



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

January 29, 2010

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 05000395/2009005 AND NRC EMERGENCY PREPAREDNESS
INSPECTION REPORT 05000395/2009501**

Dear Mr. Archie:

On December 31, 2009, 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 on January 14 and 20, 2010, with Mr. Dan Gatlin, General Manager, Nuclear Plant Operations, and other members of your staff. In addition, on October 8, 2009, the NRC completed an Emergency Preparedness inspection at your Virgil C. Summer Nuclear Station. The enclosed inspection report documents the inspection results, which were discussed on October 8, 2009, with you, and other members of your staff.

The inspections 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 one NRC-identified finding and one self-revealing finding of very low safety significance (Green). One of these findings was determined to involve a violation of NRC requirements. However, because of the very low safety significance and because it is entered into your corrective action program, the NRC is treating the finding as a non-cited violation (NCV) consistent with Section VI.A.1 of the NRC's Enforcement Policy. If you contest the NCV, you should provide a response within 30 days of the date of these inspection reports, 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, U. S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Virgil C. Summer Nuclear Station.

In addition, if you disagree with the characterization of any finding in these reports, you should provide a response within 30 days of the date of these inspection reports, with the basis for your disagreement, to the Regional Administrator, Region II, and the NRC Resident Inspector at the Virgil C. Summer Nuclear Station. The information you provide will be considered in accordance with Inspection Manual Chapter 0305.

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/

Gerald J. McCoy, Chief
Reactor Projects Branch 5
Division of Reactor Projects

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

Enclosures: NRC Integrated Inspection Report 05000395/2009005 and NRC Inspection Report 05000395/2009501 w/Attachment: Supplemental Information

cc w/encl: (See page 3)

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Letter to Jeffrey B. Archie from Gerald J. McCoy dated January 29, 2010

SUBJECT: VIRGIL C. SUMMER NUCLEAR STATION - NRC INTEGRATED INSPECTION
REPORT 05000395/2009005 AND NRC EMERGENCY PREPAREDNESS
INSPECTION REPORT 05000395/2009501

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 50-395

License No.: NPF-12

Report No.: 05000395/2009005 and 05000395/2009501

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

Facility: Virgil C. Summer Nuclear Station

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

Dates: October 1, 2009 through December 31, 2009

Inspectors: J. Zeiler, Senior Resident Inspector
J. Polickoski, Resident Inspector
M. Coursey, Reactor Inspector (Sections 1R08 and 4OA5.2)
R. Hamilton, Senior Health Physicist (Section 2OS1)
E. Michel, Senior Reactor Inspector (Section 1R08)
L. Miller, Senior Emergency Preparedness Inspector (Sections 1EP4,
4OA1.2, and 4OA5.3)

Approved by: Gerald J. McCoy, Chief
Reactor Projects Branch 5
Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000395/2009-005; IR 05000395/2009-501; 10/01/2009 - 12/31/2009; Virgil C. Summer Nuclear Station; Refueling and Other Outage Activities, Identification and Resolution of Problems

The report covered a 3-month period of inspection by resident inspectors and announced inspections by regional reactor, health physicist, and emergency preparedness inspectors. Two Green findings, one of which was a non-cited violation (NCV), were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. 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

- Green. A Green NRC-identified finding was identified for the failure to adequately implement a procedure and correct previously identified deficiencies with the licensee's operator workaround program. This resulted in operator workarounds and challenges not fully or adequately being assessed, untimely resolution and status reporting of operator workarounds. The licensee initiated Condition Report (CR)-1000079 to address this issue.

This finding is more than minor because it was similar to examples 3.j. and 3.k. in Inspection Manual Chapter 0612, Appendix E, "Examples of Minor Issues," where significant programmatic deficiencies were identified that could lead to worse errors if left uncorrected. In addition, the finding has the potential to lead to a more significant safety concern in the management and correction of operator workarounds that can have an adverse effect on the functional capability of a mitigating system or that can impact human reliability in responding to initiating events. Using NRC Inspection Manual Chapter 0609, Attachment 4, "Phase 1 – Initial Screening and Characterization of Findings," this finding was determined to be of very low safety significance (Green) because the failure to follow procedure and correct previously identified operator workaround program deficiencies, by themselves, did not result in an actual loss of operability or functionality, loss of system safety function, actual loss of safety function of a single train for greater than its Technical Specification (TS) allowed outage time, actual loss of safety function of one or more non-TS trains of equipment designated as risk-significant per 10CFR50.65 for greater than 24 hours, and was not potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding has a cross-cutting aspect in the area of problem identification and resolution associated with the corrective action program component because operations department personnel failed to take appropriate corrective actions to address previously identified deficiencies with following the operator workaround program procedure (P.1.d). (Section 40A2.3)

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Cornerstone: Barrier Integrity

- Green A Green self-revealing non-cited violation (NCV) was identified for the failure to comply with TS 6.8.1. As a result of the failure to follow a procedure, approximately 8000 gallons of water was inadvertently transferred from the SFP to the refueling cavity. This issue was entered in the licensee's CAP as CR-09-04237.

This finding is more than minor because it is associated with the human performance and configuration control attributes of the Barrier Integrity cornerstone and affects the cornerstone objective to provide reasonable assurance that physical design barriers, such as maintaining functionality of the spent fuel pool system, protect the public from radionuclide releases caused by accidents or events. Using NRC Inspection Manual Chapter 0609, Attachment 4, "Phase 1 – Initial Screening and Characterization of Findings," this finding was determined to be of very low safety significance (Green) because it only represents a degradation of the radiological barrier function provided by the spent fuel pool, in that, since water level did not decrease less than 23 feet above the top of the irradiated fuel and pool temperature only increased by two degrees Fahrenheit, adequate radiological shielding and spent fuel pool cooling margins were maintained. This finding has a cross-cutting aspect in the area of human performance associated with the work practices component because operators failed to focus adequate attention to detail on following procedure steps in the proper sequence (H.4.b). (Section 1R20)

B. Licensee-Identified Violations

None

REPORT DETAILS

Summary of Plant Status

The unit began the inspection period at full Rated Thermal Power (RTP). On October 2, 2009, an automatic reactor trip occurred following a turbine trip due to a main generator stator ground fault condition that was caused by a failure in the 'B' main generator output breaker. Following a forced outage to rebuild the 'B' main generator output breaker, the reactor was restarted on October 11 and reached 53 percent RTP on October 13. The unit remained at 53 percent power until October 16, when a planned shutdown was commenced to implement the eighteenth refueling outage (RF-18). On November 22, with the plant in Mode 5 (Cold Shutdown), a Notice of Unusual Event was declared when a fire occurred in two non-safety related balance of plant switchgear rooms located in the turbine building. Following refueling outage related work activities and fire damage repairs to the affected switchgear room equipment, reactor criticality was achieved on December 9. The main turbine was placed on-line December 10 and power was raised to 95 percent by December 13. On December 14, power was reduced to 80 percent due to a malfunction of turbine control valve #4. On December 16, while taking the turbine off-line to repair turbine control valve #4, a manual reactor trip was initiated from 43 percent power when the steam dump system failed to operate following the manual trip of the turbine. The reactor was restarted on December 17 and full RTP was reached on December 18. The unit remained at or near full RTP for the remainder of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection

.1 Seasonal Weather Susceptibilities

a. Inspection Scope

The inspectors performed one adverse weather inspection for readiness of cold weather. The inspectors verified the licensee had implemented applicable sections of operations administrative procedure (OAP)-109.1, Revision 3A, "Guidelines for Severe Weather." The inspectors walked down the condensate storage tank and refueling water storage tank (RWST) level instrumentation and selected freeze protection alarm panels to assess whether the equipment was adequately protected from cold weather and was functioning as expected. Also, the inspectors reviewed the licensee's corrective action program (CAP) database to verify that freeze protection problems were being identified at the appropriate level, entered into the CAP, and appropriately resolved.

b. Findings

No findings of significance were identified.

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.2 Actual Adverse Weather Conditions

a. Inspection Scope

The inspectors performed an impending adverse weather inspection to review the licensee's overall preparations and protection of employees and risk-significant systems in response to a tornado warning declared in Fairfield County on December 9, 2009. The inspectors verified the licensee had implemented applicable sections of OAP-109.1, Revision 3A, "Guidelines for Severe Weather," and emergency planning procedure (EPP)-015, Revision 17, "Natural Emergency." The inspectors responded to the control room during the tornado warning and monitored licensee response actions and weather report updates until the adverse weather conditions were over.

b. Findings

No findings of significance were identified.

.3 External Flooding

a. Inspection Scope

The inspectors reviewed the licensee's external flood mitigation plans to determine consistency with design requirements, final safety analysis report (FSAR) Sections 2.4.2 through 2.4.10, flood analysis documents, and EPP-015, Revision 17, "Natural Emergency." The inspectors performed walkdowns of the station to verify flood protection features remained as described in the FSAR. Specifically, the inspectors performed visual examinations of the storm drain system inside the protected area to verify that drains were not blocked and the ground was properly graded to channel water into the system. The inspectors also conducted walkdowns of the rooftop drainage systems of the auxiliary, control, turbine, and fuel handling buildings, to verify proper drainage capability.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment

.1 Partial System Walkdowns

a. Inspection Scope

The inspectors conducted three 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), FSAR, and technical specifications (TS). The inspections included review of outstanding maintenance work orders (WOs) and related condition reports (CRs) to

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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.

- 'B' emergency diesel generator (EDG) while 'A' EDG was OOS for scheduled preventive maintenance
- 'A' and 'B' spent fuel pool (SFP) pumps while 'A' SFP pump motor was supplied by non-safety related temporary power during refueling outage
- 'A' residual heat removal (RHR) pump while 'B' RHR pump was OOS for scheduled refueling outage maintenance

b. Findings

No findings of significance were identified.

