

U. S. NUCLEAR REGULATORY COMMISSION

REGION II

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

Report No.: 50-395/99-08

Licensee: South Carolina Electric & Gas (SCE&G)

Facility: Virgil C. Summer Nuclear Station

Location: P. O. Box 88  
Jenkinsville, SC 29065

Dates: October 24 - December 4, 1999

Inspectors: M. Widmann, Senior Resident Inspector  
M. King, Resident Inspector  
W. Smith, Health Physicist (Sections R1.2, R1.3, R5.1 and R7.1)

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. 50-395/99-08

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, this report includes the results of an announced inspection by a regional health physicist.

### Operations

- The inspectors concluded that the freeze protection and cold weather preparations were properly implemented and heat tracing was available to protect safety-related systems. No significant discrepancies were noted in the licensee's cold weather preparations. The system engineer was knowledgeable of the heat trace system performance and the system was being properly monitored within the licensee's Maintenance Rule program (Section O2.1).
- A recent change to emergency operating procedures was appropriate, timely, and properly approved. The inspectors concluded that change to the manual safety injection (SI) actuation criteria should help preclude an unwarranted SI following a reactor trip in a low decay heat situation (Section O3.1).

### Maintenance

- Routine maintenance and surveillance activities were generally performed satisfactorily and in accordance with approved procedures with one exception. A non-cited violation was identified for the licensee's failure to perform a retest in accordance with their post maintenance testing program. Prior to returning an air operated valve to service, the valve was not tested after the air regulator was replaced (Section M1.1).

### Engineering

- The licensee has in place adequate measures to reduce the likelihood of a draindown similar to the Wolf Creek event of September 17, 1994. Enhancements are planned to training documents and one procedure as a result of this inspection (Section E8.1).

### Plant Support

- The licensee implemented radiological controls in accordance with the Final Safety Analysis Report, Technical Specifications, license conditions, and 10 CFR Part 20 requirements (Section R1.2).
- The As Low As Is Reasonably Achievable Program activities and initiatives for refueling outage 11 were conducted in accordance with approved procedures. Action items were developed to address work activities for which the actual dose received varied by more than 25 percent from the estimated dose (Section R1.3).

- The licensee's procedures require that health physics technicians (HPTs) meet the qualifications specified in American National Standards Institute (ANSI) N18.1, "Selection and Training of Nuclear Power Plant Personnel." The vendor HPTs assigned to refueling outage 11 exceeded the minimum qualifications of ANSI N18.1 (Section R5.1).
- The licensee conducted audits and reviews of the radiation protection program as required by 10 CFR 20.1101(c) and Technical Specifications (Section R7.1).
- All six emergency preparedness drill objectives were successfully met. Operators exhibited proper procedure adherence and three-way communications. Staffing and activation of emergency response facilities were timely and were able to support emergency drill activities (Section P1.1).

## Report Details

### Summary of Plant Status

The unit operated at essentially 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 Cold Weather Preparations**

###### **a. Inspection Scope (71707)**

The inspectors conducted an independent review of the licensee's preparation for the onset of cold (sub-freezing) weather.

###### **b. Observations and Findings**

The inspectors reviewed the requirements contained in Operations Administrative Procedure (OAP)-109.1, "Guidelines for Severe Weather," Revision 1C. Section 6.1, of OAP-109.1, contains the requirements for prolonged exposure to sub-freezing ambient conditions. The inspectors verified that the requirements of Section 6.1 were completed which included preparing the service water system, the industrial cooling water system, the control rod drive mechanism cooling system, the condensate system, and the auxiliary boiler for the onset of cold weather. In addition, OAP-109.1 provides guidance for providing building protection by verifying doors and louvers are closed and that space heaters are operable. Beginning on November 3 during shift turnover, shift supervisors were verifying that freeze protection controls were in place.

