

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

October 30, 2008

Mr. Jeffrey B. Archie Vice President South Carolina Electric & Gas Company Virgil C. Summer Nuclear Station P.O. Box 88 Jenkinsville, SC 29065

SUBJECT: VIRGIL C. SUMMER NUCLEAR STATION - NRC INTEGRATED INSPECTION REPORT 05000395/2008004

Dear Mr. Archie:

On September 30, 2008, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Virgil C. Summer Nuclear Station. The enclosed integrated inspection report documents the inspection results, which were discussed with Mr. Dan Gatlin and other members of your staff on October 9, 2008.

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.

This report documents two NRC-identified findings of very low safety significance (Green) which were determined to be violations of NRC requirements. Additionally, one licensee-identified violation, which was determined to be of very low safety significance, is listed in this report. However, because of the very low safety significance of the issues and because they were entered into your corrective action program, the NRC is treating these violations as non-cited violations (NCVs) consistent with Section VI.A.1 of the NRC's Enforcement Policy. If you contest any NCV in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the United States Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Virgil C. Summer Nuclear Station.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

James S. Dodson, Acting Chief Reactor Projects Branch 5 Division of Reactor Projects

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

Enclosure: Inspection Report 05000395/2008004 w/Attachment: Supplemental Information

cc w/ encl: (See next page)

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Letter to Jeffrey B. Archie from James S. Dodson, dated October 30, 2008

SUBJECT: VIRGIL C. SUMMER NUCLEAR STATION - NRC INTEGRATED INSPECTION REPORT 05000395/2008004

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

- Docket No.: 50-395
- License No.: NPF-12
- Report No.: 05000395/2008004

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

- Facility: Virgil C. Summer Nuclear Station
- Location: P.O. Box 88 Jenkinsville, SC 29065
- Dates: July 1, 2008 September 30, 2008
- Inspectors: J. Zeiler, Senior Resident Inspector
 - J. Polickoski, Acting Senior Resident Inspector
 - K. Ellis, Acting Resident Inspector
 - B. Caballero, Operations Engineer (Section 1R11.2)
 - F. Ehrhardt, Operations Engineer (Section 1R11.2)
 - R. Chou, Senior Reactor Inspector (Section 4OA5)
- Approved by: James S. Dodson, Acting Chief Reactor Projects Branch 5 Division of Reactor Projects

CONTENTS

| <u>Summa</u> | <u>ry of Plant Status</u> | 4 |
|--------------|--|----|
| | | |
| REACT | OR SAFETY | 4 |
| 1R01 | Adverse Weather Protection | 4 |
| 1R04 | Equipment Alignment | 4 |
| 1R05 | Fire Protection | 5 |
| 1R07 | Heat Sink Performance | 6 |
| 1R11 | Licensed Operator Requalification Program | 6 |
| 1R12 | Maintenance Effectiveness | 8 |
| 1R13 | Maintenance Risk Assessments and Emergent Work Control | 9 |
| 1R15 | Operability Evaluations | 10 |
| 1R18 | Plant Modifications | 12 |
| 1R19 | Post-Maintenance Testing | 13 |
| 1R22 | Surveillance Testing | 14 |
| EMERG | ENCY PREPAREDNESS | 14 |
| 1EP6 | Drill Evaluation | 14 |
| OTHER | ACTIVITIES | 15 |
| 40A1 | Performance Indicator Verification | 15 |
| 40A2 | Identification and Resolution of Problems | 15 |
| 40A3 | Event Followup | 16 |
| 40A5 | Other Activities | 16 |
| 40A6 | Meetings, Including Exit | 25 |
| 40A7 | Licensee Identified Violations | 25 |
| | | |
| ATTAC | HMENT: SUPPLEMENTARY INFORMATION | |

| Key Points of Contact | A-1 |
|---|-----|
| List of Items Opened, Closed, and Discussed | A-1 |
| List of Documents Reviewed | A-1 |

SUMMARY OF FINDINGS

IR 05000395/2008-004; 07/01/2008 - 09/30/2008; Virgil C. Summer Nuclear Station; Licensed Operator Regualification Program and Operability Evaluations.

The report covered a three-month period of inspection by resident inspectors and two announced inspections by three regional operations and reactor inspectors. Two Green findings, which were non-cited violations, were identified by the NRC. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter 0609, "Significance Determination Process" (SDP). The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

<u>Green</u>. The inspectors identified a Green NCV of 10 CFR 55.21 for failure to perform electro-cardiogram (EKG) tests during the biennial medical exam for licensed operators. Specifically, the inspectors identified three licensed operators who had not received EKGs as part of their biennial medical exams. The licensee conducted an extent of condition review and identified ten licensed operators who had not received EKGs during their biennial medical exams. The licensee scheduled those operators for EKGs. This issue is documented in the licensee's corrective action program as Condition Report (CR) 08-03456.

This finding is more than minor because if left uncorrected, it could become a significant safety concern if an undetected cardiovascular condition impacted an operator's ability to direct or perform licensed activities. The finding affects the human performance attribute of the Mitigating Systems cornerstone because licensed operator response to initiating events mitigates undesirable consequences. Using the Significance Determination Process, this finding was determined to be of very low safety significance (Green) because the performance deficiency did not result in an actual operator performance error or plant event. The finding directly involved the cross-cutting area of Human Performance, component of "Work Practices," and the aspect of "supervisory and management oversight of work activities, including contractors, such that nuclear safety is supported", in that, the cause of the finding was the licensee's lack of oversight of the off-site contract physician's clinic (H.4.c). (Section 1R11.2)

Cornerstone: Barrier Integrity

 <u>Green.</u> The inspectors identified a Green NCV for failure to comply with Technical Specifications (TS) Limited Conditions for Operation (LCO) 3.7.6, "Control Room Normal and Emergency Air Handling System," for the failure to maintain the control room boundary intact and operable, and complete the required TS actions. Specifically, the control room pressure boundary (CRPB) was breached and inoperable, and the Control Room Normal and Emergency Air Enclosure Handling System was not capable of performing its TS function for a period of 17 days. The licensee completed repairs to the ductwork, restored compliance with the TS, and documented this issue in their corrective action program as CR-08-00944 and CR-08-00972.

This finding was more than minor because it affected the barrier performance attribute of the Barrier Integrity cornerstone and affected the cornerstone objective of providing reasonable assurance that the control room maintains radiological barrier functionality and protects the plant operators from radionuclide releases caused by accidents or events. The finding was evaluated using Inspection Manual Chapter 0609, "Significance Determination Process," Phase I Worksheet for barrier integrity. The finding was determined to be of very low safety significance (Green) because it represented a degradation of the radiological barrier function provided for the control room. The finding directly involved the cross-cutting area of Human Performance, component of Resources, and aspect of "Complete, Accurate and up-to-date Design Documentation and Procedures", in that, the post maintenance test for XAH0048 failed to include the verification of CRPB restoration through complete testing of the control room envelope (H.2.c). (Section 1R15.b)

B. Licensee-Identified Violations

A violation of very low safety significance (Green) was identified by the licensee and was reviewed by the inspectors. Corrective actions taken or planned by the licensee were entered into the licensee's corrective action program. This violation and corrective actions are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

The unit began the inspection period at 100 percent rated thermal power (RTP). The unit operated at or near RTP for the entire inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection

a. Inspection Scope

The inspectors performed two impending adverse weather inspections to review the overall preparations and protection of the risk-significant systems for the weather conditions expected. This included evaluation and review of the licensee's preparation and readiness for possible effects from Hurricane Hanna and the remnants of Tropical Storm Fay that produced severe thunderstorms and placed the site under both a tornado watch and a tornado warning. The inspectors verified the licensee had implemented applicable sections of operations administrative procedure 109.1, Revision 2D, "Guidelines for Severe Weather" and emergency planning procedure 015, Revision 16, "Natural Emergency." The inspectors walked down outside areas of the plant to verify that loose debris was properly contained to prevent adverse interaction with important plant equipment and performed visual examination of the storm drain system inside and outside the protected area to verify that drains were not blocked and the ground was properly graded to channel water into the system.

In addition, the inspectors evaluated the summer readiness of the offsite and alternate alternating current (AC) power systems by reviewing the licensee's procedures that address measures to monitor and maintain the availability and reliability of the offsite and alternate AC power systems. The documents reviewed during this inspection are listed in the attachment.