.2 Complete System Walkdown

a. Inspection Scope

The inspectors performed a detailed review and walkdown of the 'B' high head safety injection (SI) system, to identify any discrepancies between the current operating system equipment lineup and the designed lineup. This walkdown included accessible areas of the reactor and auxiliary buildings and the equipment alignment configuration as indicated from valves, pumps, and control room equipment status lights. In addition, the inspectors reviewed completed surveillance procedures, outstanding WOs, system health reports, and related CRs to verify that the licensee had properly identified and resolved equipment problems that could affect the availability and operability of the system. Documents reviewed are listed in the attachment to this report.

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 five areas (respective fire zones also noted):

- 'A' and 'B' EDG rooms (fire zones DG-1.1/1.2 and DG-2.1/2.2)
- 1DB safety-related switchgear room (fire zone IB-22.2)

- Auxiliary building switchgear room on 463' elevation (fire zone AB-1.29)
- Charging pump room 'B' (fire zone AB-1.5)
- 'A' and 'B' safety-related battery and charger rooms (fire zones IB-2, -3, -4, -5, and -6)

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance

a. Inspection Scope

The inspectors conducted one heat sink performance sample. The inspectors observed aspects of the as-found condition, cleaning, and eddy-current testing of 'B' component cooling water (CCW) heat exchanger following its opening for maintenance during RF-18. The inspectors also reviewed the results of the heat exchanger eddy-current testing and the final test report provided by the testing contractor.

b. Findings

No findings of significance were identified.

1R08 Inservice Inspection Activities (IP 71111.08P, Unit 1)

.1 Non-Destructive Examination Activities and Welding Activities

a. Inspection Scope

From October 26 - November 06, 2009, the inspectors reviewed the implementation of the licensee's Inservice Inspection (ISI) program for monitoring degradation of the reactor coolant system (RCS) boundary and risk significant piping boundaries. The inspectors' activities consisted of an on-site review of non-destructive examination (NDE) and welding activities to evaluate compliance with the applicable edition of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (BPVC), Section XI (Code of record: 2001 Edition with 2003 Addenda), and to verify that indications and defects (if present) were appropriately evaluated and dispositioned in accordance with the requirements of the ASME Code, Section XI acceptance standards.

The inspectors observed the following non-destructive examinations mandated by the ASME Section XI Code to evaluate compliance with the ASME Code Section XI and Section V requirements and if any indications and defects detected were detected, to determine if these were dispositioned in accordance with the ASME Code or an NRC approved alternative requirement.

- Reactor Vessel Inlet Nozzle 'C'
- Pump Support at 1B-412-0 XPP0048C

The inspectors reviewed the following pressure boundary welds completed for risk significant systems during the last refueling outage to determine if the licensee applied the preservice non-destructive examinations and acceptance criteria required by the construction Code NRC approved Code Case, NRC approved Code relief request or the ASME Code Section XI. Additionally, the inspectors reviewed the welding procedure specification and supporting weld procedure qualification records to determine if the weld procedure(s) were qualified in accordance with the requirements of Construction Code and the ASME Code Section IX.

- Weld on Boric Acid Blender Inlet Header Check Valve
- Diesel Generator CLR A SW RET HDR Relief VLV

b. Findings

No findings of significance were identified.

.2 PWR Vessel Upper Head Penetration (VUHP) Inspection Activities

a. Inspection Scope

For the reactor vessel head, a bare metal visual examination was required this outage pursuant to 10 CFR 50.55a(g)(6)(ii)(D).

The inspectors reviewed records of the visual examination conducted on the reactor vessel head to evaluate if the activities were conducted in accordance with the requirements of ASME Code Case N-729-1 and 10 CFR 50.55a(g)(6)(ii)(D). Specifically, the inspectors reviewed the following documentation and/or observed the following activities:

- Evaluated if the required visual examination scope/coverage was achieved and limitations (if applicable) were recorded in accordance with the licensee procedures
- Evaluated if the licensee's criteria for visual examination quality and instructions for resolving interference and masking issues were adequate

b. Findings

No findings of significance were identified.

.3 Boric Acid Corrosion Control Inspection Activities

a. Inspection Scope

The inspectors performed an independent walkdown of portions of the RHR system(s) which had received a recent licensee boric acid walkdown and determined whether the licensee's boric acid corrosion control (BACC) visual examinations emphasized locations where boric acid leaks can cause degradation of safety significant components.

The inspectors reviewed the following licensee evaluations of reactor coolant system components with boric acid deposits to determine if degraded components were documented in the CAP. The inspectors also evaluated corrective actions for any degraded reactor coolant system components to determine if they met the component Construction Code, ASME Section XI Code, and/or NRC approved alternative.

- CR-08-02906, Non-minor boron residue from setscrew of XVR08864A-SI
- CR-08-02652, NRC identified wet boron residue on XVT08363B-CS

The inspectors reviewed the following CRs related to evidence of boric acid leakage to determine if the corrective actions completed were consistent with the requirements of the ASME Code Section XI and 10 CFR Part 50, Appendix B, Criterion XVI.

- CR-09-03441, Boric acid noted on valve XVT06658-SF
- CR-09-02242, Boron discovered during walkdown of spent fuel cooling, reactor building spray, and refueling water systems

b. Findings

No findings of significance were identified.

.4 Steam Generator Tube Inspection Activities

a. Inspection Scope

The NRC inspectors interviewed eddy current testing (ET) personnel including the licensee steam generator (SG) engineer, vendor SG tube integrity engineer, vendor lead ET Level III; reviewed documentation related to the SG ISI program; and walked down ET equipment operating in containment. The following items were evaluated against the requirements of the ASME B&PV Code, Section XI; TSs; and the guidance documents referenced in NEI 97-06, Revision 2, "Steam Generator Program Guidelines."

- A sample of SG tube in-situ pressure testing screening criteria were reviewed
- SG tube ET examination scope and expansion criteria were reviewed
- SG tube repair criteria were reviewed
- No new degradation mechanisms were identified during the ET examinations
- Primary-to-secondary leakage (e.g., SG tube leakage) was below 3 gallons-per-day, or the detection threshold, during the previous operating cycle
- A sample of ET equipment and techniques used to acquire and analyze data were evaluated to determine if they were qualified or validated to detect the known/expected types of SG tube degradation in accordance with Appendix H, Performance Demonstration for Eddy Current Examination, of EPRI, Revision 7, "Pressurized Water Reactor Steam Generator Examination Guidelines"
- Reviewed the licensee's secondary side SG Foreign Object Search and Removal (FOSAR) activities
- Reviewed the licensee's SG upper bundle visual inspection activities
- SG ET personnel qualifications

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b. Findings

No findings of significance were identified.

.5 Identification and Resolution of Problemsa. Inspection Scope

The inspectors performed a review of ISI/SG related problems entered into the licensee's CAP and conducted interviews with licensee staff to determine if:

- the licensee had established an appropriate threshold for identifying ISI/SG related problems
- the licensee had performed a root cause (if applicable) and taken appropriate corrective actions
- the licensee had evaluated operating experience and industry generic issues related to ISI and pressure boundary integrity

The inspectors performed these reviews to evaluate compliance with 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requirements. The corrective action documents reviewed by the inspectors are listed in the attachment to this report.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Regualification Programa. Inspection Scope

On October 9, 2009, the inspectors observed the performance of senior reactor operator and reactor operators on the plant simulator during licensed operator training. The simulator training activities involved "Just-in-Time" training for reactor startup, secondary plant startup, and power ascension (Mode 3 to Mode 1). 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.

1R12 Maintenance Effectivenessa. Inspection Scope

The inspectors evaluated three 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, and 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 (MPFFs) 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 Process Implementation," and the Virgil C. Summer "Important To Maintenance Rule System Function and Performance Criteria Analysis," to verify consistency with the MR requirements.

- CR-08-01844, Failed 'B' RHR suction piping mechanical snubber MK-RHH-0114
- CR-09-00633, 'A' CCW liquid radiation monitor (RML0002A) ratemeter motherboard failure
- CR-09-02160, XFN0039B ('B' battery room exhaust fan) failed to start due to XDP0088B (exhaust fan outlet damper) not fully opening and activating the limit switch

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Controla. Inspection Scope

The inspectors evaluated, as appropriate, for the four 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.

- Risk assessment for forced outage related activities associated with the rebuild of the 'B' phase main generator output breaker
- Risk assessment for reactor vessel core offload activities while the 'A' train essential power was out of service for preventive maintenance with temporary non-safety related power supplied to the 'A' SFP cooling pump motor and plant radiation monitors
- Risk assessment for temporary power and alternate/emergency bus feeder alignments affecting safety-related and balance of plant switchgear (yellow risk)
- Risk assessment for number four (#4) turbine control valve failure troubleshooting, plant maneuvering to support valve maintenance, reactor and turbine trip, turbine high vibrations, and reactor and plant startup (yellow risk)

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed five 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 0E, "Operability Determination Process," and SAP-999, Revision 4C, "Corrective Action Program."

- CR-09-03822, 'B' main steam isolation valve stroke test failure
- CR-09-04470, 1A battery feeder breaker to DPN1HA bus tripped during battery recharge following capacity test
- CR-09-04988, over torque of battery XBA1A/XBA1B post connections
- CR-09-05105, RWST cannot be sampled for boron concentration due to loss of power to recirculation pump
- CR-09-05392, the turbine driven emergency feedwater pump low lube oil pressure trip tripped at low out of tolerance of 800-1500 rpm

b. Findings

No findings of significance were identified.

1R18 Plant Modifications

Permanent Plant Modifications

a. Inspection Scope

The inspectors reviewed two permanent modifications to evaluate the changes for adverse effects on system availability, reliability, and functional capability. Documents reviewed included engineering change request (ECR) implementation procedures, modification design and implementation packages, engineering calculations, WOs, site drawings, applicable sections of the FSAR, supporting 10 CFR 50.59 evaluations, TS, and design basis information. The inspectors witnessed aspects of each modification implementation and observed aspects of post-modification testing to verify adequate testing of the changes.