Operations personnel routinely verify that the installed electric heat tracing (ET) is operating properly. The inspectors conducted a walkdown of the ET system with the system engineer and verified that the heat trace circuits were in proper operating condition and that no unexplained alarms were present. A few miscellaneous insulation issues were identified on the sodium hydroxide tank and industrial cooling water lines. Six maintenance work requests (MWRs) were initiated as a result of the inspectors' walkdown. The inspectors reviewed the ET system engineer's files which included maintenance rule implementation, monthly system engineer walkdown inspection results and technical work records related to continuing review of ET system performance. The inspectors also reviewed applicable sections of the Final Safety Analysis Report (FSAR) and concluded, based on this review and the walkdown inspection, that the freeze

protection heat tracing system was properly installed to protect safety-related systems.

The installation and maintenance of heat tracing are the responsibility of the electrical maintenance group. The inspectors reviewed recent heat tracing MWRs which repaired heat tracing circuits related to the reactor makeup water storage tank and the refueling water storage tank (RWST). All work was successfully completed with the heat tracing left in a normal working condition.

As part of the licensee's cold weather protection program, Electrical Maintenance Procedure (EMP)-120.002, "Freeze Protection Heat Tracing Inspection," Revision 3, was completed on August 18. Minor problems were identified and corrected by the licensee. The inspectors reviewed paperwork associated with EMP-120.002 and independently walked down the level sensing lines associated with the condensate storage tank and the RWST. The insulation and heat tracing equipment for these lines were in good condition. During the inspectors' review, it was identified that EMP-120.003, "Functional Testing of Hydrogen Analyzer Heat Tracing," Revision 1, had not been performed since initial plant startup. Immediate actions were taken and the licensee satisfactorily performed the EMP on November 19. Investigation by the licensee into why the procedure had not been performed revealed that the system was installed per the recommendation of the vendor, a functional check procedure was written and performed, but a Preventative Maintenance Task Sheet (PMTS) was never generated to have the EMP performed on some scheduled frequency. The inspectors learned that the licensee performed an engineering evaluation in 1988 that concluded that although the heat tracing was installed, its use was not necessary to ensure the operability of the hydrogen analyzer. The heat tracing would reduce the amount of moisture in the sample lines and improve the accuracy of the results, but the capacity of the sample pump and moisture separator far exceeded the maximum rate of condensation produced. The licensee determined that they wanted the heat tracing system for the hydrogen analyzer to function. As a result, the licensee has initiated a PMTS to perform the EMP on an 18-month frequency.

c. Conclusions

The inspectors concluded that the freeze protection and cold weather preparations were properly implemented and heat tracing was available to protect the safety-related systems. No significant discrepancies were noted in the licensee's cold weather preparations. The system engineer was knowledgeable of the heat trace system performance and the system was being properly monitored within the licensee's Maintenance Rule program.

**O3 Operations Procedures and Documentation**

03.1 Review of Emergency Operating Procedure (EOPs) Revisions

a. Inspection Scope (71707)

The inspectors reviewed the implementation of recent emergency operating procedure (EOP) changes concerning manual safety injection (SI) actuation criteria.

b. Observations and Findings

A concern at another utility related to the potential for an unnecessary manual SI actuation due to a temperature induced transient following a reactor trip, particularly under low decay heat conditions, had resulted in a Direct Work Request DW-98-047 being submitted to the Westinghouse Owners Group. The Westinghouse Owners Group Emergency Response Guidelines (ERG) Operations Subcommittee reviewed this issue and concluded that in cases where containment heatup was not occurring, the pressurizer reference leg errors associated with the heatup should not be included in the pressurizer level setpoint for manual SI actuation criteria. Leaks significant enough to result in heat up of containment would result in an automatic SI or result in operators performing an SI due to exceeding normal charging pump capacity or other diverse indications of a large leak. Therefore, the pressurizer level setpoint for manual SI actuation criteria could be changed to only include normal channel accuracy for several of the ERGs. At Summer this change would result in a manual SI actuation being called for if pressurizer level can not be maintained greater than 12 percent (previously the setpoint was 18 percent) subsequent to a reactor trip.

