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

November 8, 2002

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 INSPECTION REPORT 50-395/02-07

Dear Mr. Byrne:

On October 11, 2002, the Nuclear Regulatory Commission (NRC) completed a safety system design and performance capability inspection at your Summer Nuclear Station. The enclosed report documents the inspection findings which were discussed on October 11, 2002, with you and other members of your staff.

This inspection was an examination of activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations, and with the conditions of your operating license. Within these areas, the inspection involved selected examination of procedures and representative records, observations of activities, and interviews with personnel.

On the basis of the results of this inspection, no findings of significance were identified.

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 Publically Available Records (PARS) component of the NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Charles R. Ogle, Chief
Engineering Branch 1
Division of Reactor Safety

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

Enclosure: (See page 2)

Enclosure: NRC Inspection Report 50-395/02-07 w/Attachment

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U.S. NUCLEAR REGULATORY COMMISSION
REGION II

Docket No.:	50-395
License No.:	NPF-12
Report No.:	50-395/02-07
Licensee:	South Carolina Electric & Gas (SCE&G) Company
Facility:	Virgil C. Summer Nuclear Station
Location:	P. O. Box 88 Jenkinsville, SC 29065
Dates:	September 23-27, 2002 (Week 1) October 7-11, 2002 (Week 2)
Inspectors:	F. Jape, Senior Project Manager (Lead Inspector) M. Thomas, Senior Reactor Inspector R. Moore, Reactor Inspector N. Garrett, Resident Inspector (Hatch) N. Merriweather, Senior Reactor Inspector (Week 1 only) C. Smith, Senior Reactor Inspector (Week 2 only)
Approved by:	Charles R. Ogle, Chief Engineering Branch 1 Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS

IR 05000395-02-07, South Carolina Electric & Gas Co., on 9/23-10/11/2002, Virgil C. Summer, safety system design and performance capability biennial baseline inspection.

The inspection was conducted by regional inspectors and the Hatch resident inspector. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

No findings of significance were identified.

REPORT DETAILS

1. REACTOR SAFETY

CORNERSTONES: Initiating Events, Mitigating Systems

1R21 Safety System Design and Performance Capability

.1 System Needs

a. Inspection Scope

Instrumentation

The team reviewed the design of the instrument channels which would be used by the operators to determine the refueling water storage tank (RWST) level, the containment sump level, and the instrumentation used to initiate automatic switchover to the containment sump during a small break loss of coolant accident (SBLOCA). The team reviewed appropriate design drawings, surveillance test procedures, scaling documents, and calibration procedures to determine if the instrument channels were consistent with the design bases and/or Technical Specifications (TS). Specifically, the team reviewed the RWST instrument level sensor channels, actuation logic, and interlocks for the automatic switchover to the containment sump to verify consistency with design basis documents. The instrument loop uncertainty calculation for the containment sump level channels was reviewed to determine if it adequately addressed instrument uncertainties associated with elevated containment temperatures and pressures postulated during accident conditions.

The team walked down and inspected the heat tracing control panels for the RWST level instruments to verify that they were operable and no alarms were present. Also, the team reviewed design drawings depicting the heat tracing system to verify that the temperature sensors were properly located to detect process temperatures.

The team reviewed design basis documentation that demonstrated the containment sump level instrumentation qualification for submergence post-accident operation as required by 10 CFR 50.49, “Environmental Qualification of Electrical Equipment Important to Safety for Nuclear Power Plants.”

Controls

The team reviewed the design, calibration, and maintenance of residual heat removal system (RHR) controls to verify that RHR system performance and monitoring were consistent with the design basis, Updated Final Safety Analysis Report (UFSAR), and accident analysis assumptions. A review of vendor manuals, set point calculations, calibration procedures, RWST and containment sump drawings was conducted to ensure the accuracy and reliability of controls of water sources for mitigation of the SBLOCA. Additionally, the team reviewed the calibration and surveillance tests of the flow control instrumentation for the RHR pump miniflow valves.

This review was conducted to verify that adequate pump flow was assured, consistent with vendor recommendations.

Process Medium

The team reviewed the capability of the RHR system to mitigate the effects of a SBLOCA. The team verified that this capability was consistent with the licensing bases such as the UFSAR, TS, and licensee Safety Evaluation Reports. This review included design documentation; drawings; and calculations of system capacity, RHR pump net positive suction head (NPSH) available and required, and RHR pump minimum flow and runout flow protection. In addition, the system performance documentation was reviewed to assess the reliability, availability, and adequacy of system performance testing and equipment maintenance.