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 two permanent modifications and the associated attributes reviewed are as follows:

ECR 50723, NRC Generic Letter 2008-01 vent line additions

- Licensing Basis
- Failure Modes
- Materials/Replacement Components
- Operations
- Flow paths
- Pressure Boundary
- Structural
- Post Modification Testing
- Plant Document Updating

ECR 50466, 'B' EDG governor replacement

- Licensing Basis
- Failure Modes
- Energy Needs
- Control Signals
- Timing
- Plant Document Updating
- Operations
- Flow paths
- Implementation
- Post Modification Testing
- Operability/Surveillance Testing

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 5A, "Post Maintenance Testing Guidelines."

- WO 0912367, PMT for 'B' main steam isolation valve packing adjustment
- WO 0912372, PMT for replacement of the 'A' SG feedwater flow differential pressure transmitter (IFT00477)
- WOs 0908501, 0814034, 0814927, and 0410153, PMT for scheduled preventive maintenance on 'A' EDG
- WO 0603546, PMT for replacement of the 'B' EDG governor
- WO 0914786, PMT for repair of 1C balance of plant switchgear and restoration of feed from alternate and safety-related sources
- WO 0815899, PMT for turbine driven emergency feedwater pump trip, throttle valve planned and corrective maintenance

b. Findings

No findings of significance were identified.

1R20 Refueling and Other Outage Activities

.1 'B' Main Generator Output Breaker Failure Forced Outage

a. Inspection Scope

The inspectors performed the inspection activities described below during the forced outage to rebuild the 'B' main generator output breaker that failed during full power operation resulting in an automatic reactor trip. The outage began on October 2, 2009, and ended October 11.

- The forced outage work plan was reviewed to ensure that appropriate risk controls, defense-in-depth, and TS requirements were considered in the configuration of important plant safety equipment
- When equipment was removed from service, the inspectors verified that defense-in-depth was maintained commensurate with the outage risk control plan for key safety functions and applicable TS, and that configuration changes due to emergent work and unexpected conditions were controlled in accordance with the outage risk control plan
- Plant mode changes and startup activities were monitored to verify that required TS equipment remained available and plant procedural requirements were adhered to
- Various problems that arose during the outage were reviewed to verify that the licensee was identifying problems related to outage activities at an appropriate threshold and entering them into the CAP

b. Findings

No findings of significance were identified.

.2 Refueling Outage RF-18

a. Inspection Scope

On October 17, 2009, the unit was shutdown to commence RF-18. The planned 43 day outage was completed on December 10. The inspectors used inspection procedure 71111.20, "Refueling and Outage Activities," to complete the inspections described below.

Prior to and during the outage, the inspectors reviewed the licensee's outage risk assessments and controls for the outage schedule to verify that the licensee had appropriately considered risk, industry experience and previous site specific problems, and to confirm that the licensee had mitigation/response strategies for losses of any key safety functions.

In the area of licensee control of outage activities, the inspectors reviewed equipment removed from service to verify that defense-in-depth was maintained in accordance with applicable TS and that configuration changes due to emergent work and unexpected conditions were controlled in accordance with the outage schedule and risk control plan.

The inspectors reviewed selected components which were removed from service to verify that tag outs were properly installed and that associated equipment was appropriately configured to support the function of the clearance.

During the outage, the inspectors reviewed and/or observed the following:

- RCS pressure, level, and temperature instruments to verify that those instruments were installed and configured to provide accurate indication
- The status and configuration of electrical systems to verify that those systems met TS requirements and the licensee's outage risk control plan. The inspectors also evaluated if switchyard activities were controlled commensurate with their risk significance and if they were consistent with the licensee's outage risk control assessment assumptions
- SFP cooling operations to verify that outage work was not impacting the ability of the operations staff to operate the SFP cooling system during and after core offload. The inspectors also reviewed the licensee's calculation results of SFP and reactor vessel heatup rates in case of a potential loss of cooling event
- Heavy load lifts for the reactor vessel head removal and reinstallation to ensure the activities were conducted in a controlled and safe manner. Heavy load lift procedures were reviewed to determine whether past and current practices were within the licensing basis and consistent with guidance in NUREG-0612, "Control of Heavy loads at Nuclear Power Plants"
- The control of containment penetrations and containment entries to verify that the licensee controlled those penetrations and activities in accordance with the appropriate TS and could achieve/maintain containment closure for required conditions
- All accessible areas inside the reactor building prior to reactor startup to verify that debris had not been left which could affect the performance of the containment sumps

The inspectors reviewed the following activities for conformance to applicable procedural and TS requirements:

- Plant shutdown activities
- Decay heat removal system operations
- Inventory controls and measures to provide alternate means for inventory addition
- Reactivity controls
- Reactor vessel defueling and refueling operations
- Reactor heatup, mode changes, initial criticality, startup and power ascension activities

The inspectors reviewed various problems that arose during the outage to verify that the licensee was identifying problems related to outage activities at an appropriate threshold and was entering them in the CAP.

b. Findings

Inadvertent Loss of Spent Fuel Pool Inventory

Introduction: A Green self-revealing non-cited violation (NCV) was identified for the failure to comply with TS 6.8.1. As a result of the failure to follow a procedure, approximately 8000 gallons of water was inadvertently transferred from the SFP to the refueling cavity. This issue was entered in the licensee's CAP as CR-09-04237.

Description: On October 23, 2009, with the unit in Mode 6 (Refueling), operations personnel were in the process of filling the reactor building refueling cavity from the RWST in preparation for lifting the reactor vessel head and subsequent defueling. The previous operations night shift began the evolution and had completed actions up to and including Step 2.1 of SOP-123, Revision 15, "Spent Fuel Cooling System," Section IV.D, "Filling the Fuel Transfer Canal and/or the Refueling Cavity via Spent Fuel Cooling Pump B." The night shift operations crew adequately communicated to the oncoming day shift crew that the next step (i.e., Step 2.2 for closing the 'B' SFP cooling pump header isolation valve XVG06661-SF) had not been completed. While a pre-job briefing by the oncoming shift supervisor was conducted discussing the expectation that Step 2.2 was the starting point in the evolution, the field operator failed to notice that Step 2.2 was not completed and started the evolution at Step 2.3. Upon implementing Step 2.3.d, which opened valve XVG06668-SF (fuel transfer canal SFP header isolation), a gravity flowpath was created allowing SFP water to be transferred to the fuel transfer canal and ultimately to the reactor building refueling cavity through the fuel transfer gate valve that had been previously opened. Upon receiving SFP low level alarms in the control room, the operators were directed to close all valves opened in the previous Step 2.3, which terminated the loss of SFP inventory.

At the time of the event, the 'A' SFP cooling pump was operating and taking suction from the SFP to provide cooling. Due to SFP level decreasing to the elevation of the anti-siphon holes located in the pump suction piping (~460'-3"), the pump experienced air-binding based on control room indications of reduced/loss of flow and reports of loud noises in the SFP piping. The operators secured the 'A' SFP pump to prevent any damage. The pump was later vented and successfully restarted following recovery of SFP level. During the period that both SFP cooling pumps were not in operation, SFP temperature increased by approximately 2 degrees Fahrenheit. Since SFP level was prevented from decreasing less than 23 feet above the top of the spent fuel assemblies by the design of the anti-siphon holes in the SFP piping, the action statement of TS 3.7.10 was not required to be entered. As part of the licensee's initial corrective actions, a stand down was conducted with operations personnel to review the event and re-emphasize the importance of proper procedural adherence and place-keeping practices, as well as clearer turnover communications of procedures-in-effect. In addition, a laminated SFP cooling flowpath drawing was developed and used during the rest of the

refueling outage as an operator aid when SFP system configuration changes were implemented.

Analysis: The failure to follow the system operating procedure for filling the refueling cavity, which resulted in the inadvertent transfer of 8000 gallons of water from the SFP, is a performance deficiency that was within the licensee's ability to foresee and correct. This finding is more than minor because it is associated with the human performance and configuration control attributes of the Barrier Integrity cornerstone and affects the cornerstone objective to provide reasonable assurance that physical design barriers, such as maintaining functionality of the spent fuel pool system, protect the public from radionuclide releases caused by accidents or events. Using NRC Inspection Manual Chapter 0609, Attachment 4, "Phase 1 – Initial Screening and Characterization of Findings," this finding was determined to be of very low safety significance (Green) because it only represents a degradation of the radiological barrier function provided by the spent fuel pool, in that, since water level did not decrease less than 23 feet above the top of the irradiated fuel and SFP temperature only increased by two degrees Fahrenheit, adequate radiological shielding and spent fuel pool cooling margins were maintained. This finding has a cross-cutting aspect in the area of human performance associated with the work practices component because operators failed to focus adequate attention to detail on following procedure steps in the proper sequence (H.4.b).

Enforcement: TS 6.8.1.a, "Procedures and Programs," requires that written procedures be established, implemented and maintained covering the activities specified in Appendix A, "Typical Procedures for Pressurized Water Reactors," of Regulatory Guide 1.33, "Quality Assurance Program Requirements," Revision 2, February 1978. Appendix A, Item 3.h, requires procedures for spent fuel pool cooling system operation. Procedure SOP-123, Revision 15, "Spent Fuel Cooling System," Section IV.D, "Filling the Fuel Transfer Canal and/or the Refueling Cavity via Spent Fuel Cooling Pump B," Step 2.2, requires operators to close valve XVG06661-SF ('B' SFP cooling pump header isolation) prior to opening valve XVG06668-SF (fuel transfer canal SFP header isolation) via Step 2.3.d. Contrary to the above, on October 23, 2009, an operator failed to ensure Step 2.2 was complete prior to implementing Step 2.3.d, resulting in approximately 8000 gallons of spent fuel pool water being transferred to the reactor building refueling cavity. Because this finding is of very low safety significance and has been entered into the licensee's corrective action program as CR-09-04237, this violation is being treated as an NCV, consistent with Section IV.A.1 of the NRC Enforcement Policy: NCV 05000395/2009005-01, Failure to Follow Procedure Results in Inadvertent Loss of Spent Fuel Pool Inventory.