Lastly, the inspectors reviewed the licensee's corrective action program (CAP) database to verify that weather related problems were being identified at the appropriate level, entered into the CAP, and appropriately resolved.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment

Partial System Walkdowns

a. Inspection Scope

The inspectors conducted four partial equipment alignment walkdowns to evaluate the operability of selected redundant trains or backup systems with the other train or system inoperable or out of service (OOS). Correct alignment and operating conditions were determined from the applicable portions of drawings, system operating procedures (SOPs), final safety analysis report (FSAR), and technical specifications. The inspections included review of outstanding maintenance work orders (WOs) and related condition reports to verify that the licensee had properly identified and resolved equipment alignment problems that could lead to the initiation of an event or impact mitigating system availability. Documents reviewed are listed in the attachment.

- "A" emergency diesel generator (EDG) system while "B" EDG was OOS during scheduled quarterly preventive maintenance
- "B" residual heat removal (RHR) system while "A" RHR was OOS during scheduled preventive maintenance
- "A" and "B" service water (SW) system while "C" SW was OOS during scheduled preventive maintenance
- "B" EDG system while "A" EDG was OOS during the scheduled 10-year tank inspection maintenance of "A" Fuel Oil Storage Tank (FOST)
- b. Findings

No findings of significance were identified.

- 1R05 Fire Protection
 - a. Inspection Scope

The inspectors reviewed recent CRs, WOs, and impairments associated with the fire protection system. The inspectors reviewed surveillance activities to determine whether they supported the operability and availability of the fire protection system. The inspectors assessed the material condition of the active and passive fire protection systems and features and observed the control of transient combustibles and ignition sources. The inspectors conducted routine inspections of the following nine areas (respective fire zones also noted):

- Service water pump house (fire zone SWPH-1, 3, 4, 5.1 and 5.2)
- Intermediate building, 412' elevation general area, Component Cooling Water (CCW) and SW booster pumps (fire zones IB-25.1.1, 1.2, 1.3 and 1.5)
- "A" and "B" EDG rooms (fire zones DG 1.1/1.2 and DG 2.1/2.2)
- "A" and "B" battery and charger rooms (fire zones IB-2, 3, 4, 5 and 6)
- Turbine driven emergency feedwater (TDEFW) pump room (fire zone IB-25.2)
- Centrifugal charging pump (CCP) rooms A, B and C (fire zones AB-1.5, 1.6 and 1.7)
- Auxiliary building (AB) 397' and 388' elevation (fire zone AB-1.4)
- RHR and reactor building (RB) spray pump rooms and AB 374' elevation (fire zones AB-1.1, 1.2 and 1.3)

- AB 436' elevation (fire zone AB-1.18)
- b. Findings

No findings of significance were identified.

1R07 Heat Sink

a. Inspection Scope

The inspectors observed two samples of heat sink performance. The inspectors reviewed heat exchanger performance testing, historical data trends, heat exchanger performance in terms of the design basis, compliance with commitments, and corrective actions for the EDG intercooler heat exchangers (XHE0017A/B-HE3) and the reactor building cooling units (RBCUs) (XCE-8A/B, 9A/B-AH). The inspectors discussed the heat exchanger monitoring and maintenance program and the above performance analysis obtained during testing with engineering personnel.

b. Findings

No findings of significance were identified.

- 1R11 Licensed Operator Regualification Program
- .1 Resident Inspector Quarterly Review
- a. Inspection Scope

On September 24, 2008, the inspectors observed performance of senior reactor operators and reactor operators on the plant simulator during licensed operator requalification training. The scenario (LOR-SA-012B) involved "C" reactor coolant pump number one seal failure, "B" steam generator (SG) feed flow transmitter failing low, and "A" main steam line break outside of containment. The inspectors assessed overall crew performance, communications, oversight of supervision, and the evaluators' critique. The inspectors verified that any significant training issues were appropriately captured in the licensee's CAP.

b. Findings

No findings of significance were identified.

- .2 <u>Biennial Review</u>
- a. Inspection Scope

The inspectors reviewed the facility operating history and associated documents in preparation for this inspection. During the week of August 11-15, 2008, the inspectors

reviewed documentation, interviewed licensee personnel, and observed the administration of operating tests associated with the licensee's operator regualification program. Each of the activities performed by the inspectors was done to assess the effectiveness of the licensee in implementing regualification requirements identified in 10 CFR Part 55, "Operators' Licenses." The evaluations were also performed to determine if the licensee effectively implemented operator regualification guidelines established in NUREG-1021, "Operator Licensing Examination Standards for Power Reactors." The inspectors also evaluated the licensee's simulation facility for adequacy for use in operator licensing examinations using ANSI/ANS-3.5-1985, "American National Standard for Nuclear Power Plant Simulators for use in Operator Training and Examination." The inspectors observed two crews during the performance of the operating tests. Documentation reviewed included written examinations, job performance measures, simulator scenarios, licensee procedures, on-shift records, simulator modification request records and performance test records, the feedback process, licensed operator gualification records, remediation plans, watchstanding records, and medical records. The records were inspected using the criteria listed in Inspection Procedure 71111.11. Documents reviewed during the inspection are listed in the attachment.

b. Findings

Introduction: The inspectors identified a Green non-cited violation (NCV) of 10 CFR 55.21 for failure to perform electro-cardiogram (EKG) tests during the biennial medical exam for licensed operators. Specifically, the inspectors identified three licensed operators who had not received EKGs as part of their biennial medical exams. The licensee conducted an extent of condition review and identified ten licenseed operators who had not received EKGs during their biennial medical exams. The licensee conducted EKGs during their biennial medical exams. The licensee scheduled those operators for EKGs. This issue is documented in the licensee's corrective action program as Condition Report 08-03456.

<u>Description</u>: On August 11, 2008, while reviewing licensed operator medical records, the inspectors identified two operators who had not received an EKG test as part of their biennial medical exam. The inspectors then reviewed additional licensed operator medical records and identified a third operator who had not received an EKG test. When the inspectors notified the licensee about the missing EKG tests, the licensee conducted an extent of condition review and verified that licensed operators for the oncoming shift had received a complete biennial medical exam. Additionally, the licensee scheduled the operators who had not received the full physical examination an appointment to receive the EKG test by the contract physician.

At the time of the exit meeting on August 15, 2008, the licensee had subsequently identified a total of ten licensed operators who had not received an EKG test during their biennial medical exam. The licensee utilizes an off-site physician's clinic to perform the licensed operator medical exams. The cause of the finding was the lack of licensee oversight of the off-site physician's clinic personnel, and the lack of understanding the content, extent, and methods required to ensure that complete licensed operator biennial medical exams were administered in accordance with ANSI/ANS-3.4-1983, "Medical

Certification and Monitoring of Personnel Requiring Operator Licenses for Nuclear Power Plants." The licensee stated that a root cause analysis would be performed to determine the primary and contributing causes for the missed EKG tests.

<u>Analysis</u>: The failure to perform an EKG test during the biennial medical exam for licensed operators was a performance deficiency. This finding is more than minor because if left uncorrected, it could become a more significant safety concern if an undetected cardiovascular condition impacted an operator's ability to direct or perform licensed activities. It affects the human performance attribute of the Mitigating Systems cornerstone because licensed operator response to initiating events mitigates undesirable consequences. The inspectors assessed the finding using the SDP and determined the finding to be of very low safety significance. The finding was of low safety significance because no actual consequences occurred as a result of not performing the required EKG test during the biennial medical exams. All operators involved were able to perform licensed duties. The finding directly involved the cross-cutting area of Human Performance, component of "Work Practices", and the aspect of "supervisory and management oversight of work activities, including contractors, such that nuclear safety is supported", in that, the cause of the finding was the licensee's lack of oversight of the off-site contract physician's clinic (H.4.c).

<u>Enforcement</u>: A biennial medical exam is required for licensed operators in accordance with 10 CFR 55.21. The licensee is committed to ANSI/ANS-3.4-1983, "Medical Certification and Monitoring of Personnel Requiring Operator Licenses for Nuclear Power Plants" to satisfy the 10 CFR 55.21 biennial medical exam requirement. The ANSI/ANS-3.4-1983, which includes the content, extent, and methods for licensed operator medical examinations, requires an EKG test as part of the licensed operator biennial medical examination.

