



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

February 5, 2016

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: REISSUE - VIRGIL C. SUMMER NUCLEAR STATION, UNIT 1 – NRC
INTEGRATED INSPECTION REPORT 05000395/2015004

Dear Mr. Gatlin:

On January 29, 2016, the U.S. Nuclear Regulatory Commission (NRC) issued the subject V.C. Summer Nuclear Station – NRC Integrated Inspection Report (IR) 05000395/2015004, (ADAMS Accession Number ML16029A112). In the previous issued IR Section 2RS1 was inadvertently omitted. We request that you replace the entire report with the enclosure to this letter.

In accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding," of the NRC's "Agency 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's Public Document Room or from the Publicly Available Records (PARS) component of the NRC's Agencywide Documents Access and Management 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/

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

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

Enclosure:
Reissued IR 05000395/2015004
w/Attachment: Supplementary Information

cc: Distribution via Listserv

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 Vice President - Nuclear Operations
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PUBLICLY AVAILABLE NON-PUBLICLY AVAILABLE SENSITIVE NON-SENSITIVE

ADAMS: Yes ACCESSION NUMBER: ML16036A190 SUNSI REVIEW COMPLETE FORM 665 ATTACHED

OFFICE	RII:DRP	RII:DRP	RII:DRS	RII:DRP	RII:DRP
SIGNATURE	BDB3	SON	RXK3	JTR	SDR2
NAME	B. Bishop	S. Ninh	R. Kellner	J. Reece	S. Rose
DATE	2/3/2016	2/5/2016	2/2/2016	2/3/2016	2/4/2016
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO

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Letter to Thomas D. Gatlin from Steven D. Rose dated February 5, 2016.

SUBJECT: REISSUE - VIRGIL C. SUMMER NUCLEAR STATION, UNIT 1 - NRC
INTEGRATED INSPECTION REPORT 05000395/2015004

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January 29, 2016

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 05000395/2015004**

Dear Mr. Gatlin:

On December 31, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Virgil C. Summer Nuclear Station, Unit 1. On January 21, 2016, the NRC inspectors discussed the results of this inspection with Mr. T. Gatlin and members of your staff. Inspectors documented the results of this inspection in the enclosed inspection report.

NRC inspectors documented one NRC-identified finding of very low safety significance (Green), in this report. The finding involved a violation of NRC requirements. The inspectors also documented two licensee-identified violations, which were determined to be of very low safety significance, in this report. The NRC is treating the violations as non-cited violations (NCV) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest the violation or significance of these NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Virgil C. Summer Nuclear Station, Unit 1.

If you disagree with a cross-cutting aspect assignment in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region II, and the NRC Resident Inspector at the Virgil C. Summer Nuclear Station, Unit 1.

D. Gatlin

2

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T. Gatlin

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OFFICE	RII:DRP	RII:DRP	RII:DRP	RII:DRP	RII:DRS
SIGNATURE	JTR via email	ETC1 via email	BDB3	SON	AJB1 via email
NAME	J. Reece	E. Coffman	B. Bishop	S. Ninh	A. Butcavage
DATE	1/21/2016	1/21/2016	1/20/2016	1/21/2016	1/14/2016
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO
OFFICE	RII:DRS	RII:DRS	RII:DRP		
SIGNATURE	SON /RA for BCC2/	DXB2 via email	SDR2		
NAME	B. Collins	D. Bacon	SRose		
DATE	1/22/2016	1/14/ 2016	1/28/2016		
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T. Gatlin

3

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INSPECTION REPORT 05000395/2015004

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No. 50-395

License No. NPF-12

Report Nos. 05000395/2015004

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: October 1, 2015, through December 31, 2015

Inspectors: J. Reece, Senior Resident Inspector
E. Coffman, Resident Inspector
A. Butcavage, Reactor Inspector (Section 1R08)
B. Collins, Reactor Inspector (Section 1R08)
D. Bacon, Senior Operations Engineer (Section 1R11)
R. Kellner, Senior Health Physicist (Section 2RS1)

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

Enclosure

SUMMARY

IR 05000395/2015004; 10/01/2015 - 12/31/2015: Virgil C. Summer Nuclear Station, Unit 1; Problem Identification and Resolution.