1R22 Surveillance Testing

a. Inspection Scope

The inspectors observed and/or reviewed the six surveillance test procedures (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

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established as specified in the procedures, that no equipment preconditioning activities occurred, and that acceptance criteria were met.

In-Service Tests:

- STP-125.002A, Revision 1H, "Diesel Generator 'A' Operability Test"

RCS Leakage Tests:

- STP-114.002, Revision 12A, "Operational Leakage Calculation"

Containment Isolation Valve (CIV) Tests:

- STP-215.004, Revision 6D, "Containment Isolation Valve Leakage Test for the AC, CC, DN, FS, and SW Systems"

Other Surveillance Tests:

- STP-220.008, Revision 5A, "Motor Driven Emergency Feedwater Pump Full Flow Test"
- STP-106.002, Revision 4, "Rod Position Indication Operational Test"
- STP-125.011, Revision 12E, "Integrated Safeguards Test – Train B"

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP4 Emergency Action Level and Emergency Plan Changes

a. Inspection Scope

Since the last NRC inspection of this program area, revisions 57 and 58 of the Virgil C. Summer Nuclear Station Emergency Plan were implemented by the licensee. The licensee determined that in accordance with 10 CFR 50.54(q), the changes resulted in no decrease in the effectiveness of the Plan, and that the revised Plan continued to meet the requirements of 10 CFR 50.47(b) and Appendix E to 10 CFR Part 50. The inspector conducted a sampling review of the Plan changes and implementing procedure changes made between July 1, 2008, and September 30, 2009, to evaluate for potential decreases in effectiveness of the Plan. However, this review was not documented in a Safety Evaluation Report and does not constitute formal NRC approval of the changes. Therefore, these changes remain subject to future NRC inspection in their entirety.

The inspection was conducted in accordance with NRC Inspection Procedure (IP) 71114, Attachment 04, "Emergency Action Level and Emergency Plan Changes." The applicable planning standard (PS), 10 CFR 50.47(b)(4) and its related 10 CFR 50, Appendix E requirements were used as reference criteria.

The inspector reviewed various documents which are listed in the attachment. This inspection activity satisfied one inspection sample for the emergency action level and emergency plan changes on an annual basis.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2OS1 Access Control To Radiologically Significant Areas

a. Inspection Scope

Access Controls: The inspectors evaluated licensee performance in controlling worker access to radiologically significant areas and monitoring jobs in-progress associated with the 2009 refueling outage. The inspectors directly observed implementation of administrative and physical radiological controls; evaluated radiation worker (radworker) and health physics technician (HPT) knowledge of and proficiency in implementing radiation protection requirements; and assessed worker exposures to radiation and radioactive material.

During facility tours, the inspectors directly observed postings and physical controls for radiation areas, high radiation areas (HRAs), and potential airborne radioactivity areas established within the radiologically controlled area (RCA) of the reactor building, auxiliary building, and radioactive waste (radwaste) processing and storage locations. The inspectors independently measured radiation dose rates or directly observed conduct of licensee radiation surveys for selected RCA areas. Results were compared to current licensee surveys and assessed against established postings and Radiation Work Permit (RWP) controls. Licensee key control and access barrier effectiveness were evaluated for selected Locked High Radiation Area (LHRA) and Very High Radiation Area (VHRA) locations. Changes to procedural guidance for LHRA and VHRA controls were discussed with health physics (HP) supervisors. Controls and their implementation for storage of irradiated material within the SFP were reviewed and discussed. Established radiological controls were evaluated for selected refueling outage tasks in particular removal of the reactor lower internals (core support barrel) and its subsequent storage in the lower reactor cavity. In addition, licensee controls for areas where dose rates could change significantly because of plant shutdown and refueling operations were reviewed and discussed.

For selected tasks including attaching the lower internals lift rig, removal of the lower internals and subsequent stowage of the lower internals into the lower reactor cavity. Occupational workers' adherence to selected RWPs and HPT proficiency in providing job coverage were evaluated through direct observations and remote monitoring via telemetric dosimetry and closed-circuit television. For the selected jobs, Electronic

Dosimeter (ED) alarm set points and worker stay times were evaluated against area radiation survey results.

The inspectors evaluated the effectiveness of radiation exposure controls, including air sampling, barrier integrity, engineering controls, and postings through a review of both internal and external exposure results. Worker exposure as measured by ED and by licensee evaluations of skin doses resulting from discrete radioactive particle or dispersed skin contamination events during current refueling outage activities were reviewed and assessed. The inspectors also reviewed and discussed selected whole-body count analyses conducted during the current refueling outage.

Radiation protection activities were evaluated against the requirements of FSAR Section 12; TS Sections 6.8 and 6.12; 10 CFR Parts 19 and 20; and approved licensee procedures. Records reviewed are listed in Section 2OS1 of the attachment.

Problem Identification and Resolution: Licensee CAP documents associated with access control to radiologically significant areas were reviewed and assessed. This included review of selected CRs related to radworker and HPT performance. The inspectors evaluated the licensee's ability to identify, characterize, prioritize, and resolve the identified issues in accordance with procedure SAP-999, Revision 4C, "Corrective Action Program." The inspectors also evaluated the scope of the licensee's internal audit program and reviewed recent assessment results. Licensee CAP documents reviewed are listed in the attachment.

The inspectors completed 21 of the required line-item samples described in IP 71121.01.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification

.1 Cornerstone: Mitigating Systems

a. Inspection Scope

The inspectors verified the accuracy of the licensee's PI submittals listed below for the period October 1, 2008 through September 30, 2009. The inspectors used the performance indicator definitions and guidance contained in NEI 99-02, Revision 6, "Regulatory Assessment Performance Indicator Guideline," and licensee procedure SAP-1360, Revision 1, "NRC and INPO/WANO Performance Indicators," to check the reporting of each data element. The inspectors sampled licensee event reports (LERs), operator logs, tagout records, plant risk records, plant status reports, CRs, and performance indicator data sheets to verify that the licensee had properly reported the PI data. Also, the inspectors discussed the PI data with the licensee personnel associated with the performance indicator data collection and evaluation.

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- Mitigating System Performance Indicator (MSPI) - Emergency Feedwater System
- MSPI - Cooling Water Systems
- Safety System Functional Failures

b. Findings

No findings of significance were identified.

.2 Cornerstone: Emergency Preparedness

a. Inspection Scope

The inspectors sampled licensee submittals for the three PIs listed below. For each of the submittals reviewed, the inspector reviewed the period from July 1, 2008, through June 30, 2009. To verify the accuracy of the PI data reported during that period, PI definitions and guidance contained in Nuclear Energy Institute 99-02, Revision 5, "Regulatory Assessment Indicator Guideline," were used to verify the basis in reporting for each data element.

- Emergency Response Organization Drill/Exercise Performance (DEP)
- Emergency Response Organization Readiness (ERO)
- Alert and Notification System Reliability (ANS)

The inspectors reviewed portions of the raw PI data developed from monthly performance indicator reports and discussed the methods for compiling and reporting the PIs with cognizant emergency preparedness personnel. The inspector also independently screened drill and exercise opportunity evaluations, drill participation reports, and drill evaluations. Selected reported values were calculated to verify their accuracy. The inspectors compared graphical representations from the most recent PI report to the raw data to verify that the data was correctly reflected in the report. Reviewed documents are listed in the attachment.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems

.1 Review of Items Entered into the Corrective Action Program

a. Inspection Scope

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 CAP. 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.

b. Assessment and Observations

No findings of significance were identified.

.2 Semi-Annual Review to Identify Trends

a. Inspection Scope

The inspectors performed a review of the licensee's CAP and associated documents to identify trends that could indicate the existence of a more significant safety issue. The review was focused on repetitive equipment issues, but also considered trends in human performance errors, the results of daily inspector corrective action item screening discussed in Section 4OA2.1 above, licensee trending efforts, and licensee human performance results. The review nominally considered the six-month period of July 2009 through December 2009.

Documents reviewed included licensee monthly and quarterly corrective action trend reports, engineering system health reports, maintenance rule documents, department self-assessment activities, and quality assurance audit reports.

b. Assessment and Observations

No new adverse trends were identified this period that had not already been identified by the licensee.

.3 Annual Sample Reviews

1) Quarterly Sample Review

a. Inspection Scope

The inspectors reviewed the two issues listed below in detail to evaluate the effectiveness of the licensee's corrective actions for important safety issues.

- CR-09-03543, 'A' chiller breaker secondary contacts broken while being racked in
- CR-09-04237, Inadvertent transfers of water from SFP to refueling cavity

The inspectors assessed whether the issues were 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 procedure SAP-999, Revision 4C, "Corrective Action Program."

b. Findings and Observations

The inspectors identified several problems and areas for improvement with the licensee's documentation, investigations, and corrective actions associated with both of the CRs reviewed:

CR-09-03543:

- The inspectors identified one weakness with the licensee's causal evaluation for CR-09-03543. The condition evaluation reviewed internal operating experience with broken secondary disconnects. Three previous instances were revealed where mishandling of the breaker during maintenance or transport resulted in the disconnect phenolic material breaking off and inhibiting the ability to rack the breaker (CR-04-01483, CR-06-01203, and CR-07-01808). The corrective actions identified in CR-09-03543 add procedural guidance to existing electrical maintenance procedures (EMP's) to perform visual examinations of breaker secondary disconnects immediately prior to installation. The causal evaluation weakness involved was that the condition evaluation for CR-09-03543 did not evaluate the repetitive aspect of the three previously CR identified broken secondary disconnects and that no formal CR actions were identified in those same three CRs.