Contrary to the above, the inspectors identified three licensed operators who did not receive an EKG test for their biennial medical examination. Therefore, the subject licensed operators did not receive a complete medical examination as required by ANSI/ANS-3.4-1983 and did not meet the 10 CFR 55.21 biennial medical exam requirement. Because this issue is of very low safety significance and has been entered into the licensee's corrective action program, as Condition Report 08-03456, the violation is being treated as a non-cited violation consistent with Section VI.A.1 of the NRC Enforcement Policy: NCV 05000395/2008004-01, Failure to Perform EKG Tests During Biennial Medical Exams for Licensed Operators.

1R12 Maintenance Effectiveness

a. Inspection Scope

The inspectors evaluated two equipment issues described in the CRs listed below to verify the licensee's effectiveness with the corresponding preventive or corrective maintenance associated with Structures, Systems or Components (SSCs). The inspectors reviewed maintenance rule (MR) implementation to verify that component and equipment failures were identified, entered, and scoped within the MR program.

Selected SSCs were reviewed to verify proper categorization and classification in accordance with 10 CFR 50.65. The inspectors examined the licensee's 10 CFR 50.65 (a)(1) corrective action plans to determine if the licensee was identifying issues related to the MR at an appropriate threshold and that corrective actions were established and effective. The inspectors' review also evaluated if maintenance preventable functional failures or other MR findings existed that the licensee had not identified. The inspectors reviewed the licensee's controlling procedures, i.e., engineering services procedure (ES)-514, Revision 4, "Maintenance Rule Implementation," and the Virgil C. Summer "Important To Maintenance Rule System Function and Performance Criteria Analysis," to verify consistency with the MR requirements.

- CR-08-01130 and CR-08-01550, "A" component cooling water pump inboard seal leakage and replacement
- CR-08-01186, failure of the "A" steam generator steam flow differential pressure transmitter NMD card
- b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors evaluated, as appropriate, for the five selected work activities listed below: (1) the effectiveness of the risk assessments performed before maintenance activities were conducted; (2) the management of risk; (3) that, upon identification of an unforeseen situation, necessary steps were taken to plan and control the resulting emergent work activities; and, (4) that emergent work problems were adequately identified and resolved. The inspectors evaluated the licensee's work prioritization and risk characterization to determine, as appropriate, whether necessary steps were properly planned, controlled, and executed for the planned and emergent work activities.

- Work Week 2008-28: risk assessment for scheduled maintenance and/or testing on "A" motor driven emergency feedwater (MDEFW) pump, switchyard activities, spent fuel pool "A" pump motor replacement, "A" CCP preventive maintenance, and pressurizer backup heater thermography
- Work Week 2008-29: risk assessment for scheduled maintenance and/or testing on turbine driven emergency feedwater (TDEFW) pump and "B" EDG quarterly preventive maintenance
- Work Week 2008-32: risk assessment for scheduled maintenance and/or testing on "A" RHR pump/valves (Yellow Risk) and "C" SW pump (Yellow Risk)
- Work Week 2008-34: risk assessment for scheduled maintenance and/or testing on "B" MDEFW pump breaker, "B" SW pump and SW booster pump (Yellow Risk), "B" reactor building spray pump and emergent maintenance on "B" train RBCU SW discharge valve (3107B)

- Work Week 2008-35: risk assessment for scheduled maintenance and/or testing on "A" chiller, "C" CCP, "A" EDG FOST, and impending adverse weather related to tornado watches and a tornado warning from the remnants of Tropical Storm Fay
- b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed six 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) that the licensee considered other degraded conditions and their impact on compensatory measures for the condition being evaluated; and, (5) the impact on TS limiting conditions for operations and the risk significance in accordance with the Significance Determination Process. Also, the inspectors verified that the operability evaluations were performed in accordance with station administrative procedure (SAP)-209, Revision 0D, "Operability Determination Process," and SAP-999, Revision 3A, "Corrective Action Program."

- CR-08-02997, Digital rod position indication cooling water valve XVT3169-SW exceeded stroke time
- CR-08-03016, Thermography scans on the pressurizer group #1 heater disconnects (APN4104) were found to be greater than 200 degrees Fahrenheit
- CR-08-03041, Downstream union for supply air to FCV3536-FL1-EF has air leak
- CR-08-03374, XVB-3107B open stroke time is close to its upper stroke limit
- CR-08-03871, XVB00003B-AH exceeded its maximum allowed stroke time during both the closed and open stroke test
- CR-08-00944, During air flow measurements on "A" Control Room ventilation, air flow was greater than 1000 stand cubic feet per minute (SCFM) at 1045 SCFM and control room differential pressure was less than 1/8 inches of water

b. Findings

<u>Introduction</u>: The inspectors identified a Green NCV for failure to comply with TS LCO 3.7.6, "Control Room Normal and Emergency Air Handling System," for the failure to maintain the control room boundary intact and operable, and complete the required TS actions.

<u>Description</u>: On March 11, 2008, surveillance test procedure (STP) 454.002, "Control Room Emergency Air Cleanup System Performance Test" failed to meet the TS surveillance requirement (SR) 4.7.6.e.3 acceptance criteria. Outside air intake flow was

found at 1045 SCFM versus the TS required 1000 SCFM. Control room differential pressure (DP) was found at 0.1 inches water gauge (in WG) versus the TS required 0.125 in WG. The licensee declared the "A" train of the Control Room Normal and Emergency Air Handling System inoperable and entered the TS LCO action statement (AS) 3.7.6.a.1 for one train out of service requiring plant shutdown within 7 days.

The licensee discovered that the cause of the STP failure was a gap opening in the ductwork of air handling unit (XAH0048). On March 14, 2008, the licensee repaired the XAH0048 ductwork, restored "A" train's compliance with TS LCO AS 3.7.6.a.1, and documented this issue in their corrective action program as CR-08-00944.

The inspectors determined that the gap opening in the XAH0048 ductwork affected both trains of the Control Room Normal and Emergency Air Handling System and the CRPB. When notified by the inspectors, the licensee conducted a past operability review, as documented in Licensee Event Report (LER) 05000395/2008002-01, and noted that the entire CRPB was inoperable for 17 days based on maintenance that opened the ductwork air gap on February 26, 2008. Additional review, as documented in their root cause analysis, stated that the post maintenance test was inadequate in its ability to verify restoration of the CRPB. The control room envelope was adversely impacted in that more than the TS allowed air flow and insufficient DP resulted in the potential to expose the control room operators to increased radiological dose, smoke, or toxins. Detailed engineering review from previous control room ventilation testing concluded that the control room envelope was adversely impacted with radiological dose being the most limiting factor. With the CRPB breached and inoperable, the Control Room Normal and Emergency Air Handling Systems were not capable of performing their TS function for a period of 17 days. The inspectors concurred with the licensee's conclusions as documented in their root cause analysis and LER.

<u>Analysis</u>: The licensee's failure to implement an adequate post-maintenance test for maintenance performed on XAH0048 was a performance deficiency. This finding was more than minor because it affected the barrier performance attribute of the Barrier Integrity cornerstone and affected the cornerstone objective of providing reasonable assurance that the control room maintains radiological barrier functionality and protects the plant operators from radionuclide releases caused by accidents or events. The finding was evaluated using Inspection Manual Chapter 0609, "Significance Determination Process," Phase I Worksheet for barrier integrity. The finding was determined to be of very low safety significance (Green) because it represented a degradation of the radiological barrier function provided for the control room. The finding directly involved the cross-cutting area of Human Performance, component of Resources, and aspect of Complete, Accurate and up-to-date Design Documentation and Procedures, in that, the post maintenance test for XAH0048 failed to include the verification of CRPB restoration through complete testing of the control room envelope (H.2.c).

<u>Enforcement</u>: TS LCO 3.7.6, "Control Room Normal and Emergency Air Handling System," requires, in part, that both control room normal and emergency air handling systems be operable with an operable control room boundary. Contrary to the above

from February 26, 2008 until March 14, 2008, the licensee failed to maintain operability of the CRPB, and complete the required TS actions. Because this finding is of very low safety significance and has been entered into the corrective action program as CR-08-00944 and CR-08-00972, this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy: NCV 05000395/2008004-02, Failure to Maintain the Control Room Pressure Boundary Operable and Complete the Required TS Actions.

