



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
REGION II  
245 PEACHTREE CENTER AVENUE NE, SUITE 1200  
ATLANTA, GEORGIA 30303-1257

May 7, 2015

Mr. Thomas D. Gatlin  
Vice President - Nuclear Operations  
South Carolina Electric & Gas Company  
Virgil C. Summer Nuclear Station  
P.O. Box 88  
Jenkinsville, SC 29065

SUBJECT: VIRGIL C. SUMMER NUCLEAR STATION, UNIT 1 – NRC INTEGRATED  
INSPECTION REPORT 05000395/2015001

Dear Mr. Gatlin:

On March 31, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Virgil C. Summer Nuclear Station, Unit 1. On April 14, 2015, the NRC inspectors discussed the results of this inspection with you and members of your staff. Inspectors documented the results of this inspection in the enclosed inspection report.

No NRC-identified or self-revealing findings were identified during the inspection period.

In accordance with 10 CFR 2.390 of the NRC's "Agency Rules of Practice and Procedure," 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 Agencywide Document Access and management System (ADAMS). ADAMS is accessible from the NRC Website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

**/RA/**

Steven D. Rose, Chief  
Reactor Projects Branch 5  
Division of Reactor Projects

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

Enclosure:  
IR 05000395/2015001  
w/Attachment: Supplementary Information

cc Distribution via ListServ

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T. Gatlin

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Letter to Thomas D. Gatlin from Steven D. Rose dated May 7, 2015.

SUBJECT: VIRGIL C. SUMMER NUCLEAR STATION, UNIT 1 - NRC INTEGRATED  
INSPECTION REPORT 05000395/2015001

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**U. S. NUCLEAR REGULATORY COMMISSION**

**REGION II**

Docket No. 50-395

License No. NPF-12

Report Nos. 05000395/2015001

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

Facility: Virgil C. Summer Nuclear Station, Unit 1

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

Dates: January 1, 2015, through March 31, 2015

Inspectors: J. Reece, Senior Resident Inspector  
E. Coffman, Resident Inspector  
N. Peterka, Acting Resident Inspector

Approved by: Steven D. Rose, Chief  
Reactor Projects Branch 5  
Division of Reactor Projects

Enclosure

## **SUMMARY**

IR 05000395/2015001; 01/01/2015 - 03/31/2015: Virgil C. Summer Nuclear Station, Unit 1; Integrated Inspection Report.

The report covered a three-month period of inspection by resident inspectors. No NRC-identified or self-revealing findings were identified. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision (Rev.) 5.

## REPORT DETAILS

### Summary of Plant Status

Unit 1 began the inspection period at full Rated Thermal Power (RTP). On January 3, 2015, the unit reduced load to approximately 86 percent to isolate a feedwater (FW) heater train 'B' due to a pipe leak. The leak was repaired and the unit returned to full RTP on January 8, 2015. The unit operated at or near full RTP for the remainder of the period.

#### 1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

#### 1R04 Equipment Alignment

##### Partial System Walkdowns

##### a. Inspection Scope

The inspectors conducted four partial equipment alignment walkdowns which are listed below, 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 (SOP), and technical specifications (TS). The inspections included review of outstanding maintenance work orders (WOs) and related condition reports (CRs) within the licensee's corrective action program (CAP) to verify that the licensee had properly identified and resolved equipment alignment problems that could lead to the initiation of an event, impact mitigating system availability or adversely affect barrier integrity.

- Partial walkdown of 'A' residual heat removal (RHR) during planned work on the 'B' RHR pump and support components
- Partial walkdown of 'B' reactor building (RB) spray pump during emergent inoperability of 'A' RB spray due to failure of XVG03005A to stroke fully open
- Partial walkdown of 'B' service water (SW) booster pump (SWBP) during emergent work on 'A' SWBP discharge check valve
- Partial walkdown of 'B' emergency diesel generator (EDG) during major maintenance on the 'A' EDG

##### b. Findings

No findings were identified.

