UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
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ATLANTA, GEORGIA 30303-8931

July 25, 2001

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

SUBJECT: VIRGIL C. SUMMER NUCLEAR STATION - NRC INTEGRATED INSPECTION REPORT NO. 50-395/01-02

Dear Mr. Byrne:

On June 30, 2001, the NRC completed an inspection at your Virgil C. Summer Nuclear Station. The enclosed report documents the inspection findings which were discussed on June 29, 2001, with you and other members of your staff.

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

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

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

(ADAMS). ADAMS is accessible from the NRC Web site at *http://www.nrc.gov/NRC/ADAMS/index.html* (the Public Electronic Reading Room).

Sincerely,

/RA/

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

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

Enclosure: Integrated Inspection Report No. 50-395/01-02

Attachment: Supplemental Information

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.:	50-395
License No.:	NPF-12
Report No.:	50-395/01-02
Licensee:	South Carolina Electric & Gas (SCE&G) Company
Facility:	Virgil C. Summer Nuclear Station
Location:	P. O. Box 88 Jenkinsville, SC 29065
Dates:	April 1 through June 30, 2001
Inspectors:	M. Widmann, Senior Resident Inspector D. Rich, Acting Senior Resident Inspector M. King, Resident Inspector D. Holman, Physical Security Inspector, RII (Sections 3PP1, 3PP2, and 4OA1.3) G. Kuzo, Senior Health Physicist, RII (Sections 2OS1, 2OS3, 2PS1 2PS2, and 2PS3) M. Scott, Senior Reactor Inspector, RII (Sections 1R02 and 1R17) R. Gibbs, Senior Reactor Inspector, RII (Sections 1R02 and 1R17) R. Chou, Reactor Inspector, RII (Sections 1R02 and 1R17)
Accompanying Personnel:	R. Hamilton, Health Physicist, RII
Approved by:	K. D. Landis, Chief, Reactor Projects Branch 5 Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 5000395/01-02**,** on 04/01/01 - 06/30/01, South Carolina Electric & Gas Co., Virgil C. Summer Nuclear Station. Heat Sink and Licensee Identified Violation.

The inspection was conducted by resident inspectors, a regional senior health physicist and regional senior reactor and physical security inspectors. The inspection identified two Green findings, one of which was a non-cited violation. The significance of the findings is indicated by their color (Green, White, Yellow, Red) using IMC 0609, "Significance Determination Process." The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described at its Reactor Oversight Process website at *http://www.nrc.gov/NRR/OVERSIGHT/index.html.*

A. Inspector Identified Findings

Cornerstone: Mitigating Systems

- Green. The inspectors identified a non-cited violation for failure to follow procedures to restrict service water temperatures when testing indicated that the component cooling water heat exchanger performance was degraded.

  The finding was of very low safety significance because service water temperatures never exceeded the more restrictive temperature limits. (Section 1R07).

- Green. The inspectors identified that the test interval for measuring reactor building cooling unit performance was relatively long when compared to that for heat exchangers included in a Generic Letter 89-13, "Service Water System Problems Affecting Safety-Related Equipment," program.

  The finding was of very low safety significance because the reactor building cooling units were normally cooled by industrial cooling water which was chemically treated to reduce fouling. (Section 1R07).

B. Licensee Identified Violation

Cornerstone: Initiating Events

- A violation of very low significance which was identified by the licensee has been reviewed by the inspectors. The licensee entered the violation in their corrective action program. The violation is listed in Section 4OA7 of this report.

Report Details

The unit began the inspection period at 100 percent power.

On May 18, a downpower to approximately 88 percent power was performed to allow maintenance to the B main feedwater pump. The unit was returned to 100 percent power on May 22.

On June 1, the unit commenced a planned downpower to Mode 2 to repair a leaking secondary side steam generator access port. The unit subsequently proceeded to Mode 3 to allow repair of a second steam generator (SG) access port on June 3. On June 5, the unit entered Mode 2 and entered Mode 1 on June 6. On June 8, the unit completed power accession to 100 percent power.

On June 22, the unit commenced a planned downpower to approximately 15 percent power to allow the unit to go off-line for repair of the turbine electro-hydraulic control system. The unit was returned to 90 percent power on June 24, but was unable to achieve 100 percent power due to high temperature in a switchyard air disconnect. The plant operated between 90 and 98 percent power until June 29, when the unit commenced a planned downpower to approximately 15 percent power to allow the unit to go off-line for repairs to the switchyard air disconnect. The unit was returned to 98 percent power on June 30, but was unable to achieve 100 percent power due to problems with reheater drain tank level controls.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection

a. Inspection Scope

The inspectors reviewed the licensee's instructions for severe weather (high winds, tornados and hurricanes) as described in Operations Administrative Procedure, OAP-109.1, "Guidelines for Severe Weather," Revision 1D, and Emergency Plan Procedure (EPP) 015, "Natural Emergency," Revision 14, to verify that those instructions limited the risk to the plant from weather related initiating events. The inspectors also reviewed the planning, risk evaluation and implementation of activities associated with C service water pump maintenance which involved removal of the service water pump house missile barrier while the unit was at 100 percent power (see Section 1R13). This review included review of Engineering Information Request EIR-80440 "SWPH Missile Barrier Removal," dispositioned under Engineers Technical Work Record 15995. The inspectors also reviewed Final Safety Analysis Report (FSAR) Sections 3.3 and 3.5, Design Basis Documents and recently issued Regulatory Issue Summary 2001-09, "Control of Hazard Barriers," to determined if these activities were being appropriately controlled to minimize risk from adverse weather and in accordance with procedural requirements.

b. Findings

No findings of significance were identified.