1R18 Plant Modifications

a. Inspection Scope

The inspectors evaluated two equipment changes that were considered temporary modifications to evaluate the changes for adverse effects on system availability, reliability, and functional capability. Documents reviewed included procedures, engineering calculations, modification design and implementation packages, WOs, site drawings, corrective action documents, applicable sections of the FSAR, supporting analyses, TS, and design basis information. The inspectors witnessed aspects of each modification implementation and observed aspects of post-modification testing of both temporary modifications to verify adequate testing of the changes. Documents reviewed are listed in the attachment.

The temporary modifications reviewed included: Bypass Authorization Request 08-02, for a jumper installed to allow containment incore sump level ILS01973 to replace the control room alarm for the failed level indicator ILS01974 and the foreign material exclusion (FME) cover installed over the spent fuel pool (SFP) area to prevent FME from the fuel handling building (FHB) roof decking from getting into the SFP. The inspectors evaluated the change documents and associated 10 CFR 50.59 reviews against the system design basis documentation and FSAR to verify that the changes did not adversely affect the safety function of safety systems.

The inspectors also reviewed selected CRs associated with modifications to confirm that problems were identified at an appropriate threshold, were entered into the CAP, and appropriate corrective actions had been initiated.

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing

a. Inspection Scope

For the six maintenance activities listed below, the inspectors reviewed the associated post-maintenance testing (PMT) procedures and either witnessed the testing and/or reviewed test records to assess whether: (1) the effect of testing on the plant had been adequately addressed by control room and/or engineering personnel; (2) testing was

adequate for the maintenance performed; (3) test acceptance criteria were clear and adequately demonstrated operational readiness consistent with design and licensing basis documents; (4) test instrumentation had current calibrations, range, and accuracy consistent with the application; (5) tests were performed as written with applicable prerequisites satisfied; (6) jumpers installed or leads lifted were properly controlled; (7) test equipment was removed following testing; and, (8) equipment was returned to the status required to perform its safety function. The inspectors verified that these activities were performed in accordance with general test procedure GTP-214, Revision 4G, "Post Maintenance Testing Guideline."

- WOs 0803552, 0802421, and 0802422, PMT for "B" EDG quarterly preventive maintenance and HVAC fans
- WO 0808377, PMT for inspection, reinstallation, and calibration of the "A" EDG stator temperature relay (ITY15472A)
- WO 0806944, PMT for visual and physical inspection of the pressurizer heater group #1 disconnects (APN4104) using thermography
- WO 0715503, PMT for "A" RHR pump miniflow valve FCV602A-RH preventive maintenance
- WO 0525090, PMT for "A" EDG ten year fuel oil storage tank cleaning and inspection
- WOs 0613111 and 0717572, PMT for "A" SW pump following planned preventive maintenance to replace the "A" SW pump discharge check valve (XVC03115A) and the upper bearing cooling water flow indicator (IFI04401).
- b. Findings

No findings of significance were identified.

1R22 <u>Surveillance Testing</u>

a. Inspection Scope

The inspectors observed and/or reviewed the seven STPs listed below to verify that TS surveillance requirements were followed and that test acceptance criteria were properly specified to ensure that the equipment could perform its intended safety function. The inspectors verified that proper test conditions were established as specified in the procedures, that no equipment preconditioning activities occurred, and that acceptance criteria were met.

In-Service Tests:

• STP-223-002A, "Service Water Pump Test," Revision 8 (on "A" and "B" pump)

Reactor Coolant System (RCS) Leakage:

STP-114.002, "Operational Leakage Calculation," Revision 11

Other Surveillance Tests:

- STP-220.002, "Turbine Driven Emergency Feedwater Pump and Valve Test," Revision 7
- STP-223.002A, "Service Water Pump Test," Revision 8 ("C" pump)
- STP-112.003, "Reactor Building Spray System Valve Operability Test," Revision 8B ("A" train)
- STP-125.002A, "Diesel Generator 'A' Operability Test," Revision 1G
- STP-225.001A, "Diesel Generator Support System Pump and Valve Test," Revision 7E
- b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

- 1EP6 Drill Evaluation
 - a. Inspection Scope

On September 24, 2008, the inspectors reviewed and observed the performance of a licensed operator requalification simulator drill that involved an "A" main steam line break outside of containment scenario (LOR-SA-012B). This scenario required a Notice of Unusual Event. The inspectors assessed emergency procedure usage, emergency plan classifications, and notifications. The inspectors attended the drill critique to ensure that any drill performance weaknesses were entered into the licensee's CAP.

b. Findings

No findings of significance were identified.

- 4. OTHER ACTIVITIES
- 4OA1 Performance Indicator (PI) Verification
- .1 <u>Reactor Safety: Mitigating Systems Cornerstone</u>
- a. <u>Inspection Scope</u>

The inspectors verified the accuracy of the licensee's PI submittals listed below for the period July 1, 2007 through June 30, 2008. The inspectors used the performance indicator definitions and guidance contained in Nuclear Energy Institute 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, the licensee procedure SAP-1360, Revision 1, "NRC and INPO/WANO Performance Indicators," and the licensee's "NRC Mitigating Systems Performance Index (MSPI) Basis Document, V C Summer Nuclear Station, Revision 2," to check the reporting for each data element. The inspectors sampled licensee event reports (LERs), operator logs, plant status reports, CRs, and performance indicator data sheets to verify that the licensee had

identified the cumulative safety system unavailability and required hours, as applicable. The inspectors discussed the PI data with licensee personnel associated with performance indicator data collection and evaluation.

- MSPI Emergency AC Power System
- MSPI High Pressure Injection System
- MSPI Residual Heat Removal System
- b. Findings

No findings of significance were identified.

- 4OA2 Identification and Resolution of Problems
- .1 Review of Items Entered into the Corrective Action Program

As required by Inspection Procedure 71152, "Identification and Resolution of Problems," and in order to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's corrective action program. This review was accomplished by either attending daily screening meetings that briefly discussed major CRs, or accessing the licensee's computerized corrective action database and reviewing each CR that was initiated.

- .2 Annual Sample Review
- a. Inspection Scope

The inspectors reviewed one issue in detail to evaluate the effectiveness of the licensee's corrective actions for important safety issues documented in CR-08-02054 and CR-08-02345. This review was associated with the permanent plant modification and emergent design changes to the "A" and "B" train RBCU SW discharge valves (XVB03107A/B) due to the failure of the valves to stroke properly within design constraints during the Spring 2008 outage. The inspectors assessed whether the issue was identified; documented accurately and completely; properly classified and prioritized; adequately considered extent of condition, generic implications, common cause, and previous occurrences; adequately identified root causes/apparent causes; and identified appropriate corrective actions. Also, the inspectors verified the issues were processed in accordance with SAP-999, Revision 3A, "Corrective Action Program."

b. Findings and Observations

No findings of significance were identified.

4OA3 Event Followup

.1 (Closed) LER 05000395/2008002-01: Control Room Normal and Emergency Air Handling Systems Inoperable Due to Pressure Boundary Breach.

The inspectors reviewed the subject LER and applicable condition reports (CR-08-00944 and CR-08-00972) associated with the issue to verify the LER accuracy and appropriateness of corrective actions. A detailed review of the issue and cause evaluation was documented in Section 1R15 of this report. The licensee's violation of TS 3.7.6 was the subject of NCV 05000395/2008004-02 documented in Section 1R15 of this report. No additional findings of significance were identified. This LER is closed.

4OA5 Other Activities

.1 Quarterly Resident Inspector Observations of Security Personnel and Activities

a. Inspection Scope

During the inspection period, the inspectors conducted observations of security force personnel and activities to ensure that the activities were consistent with licensee security procedures and regulatory requirements relating to nuclear plant security. These observations took place during both normal and off-normal plant working hours.

These quarterly resident inspector observations of security force personnel and activities did not constitute any additional inspection samples. Rather, they were considered an integral part of the inspectors' normal plant status review and inspection activities.

b. Findings

No findings of significance were identified.