## 1R05 Fire Protection

### .1 Quarterly Fire Protection Walkdowns

#### 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. Documents reviewed are listed in the Attachment. The inspectors conducted routine inspections of the following seven areas (respective fire zones also noted):

- Auxiliary building switchgear room 412 elevation (fire zone AB-1.10)
- Auxiliary building switchgear room 463 elevation (fire zone AB-1.29)
- Service water pumphouse (fire zones SWPH-1, 3, 4, 5.1 and 5.2)
- Diesel generator rooms 'A' and 'B' (fire zones DG-1.1, 1.2, 2.1, and 2.2)
- Intermediate building 412 elevation general area (fire zones IB-25.1.1, 1.2, 1.3, 1.5)
- Turbine driven emergency feedwater (EFW) pump room (fire zone IB-25.2)
- Charging pump rooms 'A', 'B', and 'C' (fire zones AB-1.5, AB-1.6 and AB-1.7)

#### b. Findings

No findings were identified.

### .2 Annual Fire Brigade Drill Observation

#### a. Inspection Scope

The inspectors observed the performance of an unannounced fire brigade drill on January 14, 2015. Aspects of the drill are documented in CR-15-01438. The inspectors evaluated the readiness of licensee personnel to respond and fight fires including the following aspects:

- Observe whether turnout clothing and self-contained breathing apparatus equipment were properly worn
- Determine whether fire hose lines were properly laid out and nozzle pattern simulated being tested prior to entering the fire area of concern
- Verify that the fire area was entered in a controlled manner
- Review if sufficient firefighting equipment was brought to the scene by the fire brigade to properly perform their firefighting duties
- Verify that the fire brigade leader's firefighting directions were thorough, clear and effective, and that, if necessary, offsite fire team assistance was requested
- Verify that radio communications with plant operators and between fire brigade members were efficient and effective

- Confirm that fire brigade members checked for fire victims and fire propagation into applicable plant areas
- Observe if effective smoke removal operations were simulated
- Verify that the firefighting pre-plans were properly utilized and were effective
- Verify that the licensee pre-planned drill scenario was followed, drill objectives met the acceptance criteria, and deficiencies were captured in post drill critiques

b. Findings

No findings were identified.

1R06 Flood Protection Measures

Internal Flooding

a. Inspection Scope

The inspectors reviewed and walked down portions of the intermediate building regarding internal flood protection features and equipment to determine consistency with design requirements, Updated Final Safety Analysis Report (UFSAR), and flood analysis documents. Risk significant structures, systems, and components (SSCs) in these areas included the 'A', 'B', and 'C' component cooling water (CCW) pumps, 'A' and 'B' motor driven emergency feedwater (MDEFW) pumps, turbine driven emergency feedwater (TDEFW) pump, safety-related batteries and chargers, service water booster pumps, and safety-related chillers. The inspectors reviewed the licensee's CAP database to verify that internal flood protection problems were being identified at the appropriate level, entered into the CAP, and appropriately resolved. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R07 Heat Sink Performance

Annual Review

a. Inspection Scope

The inspectors conducted one heat sink performance sample. The inspectors reviewed a visual inspection report for the 'A' EDG lube oil, jacket water, and intercooler heat exchangers. The inspectors reviewed the applicable health reports, and verified that the heat exchanger performance issues were entered into the licensee's CAP.



b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program

.1 Licensed Operator Regualification

a. Inspection Scope

The inspectors observed an operator regualification exam scenario occurring on January 27, 2015, and involving multiple failures leading to entry into abnormal operating procedures followed by emergency operating procedures in order to combat the problems. The inspectors observed crew performance in terms of communications; ability to prioritize failures in order to take timely and proper actions; prioritizing, interpreting, and verifying alarms; correct use and implementation of procedures, including the alarm response procedures; timely control board operation and manipulation, including high-risk operator actions; and oversight and direction provided by the shift supervisor, including the ability to identify and implement appropriate TS actions and emergency action levels. The inspectors reviewed the licensee's critique comments to verify that performance deficiencies were captured for appropriate corrective action.

b. Findings

No findings were identified.

.2 Resident Quarterly Observation of Control Room Operations

a. Inspection Scope

During the inspection period, the inspectors conducted observations of licensed reactor operator activities to ensure consistency with licensee procedures and regulatory requirements. For the four listed activities, the inspectors observed the following elements of operator performance: 1) operator compliance with and use of plant procedures including TS; 2) control board component manipulations; 3) use and interpretation of plant instrumentation and alarms; 4) documentation of activities; 5) management and supervision of activities; and 6) control room communications.