1R02 Evaluations of Changes, Tests, or Experiments

a. Inspection Scope

The inspectors reviewed the eight safety evaluations listed in the Attachment to confirm that the licensee had appropriately reviewed and documented changes in accordance with 10 CFR 50.59 and Station Administrative Procedure (SAP)-107, 10 CFR 50.59 "Unreviewed Safety Question Review Process," Revision 3. The inspectors also reviewed 11 screened out evaluations, listed in the attachment, for which the licensee had determined that safety evaluations were not required and to confirm that the licensee's conclusions to screen out these changes were correct and consistent with 10 CFR 50.59 and SAP-107. The inspectors also reviewed applicable sections of the FSAR, site drawings, supporting analyses, calculations, Technical Specifications (TS), and procedures to ensure appropriate information was considered and to ensure that changes could be made to the facility without obtaining a license amendment.

In addition, the inspectors reviewed the two audit reports and the three corrective action program reports listed in the Attachment to confirm that the licensee was identifying issues, entering issues into the corrective action program, and resolving the concerns.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment

.1 Availability of Redundant Equipment

a. Inspection Scope

To verify that systems / components were correctly aligned, the inspectors reviewed various documents including plant procedures, drawings and the FSAR. The inspectors also reviewed outstanding maintenance work requests (MWRs) and related Problem Identification Program reports (PIPs) to verify that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact mitigating system availability. In addition when a train of equipment was removed from service, the inspectors determined through plant walkdowns if the opposite train of equipment was correctly aligned, available and operable. The following systems / components were reviewed:

- A Emergency Diesel Generator (EDG) (while the B EDG was out of service for preventive maintenance),
- B EDG (while A EDG was out of service during scheduled surveillance testing), and
- Emergency Feedwater (EFW) pumps and associated valve lineups (following scheduled surveillance testing on the A motor driven EFW pump).

Correct alignment and operating conditions were determined from the applicable portions of the following drawings, station operating procedures (SOPs), FSAR, and TSs:

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

b. Findings

No findings of significance were identified.

.2 Semiannual Inspection

a. Inspection Scope

The inspectors performed a detailed review and walkdown of the containment isolation systems. The following documents were reviewed to determine the correct system lineup and system requirements:

- FSAR Sections 6.2, 6.3, 7.3.2, 9.4.8.3, and 14,
- NUREG-0717, “Safety Evaluation Report related to the operation of Virgil C. Summer Nuclear Station, Unit 1,"
- TS Sections 3/4.6.1, 6.3, and 6.4,
- Surveillance Test Procedure (STP)-115.001, “Penetration Isolation Verification,” Revision 13,
- Emergency Operating Procedure (EOP)-1.0, “Reactor Trip / Safety Injection,” Revision 15, Attachment 4, Containment Isolation Valve Locations,
- Drawing 1MS-41-011-8-6, “Functional Diagrams Safeguard Actuation Signals,” and

- South Carolina Electric and Gas Company Maintenance Rule Implementation System Function Worksheet for the Containment Isolation System.

In addition, the inspectors reviewed outstanding maintenance work requests on the system and performed a walkdown to identify any discrepancies between the current operating system equipment lineup and the correct design lineup. The inspectors also reviewed related PIPs to verify that the licensee had properly identified and resolved equipment problems that could affect the containment isolation system. The inspectors also observed the performance of STP-115.001 (see Section 1R22) which demonstrates containment integrity per TS Surveillance Requirement 4.6.1.1.a.

b. Findings

No findings of significance were identified.

1R05 Fire Protection

a. Inspection Scope

The inspectors reviewed current PIPs, work orders (WO), and impairments associated with the fire suppression system. The inspectors reviewed the status of ongoing surveillance activities to determine whether they were current to support the operability and availability of the fire protection system. The inspectors assessed the material condition of the active and passive fire protection systems and features, and evaluated control of transient combustibles and ignition sources.

The inspectors conducted routine inspections of the following areas:

- Main control board and control room areas (fire zone CB-17.1),
- Charging pump rooms (fire zones AB 1.5 and 1.7),
- Auxiliary building switchgear room (fire zone AB 1.29),
- A and B diesel generator rooms (fire zones DG 1.1, 1.2, 2.1 and 2.2),
- 1DA / 1DB safeguards 7.2 KV switchgear rooms (fire zones IB 20 and 22.2), and
- Component Cooling Water (CCW) pump and emergency feedwater pump areas (fire zones IB 25.1.1-1.5 and IB-25.2).

These areas are important to safety based on the licensee's fire risk analysis (Individual Plant Examination for External Events (IPEEE) External Fires Request for Additional Information (RAI), dated January 1999).

The inspectors also observed STP-728.046, "Control Building Elevations 412' and 400' Fire Barrier Inspection," Revision 4A, and STP-728.037, "Auxiliary Building Fire Barrier Inspection Elevations 502'-6", 485', 475', 474' and 463'," Revision 3. The data was reviewed to verify that the procedure acceptance criteria were met.

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance

a. Inspection Scope

The inspectors reviewed heat exchanger testing programs for the Component Cooling Water Heat Exchangers (CCW Hxs) and the Reactor Building Cooling Units (RBCUs). This review was to verify that the frequency of testing is sufficient and testing criteria is appropriate to detect any potential heat exchanger deficiencies which could mask degraded performance. The review also verified heat sink performance problems were adequately identified and entered into the licensee's corrective action program.

The inspectors observed portions of heat exchanger performance test ES-560.211, "Service Water System Heat Exchanger Performance," Revision 7, conducted in June 2001, for the A CCW Hx to verify data was accurately recorded and results met procedural acceptance criteria. The inspectors reviewed previous Hx test data from September 2000. Trending analysis and test frequency for various Hxs was discussed with the system engineer responsible for monitoring heat exchanger performance.

b. Findings

The inspectors identified two Green findings. One, which was also a non-cited violation (NCV), involved the licensee's failure to follow procedures and restrict service water temperatures when a CCW Hx was degraded. The other finding involved a long testing interval for the RBCUs which was not justified.