CR-09-04237:

- The licensee's root cause analysis (RCA) report, documented in RCA 09-04272, made the following statements regarding the status of the 'A' SFP cooling pump, which was running at the time of the loss of SFP inventory event: "there was no indication (i.e., fluctuation in pump current) that there was any air-binding. As a precautionary measure, the pump was vented prior to restarting." The inspectors determined that, while the pump was vented prior to restarting, this statement was generally inaccurate. Based on interviews with the operators immediately following the event, the inspectors had previously determined that the operators secured the 'A' SFP cooling pump due to control room flow meter indications of little or no SFP flow and reports from operators in the field that loud noises indicative of air binding could be heard in the SFP cooling piping. Therefore, contrary to the RCA statement, the operators had not secured the 'A' SFP cooling pump as a precautionary measure, but because of valid concerns that the pump might become damaged due to the air-binding. In addition, contrary to the above statement, the inspectors noted that neither control room nor local indications of pump motor current exist. To address the inspectors' comments, the licensee planned to revise the RCA to correct these inaccuracies.
- Neither CR-09-04237 nor RCA 09-04272 provided any assessment of the potential long-term impact of air-binding that was experienced by the running 'A' SFP pump. The inspectors noted that, while the pump was vented by operations prior to subsequent operation, there was no evidence that any pump performance data was evaluated to ensure pump performance had not been impacted. The inspectors determined that it was reasonable to have expected that an assessment be

conducted to ensure that there was no long term impact on pump operation due to the pump operating with air entrained in the suction piping. To address the inspectors' comment, the licensee planned to revise the CR to include actions to conduct the long term pump performance assessment.

2) Annual Operator Work Around Review

a. Inspection Scope

The inspectors reviewed the licensee's list of identified operator workarounds, burdens, and challenges associated with mitigating system equipment to determine whether any new items since the previous review conducted in 2008 would adversely affect any mitigating system function or affect the operator's ability to implement abnormal or emergency operating procedures. In addition, the inspectors performed an independent review of outstanding control board WOs and known problems with mitigating system equipment to identify any potential workarounds that had not been formally identified and evaluated by the licensee.

b. Findings and Observations

Failure to Follow Procedure and Correct Previously Identified Deficiencies with the Operator Workaround Program

Introduction: A Green NRC-identified finding was identified for the failure to adequately implement a procedure and correct previously identified deficiencies with the licensee's operator workaround program. This resulted in operator workarounds and challenges not fully or adequately being assessed, untimely resolution and status reporting of operator workarounds. The licensee initiated CR-1000079 to address this issue.

Description: In December 2008, the inspectors identified that aspects of the licensee's operator workaround program were not being implemented in accordance with OAP-113.1, Revision 2B, "Operator Workaround and Dark Board Program," to include status board and website updates. The licensee initiated CR-09-00143 on January 13, 2009, to address this deficiency, and the deficiency was also documented in Section 4OA2.3 of the NRC Integrated Inspection Report, 05000395/2008005. CR-09-00143 was closed on April 22, 2009, with no formal CR actions identified, but with an intention in the condition evaluation to update the existing status boards and ensure no untimely updates in the future.

On January 29, 2009, the licensee's quality assurance group initiated CR-09-00399 identifying unsatisfactory performance in the operator workaround program performance indicator. This CR specifically noted that the six existing operator workarounds in their review were from two to six years old, and resolution of operator workaround program concerns was not timely. As documented in the CR, quality assurance group discussions with the operations manager noted that "some of the issues had existed for too long" and "that allowing workarounds to exist for several years was likely not up to industry best practices." CR-09-00399 was closed on May 15, 2009, with no formal CR

actions identified, but with a short discussion in the condition evaluation on the scoring of issues slated for resolution by the Plant Health Committee (PHC).

On May 21, 2009, the licensee initiated CR-09-02052 identifying operator workarounds not being fully assessed, resolution of operator workarounds not being timely, and the aggregate impact of operator workarounds on operator response to operational transients not being considered. The licensee initiated an apparent cause evaluation (ACE) to evaluate the concerns. The organizational or human performance aspects evaluation noted the "lack of management attention to the importance of Workarounds," and that "this can be attributed to budget issues and unaware of industry trends." CR-09-02052 was closed on October 24, 2009, with no formal CR actions identified, but with a stated intention in the ACE for operations management to reinforce proper identification of operator workarounds or challenges per OAP-113.1.

During the current annual review of the licensee's operator workarounds program, the inspectors determined that deficiencies identified in the above CR's were not corrected, operations department personnel failed to follow OAP-113.1, with multiple instances, and the program had degraded further. Examples of the program's neglect include:

- Operator workarounds and challenges were not fully or adequately assessed. The risk evaluation for the Seal Injection Flow Control Valve (HCV-186) operator workarounds, with an Equipment Out of Service (EOOS) risk impact of Yellow, was not documented (CR-07-00730). The evaluations of four operator workarounds, as defined in OAP-113.1, with potential emergency/abnormal operating procedure (EOP/AOP) impact, were not documented with reasoning to lower and/or evaluate them as operator challenges (CR-05-03970, CR-03-02367, CR-05-01540, and CR-03-02762). An operator burden identified by a duty Shift Supervisor was not evaluated as a potential operator workarounds as required per OAP-113.1 (CR-09-03547).
- Untimely resolution and status reporting of operator workarounds. Many operator workarounds and challenge comments discussing operator workarounds resolution in the status spreadsheet were 2 years old or older despite more recent updates found during inspector CR review and/or all CR actions found to be complete years prior.
- The operator workarounds program was not maintained per other administrative requirements. An inventory review of the operator workarounds and challenge files revealed one listed operator challenge with no record. The operator workarounds status spreadsheet was not provided to the Plant Support Engineering Manager monthly as required per OAP-113.1 to facilitate system health reporting. The operator workarounds status boards were not updated or posted since the closure of CR-09-00143, and the posted status board did not exhibit multiple changes reflected in the digital version of the status spreadsheet.

The licensee initiated CR-10-00079 to address these issues.

Analysis: The licensee's workaround program as described in OAP-113.1 requires operations department personnel to identify, evaluate, determine shift operational impact, track, and correct deficiencies determined to be operator workarounds. The inspectors determined that the failure to follow OAP-113.1, with multiple instances, and correct previously identified discrepancies with the operator workaround program was a performance deficiency that was within the licensee's ability to foresee and correct and should have been prevented. This finding is more than minor because it was similar to examples 3.j. and 3.k. in Inspection Manual Chapter 0612, Appendix E, where significant programmatic deficiencies were identified that could lead to worse errors if left uncorrected and would have the potential to lead to a more significant safety concern in the management and correction of operator workarounds that can have an adverse effect on the functional capability of a mitigating system or that can impact human reliability in responding to initiating events. Using NRC Inspection Manual Chapter 0609, Attachment 4, "Phase 1 – Initial Screening and Characterization of Findings," this finding was determined to be of very low safety significance (Green) because the failure to follow procedure and correct the operator workaround program deficiencies, by themselves, did not result in an actual loss of operability or functionality, loss of system safety function, actual loss of safety function of a single train for greater than its TS allowed outage time, actual loss of safety function of one or more non-TS trains of equipment designated as risk-significant per 10CFR50.65 for greater than 24 hours, and was not potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding has a cross-cutting aspect in the area of problem identification and resolution associated with the corrective action program component because operations department personnel failed to take appropriate corrective actions to address previously identified deficiencies with following the operator workaround program procedure (P.1.d).

Enforcement: No violation of NRC regulatory requirements occurred. The inspectors determined that the finding did not represent a noncompliance because the performance deficiency involved a non-safety related procedure. Because this finding is of very low safety significance and has been entered into the licensee's corrective action program as CR-10-00079, it will be tracked as Finding (FIN) 05000395/2009005-02, Failure to Follow a Procedure and Correct Previously Identified Deficiencies with the Operator Workaround Program.

4OA3 Event Followup

.1 Automatic Reactor Trip Due to 'B' Main Generator Output Breaker Fault

a. Inspection Scope

The inspectors reviewed the October 2, 2009, automatic reactor trip due to a main generator stator ground that caused a turbine trip. The cause of the main generator stator ground was determined to be a failure in the 'B' main generator output breaker. The inspectors responded to the control room immediately following the trip and observed operator actions to stabilize the plant and observed aspects of the licensee post trip evaluation. The inspectors independently reviewed plant logs, plant computer data, and interviewed operations personnel to assess the circumstances related to the event, confirm plant equipment performed as required, and ensure that operator actions

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were appropriate and in accordance with required operating, alarm response, abnormal, and emergency procedures. In addition, the inspectors reviewed CR-09-03811 associated with the event to ensure that problems and areas for improvement were adequately addressed in the CAP.

b. Findings

No findings of significance were identified.

.2 (Closed) LER 05000395/2009002-00: Automatic Reactor Trip Due to Main Generator Output Breaker Fault

The inspectors reviewed the subject LER and applicable condition report (CR-09-03811) associated with the issue to verify the LER accuracy and appropriateness of the specified corrective actions. The cause of the 'B' main generator output breaker failure was still under investigation when the LER was submitted by the licensee. The licensee planned to supplement the LER when the root cause analysis of the failure was completed. No new findings of significance were identified. This LER is closed.

.3 Emergency Response to Fires in Turbine Building Electrical Switchgear Rooms

a. Inspection Scope

At approximately 3:42 p.m. on November 22, 2009, with the unit in Mode 5 (Cold Shutdown), the new main transformer was energized for testing following replacement during the refueling outage. The transformer circuit breaker immediately tripped and a loss of all station 7.2 kV balance of plant (BOP) power occurred due to a ground fault condition. Coincident with the BOP power loss, smoke alarms were received on the fire protection panel located in the control room. Shortly thereafter, heavy smoke was identified in both of the 7.2 kV BOP switchgear rooms located in the Turbine Building. The licensee dispatched the onsite fire brigade to the affected locations and contacted the offsite fire departments for support. At 4:00 p.m., the licensee declared a Notice of Unusual Event (NOUE) condition onsite per Emergency Action Level HU2.1, "Fire within the Protected Area not extinguished within 15 minutes of detection or explosion within the Protected Area." When the fire brigade responded, they found indications of fires in the 1A, 1B, and 1C 7.2 kV BOP normal incoming breaker cubicles located in the two BOP switchgear rooms. After the initial fires were extinguished, re-flash fires were observed and extinguished by the onsite fire brigade with support from the offsite fire departments. The licensee confirmed that the fire was extinguished at 4:40 p.m. and terminated the NOUE at 6:55 p.m.