- 'B' train solid state protection system (SSPS) testing
- Restoration of a FW heater drain line
- 'A' EDG monthly surveillance test and safety injection slave relay testing
- 'A' SSPS testing including the respective pre-job brief

b. Findings

No findings were identified.

## 1R12 Maintenance Effectiveness

### a. Inspection Scope

The inspectors evaluated one equipment issue described in the CR listed below to verify the licensee's effectiveness with the corresponding preventive or corrective maintenance associated with structure, system, 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 or other MR findings existed that the licensee had not identified. The inspectors reviewed the licensee's controlling procedures consisting of engineering services procedure, ES-514, Rev. 6, "Maintenance Rule Program Implementation," and station administrative procedure, SAP-0157, Rev. 1, "Maintenance Rule Program," to verify consistency with the MR program requirements.

- CR-14-03979, reactor head vent valve leakage due to crack in valve cage

### b. Findings

No findings were identified.

## 1R13 Maintenance Risk Assessment and Emergent Work Control

### a. Inspection Scope

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

- Work week 02, yellow risk condition for scheduled work associated with the 'C' service water pump; planned major maintenance on motor and pump; will be out of service for two weeks
- Work week 04, yellow risk condition for scheduled work associated with the 'B' RHR pump and support components

- Work week 08, yellow risk condition for scheduled work associated with chemical treatment modification on 'B' train service water
- Work week 10, fire emergency procedure red risk condition for scheduled work associated with major maintenance on the 'A' EDG

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments

.1 Operability/Functionality Evaluations

a. Inspection Scope

The inspectors reviewed six operability evaluations listed below, 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. The inspectors also verified that the operability evaluations were performed in accordance with SAP-209, Rev. 1, "Operability Determination Process," and SAP-999, Rev. 12A, "Corrective Action Program."

- CR-14-06191, Resident inspector found snubber, MK-SWH-0031, with a rotated pipe clamp greater than allowable
- CR-14-06363, Request an ES-120 to disposition the charging pump minimum flow acceptance criteria
- CR-14-06361, 'A' MDEFW pump outboard bearing oil sample has other than normal color and wear particles
- CR-15-00259, 'C' SW pump vacuum breaker pipe support Hilti-Bolt installation accept-as-is
- CR-14-06276, Determine conditions which ensure 'A' chiller can perform its design functions
- CR-15-00636, SW pump motor bearing oil cooler low flow (operator work around sample; reference section 1R15.2 below)

b. Findings

No findings were identified.

## .2 Annual Operator Work Around Review

### a. Inspection Scope

The inspectors reviewed the licensee's list of identified operator workarounds associated with mitigating system equipment to determine whether any new items, since the previous review conducted in 2014, would adversely affect any mitigating system function or affect the operators' 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

No findings 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, "Post Maintenance Testing Guideline," Rev. 5, Change C.

- WO-1210795 and 1213356, 'C' SW motor 10 year inspections
- WO-1415296, 'C' SW pump 10 year inspection/overhaul
- WO-1501650, XVG03005A-SP failed to fully open based on indication
- WO-1501670, XVC03135A failed to close following shutdown of the 'A' SW booster pump
- WO-1314698, replace EDG 'A' attached fuel oil pump
- WO-1502964, replace 'A' SW traveling screens and screen wash spray nozzles

### b. Findings

No findings were identified.

## 1R22 Surveillance Testing

### a. Inspection Scope

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

#### In-Service Tests

- STP-223.003, "Service Water Pump Performance Test Flow vs. Differential Pressure," Rev. 1A
- STP-220.002, "Turbine Driven Emergency Feedwater Pump and Valve Test," Rev. 8
- STP-212.002, "Reactor Building Spray Pump Test," Rev. 7

#### Other

- STP-503.003B, "Functional Test of Train B SW to EF Cross Connect Circuits," Rev. 3B
- STP-125.002A, "Diesel Generator A Operability Test," Rev. 2E
- STP-345-037, "Solid State Protection System Actuation Logic and Master Relay Test Train A," Rev. 18B