CCW Hx Testing

On April 23, 2001, the inspectors determined that engineering personnel did not analyze results from CCW Hx tests performed on September 7, 2000, until November 11, 2000. On November 11 the analysis showed that increased fouling had caused the B CCW Hx heat removal capability to be degraded and that in accordance with ES 560.211, Revision 6, this Hx should have been in Action Level II from September 7 until October 6, 2000. The unit was shutdown for a refueling outage from October 6, 2000, until March 11, 2001. Furthermore the November 11 analysis showed that the maximum allowed service water (SW) pump discharge temperature should have been lowered by 2.25 degrees Fahrenheit to ensure SW temperature requirements in TS 3.7.5 (Ultimate Heat Sink) were met during the September - October time period.

Both CCW Hxs were cleaned during the refueling outage to improve their heat removal capability but were not retested to determine their thermal performance. The inspectors discussed with the licensee that although cleaning of the Hxs was expected to improve their performance, testing was necessary to determine if a SW temperature restriction was required. On May 31, 2001, the licensee issued Station Order 01-08 "Temporary Limits on Service Water Temperature" and issued a TS Regulatory Interpretation (TSR 1061) for TS 3.7.5 which restricted the allowable SW temperature by 2.25 degrees.

Failure to follow procedures to place a CCW Hx in Action Level II and restrict the allowable SW temperatures for the periods September 7 to October 6, 2000, and March 11 to May 31, 2001, had a credible impact on safety, in that, service water temperatures could have exceeded allowable limits to ensure CCW Hx operability and compliance with TS 3.7.5. The TS 3.7.5 service water temperature limit ensures sufficient cooling capacity exists to perform a normal cooldown of the facility and to mitigate the effects of accident conditions within acceptable limits. During the summer, service water temperature normally approaches within several degrees of the TS 3.7.5 limit and at times in the past has been higher than the allowable SW temperature with a 2.25 degrees restriction. Under the Significance Determination Process (SDP), the inspectors determined that this finding was of very low safety significance (Green) because during the September - October and the March - May time periods, the licensee determined that service water temperatures never exceeded the value adjusted for the 2.25 degree restriction.

TS 6.8.1 “Procedures and Programs” requires, in part, written procedures shall be implemented covering procedures recommended in Appendix A of Regulatory Guide 1.33, which includes procedures for surveillance tests. Surveillance test procedure ES-560.211 Section 10.0, “Acceptance Criteria for Action Level II,” required limitations to be placed on service water temperature based on test data which show Hx degradation. Contrary to this requirement, on September 7, 2000, the licensee failed to follow ES-560.211 Section 10.0 to enter the B CCW Hx in Action Level II and place limitations on service water temperature when data indicated Hx degradation. This NRC identified violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy and is identified as NCV 50-395/01002-01. This condition has been entered in the licensee’s corrective action program under PIP 0-C-01-0719.

RBCU Testing

The inspectors reviewed the testing program for the RBCU heat exchangers and found that the licencee’s test periodicity was every seven fuel cycles, or approximately every 10.5 years. As a reference point, the inspectors noted that Hxs which are included under a Generic Letter 89-13, “Service Water System Problems Affecting Safety-Related Equipment,” program are typically tested every five years. Although, the RBCUs are not normally cooled by SW, the inspectors discussed the program test periodicity with licensee management who subsequently indicated that the longer test interval was not justifiable. The licensee plans to revise their RBCU test program frequency and test the RBCUs during the upcoming refueling outage, scheduled to start in April 2002.

Testing the RBCU at a relatively long test interval has a credible impact on plant safety because with an inappropriate test interval established, the heat transfer capability of the RBCUs may degrade without being detected such that they would be unable to meet their accident condition mitigating function to maintain reactor building temperatures within acceptable limits. Under the SDP this finding is determined to be of very low safety significance (Green) since the RBCUs are normally supplied with industrial cooling water which is chemically treated to reduce fouling. In addition, one RBCU previously tested showed little evidence of significant fouling, i.e., a heat removal value

which was well within design values. No violation of NRC requirements was identified and the licensee documented this finding in PIP 0-C-01-0742.

1R11 Licensed Operator Requalification

a. Inspection Scope

On May 7, the inspectors observed senior reactor operators' and reactor operators' performance on the plant simulator during annual licensed operator requalification training. The training scenario involved a small break loss of coolant accident with a reactor trip including stuck rods (LOR-SA-023). The inspectors evaluated if training included risk-significant operator actions and implementation of emergency classification and the emergency plan. The inspectors assessed overall crew performance, communications, supervision oversight and the evaluators' critique.

b. Findings

No findings of significance were identified.

1R12 Maintenance Rule (MR) Implementation

a. Inspection Scope

The inspectors sampled portions of selected performance-based problems associated with structures, systems or components (SSCs), to assess the effectiveness of maintenance efforts. Reviews focused, as appropriate, on: (1) scoping in accordance with the MR (10 CFR 50.65); (2) characterization of failed SSCs; (3) safety significance classifications; (4) 10 CFR 50.65 (a)(1) or (a)(2) classifications; and (5) the appropriateness of performance criteria for SSCs classified as (a)(2) or goals and corrective actions for SSCs classified as (a)(1). This review focused on the Containment Isolation System and on the equipment issues described in the PIPs listed below:

- 0-C-01-0136, B Charging Pump auxiliary oil pump high vibration / noise,
- 0-C-00-0746, XVG01611C-FW poppet valve # 7 failure, root cause review,
- 0-C-01-0357, ILT0930, C safety injection accumulator level transmitter failing,
- 0-C-01-0511, Pressure locking of XVG03106B-SW, and
- 0-C-01-0510, RMA-2 Control Power Lost, MWR 0103168 and associated root cause evaluation.