The inspectors reviewed the subcommittee's comments and concluded they supported a new manual SI actuation criteria. The inspectors verified that the licensee's EOPs were consistent with the revised ERG. The revised EOPs were approved and the changes were processed within 90 days as Priority A revisions in accordance with OAP-101.1, "Operations Procedure Feedback Program," Revision 3. Additionally, the inspectors questioned several control room operators concerning the change. All operators were aware of the change in the manual SI actuation criteria (from 18 percent to 12 percent based on indicated pressurizer level). Summer had experienced a low decay heat reactor trip on May 18, 1999, in which pressurizer level had reached a low of 18.6 percent based on computer data (reference NRC Inspection Report 50-395/99-04, Section O1.2). The inspectors concluded that this change should help preclude an unwarranted SI following a reactor trip especially in a low decay heat situation.

c. Conclusions

A recent change to emergency operating procedures was appropriate, timely, and properly approved. The inspectors concluded that change to the manual safety injection (SI) actuation criteria should help preclude an unwarranted SI following a reactor trip in a low decay heat situation.

**O8 Miscellaneous Operations Issues**

**O8.1 Review of Institute of Nuclear Power Operations (INPO) Report**

a. Inspection Scope (71707)

The inspectors reviewed the INPO evaluation report for Summer.

b. Observations and Findings

The INPO onsite assessment was conducted during the weeks of July 12 and July 19, 1999. The inspectors reviewed the INPO report to identify any issues that were not consistent with NRC findings and assessments. The issues identified in the INPO report were consistent with recent NRC assessments of licensee performance.

c. Conclusions

The report results of the Institute of Nuclear Power Operations evaluation, performed in July 1999, were consistent with recent NRC assessments of licensee performance.

## 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.

- EMP-115.009 "DC Ground Inspection," Revision 9B
- EMP-295.024 "Service Water Pump Motor Maintenance," Revision 1
- ICP-310.006 "NIS Comparator Rate Drawer Calibration," Revision 4A
- MWR 9917786 Install test equipment per GTP-216, "General Guidelines for Test Equipment Installation and Data Collection," Revision 3, for temporary 1A feedwater heater level indicator
- MWR 9917992 Troubleshooting DPN1HB /DPN1HB1 for DC grounds
- MWR 9917995 Repair Temperature Indicator Position 1 on XPN0050B (hydrogen recombiner, thermocouple # 1)
- MWR 9918060 Repair B Train DC Ground Cause by ILS-01967 B RHR room sump level switch
- PMTS 9907629 Inspect for corrosion C Service Water Pump upper and lower oil cooler per EMP-295.021
- PMTS 9910036 Weekly Lube checks for A Emergency Diesel Generator
- PMTS 9910037 Weekly Lube checks for B Emergency Diesel Generator
- STP-124.001 "Control Room Emergency Air Cleanup," Revision 8
- STP-128.021 "Fire Service Water Flow Test," Revision 10
- STP-205.003 "Charging/Safety Injection Pump and Valve Test," Revision 5C
- STP-211.002 "BEACON Flux Map Calibration," Revision 0
- STP-212.001 "Core Power Distribution Measurements," Revision 8
- STP-345.040 "Engineered Safety Feature Actuation Slave Relay Test For Train A XPN-7011," Revision 10

- STP-345.074 "Solid State Protection System Actuation Logic and Master Relay Test for Train B," Revision 9A
- STP-360.034 "Reactor Building Sample Line Atmospheric Radiation Monitor RM-A2 Operational Test," Revision 7B
- STP-395.023 "Accumulator Tank A Pressure," Revision 6B
- STP-501.001 "Battery Weekly Test," Revision 9C (for safety-related XBA-1B)

b. Observations and Findings

The inspectors' observations verified that work was performed with the work package present and actively referenced. Generally, 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. The inspectors concluded that routine maintenance and surveillance activities were generally satisfactorily performed.