The team also reviewed the RWST licensing and design basis documents to verify that an adequate supply of borated water was available to mitigate the effects of a SBLOCA. This review included TS Section 3/4.5.4, UFSAR Section 6.3.2.6, drawings, system design basis documents (DBDs), and RWST volume calculations. Also, test results (performed on a 1/4 scale model of the RWST to show the effectiveness of the RWST anti-vortex design) were reviewed to verify that vortexing had been properly considered in RWST volume calculations.

Heat Removal

The team reviewed the heat removal equipment for the RHR pump motor and RHR pump room to assess the reliability and availability of this equipment. This review included design documentation, drawings, calculations, vendor manuals, test documentation, surveillance and operating procedures and installed equipment.

The team reviewed the vendor manuals, drawings, RHR system DBD, component cooling water (CCW) heat exchanger heat load calculations, surveillance test documentation, and operating procedures to assess the design and performance of the RHR and component cooling heat exchangers. The team also reviewed CCW heat exchanger calculations, test acceptance criteria, and surveillance test results to verify that CCW heat exchanger tube plugging and fouling were evaluated for impact on heat exchanger performance.

Electrical Power Source

The team performed a design review for probable common cause failure of the charging safety injection pump (CSIP) and RHR pump motors to operate because of inadequate equipment utilization voltage. The team reviewed DBDs, calculations, vendor information and approved design output drawings of the 7.2 kilovolt (KV) and 480 volt alternating current (VAC) power distribution system. Minimum motor terminal voltages and overcurrent protective relay application for the charging injection pump and RHR motors were evaluated for compliance with vendor recommendations and industry guides and standards. The team also evaluated selected RHR motor operated valves (MOVs) for their performance capability under degraded voltage conditions against the

valve actuator minimum required open/close torque requirements. Additionally, the team reviewed the sizing and application of thermal overloads for the MOVs to verify compliance with vendor information and industry guides and standards.

b. Findings

No findings of significance were identified.

.2 Selected System Conditions and Capability

a. Inspection Scope

Installed Configuration

The team performed a field walkdown of accessible equipment related to the CSIP and support systems to assess material condition and verify the equipment alignment was consistent with system drawings and procedures. Specific equipment examined during the walkdown included the CSIPs, CCW pumps, system valves, piping, and related components.

Operations

The team reviewed selected system trending data, modifications, and maintenance histories for the CSIPs, RHR heat exchangers, and CCW heat exchangers to identify any degradation in system performance. The team reviewed selected system calculations to ensure that adequate NPSH was available for all operational modes of the CSIPs and adequate injection flow would be available during a SBLOCA scenario.

Design

Design and test documentation were reviewed to determine if the design basis assumptions for system capability were maintained. Additionally, system design changes were reviewed to verify the design function of the system was appropriately maintained. This review included design documentation, drawings, calculations, vendor manuals, test documentation, and surveillance and maintenance procedures for installed equipment. The team also performed a review to verify that power uprate modifications had been evaluated for impact on the capability of the CCW and RHR heat exchangers to remove the required heat load during the recirculation phase after a SBLOCA.

Testing

The team reviewed selected completed test data to ensure that CSIP system injection flow rates remained within system design calculations. The team reviewed documentation of completed surveillance tests, calibration procedures, and inspections of equipment required for mitigation of a SBLOCA to verify that equipment performance was appropriately monitored and maintained consistent with the design and licensing bases. Additionally, the team verified the accurate translation of setpoint values and

acceptance criteria from design documentation into the applicable test procedures. Component testing reviewed included RHR pumps, containment sump and RWST level instrumentation, RHR and CCW heat exchangers, and selected critical MOVs important for mitigating a SBLOCA.

b. Findings

No findings of significance were identified.

.3 Selected Components

a. Inspection Scope

Component Inspection

The team reviewed maintenance and testing documentation, performance trending information, and equipment history to assess the licensee's actions to verify the safety function, reliability, and availability of selected components were consistent with the UFSAR, NRC generic letters and industry standards. Additionally, potential common cause failure mechanisms due to flooding and maintenance were reviewed. The selected equipment included the RHR pumps, RHR room heating, ventilation, and air conditioning equipment, RHR and CCW heat exchangers, a risk based selection of important valves (XVG-8706A, - 8811 A&B, -8812 A&B, 0602 A&B) and level instrumentation for the RWST and containment sump.