The inspectors also reviewed the above listed PIPs to determine if maintenance preventable functional failures may have existed that the licensee did not include in their program or if other MR findings existed.

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation

a. Inspection Scope

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

- SW booster pump discharge valve XVB03106B-SW would not open,
- A EDG being surveillance tested,
- CCW surge tank level transmitter (LT-07094) work, with A CCW pump out of service and C pump aligned to A train,
- B RHR pump out of service for preventive maintenance,
- A EDG out of service for preventive maintenance, and
- C SW pump repair and SW pump house missile barrier removal.

b. Findings

No findings of significance were identified.

1R14 Personnel Performance During Non-Routine Plant Evolutions

a. Inspection Scope

This inspection evaluated operators' response for non-routine plant evolutions to ensure it was appropriate and in accordance with the required procedures.

The inspectors reviewed the operating crew's performance following the failure of a service water booster pump discharge valve (XVB03106B-SW) to open which occurred on the evening of April 10 (reference PIP 0-C-01-0511). This event occurred during STP-223.002A, "Service Water Pump Test," Revision 7, and resulted in draining of the

RBCU headers and tripping of the industrial cooling water pumps which normally supply Reactor Building (RB) cooling. This unplanned non-routine evolution required operator actions to restore RB air compressors and dryers.

On May 1, the inspectors observed and reviewed the operations crews' response to a feedwater heater transient caused by failure of the 2A heater level controller (reference PIP 0-C-01-0616). The licensee reported the resultant overpower transient in a 14-day report as required by their Operating License (reference letter RC-01-0103, dated May 15, 2001). This transient resulted in an overpower condition which lasted for less than four minutes and resulted in a peak power of 102.5 percent (see Section 4OA7).

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

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

- 0-C-01-0403, CCW system pipe clamp (MK-CCH-0320) in contact with I-beam,
- 0-C-01-0471, B EDG various problems: chirping noise from number 7 cylinder fuel injector, day tank bubbler pegged high with no high alarm, lube oil found on the floor,
- 0-C-01-0511, SW booster pump discharge Valve (XVB03106B-SW) failed to open and subsequent effect on reactor building cooling units, and
- 0-C-01-719, B CCW Hx performance test indicates a need to temporarily lower the allowable SW pump discharge temperature.

b. Findings

No findings of significance were identified.

1R16 Operator Workarounds

a. Inspection Scope

The inspectors reviewed the following items to determine whether the functional capability of the related system or human reliability in responding to an initiating event was affected by operator workarounds. The inspectors specifically considered whether the workaround affected the operators' ability to implement abnormal or emergency operating procedures for the modes of operation involved. The operator workarounds reviewed were:

- Reactor building penetration manual draining of penetrations (XRP0231, 0404, 0419 and 0421) every 31 days per STP-115.001, "Penetration Isolation Verification," Revision 13 and

- Unable to reach 100 percent power without receiving Over-Power delta Temperature (OP delta T) rod block and runback bistables. Delta T scaling issues during power ascensions (PIPs 0-C-99-0814 and 0-C-01-0371).

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications

a. Inspection Scope

The inspectors evaluated the five modifications listed in the Attachment to verify the implementation of ES-455, "Design Control: Plant Modification," Revision 2. The inspectors assessed, as appropriate, whether: (1) system energy requirements could be supplied by supporting systems; (2) materials / replacement components will perform their functional requirements under accident conditions; (3) replacement components were seismically qualified; (4) code and safety classification of replacement system, structures, and components were consistent with system design bases; (5) the modification design assumptions were acceptable; (6) post-modification testing verified system operability; (7) failure modes were bounded by existing analyses; and (8) new procedures or procedure changes were initiated. The inspectors also reviewed applicable sections of the FSAR, site drawings, supporting analyses, calculations, and TS to ensure they were correctly revised.

The inspectors also reviewed audits listed in the Attachment to confirm that the licensee was identifying modification-related issues and initiating actions to resolve concerns.

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing

a. Inspection Scope

For the post-maintenance tests (PMTs) listed below, the inspectors reviewed the test procedure and witnessed either the testing and/or reviewed test records to determine whether the scope of testing adequately verified that the work performed was correctly completed and demonstrated that the affected equipment was functional and operable:

- STP-223.002, "Service Water Pump Test," Revision 6B, PMT for B Service Water Pump following molded case circuit breaker testing (per NCN 00-769), packing adjustments, lubrication, instrument calibrations and hanger adjustments,
- STP-105.016, "Charging Pump and Diesel Generator Slave Relay Testing," Revision 7A, PMT for A EDG preventive maintenance activities (meter calibrations, relay calibrations, wiring checks, various lubrication maintenance),
- ICP-240.166, "Power Supply Testing," Revision 1A, PMT for power supply and clock card replacement following Engineered Safeguards Feature Logic System auto test failure (PIP 0-C-01-0754),
- PTP-102.008, "Main Turbine Overspeed Test," Revision 1, PMT for main turbine overspeed trip setpoint adjustments per PIP 0-C-00-1356 and PMTS 9911811,
- STP-220.007A, "Backup Air Supply Check Valve Test for Emergency Feedwater Valves," Revision 2, PMT for regulator (IFV02030-PRI-MS) replacement for EFW pump turbine steam supply flow control valve, and
- STP-0223.002A, "Service Water Pump Test," Revision 7, PMT for C service water pump shaft coupling repair.