During maintenance retests, the inspectors questioned the validity of the open stroke time testing of XVG-0813B-CS, Charging Pump B to C Suction Cross-Connect Valve. The safety function of the valve requires the valve to close. During performance of STP-205.003, "Charging/Safety Injection Pump and Valve Test," the inspectors noted that after the valve was stroked closed, maintenance personnel greased the valve stem prior to timing the valve in the open direction. Review of the data indicated that the valve met established criteria. The inspectors discussed the observation with operation department management. The licensee generated Condition Evaluation Report (CER) 99-1438 to review past practices and the effects of greasing a valve in the middle of testing. The licensee's review concluded that this was not the normal practice to perform maintenance in the middle of surveillance testing, but the effect on the valve results were negligible. A review of the previous five tests by engineering personnel determined that all results were within two-tenths of a second of each other. However, as a result of the inspectors questions, the licensee is reviewing existing maintenance procedures and STPs to determine if revisions are needed.

A second retest was also questioned by the inspectors during this period. The instrument air regulator for XVB00004A-AH, Control Room Outside Air Intake Isolation Valve, was replaced on November 11, returned to service on November 12, but no retest was performed as part of the MWR. In accordance with GTP-214, "Post Maintenance Testing Guideline," Revision 3E, a stroke test is required for an air-operated valve if the air regulator is replaced. The licensee did verify the air regulator pressure setpoint to be within tolerance prior to installation, but did not stroke the valve. An engineering evaluation stated that performance of a stroke time test was not necessary in this case, because bench verification of the pressure regulator provided assurance that the valve actuator would not experience abnormal air supply pressures and therefore would stroke within the normal time variances. However, the licensee performed STP-124.001,



"Control Room Emergency Air Cleanup," later on November 12 and verified that the stroke time of XVB00004A-AH remained within previous reference values. The inspectors noted that a stroke test of the valve following air regulator replacement would verify that the actual maintenance itself did not have any adverse impact on valve operation.

In accordance with TS 6.8.1, "Procedures and Programs," procedures shall be established, implemented and maintained covering activities that are recommended in Appendix A of Regulatory Guide (RG) 1.33, Revision 2. Specifically, RG 1.33 states that maintenance activities shall be performed in accordance with written procedures. The licensee's failure to perform the retest of valve VXB00004A-AH in accordance with GTP-214 is a violation. This Severity Level IV violation is being treated as a Non-Cited Violation consistent with Section VII.B.1.a of the NRC Enforcement Policy. This violation is identified as NCV 50-395/99008-01 and is in the licensee's corrective action program as CER 99-1418.

c. Conclusions

Routine maintenance and surveillance activities were generally performed satisfactorily and in accordance with approved procedures with one exception. A non-cited violation was identified for the licensee's failure to perform a retest in accordance with their post maintenance testing program. Prior to returning an air operated valve to service, the valve was not tested after the air regulator was replaced.

**M8 Miscellaneous Maintenance Issues (92700)**

- M8.1 (Closed) Licensee Event Report (LER) 50-395/99012-00: Inadvertent start of B Residual Heat Removal (RHR) pump. This issue was previously documented in Inspection Report 50-395/99-07, Section M1.2. No new issues or corrective actions were identified in this LER.
- M8.2 (Closed) LER 50-395/99013-00: Inadequate surveillance test from control room ventilation specification. This issue was previously documented in Inspection Report 50-395/99-07, Section M1.3, and non-cited violation 50-395/99007-02 was identified for using inadequate correction factors in a surveillance procedure. New information documented in this LER included results of a second outside air flow test that was performed to validate the satisfactory performance of the ventilation system on September 30, 1999. Results were consistent with the previous tests and within the TS limit of 1000 cfm. No other issues or corrective actions were identified in this LER.