The team performed selected field inspections of 7.2 KV switchgears and 480 VAC motor control centers. The team assessed the adequacy of the equipment material condition. The team also evaluated the installed equipment configuration for compliance with design output drawings. Additionally, the team conducted a field inspection of the RWST level transmitters to verify that the instrument locations were consistent with the instrument isometric drawings and scaling documents.

The team performed field walkdowns of the accessible equipment required for the mitigation of the SBLOCA, including RHR pumps, important valves and RWST instrumentation to assess material condition and identify degraded conditions.

b. Findings

No findings of significance were identified.

.4 Identification and Resolution of Problems

a. Inspection Scope

The team reviewed equipment problems identified in the licensee's corrective action program. This included the licensee's review and evaluation for applicability of industry Operating Experience (OE) issues.

Findings

b. No findings of significance were identified.

4. OTHER ACTIVITIES

4OA6 Management Meetings

The lead inspector presented the inspection results to Mr. S. Byrne, and other members of the licensee's staff at an exit meeting on October 11, 2002. The licensee acknowledged the findings presented. Proprietary information is not included in this inspection report.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

R. Brenner, System Engineer
S. Byrne, Senior Vice President, Nuclear Operations
D. Gatlin, Manager, Operations
G. Halnon, General Manager, Nuclear Plant Operations
G. Moffatt, Manager, Design Engineering
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B. Stokes, Supervisor, Design Engineering
R. Sweet, Supervisor, Licensing
D. Watson, Senior Nuclear Training Supervisor
S. Zarandi, Manager, Maintenance

NRC

M. King, Resident Inspector
J. Moorman, Team Leader
M. Widmann, Senior Resident Inspector

ITEMS OPENED, CLOSED, AND DISCUSSED

None

LIST OF DOCUMENTS REVIEWED

Procedures

STP-125.010, Integrated Safeguards Test Train A, Rev. 8
STP-300.003, Reactor Building Residual Heat Removal Sump A Level Instrument ILT01969 Calibration, Rev. 7
STP-300.004, Reactor Building Residual Heat Removal Sump B Level Instrument ILT01970 Calibration, Rev. 6
STP-375.001, Refueling Water Storage Tank Level Instrument ILT00990, Rev. 6
STP-395.054, Refueling Water Storage Tank Level Instrument ILT00990 Operational Test, Rev. 5
EOP-2.2, Transfer To Cold Leg Recirculation, Rev. 12
GMP-100.016, Section XXXIII, Reactor Building RHR Sump A Level ILT01969, Exhibit 03, Rev. 0
GMP-100.016, Section XXXIII, Reactor Building RHR Sump B Level ILT01970, Exhibit 04, Rev. 0
GMP-100.016, Section XIII, Refueling Water Storage Tank Levels, Rev. 0
EE-03, Electrical Protective Device Setting and Coordination, Rev. 1
ES-510, Sizing of Thermal Overloads, Rev. 1
ES-560.211, Service Water System Heat Exchanger Performance, Rev. 8
PTP-213.002, Service Water System Heat Exchanger Data Collection, Rev. 0, Change A
EMP-280.001, Testing of Thermal Overloads, Rev. 8
EMP-190.005, Test Procedure for GE Type IAC66 Relays, Rev. 7.
EMP-190.006, Test Procedure for GE Type PJC Relays, Rev. 7.
STP- 375.001, RWST Level Instrument, ILT-00990, Rev. 6
STP-300.003, Reactor Building RHR Sump A Level Instrument 1LT01969 Calibration, Rev. 7
GMP-100.020, Component Leakage Periodic Assessment, Rev. 5
EOP 1.0, Reactor Trip/Safety Injection Actuation, Rev. 17
EOP 2.0, Loss of Reactor or Secondary Coolant, Rev. 12
EOP 2.1, Post-LOCA Cooldown and Depressurization, Rev. 10
EOP 2.2, Transfer to Cold Leg Recirculation, Rev. 9
GTP-302, Inservice Testing of Valves Second Ten Year Interval, Rev. 12
SOP-112, Safety Injection System, Rev. 15
SOP-118, Component Cooling Water, Rev. 14
STP-105.003, Safety Injection Valve Operability Test, Rev. 14
STP-105.006, Safety Injection/Residual Heat Removal Monthly Flow Path Verification Test, Rev. 11
STP-109.001, Reactor Building Inspection, Rev. 9
STP-230.006A, ECCS/Charging Pump Operability Testing (Refueling), Rev. 4
STP-230.006B, ECCS Flow Balance (Refueling), Rev. 3
STP-406.002, Reactor Building Recirculation Sump Inspection, Rev. 6