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activities

a. Inspection Scope

The licensee reduced power on June 1 in order to troubleshoot and repair the cause of increasing reactor building sump in-leakage. The licensee performed a Furmanite repair on two SG secondary side access ports and started up the reactor on June 5. During the outage, the unit was not cooled down below Mode 3 conditions. The inspectors monitored portions of the power reduction and shutdown activities including decay heat removal, foreign material exclusion control, and configuration control. The inspectors observed reactivity control and criticality predictions and observed reactor startup and portions of power ascension to 100 percent power. The inspectors reviewed reactor

coolant system and pressurizer cooldown and heat-up data and compared the data to TS limits.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing

a. Inspection Scope

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

- STP-205.003, “Charging /Safety Injection Pump and Valve Test,” Revision 5C, for the B Charging / Safety Injection Pump and associated valves,
- STP-125.002A, “Diesel Generator Operability Test,” Revision 0B, for the A EDG,
- STP-115.001, “Penetration Isolation Verification,” Revision 13,
- STP-345.037, “Solid State Protection System Actuation Logic and Master Relay Test for Train A,” Revision 15A,
- PTP-102.001B, “Main Turbine Tests,” Revision 13 (for turbine control valve testing), and
- STP-220.001A, “Motor Driven Emergency Feedwater Pump and Valve Test,” Revision 6, for the A pump.

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed temporary modifications to assess the impact on risk-significant SSC parameters, such as, availability, reliability and functional capability. The inspectors assessed whether the temporary modifications had adversely affected safety functions of required systems. The following temporary modifications were reviewed:

- B main feedwater pump non-standard repair per work order WO 0105502 including 50.59 evaluation review and foreign material exclusion control,

- Secondary leak repairs on the B and C SG access port covers per NCN 01-758 and NCN 01-790, respectively, and

- Scaffold Request 7439 and associated technical work record evaluations and 50.59 evaluation allowing C SG scaffold to remain in the reactor building during Mode 1 operations following secondary leak repairs.

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation

a. Inspection Scope

On April 26, the inspectors observed the performance of a drill conducted to train on the integrated capabilities of the associated emergency organizations and a major portion of the Virgil C. Summer Nuclear Station Radiation Emergency Plan. This drill is also considered as one of the required Health Physics Drills. Participation of the state and local governments was limited to receiving Emergency Notification and the associated forms per their request. The inspectors observed various aspects of the drill in the Operations Support Center and Technical Support Center. The inspectors assessed emergency procedure usage, including proper emergency plan classification, notifications and protective area recommendations to ensure the licensee was properly identifying and entering any problem areas into their corrective action program. This inspection evaluated the adequacy of the licensee conduct of the drill, critique performance and determined whether the drill was of appropriate scope to be included in the performance indicator statistics. The inspectors reviewed issues affecting the performance indicator data to verify if they were appropriately captured.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstones: Occupational Radiation Safety and Public Radiation Safety

2OS1 Access Controls to Radiologically Significant Areas

.1 Access Control Observations

a. Inspection Scope

Licensee administrative controls for high radiation and locked high radiation areas were reviewed. During the onsite inspection, high radiation area key control was examined; and radiation work permit (RWP) and standing radiation work permit (SRWP)

development, use, and termination were reviewed and evaluated. Licensee procedural guidance for surveys and controls associated with reactor building and incore pit entries were inspected.

Licensee radiation protection activities for two "at power" containment entries conducted during the week of May 28, 2001, and for radioactive waste staged and awaiting shipment on May 31, 2001, were evaluated. The evaluations of containment entries included record review, discussions, and direct observation of licensee administrative controls, surveys, personnel monitoring, pre-job briefings associated with applicable RWPs. The evaluation included review of airborne contamination levels, neutron dose rates, multi-badging for high dose rate gradients, and electronic dosimetry requirements. Current radiation survey results were reviewed and compared with previous surveys conducted for the same and overlapping areas. The initial startup neutron spectrum study data were reviewed to evaluate established calibration factors for neutron dose rate and dosimetry instrumentation used during the containment entries. Electronic dosimeter set-points were evaluated against the expected containment conditions and actual set-points verified for several workers. Through direct interviews, the inspectors assessed proficiency of health physics technicians assigned job coverage. For the containers of radioactive waste awaiting shipment, dose rates were measured and label information accuracy reviewed.

Licensee activities were reviewed against TS and 10 CFR Part 20 requirements. The following health physics procedures (HPP) and RWPs were reviewed and discussed with licensee representatives:

- HPP-401, "Issuance, Termination and Use of RWPs and SRWPs," Revision 14,
- HPP-402, "Radiological Survey Requirements and Controls for Reactor Building and Incore Pit Entries," Revision 10,
- HPP-411, "Monitoring Exposure with Multiple Badging," Revision 9,
- HPP-719, "Authorization and Control for Resin Transfer," Revision 4,
- RWP 01-20, 05/24/2001, and
- RWP 01-23, 05/30/2001.

b. Findings

No findings of significance were identified.

.2 Problem Identification and Resolution

a. Inspection Scope

The inspectors reviewed and discussed the following PIPs associated with radiological controls and assessments:

- 0-C-01-0394, Dated 3/20/01, Truck Driver and Security Officer Entered Radiologically Controlled Area Yard Without an Electronic Dosimeter,

- 0-C-01-0410, Dated 2/26/01, Inconsistencies, Discrepancies, and Poor Practices Noted with Radioactive Material Container Labels During the HP Field Operations Self Assessment,

- 0-C-01-0411, Dated 2/28/01, Improper and/or Inadequate Posting of Radiological Areas Discovered During the HP Field Operations Self Assessment,

- 0-C-01-0415, Dated 3/22/01, Incomplete Resin Transfer Permits, and

- 0-C-01-0489, Dated 4/6/01, Skin Dose Was Not Calculated from External Contamination From a Hot Particle as per HPP-405 in a Timely Manner.