**III. Engineering**

**E8 Miscellaneous Engineering Issues**

- E8.1 Review of Susceptibility to Draindown During Shutdown and Common Mode Failure of Emergency Core Coolant System (TI 2515/142)

a. Inspection Scope (2515/142)

This inspection was to verify adequate measures had been taken to reduce the likelihood of a draindown similar to that of the Wolf Creek event that occurred on September 17, 1994.

b. Observations and Findings

The inspectors reviewed the assessments and actions taken by the licensee in response to NRC Information Notice (IN) 95-03, "Loss of Reactor Coolant Inventory and Potential Loss of Emergency Mitigation Functions While in a Shutdown Condition," January 18, 1995, and Supplement 1 to IN 95-03 issued March 25, 1996. Review of licensee response to Generic Letter (GL) 98-02, "Loss of Reactor Coolant Inventory and Associated Potential for Loss of Emergency Mitigation Functions While in a Shutdown Condition," issued May 28, 1998, was also performed. This review determined that due to comparable plant design features, certain equipment failures or operator errors could lead Summer to be susceptible to common-cause failure similar to those that occurred at Wolf Creek. The licensee had previously addressed Generic Issue 105, "Interfacing System LOCA (loss of coolant accident) in Light Water Reactors," which identified both high and low pressure potential draindown paths including the path of concern. The licensee has implemented under its 10 CFR 50, Appendix B, Quality Assurance Plan the necessary controls (i.e., procedures, locking devices, and independent verifications) to provide adequate assurance that the safety-related functions of the RHR system and Emergency Core Cooling System (ECCS) would not be adversely affected by activities conducted during hot shutdown.

Review of the Wolf Creek event and the Summer operating procedures revealed a significant operational difference, in that, at no time during Summer's cooldown and RHR boration does the SI hot leg injection header recirculation isolation valve (XVG-8881) get opened. This is a normally locked closed valve at Summer, which is strictly controlled in accordance with OAP-106.3, "Locked Valve Program," Revision 3B. This procedure requires independent verification. In addition, the two surveillance procedures that open valve (XVG-8881) have "Initial Conditions" that require the procedures only be performed in Modes 5 (less than 200 degrees Fahrenheit), Mode 6 (Refueling) or during defueled conditions. With the plant below 200 degrees Fahrenheit, the potential to render ECCS equipment inoperable due to steam binding would be avoided. Changes in RHR boron are procedurally controlled and use a different lineup than that at Wolf Creek. Unlike Wolf Creek, Summer does not use recirculation to the RWST. Operations management considered the current controls in place sufficient and decided against placing a placard as an additional protection against inadvertent draindown. Therefore, the licensee determined that no changes were required to the cooldown, heatup, boration evolution, In-Service Testing (IST) or Appendix J testing procedures or plant labeling as a result of the Wolf Creek event review. The inspectors agreed with this evaluation.

The licensee has provided significant training in response to the GL 98-02 issues and related topics in Licensed Operator Requalification (LOR) training. INPO had issued a Significant Event Report (SER) 17-95 on the Wolf Creek Event. This SER was required

reading for the operators in September 1995. The inspectors verified that the training and attendance records for the LOR-SOER-96-1 lesson plan included classroom training on the Wolf Creek event. During the April 1999 Refueling outage, "Just-in-Time Operating Experience" training based on an INPO provided document "Residual/Decay Heat Removal System Operation During Plant Evolutions and Testing-PWR" was also provided. This item was covered at a morning and afternoon outage plan of the day meeting. Regular training has also been provided on various aspects related to this event such as valve position verification, independent verification, procedure compliance, control room command and control, locked valve program and EOP-2.5, "LOCA Outside Containment," Revision 6. Abnormal Operating Procedure (AOP)-112.1, "Shutdown LOCA" training was included as part of 1994 LOR training. The Summer training department, following review of NRC TI 2515/142, also plans to incorporate GL 98-02 and IN 95-03 into the classroom lesson plans for Emergency Operations (EO)-6, "RHR Operations," LOR-AOP-112.1, CS-9, "Case Studies" and simulator training LOR-SIM-ST-093 on shutdown LOCAs before the next refueling outage (currently scheduled for October 2000).