### b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

## 1EP6 Drill Evaluation

### Emergency Preparedness Drill

#### a. Inspection Scope

On February 18, 2015, the inspectors reviewed and observed the performance of an emergency preparedness (EP) turnover drill that involved a main turbine blade failure resulting in loss of condenser vacuum and damage to a structure housing safety-related equipment, ejection of a reactor control rod causing damaged fuel, and an earthquake causing additional fuel damage and increased radiation challenging the containment barrier, which required entry into increasing emergency action levels starting with an Alert and ending in a General Emergency. The drill involved the first use of a new Technical Support Center. The inspectors assessed abnormal and emergency procedure usage, emergency plan classifications, protective action recommendations, respective notifications and the adequacy of the licensee's drill critique. The inspectors verified that drill deficiencies were captured into the licensee's corrective action program.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification

Mitigating Systems Cornerstone

a. Inspection Scope

The inspectors verified the accuracy of the licensee's PI submittals listed below for the period January 1, 2014, through December 31, 2014. The inspectors used the performance indicator definitions and guidance contained in Nuclear Energy Institute (NEI) 99-02, Rev. 7, "Regulatory Assessment Performance Indicator Guideline," and licensee procedure SAP-1360, Rev. 2, "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.

- Unplanned Scrams per 7000 Critical Hours
- Unplanned Power Changes per 7000 Critical Hours
- Unplanned Scrams with Complications

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution

.1 Review of Items Entered into the Corrective Action Program

a. Inspection Scope

As required by inspection procedure (IP) 71152, "Identification and Resolution of Problems," dated January 1, 2015, 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. Findings

No findings were identified.

.2 Annual Sample Review of CR-14-04564 and CR-14-04592

a. Inspection Scope

The inspectors reviewed CR-14-04564 and CR-14-04592, 'A' EDG fuel oil leak in detail to evaluate the effectiveness of the licensee's corrective actions for important safety issues. The inspectors assessed whether the issue was properly 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 and timely corrective actions. Also, the inspectors verified the issues were processed in accordance with procedure, SAP-999, "Corrective Action Program," Rev. 12A.

b. Findings

No findings were identified.

Condition Report 14-04564 was initiated on August 20, 2014, for a fuel oil leak estimated at 120 drops per minute with the 'A' EDG in service and located at a threaded connection on the north side fuel rack. The licensee's initial operability assessment concluded the 'A' EDG was operable for the existing leak rate. Work Order 14011019 was initiated by the licensee for repairs, and CR-14-04592 was subsequently initiated when a crack discovered in the root of the threaded portion of the Schedule 40 pipe section of the fuel rack. The licensee's evaluation concluded that: "The hairline crack did not challenge the capability of the fuel oil system to provide fuel to the 'A' DG for seven days of operation during a postulated emergency reactor shutdown with post accident electric loads."

The inspectors performed an independent review of this issue. CR-14-04592 referenced CR-03-03500 which documented a previous leak stating: "During a run on 'A' Diesel Generator (XEG0001A-E) the fuel supply line on the right bank ruptured at the threads." CR-03-03500 was not specific regarding the consequence of the 2003 fuel oil leak other than to say the line 'ruptured' at the threads. The inspectors identified control room logs from the event on October 21, 2003, which stated: "Secured 'A' D/G due to injector header fuel oil leak at #7 injector." The inspectors concluded that the leak was a significant leak when considering the use of the word, "ruptured." The inspectors reviewed the nonconformance notice (NCN) package, 03-3500, which was developed to repair the leak which identified the fuel supply pipe had broken at the pipe threads. The incorporated engineering technical work review (TWR), RM19910, stated that the pipe was ¾ inch, Schedule 40, Grade A53, approximately 14 inches long, threaded at both ends, and safety-related. The inspectors noted that the apparent cause of the crack was "due to the maintenance evolution of installing the rubber shock-absorbers on the fuel supply piping." Consequently, the licensee did not consider the event was a functional failure since it was caused by and occurred during a maintenance evolution. The inspectors noted that the replacement pipe used for repair was similar as noted in the vendor manual.