The report covered a three-month period of inspection by resident inspectors, regional reactor inspectors and a senior operations engineer. One NRC-identified violation was identified and documented in this report. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP), dated April 29, 2015. The cross-cutting aspects were determined using IMC 0310, "Aspects Within the Cross Cutting Areas," dated December 4, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy dated February 4, 2015. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 5.

Cornerstone: Mitigating Systems

- Green. The inspectors identified a non-cited violation of 10 CFR 50, Appendix B, Criterion V, Instructions, Procedures, and Drawings, which requires in part that activities affecting quality shall be accomplished in accordance with procedures. Specifically, the licensee failed to accomplish preventative maintenance diagnostic testing in accordance with their station administrative program procedure, SAP-160, "Motor Operated Valve Program," Revision 1, to identify degradation of a torque switch that led to two failures of stroke time testing of 'A' train reactor building spray (SP) sump isolation valve, XVG03005A-SP. This also resulted in a loss of safety function involving reactor building spray. The licensee entered the problem into their corrective action program as condition report, CR-15-00541.

The inspectors identified a performance deficiency (PD) for the failure to accomplish the requirements of SAP-160 leading to two failures of XVG03005A-SP. The inspectors reviewed IMC 0612, Appendix B, "Issue Screening," dated September 7, 2012, and determined the PD was more than minor because it adversely impacted the barrier integrity cornerstone objective to provide reasonable assurance that the reactor building or containment protects the public from radionuclide releases caused by accidents or events and the related attribute of structures, systems and components (SSC) performance. Specifically, the licensee failed to perform preventative maintenance diagnostic testing required by SAP-160 to identify degradation of a torque switch for XVG03005A-SP. The inspectors used IMC 0609, Appendix A, Exhibit 3, "Barrier Integrity Screening Questions," dated July 1, 2012, and IMC 0609, Appendix H, "Containment Integrity Significance Determination Process," dated May 6, 2004, and determined the finding was of very low safety significance or Green, because the finding did not represent a significant impact to Large Early Release Failure. The inspectors reviewed IMC 0310, "Aspects Within Cross Cutting Areas," dated December 4, 2014, and determined the cause of this finding involved the cross-cutting area of problem identification and resolution and the aspect of evaluation, P.2, because the licensee failed to thoroughly evaluate the failures of XVG03005A-SP to ensure that resolutions address causes and extent of conditions commensurate with their safety significance. (Section 40A2.2)

Two violations of very low safety significance that were identified by the licensee have been reviewed by the NRC. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. The violations and corrective action tracking numbers are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

Unit 1 began the inspection period at full Rated Thermal Power (RTP) and operated at or near full RTP until October 2, 2015, when the unit was brought off line to start a refueling outage. The unit returned to service on December 2, 2015, and resumed full RTP on December 5, 2015. The unit operated at or near full RTP for the remainder of the quarter.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection

Seasonal Weather Susceptibilities

a. Inspection Scope

The inspectors performed one seasonal extreme weather inspection for readiness of cold weather for two risk significant components. The inspectors verified the licensee had implemented applicable sections of operations administrative procedure, OAP-109.1, Revision (Rev.) 4D, "Guidelines for Severe Weather." The inspectors reviewed preparations for extreme cold weather and walked down the refueling water storage tank (RWST) and associated outside emergency core cooling system (ECCS) suction piping and the sodium hydroxide (NaOH) tank and associated outside piping to assess whether the equipment was adequately protected from cold weather and would function as expected during an accident event. 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 were identified.

1R04 Equipment Alignment

Partial System Walkdowns

a. Inspection Scope

The inspectors conducted three 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) to verify that the licensee had properly identified and resolved equipment alignment problems that could lead to the initiation of an event or impact mitigating system availability. Documents reviewed are listed in the attachment.

- Partial walkdown of 'A' emergency diesel generator (EDG) following refueling outage work activities
- Partial walkdown of 'A' safety injection (SI) pump following refueling outage work activities
- Partial walkdown of the 'A' motor driven emergency feedwater (MDEFW) components following refueling outage work activities

b. Findings

No findings were identified.

1R05 Fire Protection

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 five areas (respective fire zones also noted):

- Auxiliary building 436 elevation (fire zone AB-1.18)
- Reactor building (fire zone RB-1.2)
- Control room (fire zone CB-17.1)
- Control building 482 elevation (fire zones CB-22, CB-23)
- Intermediate building (fire zones IB 25.5, 25.6.1, 25.6.2, 25.7)

b. Findings

Introduction: An unresolved item (URI) was identified by the inspectors during the walkdown of the Intermediate building fire area involving an engineering justification for a departure from NFPA 80-1973 as required by the Fire Protection Program for replacement fire doors DRIB/105A and DRIB/105B located in the intermediate building.

