Several areas for improvement in reducing the time for sampling and analysis were identified.

In spite of several negative observations, the inspectors noted marked improvement in the overall performance of the 1999 drill. The licensee had performed a significant revision to Chemistry Procedure (CP)-920, "Operation of the Nuclear Sample System Under Post Accident Conditions," Revision 2A, to break up long and confusing steps into simpler and more straightforward steps. Changes were also made to the procedure to allow easier use of the procedure during plant drill exercises. Additionally, the procedure for the drill was more realistically performed, in that, the procedure was accomplished with having only one chemist available to perform the majority of CP-920. Items noted in the 1998 drill as deficiencies were addressed and satisfactorily accomplished in the 1999 drill. The inspectors concluded the licensee has in place the necessary equipment, procedures and trained chemistry personnel to collect and analyze a sample in approximately three hours from the time a decision is made to take a post accident sample. The inspectors also concluded that the critique was thorough and the licensee appropriately captured areas for improvement.

c. Conclusions

As compared to a 1998 drill, a marked improvement was observed in the performance of the 1999 post accident sampling system drill. The inspectors concluded that the licensee has in place the necessary equipment, procedures and trained chemistry personnel to collect and analyze post accident samples as required. The licensee

appropriately captured in their critique and corrective action process areas for improvement to reduce the time for sampling and analysis.

F2 Status of Fire Protection Facilities and Equipment

F2.1 Kaowool Fire Barriers

a. Inspection Scope (71707, 71750)

Based on preliminary fire tests results for one-hour Kaowool fire barriers, the inspectors reviewed the compensatory measures implemented by the licensee.

b. Observations and Findings

On December 28, 1999, the licensee performed confirmatory fire tests on Kaowool triple wrap fire barriers at an offsite test facility. These barriers are installed at the plant with the intent to meet the requirements of 10 CFR 50, Appendix R III.G.2, "Fire Protection of Safe Shutdown Capability," for one-hour fire barriers. The large scale specimens built for the confirmatory tests were consistent with as-built configurations currently installed and relied upon for protection in the plant. Preliminary results of the tests indicated that small cable trays (6-inch by 6-inch, and less), open air conduits (1-inch, and less), and air drop configurations did not meet the one-hour fire and hose stream tests. Other applications (i.e., larger cable trays and conduits) appeared to meet the acceptance criteria. However, the licensee immediately established roving fire watches as a compensatory measure for all Appendix R affected configurations until a resolution is determined. The licensee completed a one-hour notification report to the NRC for a condition outside the design basis of the plant on December 29, 1999. This report was submitted in accordance with the requirements of 10 CFR 50.72(b)(1)(ii)(B), "One-Hour Reports." A 30-day special report was issued on February 2, 2000, due to compensatory action (i.e., roving fire watches) in place in excess of the fire protection program allowed time of seven days. In addition, LER 50-395/1999-014-00 was issued for a condition outside the design basis of the plant.

The inspectors walked down the compensatory posts established for the roving one-hour fire watches. The watches are being conducted by security officers on shift that are qualified as fire watches. A total of 30 Appendix R penetrations are being compensated in 18 different areas. The inspectors observed the officers conduct several consecutive fire watch rounds. Although the officers did not know the exact location of every fire barrier with Kaowool, they were knowledgeable of the general areas under the fire watch. The inspectors were confident based on discussions with the officers that they clearly understood their mission, i.e., there was to be no evidence of smoke or fire and that the areas were to be free of combustible materials.

c. Conclusions

The inspectors concluded that the licensee implementation of compensatory measures for one-hour Kaowool fire barriers was appropriate as an interim measure until a final resolution can be determined.

V. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of licensee management at the conclusion of the inspection on January 18, 2000. The licensee acknowledged the findings presented.

The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. 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, Plant Support Engineering
S. Byrne, General Manager, Nuclear Plant Operations
R. Clary, Manager, Plant Life Extension
C. Fields, Manager, Quality Systems
M. Fowlkes, Manager, Operations
L. Hipp, Manager, Nuclear Protection Services
G. Moffatt, Manager, Design Engineering
K. Nettles, General Manager, Nuclear Support Services
A. Rice, Manager, Nuclear Licensing and Operating Experience
G. Taylor, Vice President, Nuclear Operations
R. White, Nuclear Coordinator, South Carolina Public Service Authority
B. Williams, General Manager, Engineering Services
G. Williams, Manager, Maintenance Services

INSPECTION PROCEDURES USED

IP 37551: Onsite Engineering
IP 40500: Effectiveness of Licensee Process to Identify, Resolve, and Prevent Problems
IP 61726: Surveillance Observations
IP 62707: Maintenance Observations
IP 71707: Plant Operations
IP 71750: Plant Support Activities
IP 92700: Onsite Followup of Written Reports of Nonroutine Events at Power Reactor Facilities
IP 92901: Followup - Operations

ITEMS CLOSED

Closed

50-395/98005-01	IFI	Review implementation of the Primary Identification Program and resolution of QA-CAR-91-1 (Section O8.1)
50-395/1998008-00	LER	Missed surveillance test for ECCS subsystems - Tavg $\geq$ 350° Fahrenheit (Section M8.1)
50-395/1999004-00, 01, 02	LER	Fuel assembly top nozzle holddown spring failure (Section E8.1)