Licensee prioritization of the issues, extent of condition determinations, and corrective actions were evaluated. The identified issues were discussed with responsible respiratory protection staff and status of corrective actions were reviewed. The reviewed issues were evaluated against 10 CFR Part 20, and FSAR details.

b. Findings

No findings of significance were identified.

2OS3 Radiation Monitoring and Protection Equipment

.1 Portable Radiation Survey Instruments

a. Inspection Scope

For a May 30, 2001, “at power” containment entry, and a May 30, 2001 resin shipment, the inspectors evaluated availability and operability of personnel radiation survey instruments. Instrument calibration adequacy was assessed and performance of response checks were observed. Calibration data was evaluated and response checks were observed for the following instruments: RO-20 Serial Number (SN) 3159, ASP-1 Rem Ball SN 2195, and Teletector SN 19713. The inspectors reviewed the response checks for the following instruments used on a previous containment entry (5/24/01): PNR-4 Rem Ball SN 2195, RO-20 SN 3160, and Teletector SN11726.

Activities observed within this program area were evaluated against applicable requirements in 10 CFR Part 20, and details documented in TS and the FSAR.

b. Findings

No findings of significance were identified.

.2 Respiratory Protection Equipment

a. Inspection Scope

The inspectors reviewed and discussed PIPs 0-C-01-0446, dated March 29, 2001, Scott Air Pack Bottles (61) Found to be not NIOSH Approved due to Vendor Error. Licensee prioritization of the issue, extent of condition determination, and corrective actions were evaluated. The identified issue was discussed with responsible respiratory protection staff, and reviewed against vendor documentation to assess safety significance. The inspectors assessed corrective actions based on direct observation of staged air pack bottles.

The identified issue was evaluated against 10 CFR 20, Subpart H, Respiratory Protection and Controls to Restrict Internal Exposure in Restricted Areas.

b. Findings

No findings of significance were identified.

2PS1 Radioactive Effluent Processing and Release

a. Inspection Scope

The inspectors reviewed and discussed results presented in the Calendar Year (CY) 2000 Annual Effluent and Waste Disposal Report. Selected radionuclide lower limit of detection limit (LLD) values for vendor laboratory effluent sample analyses and compensatory sampling for a out-of-service atmospheric radiation monitor (RM-A3) during the period September 27-29, 2000 were examined.

The effluent monitoring and processing activities were reviewed against Regulatory Guide (RG) 4.15, Quality Assurance for Radiological Monitoring Program (Normal Operations) - Effluent Streams and the Environment, Revision 1, February 1978; and the Offsite Dose Calculation Manual, Revision 23, details.

b. Findings

No findings of significance were identified.

2PS2 Radioactive Material Processing and Transportation

a. Inspection Scope

Radiation protection program activities associated with radioactive waste characterization and transportation activities were directly observed and evaluated. On May 30, 2001, the inspectors directly observed radiation surveys, loading, and completion of required documentation in preparation for the transport of de-watered charcoal and bead resins to a licensed waste processor. For the observed shipment, calendar year 2000 charcoal and bead radiochemical sample analysis results used to determine scaling factors and calculations to account for difficult-to-measure

radionuclides were reviewed for applicability; shipping container dose rate and contamination survey results were observed and measured; and shipping paper data for Shipment Manifest Number 01-45, Radioactive Material LSA n.o.s., 7, UN2912, Fissile Excepted, were reviewed for accuracy and completeness.

The observed radiation and transportation activities, survey results, and associated shipping paper documentation were reviewed against 10 CFR Parts 20, 61, 71; 49 CFR Parts 170 -189; FSAR details, and HPP-703, "Shipping Radioactive Material," Revision 13.

b. Findings

No findings of significance were identified.

2PS3 Radiological Environmental Monitoring Program

a. Inspection Scope

The inspectors reviewed and discussed results presented in the 2000 Annual Radiological Environmental Monitoring Report. Quality control activities to meet selected radionuclide LLDs for environmental tritium and gross alpha-beta analyses were assessed. Positions of sample station locations and equipment were discussed and compared with current five year running average meteorological dispersion and deposition data.

Implementation of the REMP sampling and laboratory QC activities were evaluated against RG 4.15, Quality Assurance for Radiological Monitoring Program (Normal Operations) - Effluent Streams and the Environment, Revision 1, February 1978 and ODCM Revision 23, details.

b. Findings

No findings of significance were identified.

3. SAFEGUARDS

Cornerstone: Physical Protection

3PP1 Access Authorization (Behavior Observation Program)

a. Inspection Scope

The inspector evaluated licensee procedures, Fitness For Duty (FFD) reports, and licensee audits. Additionally, the inspector interviewed five representatives of licensee management and five escort personnel concerning their understanding of the behavior observation portion of the personnel screening and FFD program. In interviewing these personnel, the inspector evaluated the effectiveness of their training and abilities to recognize aberrant behavioral traits, physiological indications of narcotic and alcohol use, and work call-out reporting procedures. Licensee compliance was evaluated

against requirements in the V. C. Summer Nuclear Plant Physical Security Plan and associated procedures, and 10 CFR Part 26, Fitness For Duty Programs.

b. Findings

No findings of significance were identified.

3PP2 Access Control

a. Inspection Scope

The inspector observed access control activities, and search / access control equipment testing. In observing the access control activities, the inspector assessed whether officers could detect contraband prior to it being introduced into the protected area. The protective barriers for the Final Access Control facility were inspected to ensure compliance with protection standards in the Physical Security Plan. Additionally, the inspector assessed whether the officers were conducting access control equipment testing in accordance with regulatory requirements through observation, review of procedures and log entries. Preventive and post-maintenance procedures were evaluated and observed as performed. Lock, combination, and key control procedures were evaluated, as well as, aspects of the site access authorization program.