Condition Report 14-04592 stated the following as the most probable cause of the 2014 leak: "After an investigation of work history and industry OE, the most probable cause is most likely a single impact event that occurred in 2003 during RF-14 (CR-03-03500) maintenance. At that time the rubber blocks for the fuel oil header supports were replaced per CR-03-01290 identifying the rubber blocks were aged and needed replaced during a System Engineer walkdown of 'A' Diesel Generator. The fuel oil header supplying Cyl. 7-12 of XEG0001A-E, 'A' Diesel Generator pipe nipple had to be replaced on 10/22/2003 under NCN 03-3500 due to a broken pipe at the threads during maintenance. A similar condition could have affected Cyl. 1-6 fuel oil supply header pipe nipple. And over the next eleven years the pipe nipple experienced low stress high cycle fatigue."

The inspectors noted that an action from CR-14-04592 was to examine the 'B' EDG for extent of condition. Subsequently, the licensee initiated CR-14-05797 for a fuel oil leak in a similar location. The cause from this CR stated: "After an investigation of work history, industry OE, and in house OE the most probable cause is most likely a small hairline crack in the pipe nipple threads. The crack was most likely caused by a single impact event followed by subsequent low stress high cycle fatigue. After the pipe nipple was replaced the old pipe nipple was taken to be inspected. Investigation discovered a small hairline crack in the pipe nipple threads."

The inspectors noted that both the 'A' and 'B' EDG fuel oil leaks in 2014 were repaired using Schedule 40 threaded pipe.

Significant OE exists in other industry documents regarding failure of Schedule 40 threaded piping due to the limited wall thickness at the root of the thread and are documented in previous NRC reports:

- NRC Integrated Inspection Report 05000313/2006005 and 05000368/2006005, dated February 14, 2007, Section 1R15 (ADAMS ML070450249)
- NRC Integrated Inspection Report 05000454/2004007; 05000455/2004007, dated November 8, 2004, Section 1R04.2 (ADAMS ML043270255)
- NRC Special Inspection Report 05000458/2012013, dated February 12, 2013, Section 3.3 (ADAMS ML13043A170)
- Industry OE document in CR-03-00651 for an EDG event occurring on January 27, 2003, at Fermi Unit 2, in which a ¾ inch, Schedule 40 pipe nipple cracked at the root of the threads which was exacerbated by corrosion.

Additionally, the inspectors identified engineering services specification, SP-337, "Pipeline Specification for Conventional Piping," Rev. 14, that states: "Schedule 40 piping is not to be threaded."

The inspectors continue to engage the licensee concerning:

- The use of threaded Schedule 40 piping in safety-related applications when plant standards do not allow for conventional applications.



- The continued use of vendor specified parts, in which operating experience demonstrates a failure vulnerability.
- Given the failure history, the CR-14-04592 evaluation should provide justification for the statement: "The hairline crack did not challenge the capability of the fuel oil system to provide fuel to the 'A' DG for seven days of operation during a postulated emergency reactor shutdown with post accident electric loads."

The licensee initiated CR-15-01352 to evaluate the inspectors' concerns. The inspectors continue to monitor the licensee's evaluation and associated corrective actions.

### .3 Annual Sample Review of CR-14-00442

#### a. Inspection Scope

The inspectors reviewed CR-14-00442, 'A' SW motor lower bearing oil cooler low flow, dated May 15, 2014, in detail to evaluate the effectiveness of the licensee's corrective actions for important safety issues. The inspectors assessed whether the issue was properly 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 and timely corrective actions. Also, the inspectors verified the issues were processed in accordance with procedure, SAP-999, "Corrective Action Program," Rev. 12A.

#### b. Findings

No findings were identified.

As discussed in Section 1R15.2 of this report, the inspectors' review of various mitigating system problems within the licensee's control room logs revealed frequent adjustments of bearing cooling flows to both trains of the SW pump motor bearing oil heat exchangers. Specifically, from July 13, 2014, through January 20, 2015, the inspectors identified 43 log entries for flow adjustments. The inspectors noted that the flow adjustments result in the dislodge of sediment accumulating and preventing an accurate reading of bearing cooling flow. Additionally, long term review of bearing temperatures has not revealed an adverse trend.