Completed Surveillance Procedures

ES-560.211, Service Water Heat Exchanger Performance (CCW Heat Exchanger A), completed 4/20/00, 5/31/00, 8/29/00, 6/27/01, 6/11/02
ES-560.211, Service Water Heat Exchanger Performance (CCW Heat Exchanger B), completed 9/7/00, 7/16/01, 6/18/02
OAP-106.1, Operating Logs (RWST Level and Temperature), completed daily 1/1/02 - 10/9/02
OAP-106.3, Locked Valve Program (RHR Heat Exchanger A CCW Outlet Valve), completed 5/7/02)
OAP-106.3, Locked Valve Program (RHR Heat Exchanger B CCW Outlet Valve), completed 5/18/02)
STP-205.004, RHR Pump A and Valve Operability Test, completed 7/11/02
STP-230.007, RHR Pump A and Check Valve Full Flow Test, completed 5/13/02
STP-0401.005, RHR Inlet Header Relief Valve Set Point test, completed 10/15/97 and 10/16/00
STP 0375.004, RWST Level Transmitter Loop calibration, completed 10/26/01
STP-601.001, Boron Concentration Procedure Testing Normal Boron Sources, completed weekly 7/2/02 - 9/24/02
STP-0125.010, Train A Integrated Safeguards Test, completed 5/26/02
STP-0125.011, Train B Integrated Safeguards Test, completed 5/23/02
STP-0135.001, PAMS Instrument Channel Check, completed 8/16/02 and 9/13/02

Drawings

VCS-ILT00990-SF, Sheet 1, Instrument Loop Diagram Refueling Water Storage Tank (RWST) Level, Rev. 7
VCS-ILT00990-SF, Sheet 2, Instrument Loop Diagram Refueling Water Storage Tank (RWST) Level, Rev. 1
VCS-ILX00990-SF, Sheet 1, Instrument Loop Diagram Two Out of Four Reactor Water Storage Tank Lo-Lo Level, Rev. 2
VCS-ILT00991-SF, Sheet 1, Instrument Loop Diagram Refueling Water Storage Tank Level #2, Rev. 6
VCS-ILT00992-SF, Sheet 1, Instrument Loop Diagram Refueling Water Storage Tank (RWST) Level, Rev. 4
VCS-ILT00993-SF, Sheet 1, Instrument Loop Diagram Refueling Water Storage Tank (RWST) Level #4, Rev. 6
VCS-ILT01969-LD, Sheet 1, Instrument Loop Diagram Reactor Building RHR Sump A Level, Rev. 5
VCS-ILT01970-LD, Sheet 1, Instrument Loop Diagram Reactor Building RHR Sump B Level, Rev. 4
1MS-51-728, Sheet 34, NLP GP2 Schematic, Rev. 0
VCS-IVS06001-X1, XPN6001 Card & Power Supply Failure Alarm Circuitry, Rev. 0
VCS-IVS06002-X1, XPN6002 Card & Power Supply Failure Alarm Circuitry, Rev. 0
B0208-095, Sheet 21, Elementary Diagram Recirc Sump To RHR Pump A Isolation VV 8811A (XVG8811A), Rev. 10