Licensee compliance was evaluated against requirements in the V. C. Summer Nuclear Plant Physical Security Plan and associated procedures; 10 CFR Part 73.55, Requirements for Physical Protection of Licensed Activities in Nuclear Power Reactors Against Radiological Sabotage; and Part 73.56, Personnel Access Authorization Requirements for Nuclear Power Plants.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification

.1 Unplanned Scrams per 7,000 Critical Hours PI

a. Inspection Scope

The inspectors assessed the accuracy of the PI for “Unplanned scrams per 7,000 Critical Hours.” The inspectors reviewed selective samples of station logs, NRC Inspection Reports, licensee event reports, monthly operating reports, and corrective action program database for the period of June 2000 through April 2001.

b. Findings

No findings of significance were identified.

.2 Scrams with Loss of Normal Heat Removal PI

a. Inspection Scope

The inspectors assessed the accuracy of the PI for "Scrams with a Loss of Normal Heat Removal." The inspectors reviewed selective samples of station logs, NRC Inspection Reports, licensee event report, monthly operating reports, and corrective action program database for the period of June 2000 through April 2001.

b. Findings

No findings of significance were identified.

.3 Physical Protection PI

a. Inspection Scope

The inspector evaluated the licensee's programs for gathering and submitting data for the "Protected Area Security Equipment Performance Index," "Personnel Screening Program Performance" and "Fitness-For-Duty / Personnel Reliability Program Performance" PIs. The evaluation included the licensee's tracking and trending reports and security event reports for the PI data submitted from the first quarter to the fourth quarter of 2000. Licensee performance was evaluated against guidelines in Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 0.

b. Findings

No findings of significance were identified.

4OA3 Event Follow-up

.1 (Closed) Licensee Event Report (LER) 50-395/2001003-00: Manual reactor trip due to two rods failing to respond to a withdrawal demand. This LER documents a manual reactor trip initiated on March 1, 2001, during low power physics testing due to two control rods that remained fully inserted following a withdrawal demand of shutdown bank B. All systems functioned as designed following the reactor trip. This event was previously reviewed in Inspection Report 50-395/00-07 (Section1R14) with no findings of significance identified. This event did not constitute a violation of NRC requirements. The licensee documented corrective actions for this event in PIP 0-C-01-296 and this LER.

.2 (Closed) LER 50-395/2001002-00: Inappropriate mode change during Resistance Temperature Detector (RTD) cross calibration of the reactor protection system. This LER documents licensee entry into Mode 3 with required instrumentation out of service (specifically, the P-12 interlock, which allows blocking of the low steamline pressure isolation signal below the low-low average temperature of 552 degrees Fahrenheit). This was a violation of TS 3/4 3.2, Table 3.3-3.

This issue did not represent an actual or credible impact on safety since the P-12 function was already fulfilled during this period due to the RTD procedure requiring all P-12 bistables to be placed in the tripped condition. Additionally, the main steam isolation valves were always closed. Although this issue should be corrected, it constitutes a violation of minor safety significance and is not subject to enforcement action in accordance with Section IV of the Enforcement Policy. This item is documented in the licensee's corrective action program as PIP 0-C-01-0262.

.3 (Closed) LER 50-395/2000008-01: Reactor coolant system pressure boundary degradation, (Revision 1). This revision to the original LER addresses the root cause of the crack in the A reactor coolant loop hot leg discovered on October 12, 2000. The LER revision documents licensee's root cause analysis, extent of condition determinations and information related to the corrective actions. The root cause analysis determined that the leak was the result of primary water stress corrosion cracking (PWSCC). This event was previously reviewed by an NRC Special Inspection Team and documented in NRC Special Inspection Report No. 50-395/00-08 available at the NRC Website: *http://www.nrc.gov/NRC/REACTOR/SUMMER/index.htm* under the NRC Inspection Team and Reports link for the report issued March 15, 2001 (or at ADAMS Accession Number: ML010740293). The special inspection team report concluded that the licensee's actions were appropriate and no performance deficiencies were identified.

.4 (Closed) LER 50-395/1999004-02: Failure of top nozzle holddown spring screws, (Revision 2). Revision 2 adds additional information from the most recent refueling. The licensee made repairs due to additional degraded top nozzle holddown spring screws being found. The LER also noted changes due to the use of previously burned fuel assemblies in the current (cycle 13) core due to the extended cycle 12 refueling outage. This issue was previously reviewed in NRC Integrated Report Nos. 50-395/99-09 and 50-395/00-06. No findings or issues of significance were identified. This event did not constitute a violation of NRC requirements.

4OA5 Other

Review of Institute of Nuclear Power Operations (INPO) Report

The inspectors reviewed the interim INPO report for the May 2001 evaluation. There were no safety significant issues discussed that warranted additional NRC attention.

4OA6 Meetings

Exit Meeting Summary

The inspectors presented the inspection results to Mr. S. Byrne, Senior Vice President, and other members of the licensee's staff on June 29, 2001.

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

4OA7 Licensee Identified Violation

The following finding of very low significance was identified by the licensee and is a violation of NRC requirements which meets the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as an NCV.