At the time of the event, the inspectors were onsite and immediately responded to the control room to monitor licensee emergency actions, evaluate the actual/potential impact on safety-related equipment, and notified NRC regional and headquarters management of the event and the status of plant conditions and fire brigade response actions.

b. Findings

The inspectors verified that the licensee's response to the event was appropriate and consistent with emergency and fire response procedure requirements. The inspectors verified that the NRC reporting requirements for the event were properly implemented and that the licensee entered the issues related to the event into their CAP. The licensee determined that the cause of the fire was the failure to remove ground protection devices that were left in the 1A, 1B, and 1C 7.2 kV BOP normal incoming breaker cubicles earlier in the outage. With the ground devices still installed, a direct path to ground and significant arc flash occurred in each of the three 7.2 kV BOP incoming breaker cubicles when the main transformer was energized.

At the end of the inspection period, the inspectors were awaiting the completion of the licensee's Corrective Action Review Board review of the root cause evaluation results to understand the potential performance deficiencies. This issue is unresolved pending review of the licensee's final evaluation and corrective actions by the inspectors in order to characterize this issue. This unresolved item (URI) is identified as 05000395/2009005-03, Control of Electrical Grounding Devices Resulting in Fires in the Turbine Building Non-Safety-Related Switchgear.

.4 Manual Reactor Trip During Planned Downpower to Repair Turbine Control Valve #4

a. Inspection Scope

The inspectors reviewed the December 16, 2009, manual reactor trip that was inserted at 43 percent RTP due to a failure of the steam dump system to actuate following a planned manual trip of the turbine. The turbine was being taken off-line to allow repairs to a stuck open turbine control valve #4. The cause of the steam dump system malfunction was determined to be a failed 7300 process cabinet system circuitry card. The inspectors were present in the control room at the time of the reactor trip and observed operator actions to stabilize the plant using emergency and normal operating system procedures and observed aspects of the licensee post trip evaluation. The inspectors independently reviewed plant logs, plant computer data, and interviewed operations personnel to assess the circumstances related to the event, confirm plant equipment performed as required, and ensure that operator actions were appropriate and in accordance with required operating, alarm response, abnormal, and emergency procedures. In addition, the inspectors reviewed CR-09-05566 and CR-09-05567 associated with the event, to ensure that problems and areas for improvement were adequately addressed in the CAP.

b. Findings

No findings of significance were identified with the operators' response to the event.

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 Reactor Coolant System Dissimilar Metal Butt Welds (NRC Temporary Instruction (TI) 2515/172, Revision 1)

a. Inspection Scope

The inspectors conducted a review of the licensee's activities regarding licensee dissimilar metal butt weld (DMBW) mitigation and inspection implemented in accordance with the industry self-imposed mandatory requirements of Materials Reliability Program (MRP)-139, "Primary System Piping Butt Weld Inspection and Evaluation Guidelines." TI 2515/172, "Reactor Coolant System Dissimilar Metal Butt Welds," was issued February 21, 2008, to support the evaluation of the licensees' implementation of MRP-139.

The documents reviewed by the inspectors for this inspection are listed in the attachment to this report.

From October 26, 2009 through October 30, 2009, the inspectors performed a review in accordance with TI-172 as described in the Observation Section below:

b. Observations

Summary: Summer Unit 1 is a Westinghouse three loop designed plant. The licensee had identified a population of DMBWs susceptible to primary water stress corrosion cracking in accordance with MRP-139 guidelines. The licensee has completed pressurizer weld overlays to augment the margin to safety on these welds.

In accordance with requirements of TI 2515/172, Revision 0, the inspectors evaluated and answered the following questions:

(1) Implementation of the MRP-139 Baseline Inspections

1. a. Have the baseline inspections been performed or are they scheduled to be performed in accordance with MRP-139 guidance?

Yes, they were performed during a previous period.

- b. Were the baseline inspections of the pressurizer temperature DMBW's of the nine plants listed in 03.01.b completed?

Yes

2. Is the licensee planning to take any deviations from the MRP-139 baseline inspection requirements of MRP-139? If so, what deviations are planned, what is the general basis for the deviation, and was the NEI-03-08 process for filing a deviation followed?

No

(2) Volumetric Examinations

1. Were the examinations performed in accordance with the MRP-139, Section 5.1 guidelines and consistent with NRC staff relief request authorization for weld overlaid welds?

Yes

2. Were examinations performed by qualified personnel? (Briefly describe the personnel training/qualification process used by the licensee for this activity.)

Yes

3. Were examinations performed such that deficiencies were identified, dispositioned, and resolved?

Yes

(3) Weld Overlays

This portion of the TI was not inspected during the period of this report.

(4) Mechanical Stress Improvement

There were no stress improvement activities performed or planned by this licensee to comply with their MRP-139 commitments.

(5) Application of Weld Cladding and Inlays

This portion of the TI was not inspected during the period of this report.

(6) Inservice Inspection Program

This portion of the TI was not inspected during the period of this report.

c. Findings

No findings of significance were identified.

.3 (Closed) NRC TI 2515/175, Emergency Response Organization, Drill/Exercise Performance Indicator, Program Reviewa. Inspection Scope

The inspectors completed Temporary Instruction TI 2515/175, Emergency Response Organization, Drill/Exercise Performance Indicator, Program Review.

b. Findings and Observations

No findings of significance were identified. Appropriate documentation of the results was provided to NRC Headquarters staff, as required by the TI. This completes the Region II inspection requirements for this TI for Virgil C. Summer Nuclear Station.

.4 (Closed) NRC TI 2515/180, Inspection of Procedures and Processes for Managing Fatiguea. Inspection Scope

The objective of this TI was to determine if licensees' implementation procedures and processes required by 10 CFR 26, Subpart I, "Managing Fatigue" are in place to reasonably ensure the requirements specified in Subpart I are being addressed. The TI applies to all operating nuclear power reactor licensees but is intended to be performed for one site per utility. The inspectors interfaced with the appropriate station staff to obtain and review station policies, procedures, and processes necessary to complete all portions of this TI.

b. Findings and Observations

No findings of significance were identified.

.5 (Closed) URI 05000395/2009003-01, Review Licensee Re-Evaluation of Degraded Spent Fuel Pool Area Radiation Monitor RM-G8.

a. Inspection Scope

URI 05000395/2009003-01 was opened in NRC Inspection Report 05000395/2009003 pending NRC review as to whether a performance deficiency and/or violation existed for the inspector's identification on January 21, 2009, that electrical power was lost to the alarm circuitry of the SFP area local radiation monitor (RM-G8). The loss of power rendered the RM-G8 local audible and warning light alarms non-functional while spent fuel reconstitution activities were ongoing. To address corrective action weaknesses identified by the inspectors during the original review of the CR which documented this issue (CR-09-00279), the licensee reopened the subject CR to address aspects that were necessary for the inspectors to complete the issue characterization review. The inspectors reviewed the updated information provided by the licensee in CR-09-00279, discussed the details with licensee personnel, and discussed TS 3.3.3.1, "Radiation Monitoring Instrumentation," with the NRC staff in the Nuclear Reactor Regulation Division of Inspection and Regional Support TS Branch (ITSB) as it relates to the requirements for the local audible and visual alarm functions.

b. Findings

Review of Potential Performance Deficiency: Previously, the licensee determined the cause of the loss of power to the RM-G8 local audible/visual alarms was a blown fuse in the alarm power circuit. However, the licensee was unable to identify how and when the fuse was blown. The only possible cause considered, was when an operator replaced a power availability light bulb in another local area radiation monitor (RM-G12) two days prior to when the inspectors identified the issue with RM-G8. A work order was initiated at the time to investigate why the new bulb replaced in RM-G12 would not illuminate. The work order stated that a problem with the RM-G12 bulb socket was suspected. Although not recognized at the time, RM-G12 shares a common alarm power circuitry with RM-G8. The licensee theorized that during this bulb replacement activity, an inadvertent short could have occurred.

The licensee's re-evaluation of the issue did not identify any new details into the possible circumstances of the blown fuse. Therefore, assuming the fuse was blown when the licensee suspected, i.e., during replacement of the RM-G12 bulb, the inspectors determined that it was not reasonable at that time for the licensee to have known that RM-8 could have been impacted. Since a work order was initiated to investigate the RM-G12 monitor socket issue, reasonable actions were taken upon identification of the problem at the time.

To address future situations where an alarm power circuitry fuse could fail and go unnoticed for an extended period, the licensee's re-evaluation created an action to add to the operator daily rounds sheets, visual verification that the power availability light was illuminated on RM-G8 and other TS related area radiation monitors. The inspectors determined that while these additional checks were considered prudent since circuitry fuse failures are not alarmed conditions, the lack thereof prior to the incident, was not a

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violation of any regulatory requirement. The inspectors confirmed that the TS surveillances requirements for RM-G8, including analog channel operational tests, channel calibrations, and channel checks, were being conducted, which provide the minimum regulatory requirements for verifying the proper operation of the monitor.