B-208-095, Sheet 22, Elementary Diagram Recirc Sump To RHR Pump B Isolation VV 8811B (XVG8811B), Rev. 10
1MS-11-016, 40’ Diameter X 58’ - 0" Refueling Water Storage Tank, Rev. 8
E-511-101, Reactor Building Liner Plate Bottom Plan and Section, Rev. 3
DE(1)-LD-LT-1970, Reactor Building RHR Sump “B” Level Transmitter, Rev. 3G
DE(1)-LD-LT-1969, Reactor Building RHR Sump “A” Level Transmitter, Rev. 3G
E-811-003, Instrument Location Layout Reactor Building- Above & Below Basement Floor Elevation 412'-0", Rev. 33
E-511-108, Reactor Building Liner Plate Sump Details, Rev. 3
C-818-651, Sheet 1, Instrument Installation Isometric RWST Level Trans. LT-990 Relocation and Level Indicator LI-990 Mounting, Rev. 01
DE(I)-SF-LT990, Refueling Water Storage Tank Level Transmitter, Rev. 26
C-818-651, Sheet 3, Instrument Installation Isometric Refueling Water Storage Tank Level Transmitter LT-992 Relocation, Rev. 01
C-818-651, Sheet 2, Instrument Installation Isometric Refueling Water Storage Tank Level Transmitter LT-991 Relocation, Rev. 01
C-818-651, Sheet 4, Instrument Installation Isometric Refueling Water Storage Tank Level Transmitter LT-993 Relocation, Rev. 01
DE(I)-SF-LT991, Refueling Water Storage Tank Level Transmitter, Rev. 7
DE(I)-SF-LT992, Refueling Water Storage Tank Level Transmitter, Rev. 7
DE(I)-SF-LT993, Refueling Water Storage Tank Level Transmitter, Rev. 6
E-206-022, One Line and Relay Diagram 7200 V Switchgear- Busses 1DA, 1DB, 1EA, and 1EB, Rev. 14.
E-206-034, Electrical One Line and Relay Diagram, 480/277 Volt Switchgear Bus 1DA1, 1DA2, 1DB1, 1DB2, 1EA1, and 1EA2, Rev. 19.
E-207-016, Electrical Three Line Diagram, 7200 Volt Switchgear Bus 1DA, Rev. 13.
E-207-017, Electrical Three Line Diagram, 7200 Volt Switchgear Bus 1DB, Revision.
E-207-027, Electrical Three Line Diagram, 480/277 Volt Switchgear Bus 1DA1 and 1DA2, Rev. 14.
B-201-359, Electrical Motor Control Center Unit Listing
XMC1DAZY, Sheet 3, Rev. 10
XMC1DAZY, Sheet 6, Rev. 8
B-201-362, Electrical Motor Control Center Unit Listing
XMC1DBZY, Sheet 1, Rev. 9
XMC1DBZY, Sheet 6, Rev. 9.
XMC1DBZY, Sheet 7, Rev. 8.
04 4461 SS-200-927, Electrical Load Centers Relay and Breaker Settings, (Load Center 1DA1), Sheet 14, Revision
04-4461 SS-200-927, Electrical Load Centers Relay and Breaker Settings, (Load Center 1DB1), Sheet 16, Revision
115E070, Motor Operated Gate Valve (XVG-008811A&B). Rev. 4
115E069, Motor Operated Gate Valve, (XVG-008812A&B), Rev. 3
DE(1)-LD-LT-1970, Reactor Building RHR Sump “B” Level Transmitter, Rev. 3G
302-692, Safety Injection (FSAR fig.6.3-1, sheet 2), Rev. 11
302-641, RHR (FSAR fig. 5.5-4), Rev. 14
511-101, Reactor Building Liner Plate - Bottom Plan Section, Rev. 3

511-108, Reactor Building Liner Plate - sump details, Rev. 3
208-084, Electrical Elementary Diagram - RHR Pump Mini-flow Valve, FCV-0602A, Rev. 7
DE(1)-SF-LT-0993, RWST Level Transmitter, Rev. 6
E-511-101, Reactor Building Liner Plate, Bottom Plan and Section, Rev. 3
E-511-108, Reactor Building Liner Plate, Sump Details, Rev. 3
E-302-641, Residual Heat Removal, Rev. 14
E-302-651, Spent Fuel Cooling, Rev. 39
E-302-671, Chemical and Volume Control, Rev. 7
E-302-672, Chemical and Volume Control, Rev. 8
E-302-673, Chemical and Volume Control, Rev. 14
E-302-675, Chemical and Volume Control, Rev. 20
E-302-677, Chemical and Volume Control, Rev. 9
E-302-691, Safety Injection, Rev. 11
E-302-692, Safety Injection, Rev. 11
E-302-693, Safety Injection, Rev. 19