The inspectors discussed various aspects of outage control with numerous operators, and test unit and outage management personnel. Outage supervision and the Independent Safety Engineering Group (ISEG) provided defense in-depth management to assure proper work controls and outage coordination remained effective. The outage organization consisted of outage managers, outage coordinators, and various window managers (primary, secondary, electrical, testing and operations work managers). The use of shift engineers (shift technical advisor qualified individuals, including several licensed personnel) in these positions provided an additional level of review and protection for the proper coordination of scheduled and emergent maintenance work activities during outages. The concept of a "Protected Train" is also practiced where, with few exceptions, work on the protected train is prohibited as described in Administrative Instruction (AI)-600, "ISEG Outage Safety Review Guidelines," Revision 6. As a result of reviewing NRC TI 2515/142, ISEG plans to revise AI-600, Attachment V, "Valves to Check for RCS Draindown," to include valves XVG-08887A, XVG-8887B and XVG-08881. The inspectors directly observed the multi-level defense in-depth outage control strategy during the last refueling outage (April 1999). Additionally, the inspectors noted good control of activity levels in the control room to prevent excessive noise or distractions thereby allowing operators to better focus on risk significant tasks. Proper command and control combined with good questioning attitudes by licensed individuals were also observed by the inspectors during the refueling outage.

Based on this review, the inspectors have verified that the licensee has in place adequate measures to reduce the likelihood of a draindown similar to the Wolf Creek event of September 17, 1994.

c. Conclusions

The licensee has in place adequate measures to reduce the likelihood of a draindown similar to the Wolf Creek event of September 17, 1994. Enhancements are planned to training documents and one procedure as a result of this inspection.

#### 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.

#### **R1.2 Occupational Radiation Exposure Controls**

##### **a. Inspection Scope (83750)**

The inspectors toured the radiological control area (RCA) to observe and evaluate work activities in progress, dosimetry use, and controls for airborne radioactivity areas, high radiation areas (HRAs), locked-HRAs, and very-HRAs. The inspectors compared the implementation of radiological controls against applicable sections of the FSAR, TS, and 10 CFR Part 20.

##### **b. Observations and Findings**

Posting and barricading of two very HRAs, all eleven locked HRAs, and eighteen of approximately twenty-five HRAs were verified. The locked high radiation areas were physically checked to verify they were locked and not accessible. The inspectors also observed health physics job coverage in two HRA's. The work activity observed met radiation work permit requirements for work in HRAs.

During tours of the RCA, workers were observed wearing proper dosimetry equipment. Plant housekeeping was good. The total contaminated area of the RCA, excluding the reactor building, was 1.81 percent or 2414 ft<sup>2</sup> which was less than the goal of 2500 ft<sup>2</sup>

##### **c. Conclusions**

The licensee implemented radiological controls in accordance with the Final Safety Analysis Report, Technical Specifications, license conditions, and 10 CFR Part 20 requirements.

#### **R1.3 As Low As Is Reasonably Achievable (ALARA) Program Implementation**

##### **a. Inspection Scope (83750)**

The ALARA program implementation was reviewed and evaluated against applicable sections of 10 CFR Part 20 and licensee procedures.