Review Impact of Degradation on Technical Specifications: TS 3.3.3.1, "Radiation Monitoring Instrumentation," requires RM-G8 to be operable with its alarm/trip setpoint within the specified limits whenever fuel is in the storage pool or fuel handling building. The TS Bases states that the operability of the radiation monitors ensures that 1) radiation levels are continuously measured in the areas, and 2) the alarm or automatic action is initiated when the radiation level trip setpoint is exceeded. The licensee concluded that RM-G8 was "degraded, but TS operable" with the local alarm horn and red warning light in the spent fuel pool area non-functional due to the blown fuse. The basis for this conclusion was that the control room alarm for RM-G8 remained functional, which would allow the control room to direct the evacuation of personnel in the spent fuel pool area if the alarm setpoint was reached during a fuel handling accident. The inspectors disagreed with the licensee's position, in that, the control room alarm does not provide the equivalent radiological protection function as the local area alarms. Plant personnel are trained to respond to local area radiation audible and visual alarms by immediately evacuating the areas affected. Without the function of the local alarm feature during a radiological incident in the SFP area, personnel in the area would not be immediately aware of the adverse conditions and relying on the control room to direct evacuation of the area would incur inherent delays in personnel evacuation. This determination was based, in part, on the inspectors' review of the control room alarm response procedures and interviews with control room supervisors regarding their implementation of these procedures. Since the procedures directed actions for the operators to verify the (high setpoint) alarm was valid prior to taking actions to evacuate the SFP area, the control room supervisors interviewed by the inspectors stated that as part of this verification process, they would send a building operator or direct a health physics technician to the area to validate the alarm prior to implementing actions to evacuate the area.

Upon consultation with the NRC staff in the ITSB, the staff agreed with the inspectors' conclusion that the local audible/visual alarm capability of RM-G8 is required to be functional in order to meet the operability requirements of TS 3.3.3.1. The licensing basis for the alarm functions is discussed in FSAR Section 12.1.4. The FSAR design basis states that "the area radiation monitors are designed to detect, indicate, annunciate, and record the radiation levels monitored at selected locations inside the plant." The FSAR expands upon this concept of "annunciating, at selected locations inside the plant," in the system description which states that "each area radiation monitor..., is provided with a local audible and visual alarm located near the detector..." Further, the equipment attributes that are required for maintaining TS operability is determined by the existing TS Surveillance Requirement (SR 4.3.3.1), which includes the requirement that the radiation monitoring instrumentation be demonstrated operable by the performance of periodic analog channel operational tests. The TS definition of an analog channel operational test is the injection of a simulated signal into the channel to verify operability of alarm, interlock and/or trip function. This definition clearly covers the alarm functions as described in the FSAR.

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In the licensee's re-evaluation of CR-09-00279, documented evidence was provided that during the two days that the local alarm feature of RM-G8 was believed to be non-functional, i.e., from January 19, 2009 thru January 21, 2009, health physics personnel were taking local area radiological surveys of the SFP area as part of their monitoring of fuel reconstitution activities. The inspectors determined that the conduct of these surveys met the TS action requirements had the licensee known that RM-G8 was inoperable during the stated period, therefore, no violation of the TS 3.3.3.1 actually occurred.

Conclusions: Based on subsequent reviews of the circumstances associated with this issue, the inspectors determined that a performance deficiency and/or violation of TS did not occur. This URI is closed.

4OA6 Meetings, Including Exit

Exit Meeting Summary

The results of the emergency preparedness inspection were presented to Mr. Jeffrey Archie and other members of the licensee staff on October 8, 2009.

The results of the radiation protection inspection were presented to Mr. Dan Gatlin, General Manager, Nuclear Plant Operations, and other members of the licensee staff on October 30, 2009.

The results of the inservice inspection were presented to Mr. Dan Gatlin and other members of the licensee staff on October 30, 2009.

The inspectors presented the integrated inspection results to Mr. Dan Gatlin and other members of the licensee staff on January 14 and January 20, 2010.

The licensee acknowledged the results of these inspections. The inspectors confirmed that inspection activities discussed in this report did not contain proprietary material.

ATTACHMENT: SUPPLEMENTAL INFORMATION

Enclosure

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

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 Operations
R. Justice, Manager, Maintenance Services
D. Lavigne, General Manager, Organizational / Development Effectiveness
G. Lippard, Manager, Operations
M. Mosley, Manager, Chemistry
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
R. Williamson, Manager, Emergency Planning
S. Zarandi, General Manager, Nuclear Support Services

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000395/2009005-01	NCV	Failure to Follow Procedure Results in Inadvertent Loss of Spent Fuel Pool Inventory. (Section 1R20)
05000395/2009005-02	FIN	Failure to Follow a Procedure and Correct Previously Identified Deficiencies with the Operator Workaround Program (Section 4OA2.3)

Opened

05000395/2009005-03	URI	Control of Electrical Grounding Devices Resulting in Fires in the Turbine Building Non-Safety-Related Switchgear (Section 4OA3.3)
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Closed

05000395/2009002-00	LER	Automatic Reactor Trip Due to a Main Generator Output Breaker Fault (Section 4OA3.2)
05000395/2525/175	TI	Emergency Response Organization, Drill/Exercise Performance Indicator, Program Review (Section 4OA5.3)
05000395/2515/180	TI	Inspection of Procedures and Processes for Managing Fatigue (Section 4OA5.4)
05000395/2009003-01	URI	Review Licensee Re-Evaluation of Degraded Spent Fuel Pool Area Radiation Monitor RM-G8 (Section 4OA5.5)

Discussed

05000395/2515/172	TI	Reactor Coolant System Dissimilar Metal Butt Welds (DMBW) (Section 4OA5.2)
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LIST OF DOCUMENTS REVIEWED

Section 1R04: Equipment Alignment

Procedures and Drawings

SOP-306, Emergency Diesel Generator, Rev. 17G
SOP-123, Spent Fuel Pool Cooling, Rev. 15
SOP-115, Residual Heat Removal, Rev. 20G
FSAR, Chapter 6.3, Emergency Core Cooling System, Amendment 00-01
FSAR, Chapter 9.3.4, Chemical and Volume Control System, Amendment 00-01
SOP-102, Chemical and Volume Control System, Revision 22I
SOP-112, Safety Injection System, Rev. 17F
STP-105.003, Safety Injection Valve Operability Test, Rev. 15B
STP-105.006, Safety Injection/Residual Heat Removal Monthly Flowpath Verification Test, Rev. 11D
STP-105.007, Accumulator Isolation Valve Verification Test, Rev. 5
STP-105.008, Charging Pump Breaker Position Verification, Rev. 5A
STP-205.003, Charging/Safety Injection Pump and Valve Test, Rev. 7
STP-205.005, Chemical and Volume Control System Valve Operability Test, Rev. 5C
Drawing, E-302.691, Safety Injection, Rev. 13
Drawing, E-302.692, Safety Injection, Rev. 13
Drawing, E-302-693, Safety Injection, Rev. 22
Drawing, E-302-671, Chemical and Volume Control, Rev. 9
Drawing, E-302.672, Chemical and Volume Control, Rev. 11
Drawing, E-302-673, Chemical and Volume Control, Rev. 16
Drawing, E-302-674, Chemical and Volume Control, Rev. 13
Drawing, E-302-675, Chemical and Volume Control, Rev. 27
Drawing, E-302-676, Chemical and Volume Control, Rev. 14
Drawing, E-302-677, Chemical and Volume Control, Rev. 11

1R08: Inservice Inspection Activities

Procedures

PSEG-19, Boric Acid Corrosion Evaluation, Rev. 0
SAP-1100, Boric Acid Corrosion Control Program, Rev. 1
SGMP-100.006, Steam Generator Tube Inspection Eddy Current Data Analyst Guidelines, Rev. 1
AREVA 03-9115236, Secondary Side Visual Inspection Plan and Procedure for VC Summer RFO-18
SAP-0363, Foreign Material and Debris Control, Rev. 7

CAP Documents

CR-08-02906, Non-minor boron residue from setscrew of XVR08864A-SI
CR-08-02652, NRC identified wet boron residue on XVT08363B-CS
CR-09-03441, Boric acid noted on valve XVT06658-SF
CR-09-02242, Boron discovered during SF/SP/RW walkdown
CR-09-04275, Steam drum upper access hatch sheared nut
CR-05-01731, Debris found in "B" Steam Generator (XSG0002B) feed ring
CR-05-01775, Debris found in SG B requires evaluation
CR-05-01776, Debris found in SG C requires evaluation
CR-09-04288, Alpha SG foreign material in the feed ring spray nozzles

CR-09-04364, B SG foreign material in the feed ring spray nozzles
 CR-09-04436, Charlie SG foreign material in the feed ring spray nozzles
 CR-09-04644, Stream Drum upper internals not inspected
 *CR-09-04645, Eddy current calibration standard quality assurance records
 *CR-09-04646, Stress relief heat treatment of eddy current calibration standards
 *CR-09-04647, Appendix H does not address swept peak frequency

*Created as a result of this inspection

Other

ASME Section XI VT-3 supports for Pump Support at 1B-412-0 XPP0048C
 ASME Section XI VT-3 supports MK-SWH-0245
 ASME Section XI VT-3 supports MK-VUH-1476
 ASME Section XI VT-3 supports MK-VUH-009
 ASME Section XI VT-3 supports MK-SWH-0009
 Eye Examination Record for Shealy, Michael
 Certification Record for Shealy, Michael
 Certificate of Qualification for A. Roy Caban
 W/O 0816583-001 for DIESEL GEN CLR A SW RET HDR RELIEF VLV
 W/O 0806644-001 for BORIC ACID BLENDER INLET HDR CHK VALVE
 Examination Record for Reactor Vessel Inlet Nozzle 'C'
 Westinghouse Specification B163C12, "Thermally Treated Alloy 690 Tubing for Virgil Summer Unit No.1 Replacement Steam Generators (Section III-NB, SB-173, Code Case N20), Rev E
 AREVA Engineering Information Record 51-9118215-001, "Material Dedication for VC Summer SG Tubing for ECT Cal Standards"
 AREVA Drawing 9119295B, "VC Summer ASME-EDM Cal Std as Built," Rev. 001
 Sandvik Steel, Control Procedure CP 940, Archive Samples, Rev. 0
 AREVA NP, Inc., Engineering Information Record 51-5007713-005, "VC Summer EOC18 Steam Generator Degradation Assessment," 9/21/2009
 AREVA Document 03-1275114, "Eddy Current Data Management Guidelines," Rev. 14
 AREVA Engineering Information Record 51-9120499-000, "VC Summer RFO18 Inspection Plan"
 AREVA Engineering Information Record 51-5066244-00, "A CMOA Evaluation of Steam Generator Tubing at VC Summer, RFO15"
 ZETEC Certificate of Conformance, Delivery: 3040, Purchase Order 1008036831, Version 2
 AREVA Engineering Information Record 51-9114307-000, "Qualified Appendix H Eddy Current Techniques for VC Summer Unit 1," Rev. 0
 AREVA Examination Technique Specification Sheet, ETSS_BOB001_MIZ80_R0
 AREVA Examination Technique Specification Sheet, ETSS_RPC001_MIZ80_R0
 Email from David Popovich (Westinghouse) to Margaret Fanguy (VC Summer), RE: Upper Internals Inspection, 11/5/2009
 LTR-SGDA-05-79, Completed upper internals inspection from RFO-15, 4/14/2005
 SCE&G Letter RC-98-0051, Response to Generic Letter 97-06, 3/19/1998
 SCE&G Letter RC-99-0023, Supplemental Response to Generic Letter 97-06, 2/1/1999
 SCE&G Letter RC-00-0247, Supplemental Response to Generic Letter 97-06, 5/31/2000
 AREVA Document 03-9114614, "Site Requirements for Secondary Side Inspections & FOSAR," Rev. 000