Calculations

DC09650-022, Reactor Building Sump Level Accuracies, Rev. 6
DC820-001, ESF Under Voltage Relay Logic Setting, Rev. 17
DC822-007, Relay Setting Calculation, Charging/SI Pump 7.2 KV Motor Feeder Circuits, dated 3/23/1978
DC08200-003, Class 1E 460 Volt MOV Starting Voltages at Degraded Voltage Conditions, Rev. 6
DC0 4680-029, RWST Levels and Volumes Referenced in FSAR 6.3.2.6, Rev. 1
DC0 9620-012, RWST Level Instruments (1LT00990, 1LT00990A, 1LT00991, 1Lt00992, 1LT00993) Uncertainties, Rev. 1
DC0 3190-007, Reactor Building Sump Level Vs RWST Level Drawdown, Rev. 0
N4SA-CG-119, ECCS Acceptance Criteria, dated 8/22/78
DC0 4410-007, RHR Pump NPSH Requirements During Recirculation, Rev.1
DC0 1520-049, Maximum Differential Pressure for SI System MOV Operation, Rev. 5
DC0 1520-059, Minimum Required Thrust for Rising Stem MOVs in the SI System, Rev. 8
DC0 9650-022, Reactor Building Sump Level Accuracies, Rev. 6
DC00040-077, Design Basis Timelines for Completing Transition from Injection to Recirculation Phase During a LOCA, Rev. 0
DC04310-019, CCW Heat Loads @ 2900 MWt with Delta-75 S/Gs, Rev. 2
DC04310-038, Determination of Limiting Fouling for CCW HX (2900 MWt), Rev. 0
DC04330-061, RHR/CCW/SW Analyses for 2900 MWt, Rev. 3
FSE/SS-CGE-1850, Verify Summer RHR Pump Can Operate for At Least 1 Hour During Injection Mode without CCW to RHR Heat exchanger, dated 11/13/92
N4SCGE-105, RHR Set Point, Rev. 0

Technical Specifications

3/4.3.2 Engineered Safety Feature Actuation System Instrumentation
3/4.3.3 Monitoring Instrumentation
3/4.5.4, Refueling Water Storage Tank
3/4.7.3, Component Cooling Water System

Modifications

ET/BT260, Minor Change in Mechanical Seals for SI/CHG Pumps XPP0043A, B, and C
ECR 50260, RHR Pump Mini-flow Switch Relocation, dated 5/14/02
MRF-21479, 1LT-1969 and 1970 (Containment Sump Level) Span Adjusted, dated 1/18/99

Design Basis Documents

Chemical and Volume Control/Boron Thermal Regeneration System (CS), Rev. 7
Reactor Building Spray (SP), Rev. 5
Residual Heat Removal System (RH), Rev. 10
Safety Injection System (SI), Rev. 10
Spent Fuel Cooling System (SF), Rev. 6

Updated Final Safety Analysis Report (UFSAR)

Section 6.2.2, Reactor Building Heat Removal System
Section 6.3, Emergency Core Cooling System
Section 9.2.2, Component Cooling Water System
Section 9.3.4, Chemical and Volume Control System
Section 15.3.1, Loss of Reactor Coolant from Small Ruptured Pipes or Cracks in Large Pipes Which Actuates the Emergency Core Cooling System

Problem Investigation Process Reports (PIP)

0-C-01-0160, Charging Pump Suction Pressure Drop During Gravity Feed
0-C-02-1228, Charging Pump Suction Pressure Drop During Gravity Feed
0-C-02-3176, Voiding in Emergency Boration Line
0-C-00-1406, Breaker Trip for LCV-00602A during XVG-8706A dp Test
0-C-98-0667, RHR/SI System Vent
0-C-99-1188, RHR/SI System Vent
0-C-00-0267, RHR/SI System Vent
0-C-02-0559, Water in RHR Sump
0-C-02-3152, ECCS Flow Balance
0-C-00-0868, Overloads Tripped While Testing LCV-115D
0-C-00-1101, Timeline for Emergency Actions Not In Accordance With FSAR Required Times
0-C-01-2264, Additional Program Controls Required for Diesel Air Compressor
0-C-99-0409, XVG-8809B Overload Tripped
0-C-01-0227, RV Nozzle Insulation