.2 <u>NRC Temporary Instruction (TI) 2515/172, Reactor Coolant System Dissimilar Metal Butt</u> Welds (DMBWs)

a. Inspection Scope

From July 7 to 10, 2008, the inspectors reviewed the licensee's activities related to the inspection and mitigation of DMBWs in the RCS to ensure that the licensee activities were consistent with the industry requirements established in the Materials Reliability Program (MRP) document MRP-139, Primary System Piping Butt Weld Inspection and Evaluation Guideline, July 2005. The review covered: a) documentation review and direct observation of baseline volumetric Ultrasonic examination (UT) and supplemental surface Eddy Current examinations (ET) and mitigation by Mechanical Stress Improvement Process (MSIP) for the two DMBWs on the hot leg B and C reactor vessel nozzles during the outage in May 2002; b) documentation review and direct observation of the volumetric UT and surface ET and Full Structural Weld Overlays (FSWOLs) for the six DMBWs on the pressurizer nozzles during the refueling outage in May 2008; and c) review of the MRP-139 program. For the direct observations of volumetric UT and ET, the application of MSIP, and the application of FSWOL for the inservice inspection during the refueling outage in May 2002 and the refueling outage in May 2008, please refer to Section 1R08, Inservice Inspection (ISI) Activities (71111.08P) documented in

NRC Integrated Inspection Reports 50-395/2002-002 and 05000395/2008003 and Section 4OA5.2, NRC TI 2515/172, Reactor Coolant System Dissimilar Metal Butt Welds documented in NRC Integrated Inspection Report 05000395/2008003.

b. Findings and Observations

No findings of significance were identified.

A. MRP-139 Baseline Inspections

1) Have the baseline inspections been performed or are they scheduled to be performed in accordance with MRP-139 guidance? Were the baseline inspections of the pressurizer temperature DMBWs of the nine plants listed in Section 03.01.b of TI 2515/172, completed during the spring 2008 outages?

(I) <u>Hot Leg "A," "B," and "C" Dissimilar Metal Welds Between the Reactor</u> <u>Vessel Nozzles and Safe Ends</u>

Yes. The licensee performed baseline volumetric examinations with the conventional manual Ultrasonic Examinations (UT) and supplemental Eddy Current Examinations (ET) in May 2002 for the hot leg "B" and "C" reactor vessel nozzle to safe end welds prior to the application of the Mechanical Stress Improvement Process (MSIP), required to be completed per MRP-139 Section 1.2. The licensee used the examinations performed prior to the application of MSIP as the baseline volumetric examination. The UT procedure for the baseline volumetric examination was not a qualified procedure to ASME Code Section XI Appendix VIII requirements which require the qualification such as Performance Demonstration Initiative (PDI). The baseline UT was completed prior to the issuance of the MRP-139 and ASME Code Section XI Appendix VIII requirements. The licensee performed the UT and application of the MSIP on the hot leg "B" and "C" reactor vessel nozzle welds in May 2002. The Hot Leg "A" reactor vessel nozzle weld was replaced with corrosion resistant material in October 2000. The licensee performed profile measurements of the weld and pipe surfaces in preparation for baseline volumetric examination by UT, then performed the UT. The examinations were documented in "Wesdyne Final Report, Examination of Reactor Vessel Nozzles to Pipe Welds for Hot Legs "B" and "C", Outage 13, 2002 for VC Summer." The licensee performed UT qualified by PDI, and supplemental ET again for both welds during the 10-year reactor vessel nozzle weld inservice inspection (ISI) in October 2003. Therefore, the licensee performed the baseline inspection in October 2003 and met the implementation deadline requirement on December 31, 2009 set by the MRP-139 for the baseline volumetric examination of the two DMBWs on the hot leg "B" and "C" reactor vessel nozzles to safe ends. The licensee used the UT Procedure PDI-ISI-254-SE, "Remote Inservice Examination of Reactor Vessel Nozzle to Safe End, Nozzle to Pipe, and Safe End to Pipe Welds (Remote Automated UT), Rev. 1 for the baseline volumetric examination. The examination was performed using ASME Section XI, Appendix VIII, qualified

techniques, equipment, and personnel. The procedure was qualified in accordance with ASME Section XI, Appendix VIII, as implemented through the EPRI PDI Program. The examinations resulted in 100% coverage in the circumferential and axial beam directions. The inspectors reviewed the procedures, work orders, work packages, examination reports, equipment qualification records, and personnel qualification and certificates.

The Hot Leg "A" dissimilar metal weld between the reactor vessel nozzle and safe end was replaced with the Primary Water Stress Corrosion Crack (PWSCC) corrosion resistant material, alloy 52M, in October 2000 and is not included in the volumetric examination required by the MRP-139, Section 1.2.

(II) <u>Cold Leg "A," "B," and "C" Dissimilar Metal Welds Between the Reactor</u> <u>Vessel Nozzles and Safe Ends</u>

Alloy 82/182 DMBWs exposed to temperatures equivalent to the cold legs connecting to the Reactor Vessel will be examined for the baseline volumetric examination in November 2009 and will meet the MRP-139 implementation deadline December 31, 2010.

(III) <u>Hot and Cold Leg "A," "B," and "C" Dissimilar Metal Welds Between the</u> <u>Steam Generator Nozzles and Safe Ends</u>

There are no Alloy 82/182 DMBWs exposed to temperatures equivalent to the hot or cold legs connected to the Steam Generators because of the use of stainless steel welds and piping in the recently replaced new Steam Generators.

(IV) Six DMBWs on the Pressurizer

Yes. The licensee performed baseline volumetric inspection activities for the six DMBWs on the pressurizer, required to be completed per MRP-139 Section 1.2, after the completion of the FSWOL mitigation. The licensee performed profile measurements of the weld and pipe surfaces in the preparation for the baseline volumetric examination by UT. However, the licensee concluded that the surfaces were difficult to prepare for the UT and the examination coverage would be less than 90 percent. The licensee decided to perform FSWOL for mitigation, and conduct phased array UT after the completion of the FSWOL on all six pressurizer DMBWs during the refueling outage in May 2008, based on the crack assumption of Section 6.6 Category F, MRP-139 and NRC relief request authorizations. The licensee performed a technical justification and submitted deviations to MRP Group to extend the implementation deadline to the spring 2008 from the required deadline December 31, 2007. VC Summer is listed as one of nine pressurized water reactor plants in section 03.01.b of TI 2515/172 for completion of pressurizer DMBW exams by the spring 2008. The inspectors verified that the licensee met the extended implementation deadline requirement in the spring 2008 outage for the MRP-139 for the baseline volumetric

examination on pressurizer DMBWs by performing the FSWOL and conducting UT after the weld overlays.

The licensee used the phased array UT Procedure PDI SI-UT-126, Procedure for Phased Array Ultrasonic Examination of Weld Overlaid Similar and Dissimilar Metal Welds, Rev. 3 to complete the baseline volumetric examinations. For the detail of the examinations, please refer to Section 4OA5.2 of the NRC Integrated Inspection Report 05000395/2008003.

The inspectors reviewed documents for volumetric examinations covering the following: examination plan, UT examination procedure and documentation to support its qualification for the intended use, assessment of personnel training and qualification, equipment certification and calibration records, and the final examination report.

2) Is the licensee planning to take any deviations from MRP-139 requirements?

Yes. The licensee took deviations from MRP-139 requirements and submitted a technical justification to the EPRI Material Reliability Program Group for the deviations on the six DMBWS on the pressurizer. The inspection implementation deadline of December 31, 2007 was extended to the spring 2008 outage. SCE&G Letters to EPRI Material Reliability Program were submitted as Technical Justification for Deviation from EPRI MRP-139 Inspection Requirements for Pressurizer Alloy 600/82/182 Welds at VC Summer Nuclear Station, Rev. 0, Dated June 29, 2006 and Rev. 1, Dated October 8, 2007. The licensee also informed NRC resident inspectors of the deviation.

- B. <u>Examinations and Weld Overlays Mitigations Performed Six DMBWS on</u> <u>Pressurizer</u>
- Performed in accordance with the examination guidelines in MRP-139, Section 5.1 for unmitigated welds and consistent with NRC staff relief request authorization for weld overlaid welds?