NCV Tracking Number	Requirement Licensee Failed to Meet
NCV 50-395/01002-02	Technical Specification 6.8.1.a and Regulatory Guide 1.33, Revision 2 (in part) requires procedures be established for alarm conditions. Contrary to these requirements, the licensee failed to establish an adequate alarm response procedure for a feedwater transient alarm. Specifically, Annunciator Response Procedure ARP-001-XCP-627, Revision 11D was inadequate for the Feedwater Heater 1, 2, 4 Isolate / Level Hi-Hi alarm, in that, it failed to direct a power reduction for an isolated feedwater heater. This inadequate procedure contributed to exceeding the licensed 2900 megawatts thermal power limit on May 21, 2001. This item was entered in the licensee's corrective action program as PIP 0-C-01-0616. (Green)

Attachment

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

J. Archie, General Manager, Engineering Services
F. Bacon, Manager, Chemistry Services
L. Blue, Manager, Health Physics and Radwaste
M. Browne, Manager, Nuclear Licensing and Operating Experience
R. Clary, Manager, Plant Life Extension
C. Fields, Manager, Quality Systems
D. Gatlin, Manager, Operations
G. Halnon, General Manager, Nuclear Plant Operations
L. Hipp, Manager, Nuclear Protection Services
G. Moffatt, Manager, Design Engineering
K. Nettles, General Manager, Nuclear Support Services
A. Rice, Manager, Plant Support Engineering
A. Torres, Manager, Planning/Scheduling and Project Management
R. White, Nuclear Coordinator, South Carolina Public Service Authority
G. Williams, Manager, Maintenance Services

ITEMS OPENED AND CLOSED

Opened and Closed

50-395/01002-01	NCV	Failed to follow procedure to enter the B component cooling water heat exchanger in Action Level II and place limitations on service water temperature when testing indicated degradation (Section 1R07)
50-395/01002-02	NCV	Failure to establish an adequate annunciator response procedure resulted in exceeding licensed thermal power (Section 4OA7)

Closed

50-395/2001003-00	LER	Manual reactor trip due to two rods failing to respond to a withdrawal demand (Section 4OA3.1)
50-395/2001002-00	LER	Inappropriate mode change during resistance temperature detector cross calibration of the reactor protection system (Section 4OA3.2)
50-395/2000008-01	LER	Reactor coolant system pressure boundary degradation (Section 4OA3.3)
50-395/1999004-02	LER	Failure of top nozzle holddown spring screws (Section 4OA3.4)

DOCUMENTS REVIEWED

Sections 1R02 and 1R17

Safety Evaluations:

ECR (@) 50261	Temporary Service Water Pond Cooling Towers
ECR 50327	Change CRDM Cooling Relief Valves Setpoints
ECR 50032	Diesel Generator Injector Cooling Elimination
ECR 50178B	Cycle 13 Reload Core Design
NCN 00-1603	Evaluation of Reactor Building Cooling with Reactor Cavity Seal Ring Removed
ECR 50387	Temporary Auxiliary Boiler
RN (&) 01-042	FSAR Section 10.2 to Reflect the Current Basis for the Evaluation of Turbine Missiles (GE JO 2010)
TSR (#) 1060	Source Range Reactor Trip Protection

Screened Out Evaluations:

ET/BT (*) 500	Breaker Conductor Sleeving
ECR 50321	Chill Room Air/Water/Electrical Penetrations
NCN (%) 00-0528	Cracked Weld on Striker Plate (SW pump breaker in XSW1EA)
NCN 00-1297	Louvers on B train supply duct found loose and disconnected CB 448 Cable Area)
NCN 00-1031	Found interference between positive interlock plates and link pin (Breaker for EFW pump A)
NCN 00-1845	Containment Penetration Conductor Pin Failed During Use
NCN 01-0250	Paint is peeling from XFN-0065B-AH (EFW line to SG B at 493' elevation)

Modification Packages:

ECR 50056	Diesel Generator Heat Exchanger Replacement
ECR 50032	Diesel Generator Injector Cooling Elimination
ECR 50101	Battery Charger Test Panel
ECR 50157	Add Six New Isolation Valves to Emergency Feedwater (partially completed)
ECR 50178B	Cycle 13 Reload Core Design

Audits:

QA-AUD-200003	Station Training, Qualification, and Performance (Unit Staff), 5/23/00
QA-AUD-20012-0,	Design Activities, 3/6/01

PIPs:

numbers: 0-C-00-1528, 0506, 1297, and 0629

Procedures:

MMP-180.0 04, EDG Engine Governor and Control Maintenance, Revision 7 A

AOP-118.1, Total Loss of Component Cooling Water, Revision 2

EOP 1.0, Reactor Trip/Safety Injection Actuation, Revision 15

EOP 1.1, Reactor Trip Recovery, Revision 11

SAP-1141, Nonconformance Control Program, Revision 8

ES-509, Disposition of Site Nonconformances, Revision 6

ES-416, Design Modification Change Process and Control, Revision 14

ES-455, Design Control: Plant Modification, Revision 2

SAP-107, 10 CFR 50.59 Unreviewed Safety Question Review Process, Revision 3

Notes:
* = Equal to/Better than
% = Non-Conformance Notice
@ = Engineering Change Request
# = Technical Specification Relocation
& = Revision Notice (FSAR)

Sections 3PP1 and 3PP2

Various Licensee Primary Identification Program documents

V. C. Summer Physical Security Plan (Revision 9)

V. C. Summer Security Plan Procedures: SPP-224, SPP-203, SPP-228, SPP-201, SPP-210, SPP-213, SPP-214

Security Lesson Plan 1203-C, Contraband Detection Equipment & Operation

Fitness for Duty Semi-Annual Reports, January through December, 2000

Safeguard Event Logs, 2001

Fitness-for-Duty/Continual Behavior Observation General Employee Training Handout, Revision 3

Fitness-for-Duty/Continual Behavior Observation Training Lesson Plan, Revision 2

Security Force and Operations Key and Lock Inventory Logs