##### **b. Observations and Findings**

For operating Cycle 11 the licensee's collective occupational dose goals were 90 person-rem for the Cycle 11 refueling outage (RFO 11) activities and 10 person-rem for

non-outage activities. Through November 19, 1999, the annual exposure to date was 130 person-rem, with approximately 116 person-rem attributed to RFO 11. The licensee reviewed and assigned action items for outage work with a 25 percent difference between estimated and actual dose. The inspectors evaluated the 2<sup>nd</sup> Quarter 1999 ALARA Committee Meeting Minutes and found that actions are planned to prevent problems that occurred during RFO 11 from repeating in RFO 12. The inspectors also noted that the RFO 11 goal was exceeded due to emergent work activities and higher radiation and contamination levels on steam generator equipment.

The inspectors compared the current years occupational dose to previous years. Although the outage goals for the last two outages were exceeded, there was a decreasing trend in outage dose due partly to improved RFO 11 shutdown chemistry. The following table is based on previous inspection report data and licensee reports.

Annual Dose (person-rem)			Outage Dose (person-rem)			
Year	Goal	Actual	Outage Type	Goal	Actual	Days
1996	117	97 <sup>1</sup>	RFO-9	110	89 <sup>2</sup>	39
1997	90	187 <sup>1</sup>	RFO-10	95	170 <sup>2</sup>	34
1998	19	14 <sup>1</sup>	No RFO			
1999	100	130 <sup>2,3</sup>	RFO-11	90	116 <sup>2</sup>	38

<sup>1</sup> Based on thermoluminescent dosimeters (TLD)

<sup>2</sup> Based on electronic dosimeter

<sup>3</sup> As of 11/19/99

c. Conclusions

The As Low As Is Reasonably Achievable Program activities and initiatives for refueling outage 11 were conducted in accordance with approved procedures. Action items were developed to address work activities for which the actual dose received varied by more than 25 percent from the estimated dose.

**R5 Staff Training and Qualification in RP&C**

**R5.1 Qualifications of Vendor Health Physics Technicians (HPT)**

a. Inspection Scope (83750)

The licensee's procedures require that the HPT staff meet the qualifications of American National Standards Institute (ANSI) N18.1, "Selection and Training of Nuclear Power Plant Personnel." This standard requires that HPT have a minimum of two years of working experience in their specialty.

b. Observations and Findings

The inspectors reviewed resumes for nine of twenty-two vendor HPT who worked during RFO 11 that were identified by the licensee as senior technicians meeting the requirements of ANSI N18.1. The inspectors verified that the individuals had more than the two-year minimum experience required for senior technicians. The inspectors also reviewed radiological surveys performed in high radiation areas during the outage by vendor HPT and determined them to be adequate.

c. Conclusions

The licensee's procedures require that health physics technicians (HPTs) meet the qualifications specified in American National Standards Institute (ANSI) N18.1, "Selection and Training of Nuclear Power Plant Personnel." The vendor HPTs assigned to refueling outage 11 exceeded the minimum qualifications of ANSI N18.1.

**R7 Quality Assurance in RP&C**

**R7.1 Licensee Audits and Assessments**

a. Inspection Scope (83750)

The inspectors reviewed the results of licensee audits and appraisals of radiation protection activities to verify the processes identified program deficiencies and a corrective action program was implemented.

b. Observations and Findings

The inspectors reviewed the results of radiation control quality assurance audit numbers 95013, 97016 and 99017. The audit identified deficiencies were properly addressed in the licensee corrective action program. The inspectors also reviewed the Annual ALARA Appraisal for 1996, 1997 and 1998. The inspectors determined that the audits and appraisals were of sufficient scope and depth to identify potential problems and that corrective actions were monitored to resolution.

c. Conclusions

The licensee conducted audits and reviews of the radiation protection program as required by 10 CFR 20.1101(c) and Technical Specifications.