Yes. The licensee performed FSWOL on the six DMBWs on the pressurizer nozzles including one surge, one spray, three safety, and one relief line and conducted a phased array UT for all the welds after the completion of FSWOL based on requirements of the relief requests and the crack assumption of Section 6.6 Category F of MRP-139. The UT prior to the FSWOL was not required per MRP-139 or the relief request authorizations and Safety Evaluation Reports. The phased array UT used to examine the DMBWs after the completion of the FSWOL met with examination guidelines in MRP-139, Section 5.1.

The procedure was qualified in accordance with ASME Section XI, Appendix VIII, as implemented through the EPRI PDI Program. Prior to each examination after the weld overlays were completed, the licensee verified the FSWOL surface flatness as well as the surface roughness to ensure it permitted volumetric examination. The licensee utilized phased array UT technology to perform the

examination using procedure PDI SI-UT-126, "Procedure for the Phased Array Ultrasonic Examination of Weld Overlaid Similar and Dissimilar Metal Welds," Rev. 3. The UT examiners scanned the FSWOL to the maximum extent practicable in two axial and two circumferential directions. The licensee was able to obtain adequate coverage in the UT examination performed to detect fabrication flaws in the FSWOL. The examinations resulted in 100% coverage without indications identified in the circumferential and axial beam directions. For the pre-service examination of the new volume above the dissimilar metal weld, the licensee obtained 100% coverage in the circumferential and axial beam directions.

The inspectors reviewed the procedures, work orders, work packages, examination reports, equipment qualification records, and personnel qualification and certificates.

The inspectors verified that the examination was in accordance with the relief request authorizations. The inspectors observed the phased array UT examinations during the May 2008 outage and documented the detail in Section 4OA5.2 of the NRC Integrated Inspection Report 05000395/2008003.

2) Performed in accordance with ASME Code welding requirements and consistent with NRC staff relief requests authorizations? Has the licensee submitted a relief request and obtained NRR staff authorization to install the weld overlays?

Yes. The licensee performed the volumetric examinations and applied FSWOLs on the six DMBWs on the pressurizer nozzles in accordance with the ASME Code welding requirements and consisted with NRC staff relief request authorizations.

The licensee submitted the relief requests to use alternative to ASME Code Section XI requirements for application of weld overlay repairs for the pressurizer nozzle DMBWs and obtained NRR staff authorizations. SCE&G Letter RC-07-0085 dated June 1, 2007 and SCE&G Supplemental Letter RC-08-0009 dated January 18, 2008, Relief Request to Use Alternatives to ASME Code Section XI Requirements for Application of Weld Overlay Repairs (RR-III-05) were submitted, and NRR staff authorizations for installations were obtained on March 25, 2008.

The inspectors reviewed welding procedure specifications, procedure qualification records, weld wire certifications, and the welding process control sheets for compliance with ASME Section IX welding requirements and adherence to the relief requests and safety evaluations. The inspectors observed the implementation of the weld overlays during the May 2008 outage and documented the detail in Section 4OA5.2 of the NRC Integrated Inspection Report 05000395/2008003.

3) Performed by qualified and knowledgeable personnel?

Yes. The personnel such as welders and phased array UT examiners involved in the DMBWs at the pressurizer nozzles for the mitigation using FSWOL were qualified and knowledgeable in accordance with the requirements of the MRP-139, the ASME Code, and the relief requests. The examiners were qualified Level II or Level III in the UT methods as required by the UT procedures and in accordance with the vendor's written practice for NDE personnel. The UT examiners were also PDI qualified for the specific UT procedure they implemented. The final examination reports were reviewed by vendor and /or licensee Level III UT examiners.

The welding personnel were qualified in accordance with the requirements identified in ASME Code Section IX. The inspectors reviewed the welder performance qualification test records and compared them with the requirements of ASME Code.

The welding process control sheets were reviewed for compliance with the proposed alternative approved on the relief requests and ASME Code Section IX requirements.

4) Performed such that deficiencies were identified, dispositioned, and resolved?

Yes. There were no indications were identified by phased array ultrasonic examinations for the FSWOLs at the six DMBWs on the pressurizer.

- C. <u>Examinations and Mechanical Stress Improvement Process Two DMBWs</u> Between Hot Leg B and C Reactor Vessel Nozzles and Safe Ends
- 1) Are the nozzle, weld, safe end, and pipe configurations, as applicable, consistent with the configuration addressed in the stress improvement (SI) qualification report?

Yes. They were consistent with the qualification report. Westinghouse and its vendor, AEA Technology, performed an analytical verification of MSIP to be used for all the dissimilar welds on the hot leg "B" and "C" vessel nozzles. The qualification report was Westinghouse Report TR05640-001(or AEA Technology Report 3768-4-001-00), Analytical Verification of the MSIP for PWR RPV Hot Leg Nozzle Welds for VC Summer (Loops "B" and "C"), Rev 0, Dated February 15, 2002. The inspectors reviewed this document, compared it to the procedure used, and observed the implementation of the MSIP during the May 2002 outage and documented the detail in Section 1R08, ISI Activities (71111.08P) of the NRC Integrated Inspection Report 50-395/2002-002.

2) Does the SI qualification report address the location radial loading is applied, the applied load, and the effect that plastic deformation of the pipe configuration may have on the ability to conduct volumetric examinations?

Yes. The analytical verification provided the loading location and the applied load and also considered the effect that plastic deformation of the pipe configuration may have on the ability to conduct volumetric examinations. The vendor also used a field service procedure to control the implementation process, Westinghouse MRS-SSP-1300, Field Service Procedure for Application of the MSIP for VC Summer, Rev. 1 (Note: this procedure served as a work process to complete the MSIP on May 2, 2002). The licensee completed the UT after each MSIP and obtained 100 percent coverage in both axial and circumferential directions for the two DMBWs on the hot leg "B" and "C" vessel nozzles.

3) Do the licensee's inspection procedure records document that a volumetric examination per the ASME Code, Section XI, Appendix VIII was performed prior to and after the application of the SI?

Yes. The licensee performed volumetric examinations of automated UT (conventional) and surface examinations of the supplemental ET and recorded the results prior to and after the application of the MSIP for the two DMBWs on the hot leg "B" and "C" vessel nozzles per the ASME Code, Section XI.

The results of UTs and ETs prior to and after the MSIP were documented in Wesdyne Final Report, Examination of Reactor Vessel Nozzles to Pipe Welds for Hot Legs "B" & "C", Outage 13, May 2002 for VC Summer (Automated UT and ET Examinations Prior to and After MSIP Including Equipment and Personnel Qualification). The venders used Westinghouse CGE-ISI-254, Remote Inservice Examination of Reactor Vessel for VC Summer, Rev. 2 (A process with the Computer-Controlled Examination Tool and the Paragon Ultrasonic Data Acquisition System) and Westinghouse CGE-ISI-207-ET, ET Examination of Reactor Vessel to Pipe Welds Inside Surface for VC Summer Unit 1, Rev. 1 and 2, which were also used for the baseline volumetric examination prior to the MSIP.

In October 2003, the licensee performed a 10-year ISI examination for the vessel nozzle welds using UT and ET for the hot leg "B" and "C" vessel nozzle welds again. The UT examination in 2003 was performed using ASME Section XI, Appendix VIII, qualified techniques, equipment, and personnel. The procedure was qualified in accordance with ASME Section XI, Appendix VIII, as implemented through the EPRI PDI Program. The procedure used was PDI-ISI-254-SE, Remote Inservice Examination of Reactor Vessel Nozzle to Safe End, Nozzle to Pipe, and Safe End to Pipe Welds, Rev. 1 (Remote Automated UT). The examinations resulted in 100% coverage in the circumferential and axial beam directions. The inspectors reviewed the procedures, work orders, work packages, examination reports, equipment qualification records, and personnel qualification and certificates.

4) Does the SI qualification report address limiting flaw sizes that may be found during pre-SI and post-SI inspections and that any flaws identified during the

volumetric examination are to be within the limiting flaw sizes established by the SI qualification report.

Yes. Section 4.3.1 Non Destructive Examination (NDE) of Modification package ECR-50450 for the examination and application of MSIP on the hot leg "B" and "C" reactor vessel nozzle welds stated that the guidelines in NUREG-0313 Rev. 2 would be used which requires that welds with cracks that are no longer than 10 percent of the circumference and are no longer than 30 percent of the wall thickness will be considered to be mitigated by stress improvement. These were the limiting flaw sizes prior to and after the implementation of the MSIP.