A review of the current operator burden list did not reveal any related entries, and the inspectors engaged the licensee regarding the issue. Subsequently, a review of the licensee's CAP identified CR-14-00442, initiated on February 2, 2014, for adjustments to the lower bearing cooling flow to the 'A' SW pump motor lower bearing oil heat exchanger and for an evaluation as an operator challenge/workaround in accordance with operations administrative procedure, (OAP)-113.1, "Operator Workaround and Dark Board Program," Rev. 4. Following additional discussion with the licensee, the evaluation per OAP-113.1 was completed on February 13, 2015, and concluded the SW pump motor bearing cooling flow adjustments was an 'operator challenge'. The licensee's corrective actions include: (1) the development of a PM to periodically clean

the flow indicators as an action from CR-13-04348; and (2) complete the SW chemical cleaning modification, scheduled to finish in May, 2015, which will maintain silt and other solids in suspension. The residents will continue to monitor the licensee's corrective actions to resolve this operator challenge.

4OA6 Meetings, Including Exit

On April 14, 2015, the resident inspectors presented the integrated inspection report results to Mr. Dan Gatlin and other members of the licensee staff. The licensee acknowledged the results of these inspections. The inspectors confirmed that inspection activities discussed in this report did not contain proprietary material.

ATTACHMENT: SUPPLEMENTARY INFORMATION

## **SUPPLEMENTARY INFORMATION**

### **KEY POINTS OF CONTACT**

#### **Licensee Personnel**

A. Barbee, Director, Nuclear Training  
C. Calvert, Manager, Design Engineering  
M. Coleman, Manager, Health Physics and Safety Services  
N. Constance, Manager, Nuclear Training  
G. Douglass, Manager, Nuclear Protection Services  
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L. Harris, Manager, Quality Systems  
R. Haselden, General Manager, Organizational / Development Effectiveness  
R. Justice, Manager, Nuclear Operations  
G. Lippard, General Manager, Nuclear Plant Operations  
M. Moore, Supervisor, Nuclear Licensing  
D. Shue, Manager, Maintenance Services  
W. Stuart, General Manager, Engineering Services  
W. Taylor, Nuclear Licensing Engineer  
B. Thompson, Manager, Nuclear Licensing  
J. Wasieczko, Manager, Organization Development and Performance  
D. Weir, Manager, Plant Support Engineering  
R. Williamson, Manager, Emergency Planning  
S. Zarandi, General Manager, Nuclear Support Service

## LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened None

Closed None

Discussed None

## LIST OF DOCUMENTS REVIEWED

### **Section 1R06: Flood Protection Measures**

Design Calculation DC03290-005, "Effect of FW Line Break on Flood Levels in IB, AB and Penetration Access Area," Rev. 2H

Design Calculation DC03490-003, "Intermediate Building Flooding Evaluation," Rev. 0

Design Basis Document, "Drains, Sumps, and Leak Detection ND (ND)," Rev. 2D

Design Basis Document, "Feedwater System (FW)," Rev. 15

## LIST OF ACRONYMS

ADAMS	Agency Document Access and Management System
CAP	Corrective Action Program
CCW	Component Cooling Water
CFR	Code of Federal Regulations
CR	Condition Report
EDG	Emergency Diesel Generator
EFW	Emergency Feedwater
EP	Emergency Preparedness
FW	Feedwater
GTP	General Test Procedure
IP	Inspection Procedure
LER	Licensee Event Report
MDEFW	Motor Driven Feedwater
MR	Maintenance Rule
NCN	Nonconformance Notice
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
OAP	Operations Administrative Procedure
OE	Operating Experience
OOS	Out of Service
PARS	Publicly Available Record
PI	Performance Indicator
PMT	Post-Maintenance Testing
RB	Reactor Building
REV.	Revision
RHR	Residual Heat Removal
RTP	Rated Thermal Power
SAP	Station Administrative Procedure
SCE&G	South Carolina Electric and Gas
SOP	System Operating Procedure
SSC	Structure, System, and Components
SSPS	Solid State Protection System
STP	Surveillance Test Procedure
SW	Service Water
SWBP	Service Water Booster Pump
SWPH	Service Water Pump House
TDEFW	Turbine Driven Emergency Feedwater
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
WANO	World Association of Nuclear Operators
WO	Work Order