**P1 Conduct of EP Activities**

**P1.1 Emergency Preparedness (EP) Drill**

a. Inspection Scope (71750)

The inspectors observed and participated in the last emergency preparedness drill scheduled for 1999.

b. Observations and Findings

On December 2, the licensee conducted an announced training emergency drill. The drill involved personnel assigned to the "C" EP team. The six drill objectives were to demonstrate:

- the staff's ability to classify emergencies through understanding of emergency action levels and initiating conditions,
- the staff's ability to activate the Radiation Emergency Plan and procedures,
- the staff's ability to respond to an emergency, make proper and timely notifications through each emergency classification, and activate the emergency response facilities (ERFs) in an efficient and timely manner,
- the adequacy, effectiveness, and proper utilization of ERFs and their emergency response equipment,
- the staff's ability to formulate and make protective action recommendations to protect station personnel and the general public based on plant parameters, in-plant and out-of-plant surveys, and offsite field monitoring information, and
- the staff's ability to evaluate the source term and make dose projections based on plant parameters and field surveys.

The drill involved a tornado in the high voltage switchyard which caused a loss of normal offsite power to B train. The scenario also included an inoperable B train emergency diesel generator, and a tube rupture in steam generator C resulting in a manual reactor trip and safety injection. The inspectors observed the operations response crew in the control room simulator and staffing and activation of the technical support center (TSC).

The inspectors observed operators' response to the scenario. Communication between operators was good, using three-way communications. The operators exhibited adequate procedure use. Staffing of the TSC was timely and orderly, in that, required personnel were readily available and assumed the responsibilities associated with their designated positions without difficulty. The emergency operating facility was setup, manned, and activated within the required time frame. The inspectors also reviewed the licensee's emergency drill critique and found that issues identified during the drill were appropriately captured in their documentation.

c. Conclusions

All six emergency preparedness drill objectives were successfully met. Operators exhibited proper procedure adherence and three-way communications. Staffing and activation of emergency response facilities were timely and were able to support emergency drill activities.

**S8 Miscellaneous Security and Safeguards Issues (92904)**

- S8.1 (Closed) Inspection Followup Item (IFI) 50-395/99004-02: Review documentation, implementation and qualification of security force for new handguns.

An issue concerning the recording of failures during initial qualification on a new make of weapon had been identified in NRC Inspection Report No. 50-395/99-04 (Section S5.1). Followup inspection, including conferring with Office of Nuclear Reactor Regulation security personnel concerning this item, confirmed there is no requirement to record initial handgun test failures. All of the security force, except for five individuals, had qualified for the new handguns (as of November 16). The inspectors verified the five remaining individuals' qualification records for the previously issued handguns were still current. The five remaining personnel are continuing to train and will retest at a later date. The inspectors also reviewed qualification documents and licensee procedures related to the qualification of the security force for new handguns. No additional concerns were noted during this review. The inspectors concluded that the implementation, documentation and qualification of the security force for a newly acquired handgun were performed in accordance with the licensee's Physical Security Plan and implementing procedures.

**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 December 8, 1999. On January 3, 2000, NCV 50-395/99008-01 was discussed with the licensee. 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  
 T. Franchuk Supervisor, Quality Assurance  
 D. Gatlin, Supervisor, 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 61726: Surveillance Observations  
 IP 62707: Maintenance Observations  
 IP 71707: Plant Operations  
 IP 71750: Plant Support Activities  
 IP 83750: Occupational Radiation Exposure  
 IP 92700: Event Reports  
 IP 92904: Followup - Plant Support  
 TI 2515/142: Draindown During Shutdown and Common-Mode Failure

## ITEMS OPENED AND CLOSED

Opened

50-395/99008-01	NCV	Failure to retest an air operated valve following replacement of the air regulator (Section M1.1)
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Closed

50-395/99008-01	NCV	Failure to retest an air operated valve following replacement of the air regulator (Section M1.1)
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50-395/99012-00	LER	Inadvertent start of B residual heat removal (RHR) pump (Section M8.1)
50-395/99013-00	LER	Inadequate surveillance test from control room ventilation specification (Section M8.2)
50-395/99004-02	IFI	Review documentation, implementation and qualification of security force for new handguns (Section S8.1)