0-C-00-1436, Insulation for Valve XVG-8000B-RC
0-C-01-0270, Unsnapped Mirror Insulation
0-C-98-0907, RHR Train A Mini-flow Valve Breaker Trip
0-L-00-0015, VEN-00-0015, 25 inch RLIJ shafts - Ingersol Dresser
0-L-99-0433, RHR Pump Vendor in Information Notice Regarding Pump Operational Recommendations
0-L-01-0102, RHR Mini-flow Valve Microswitch Failure, Train A
0-L-02-2833, RHR Pump Inspection IAW Vender Operator Experience Issue (ESBU-TB-96-03-RO)
0-L-00-0875, RWST Level Transmitter 1LT00993 Failed high
0-L-01-1579, RWST Level Transmitter Alarm Dead Band Application
0-C-00-1406, RHR Mini-flow Valve Breaker Tripped During XVG-8706A dp Testing
0-C-01-2222, Westinghouse Notice on Reduced ECCS Flow Due to RHR Mini-flow Valve Open/Close Time
0-C-01-0719, CCW Heat Exchanger B Would not Meet Heat Transfer Coefficient Acceptance Criteria for 95 °F Service Water Inlet Temperature
0-C-01-1031, CCW Heat Exchangers A and B in Action Level 1 due to Performance Tests on 7/3/01 and 7/16/01
0-C-01-2581, Service Water Heat Exchanger Performance Testing Self Assessment
0-C-02-2965, RWST Boron Concentration Below Technical Specifications Minimum Value

MISCELLANEOUS DOCUMENTS

Vendor Manual 1-MS-94B-1238, Rosemount Instrument Manual, Model 1154 Alphaline Pressure transmitter for Nuclear Service, Rev. 2
Vendor Manual 1-MS-94B-757, ITT Barton Model 752 Differential Pressure Electronic Transmitter, Rev. 1
Vendor Manual 1-MS-94B-302, Ingersoll-Rand RHR Pump Manual, Rev. 3
Vendor Manual 1-MS-94B-073, Westinghouse Instruction Manual for Auxiliary Heat Exchangers, Rev. 2
EQDP-IN1-R15-4, Qualification for Model 1154 Rosemount Transmitters, Rev. 2
QCTR-108, Class 1E Qualification Test Report for Instrument Model W1151/1251, Rev.1
41508-1, Summary of Seismic Simulation Test Report for One Model 344 and one Model 345 Three-Pen Recorders, approved 12/11/90
VCSNS-DBD Motor Operated Valve Design Review, Capability and Setup, Volume 2, Rev. 3
PIP No. 0-C-02-1636, The ‘A’ Charging Pump Breaker could not be racked down due to worn engagement pawl
PIP No. 0-C-02-1228, STP-104.001 was unsatisfactory due to inability to complete step 6.5.
PIP No. 0-C-02-0207, Response to inadvertent pressurization of the RHR system.
PIP No. 0-C-02-0136, XPP0043B-PP1 is making abnormal noise and has increased vibrations
PIP No. 0-C-02-0171, “B” Charging Pump Oil Pump Cycling Excessively
MED-AEE-9170, CGE CH/SI Pump Runout Test Final Report, 6/30/93
SEC-SAI-4350-C1, V.C. Summer (CGE) SBLOCA Analysis for Uprated Power/Replacement Steam Generators with 10% SGTP-Evaluation of Effects of Educed SI Flow Rates, Rev. 1
TR04620-001, Hydraulic Model Study of RWST for Vortex Evaluation, Rev. 0
TR04650-001, Model Study of Reactor Compartment Sump Flow Characteristics, 8/30/00

RC-02-0086, Virgil C. Summer Nuclear Station, Docket No. 50/395, Operating License No. NPF-12, ECCS Evaluation Annual Report
RC-93-0160, Virgil C. Summer Nuclear Station, Docket No. 50/395, Operating License No. NPF-12, Response to NRC Bulletin 93-02, dtd 6/10/93
1MS-94B-025, Pacific Pump Co., Charging/Safety Injection Pump

Corrective Actions (CERs) issued as a result of this inspection:

02-3108, Margin discussion for the SI DBD was incorrect and needs to be revised
02-3228, NPSH for RHR pumps
02-3160, Corrective action basis for OE evaluation not provided
02-3124, OE evaluation of incorrect wiring found at Vogtle, (a common cause event)