AREVA Document 03-9115236, "Secondary Side Visual Inspection Plan and Procedure for VS Summer RFO18," Rev. 000

AREVA 32-5007809-01, "VC Summer Flawed SG Tube Structural Limits"

Section 1EP4: Emergency Action Level and Emergency Plan Changes

Plans and Changes packages

EP-100, Radiation Emergency Plan, Rev. 57 and 58

EPP-001, Activation and Implementation of Emergency Plan, Rev. 29A, 29B, and 30

EPP-001.2, Alert, Rev. 7B

EPP-001.4, General Emergency, Rev. 8

EPP-002, Communication and Notification, Rev. 34

EPP-005, Offsite Dose Calculation, Rev. 20

EPP-012, Onsite Personnel Accountability and Evacuation, Rev. 12B and 12C

EPP-051, Emergency Operations Facility, Rev. 7B

EPP-102, Emergency Plan Training, Rev. 5

EPP-110, Emergency Action Level Reference Manual, Rev. 0

2OS1: Access Control to Radiologically Significant Areas

Procedures, Guidance Documents, and Manuals

HPP-152, Radiation Control Area Access Control, Rev. 10

HPP-160, Control and Posting of Radiation Control Zones, Rev. 11

HPP-245, Radiological Controls for Failed Fuel, Rev. 0

HPP-403, Radiological Controls for Nuclear Work Activities, Rev. 10

HPP-413, Diving Operations, Rev. 2

HPP-517, Multiple Whole Body and Extremity Badging Exposure Calculations, Rev. 8

SAP-999, Corrective Action Program, Rev. 4

Records and Data

QA Audit: QA-AUD-200901-0, Station Radiation Control and Radioactive Waste, Dated 3/19/2009

RWP #09-4200 All refueling activities outside the reactor cavity (with 12 major subtasks)

RWP # 09-4201 High risk refueling activities (with 8 major subtasks)

CAP Documents

CR-08-04143, The Health Physics CR Review Team has identified the need to perform an analysis review of a negative trend with control of tools and equipment designated for RCA use only

CR-08-05198, CR generated to document Snapshot Self-Assessment SA 08-HP-04S performed by Health Physics to determine if V.C Summer's key controls are in compliance with regulatory and industry standards

CR-09-00544, while performing a routine survey in the west penetration room, the HP received a dose rate alarm. The HP immediately left the area and exited the RCA (50.8 mrem/hr with an alarm point of 50 mrem/hr)

CR-09-02307, ED malfunctioned while logging into the RCA. While logging in worker received both a dose and dose rate alarm that was determined to be an instrument malfunction

CR-09-02096, On Thursday May 21, 2009 an Airborne Radiation Area was created while performing decon activities in the Decon Tent. The decontamination of tools and equipment resulted in an air sample >0.25 DAC

Section 40A1: Performance Indicator Verification**Procedures**

EPP-106, Emergency Preparedness Performance Indicator Procedure, Rev. 1A
 SAP-0127, Initial Training for Emergency Services Personnel, Rev. 1B

Records and Data

ANS data from 3rd Qtr 2008 to 2nd Qtr 2009
 DEP data from 3rd Qtr 2008 to 2nd Qtr 2009
 ERO data from 3rd Qtr 2008 to 2nd Qtr 2009

Condition Reports Initiated for NRC Identified Issues

CR-09-03790, MSIV hot adjustment made without retest with surveillance procedure STP-130.004D
 CR-09-03805, Valve Packing Manuel was inaccurate for MSIV packing torque setpoint
 CR-09-03806, Inaccurate Licensing Basis Document was found still active and in the control room and design engineering areas for use when should have been removed from circulation
 CR-09-03817, Fire protection sprinkler hanger found unattached from turbine building fire zone above three main generator output breakers
 CR-09-03901, Inaccurate information in TS cross reference database for TS 3.7.6 associated with the control room ventilation system
 CR-09-03919, Failure to follow surveillance test procedure STP-395.004 precaution step
 CR-09-03934, Error in performance of shutdown margin calculation
 CR-09-04334, Reactor building cavity foreign material exclusion concerns
 CR-09-04356, Safety function bar chart error for spent fuel pool power restoration due to schedule change without contacting risk reviewer
 CR-09-04478, Normal feed ground wire on temporary power to SFP 'A' was removed which was not in accordance with EMP-100.004
 CR-09-04953, Inadequate foreign material exclusion controls for work near reactor building sump
 CR-09-05018, TDEFW entry door failure to open due to handle degradation
 CR-09-05039, Additional functional testing requirement detail needed in the "B" EDG 2301A governor modification (ECR 50466) to aid in the post-installation test strategy
 CR-09-05133, Door DRIB/119 found open (fire door) will not close due to high differential pressure
 CR-09-05361, Boron leakage found downstream of valve XVM18705-RH during containment walkdown
 CR-09-05410, Reactor building walkdown identified reactor vessel packing material left following containment closeout inspection
 CR-09-05412, Incore seal table leakage identified on penetrations E5 and B7
 CR-09-05430, Security controllers were separated from their Security drill players during force-on-force exercise training
 CR-09-05579, Post reactor trip evaluation failed to review complete sequence of events
 CR-10-00079, Operator workaround program not being update as required by OAP-113.1

LIST OF ACRONYMS

AB	Auxiliary Building
ACE	Apparent Cause Evaluation
ADAMS	Agency Document Access and Management System
ALARA	As Low As Reasonably Achievable
ANS	Alert and Notification System (ANS) Testing
AOP	Abnormal Operating Procedure
ASME	American Society of Mechanical Engineers
BACC	Boric Acid Corrosion Control
BOP	Balance of Plant
BPVC	Boiler and Pressure Vessel Code
CAP	Corrective Action Program
CCW	Component Cooling Water
CFR	Code of Federal Regulations
CIV	Containment Isolation Valve
CR	Condition Report
DEP	Emergency Response Organization Drill/Exercise Performance
DG	Diesel Generator
DMBW	Dissimilar Metal Butt Weld
ECR	Engineering Change Request
ED	Electronic Dosimeter
EDG	Emergency Diesel Generator
EMP	Electrical Maintenance Procedure
EOP	Emergency Operating Procedure
EOOS	Equipment Out of Service
EPA	US Environmental Protection Agency
EPP	Emergency Planning Procedure
EPRI	Electric Power Research Institute
ERO	Emergency Response Organization
ES	Engineering Services Procedure
ET	Eddy Current Testing
FIN	Finding
FOSAR	Foreign Object Search and Removal
FSAR	Final Safety Analysis Report
GTP	General Test Procedure
HP	Health Physics
HPT	Health Physics Technician
HRA	High Radiation Area
IB	Intermediate Building
INPO	Institute of Nuclear Power Operations
IP	Inspection Procedure
IR	Inspection Report
ISI	Inservice Inspection
ITSB	Division of Inspection and Regional Support TS Branch
LER	Licensee Event Report
LHRA	Locked High Radiation Area
MPFF	Maintenance Preventable Functional Failure

MR	Maintenance Rule
MRP	Materials Reliability Program
MSPI	Mitigating Systems Performance Index
MSIV	Main Steam Isolation Valve
NCV	Non-Cited Violation
NDE	Non-Destructive Examination
NEI	Nuclear Energy Institute
NOUE	Notification of Unusual Event
NRC	Nuclear Regulatory Commission
NUREG	NRC Technical Report Designation
OAP	Operations Administrative Procedure
OOS	Out of Service
PARS	Publicly Available Records
PHC	Plant Health Committee
PI	Performance Indicator
PMT	Post-Maintenance Testing
PS	Planning Standard
PWR	Pressurized Water Reactor
RCA	Root Cause Analysis
RCA	Radiologically Controlled Area
RCS	Reactor Coolant System
Rev.	Revision
RF-18	Eighteenth Refueling Outage
RFO	Refueling Outage
RHR	Residual Heat Removal
RM	Radiation Monitor
RP	Radiation Protection
RTP	Rated Thermal Power
RWP	Radiation Work Permit
RWST	Refueling Water Storage Tank
SAP	Station Administrative Procedure
SCE&G	South Carolina Electric and Gas
SDP	Significance Determination Process
SFP	Spent Fuel Pool
SG	Steam Generator
SI	Safety Injection
SOP	System Operating Procedure
SSC	Structures, Systems, and Components
STP	Surveillance Test Procedure
TDEFWP	Turbine Driven Emergency Feedwater Pump
TI	Temporary Instruction
TS	Technical Specification
URI	Unresolved Item
VHRA	Very High Radiation Area
VUHP	Vessel Upper Head Penetration
WANO	World Association of Nuclear Operators
WO	Work Order