Nonconformance Notice (NCN) NCN-02-1308, and Primary Identification Program No.0-C-02-1308, Rejective Flaw in "B" RCS Vessel Hot Leg Nozzle to Pipe Weld No.FW-15 for Pre MSIP, documented the flaw sizes and evaluation of the UT and ET prior to and after the applications of the MSIP for the vessel hot leg "B" and "C" nozzle welds. The flaws were evaluated to be within the limit and acceptable for the application of the MSIP. These flaws were also evaluated and accepted by the NRC per Letter to SCE&G, Safety Evaluation of Flaws Detected in VC Summer Nozzle to Pipe Welds in the Hot Legs of Loops "B" and "C," October 1, 2002.

5) Performed by qualified and knowledgeable personnel?

Yes. Personnel such as operators for the MSIP and automated UT and ET examiners involved with the DMBWs on the hot leg "B" and "C" reactor vessel nozzles for the mitigation using MSIP were qualified and knowledgeable in accordance with the requirements of MRP-139 and the ASME Code. The examiners were qualified Level II or Level III in the UT and ET methods as required by the UT and ET procedures and in accordance with the vendor's written practice for NDE personnel. The UT examiners were also PDI-qualified for the specific UT procedures they implemented. The final examination reports were reviewed by the vendor and/or licensee Level III UT examiners. The inspectors reviewed the operator performance qualification records and compared them with the requirements of the vendor procedures and the ASME Code for the MSIP application.

6) Performed such that deficiencies were identified, dispositioned, and resolved?

Yes. The licensee and vendors performed the UTs and MSIPs based on the procedures which can identify, disposition, and resolve the problems.

The cracks or defects were identified as NCN-02-1308 as discussed in the previous item for the limiting flaw sizes during the UT and ET exams.

- D. In-service Inspection Program
- 1) Has the licensee prepared an MRP-139 in-service inspection program?

No. The licensee did not have a stand-alone MRP-139 in-service inspection program document. However, the licensee's MRP-139 inservice inspection program is included in the ASME Section XI In-service Inspection Program (ISI Program). The inspectors reviewed the Third Interval ISI Plan. The licensee will revise the Third Interval ISI Plan to add more details to the examination methods and frequencies for the MRP-139 ISI requirements.

2) Are welds appropriately categorized?

Yes. The welds were appropriately categorized by the licensee's responsible engineer. However, the licensee is in the process of integrating the requirements of the examination methods and frequencies for all DMBWs in the Third Interval ISI Plan to meet the MRP-139 ISI requirements. The licensee has enough time to perform this task before the required inspections. The inspectors reviewed all DMBWs categorized at the time of the inspection for appropriate categorization.

The pressurizer nozzles were correctly categorized as Category F welds in their pre-FSWOL condition by not performing the baseline volumetric examinations and categorized as Category F for the ISI program after the FSWOL.

3) Are inspection frequencies consistent with the requirements of MRP-139?

Yes. The licensee plans inspection frequencies for welds in the MRP-139 ISI program to be consistent with the requirements of MRP-139.

4) What is the licensee's basis for categorizing welds as H or I and plans for addressing potential PWSCC?

No welds are categorized as H or I.

5) What deviations has the licensee incorporated and what approval process was used?

No deviations to MRP-139 ISI inspection program requirements have been planned by the licensee.

4OA6 Meetings, Including Exit

Exit Meeting Summary

The inspectors presented the inspection results to Mr. Dan Gatlin and other members of the licensee staff on October 9, 2008. The licensee acknowledged the results. The inspectors confirmed that inspection activities discussed in this report did not contain proprietary material.

40A7 Licensee Identified Violations

The following violation of very low safety significance (Green) was identified by the licensee and is a violation of NRC requirements which met the criteria of Section VI of the NRC Enforcement policy, NUREG-1600, for being dispositioned as an NCV.

• 10 CFR 55.25 states "If, during the term of the license, the licensee develops a permanent physical or mental condition that causes the licensee to fail to meet the requirements of 10CFR 55.21 of this part, the facility licensee shall notify the Commission, within 30 days of learning of the diagnosis, in accordance with 10 CFR 50.74(c). For conditions in which a conditional license (as described in 10 CFR 55.33(b) of this part) is requested, the facility licensee shall provide medical certification on Form NRC 396 to the Commission (as described in 10 CFR 55.23 of this part)." Contrary to this, the licensee did not notify the Commission when eleven licensed operators were diagnosed with a permanent physical medical condition within 30 days as required by 10 CFR 55.25. This finding was identified by the licensee in CR-08-00080 and CR-05-03172. This finding was of very low safety significance because, in all cases, the conditions were under control with no impact on the individuals' abilities to perform licensed duties.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

- J. Archie, Vice President, Nuclear Operations
- L. Bennett, Manager, Plant Support Engineering
- L. Blue, Manager, Nuclear Training
- M. Browne, Manager, Quality Systems
- A. Cribb, Supervisor, Nuclear Licensing
- G. Douglass, Manager, Nuclear Protection Services
- M. Fowlkes, General Manager, Engineering Services
- D. Gatlin, General Manager, Nuclear Plant Operations
- R. Justice, Manager, Maintenance Services
- D. Lavigne, General Manager, Organizational / Development Effectiveness
- G. Lippard, Manager, Operations
- M. Mosley, Manager, Chemistry Services
- P. Mothena, Manager, Health Physics and Safety Services
- J. Nesbitt, Manager, Materials and Procurement
- D. Shue, Manager, Planning / Outage
- W. Stuart, Manager, Design Engineering
- B. Thompson, Manager, Nuclear Licensing
- S. Zarandi, General Manager, Nuclear Support Services

ITEMS OPENED, CLOSED, AND DISCUSSED

| <u>Opened</u> | | , |
|---------------------|-----|---|
| 05000395/2515/172 | TI | Reactor Coolant System Dissimilar Metal Butt Welds (DMBWs). (Section 4OA5.2) |
| Opened and Closed | | |
| 05000395/2008004-01 | NCV | Failure to Perform EKG Tests During the Biennial Medical Exam for Licensed Operators (Section 1R11.2) |
| 05000395/2008004-02 | NCV | Failure to Maintain the Control Room Pressure Boundary Operable and Complete the Required TS Actions (Section 1R15) |
| Closed | | |
| 05000395/2008002-01 | LER | Control Room Normal and Emergency Air Handling Systems Inoperable Due to Pressure Boundary Breach (Section 40A3.1) |
| Discussed | | (, |

NONE

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

<u>Procedures and Documents</u> AOP 301.1, Revision 0B, Response to Electrical Grid issues OAP 100.4, Revision 2C, Communication SO 08-10, Revision 0, Economic Restrictions South Carolina Electric and Gas Company Nuclear-Electric Interface Agreement, Revision 1

Section 1R04: Equipment Alignment

Procedures, FSAR, and Drawings SOP-115, Revision 20A, Residual Heat Removal SOP-117, Revision 20K, Service Water System SOP-306, Revision 17F, Emergency Diesel Generator FSAR 8.3.1.1.2, Onsite Standby Power Supplies

Section 1R11: Licensed Operator Regualification

Procedures:

NTM Chapter 30.05, Revision 0A, Requalification Program for Licensed Operators and Senior Operators

NTM Chapter 30.05A, Revision 0B, Licensed Operator Requalification Program Annual Examination

NTM Chapter 30.12, Revision 0B, Simulator Training and Evaluation

SAP-1160, Revision 5G, Station Administrative Procedure, Medical Requirements for Special Duties

Written Examinations Reviewed:

All 2007 Biennial Written Examinations

Simulator Documents:

TQP-104, Revision 0, Simulator Review Group Closed CRs that were Simulator Related since 7/8/07 Outstanding Simulator Discrepancy List as of 7/07/08

Steady State Tests:

- IST-4.4, Revision 6, 25% Power Steady State Accuracy Tests: 7/6/07 and 7/24/08
- IST-4.2, Revision 20, 75% Power Steady State Accuracy Tests: 7/6/07 and 7/23/08

Transient Tests (2006 & 2007):

- IST-7.3, Revision 11, Main Turbine Trip At Max Power Which Does Not Cause Reactor Trip
- IST-7.6, Revision 16, Slow Primary System Depressurization to Saturated Conditions w/ ECCS Inhibited
- IST-7.9, Revision 14, Trip of One Reactor Coolant Pump

Malfunction Tests:

- IST-6.12.3, Revision 7, Reactor Coolant Pump Trip, 2002 and 2006
- IST-6.7.1.2, Revision 8, Loss of Normal and Emergency Feedwater, 2001 and 2005
- IST-6.11.5, Revision 6, Pressurizer Pressure Channel Failure, 2002 and 2006
- IST-6.15.1, Revision 6, Inadvertent Turbine Trip, 2003 and 2007
- IST-6.7.8, Revision 10, Feed Line Break Inside Containment, 2000 and 2004

Job Performance Measures (JPMs)

JPP-099, Revision 7, Locally Close "A" MSIV To Isolate "A" S/G JPP-055, Revision 9, Locally Start the Turbine Driven Emergency Feedwater Pump JPP-096, Revision 8, Locally Trip the Reactor JPS-005, Revision 18, Transfer To Cold Leg Recirculation JPSF-085, Revision 7, S/G Tube Rupture (Depressurize RCS To < Ruptured S/G Pressure) JPS-075, Revision 5, Classify Emergency Plan Event

Simulator Scenarios

LOR-SA-006R, Revision 1, 25% Power, N-44 Spikes Low, PT-464 Fails Low, Loss of XSW-1C Service Bus, High RCS Activity, SBLOCA, "A" SWBP Fail To Start With PVB-3107A Open, "B" EFW Pump Failure

LOR-SA-082R, Revision 4, 50% Power, "C" S/G Common Reference Leg Failure, Loss of Main Condenser Vacuum/"A" Circ Water Pump Trip, "B" CCW Pump Fail To Start, PT-444 Failed As-Is, "A" MSIV Fail To Close, "C" MSIV Fail To Auto Close, Main Steam Line Break

Condition Reports & LERs

CR-08-00880, Licensed Operator Diagnosed with Type II Diabetes Not Reported on Initial License Application

CR-08-03456, Missed Electro Cardiogram Tests Discovered by NRC Inspectors CR-05-03172, NRC Inspectors Identified Change in Medical Condition-Hypertension & Subsequent Licensee Review identified 11 Failures to Make Required Reporting CR-06-02576, NRC Inspector's Concerns w/ Medical Records During 2006 LOR Review CR-07-01609, New Medical Restriction Not Reported to NRC Within Required Time CR-07-0253, Site Medical Procedure (SAP) Language Confusing and Needs Revision CR-07-02502, QA Audit Results: Medical Examiner Evaluation Form Signed Before Lab Results CR-07-02768, Borderline Vision Retest for Operator CR-08-03346, Simulator Crew Failure during 2008 LOR Annual Exams CR-08-03267, Training Sequester Room Allows General Access Not Limited CR-08-03087, QA Finding on Operator Training Exam Control Deficiencies CR-08-03083, Site Employee Entered Simulator Exam In Progress Area CR-08-03142, Operator Regual Exam Bank Needs Improvement

LER 2006-4-0, Turbine Trip Due to Operator Over Feeding the Steam Generators LER 2007-2-0, Failure to Follow Administrative Controls Results in LCO 3.6.4 Violation

Other:

Reactivation Records (3)

Medical Records (7) Attendance Records (3) Feedback Comments from Licensed Operator Requal 2005 thru 2008 Remedial Training Plans-Written Exam Failures (3) Remedial Training Plans-As Found Exam Crew Failure (1) SA08-TN-04S, Snapshot Self Assessment of LOR Inspection Criteria in IP-71111.11 SA08-TN-05, Focused Self Assessment Report (Simulator)

Section 1R18: Plant Modifications

Other Documents BAR 08-02 EIR 81449

Corrective Action Program Documents CR-08-03365

Section 40A1: Performance Indicator Verification

Records

PI Submittals from July 2007 – June 2008

Procedures **Procedures**

HPP-242, Revision 0, Reporting of NRC Performance Indicators SAP-1360, Revision 0, NRC and INPO/WANO Performance Indicators NRC Mitigating Systems Performance Index (MSPI) Basis Document, V C Summer Nuclear Station, Revision 2

Condition Reports Initiated for NRC Identified Issues

CR-08-02895, Pressurizer Relief Tank Transmitter indication spiked irregularly CR-08-02952, RCS specific activity data entry error CR-08-03106, Issues keeping mechanics Fire Brigade gualified CR-08-03135, ERDS failed to disconnect from transmitting data to the NRC CR-08-03311, Place temporary cooling in the Turbine Building CR-08-03343, SW Pump Motor had oil in its air discharge filter box CR-08-03352, FCV602A lower gear frame cover incorrectly installed CR-08-03458, Clarification needed in EPP13 for a response to a station fire outside the PA CR-08-03489, SW valves 3106/3107 are not tested in the safeguards STP CR-08-03519, Molded case circuit breaker trip point vulnerabilities identified CR-08-03802, Failure to properly initial and date Security Force/Training Bulletins CR-08-03960, Dried Boron was noted on the outside of 'B' RB Spray pump casing vent valve CR-08-03963, Dried Boron noted on top of RHR Sump Pump discharge valve CR-08-04136, TS Bases not revised as part of MRF-22362 CR-08-04137, Design basis calculations do no support normal operation of RBCU's on SW CR-08-04257, Questions regarding DG being paralleled to the grid for testing CR-08-04341, Security was not notified of Tornado Warning CR-08-04346, 'B' DG tag out batch file was not run as required for simulator scenario

Attachment

LIST OF ACRONYMS

| AB | Auxiliary Building |
|-------|--|
| AC | Alternating Current |
| ADAMS | Agency Document Access and Management System |
| ASME | American Society of Mechanical Engineers |
| CAP | Corrective Action Program |
| CCP | Centrifugal charging pump |
| CCW | Component Cooling Water |
| CR | Condition Report |
| CRPB | Control Room Pressure Boundary |
| DMBW | Dissimilar Metal Butt Weld |
| ECG | Electro-Cardiogram |
| EDG | Emergency Diesel Generator |
| FME | Foreign Material Exclusion |
| ET | Eddy Current Testing |
| FME | Foreign Material Exclusion |
| FOST | Fuel Oil Storage Tank |
| FSAR | Final Safety Analysis Report |
| FSWOL | Full Structural Weld Overlay |
| I&C | Instrument and Control |
| ISI | In-Service Inspection |
| LCO | Limiting Condition of Operation |
| LER | Licensee Event Report |
| MDEFW | Motor Driven Emergency Feedwater Pump |
| MR | Maintenance Rule |
| MRP | Materials and Reliability Program |
| MSIP | Mechanical Maintenance Procedure |
| MSPI | Mitigating Systems Performance Index |
| NCV | Non-Cited Violation |
| NDE | Nondestructive Examination |
| NRC | Nuclear Regulatory Commission |
| OOS | Out of Service |
| PARS | Publicly Available Records |
| PDI | Performance Demonstration Initiative |
| PI | Performance Indicator |
| PMT | Post-Maintenance Testing |
| PWR | Pressurized Water Reactor |
| PWSCC | Primary Water Stress Corrosion Crack |
| RB | Reactor Building |
| RBCU | Reactor Building Cooling Unit |
| RCS | Reactor Coolant System |
| RHR | Residual Heat Removal |
| KPV | Reactor Pressure Vessel |
| KIP | Rated Thermal Power |
| SAP | Station Administrative Procedure |
| SCE&G | South Carolina Electric and Gas |

Attachment

| SCFM | Standard Cubic Feet per Minute |
|-------|---|
| SDP | Significance Determination Process |
| SFP | Spent Fuel Pool |
| SG | Steam Generator |
| SI | Stress Improvement |
| SOP | System Operating Procedure |
| SSC | Structures, Systems, or Components |
| STP | Surveillance Test Procedure |
| SW | Service Water |
| TDEFW | Turbine Driven Emergency Feedwater Pump |
| TI | Temporary Instruction |
| TS | Technical Specification |
| UT | Ultrasonic Testing |
| WO | Work Order |