Description: The inspectors identified an issue of concern regarding replacement of fire door DRIB/105 with a single door jamb containing two fire doors DRIB/105A and DRIB/105B. These replacement doors were installed in a back to back configuration to provide a pressure barrier function in addition to the fire barrier function but were not self-closing as required by NFPA 80-1973. The licensee subsequently initiated CR-15-04027 to evaluate this issue of concern.

Pending completion of additional evaluations needed to determine the existence of any related performance deficiencies, this is identified as URI 05000395/2015004-01, Departure from NFPA 80-1973 for Replacement Fire Doors.

1R06 Flood Protection Measures

.1 Internal Flooding

a. Inspection Scope

The inspectors reviewed and walked down portions of the auxiliary building 374 elevation 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 SSCs in these areas included the 'A' and 'B' train residual heat removal (RHR) and reactor building (RB) spray pumps. 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.

.2 Annual Review of Electrical Manholes

a. Inspection Scope

The inspectors reviewed a licensee's periodic inspection of two risk-significant electrical manholes (EMH), EMH-001 and EMH-002, containing safety-related cables for assessment of leaks, cable supports and structures, and general structural integrity. In addition, the inspectors reviewed several past periodic licensee inspection results for the above mentioned manholes to ensure that any degraded conditions identified were appropriately resolved. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified

1R08 Inservice Inspection Activities

a. Inspection Scope

Non-Destructive Examination Activities and Welding Activities

From October 12–16, 2015, the inspectors conducted an onsite review of the implementation of the licensee's inservice inspection (ISI) program for monitoring degradation of the reactor coolant system (RCS) boundary, risk-significant piping and component boundaries, and containment boundaries in Unit 1.

The inspectors either directly observed or reviewed the following non-destructive examinations (NDEs) mandated by the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code of Record: 2007 Edition with 2008 Addenda) to evaluate compliance with the ASME Code, Section XI and Section V requirements and, if any indications or defects were detected, to evaluate if they were

disposed in accordance with the ASME Code or an NRC-approved alternative requirement. The inspectors also reviewed the qualifications of the NDE technicians performing the examinations, to determine whether they were current and in compliance with the ASME Code requirements.

- Radiographic Inspection Report (IR), 3-inch Piping Weld MW-3, ASME Code Class 2 (Reviewed)
- Surface Examination Penetrant Test (PT), Weld MW-1, ECR 51007, RWST Supply to FLEX Piping Installation, ASME Class 2 (Reviewed)
- PT, Weld of Valve XVT-08389-CS, Code Class 2 (Reviewed)

The inspectors reviewed the following in progress welding activities, qualification records, and associated documents in order to evaluate compliance with procedures and the ASME Code, Section XI and Section IX requirements. Specifically, the inspectors reviewed a sample of the work order, repair and replacement plan, weld data sheets, welding procedures, procedure qualification records, welder performance qualification records, and NDE reports.

- Weld MW-83, Feedwater Piping Replacement, ASME Code Class 2
- Weld MW-84, Feedwater Piping Replacement, ASME Code Class 2
- Weld MW-87, Feedwater Piping Replacement, ASME Code Class 2

During non-destructive surface and volumetric examinations performed since the previous refueling outage, the licensee did not identify any relevant indications that were analytically evaluated and accepted for continued service; therefore, no NRC review was completed for this inspection procedure attribute.

Pressurized Water Reactor Vessel Upper Head Penetration Inspection Activities

The inspectors reviewed portions of the bare metal visual examination of the reactor vessel upper head penetrations (VUHPs) to determine if the examinations were performed in accordance with the requirements of ASME Code Case N-729-1 and 10 CFR 50.55a(g)(6)(ii)(D). Additionally, the inspectors reviewed examination records to determine if the required examination coverage was achieved and if limitations were recorded in accordance with the licensee procedures.

The inspectors observed the NDE activities for the volumetric examination of reactor VUHP numbers 23, 27, 33, and 61 to determine if the activities, including the disposition of indications and defects, were conducted in accordance with the requirements of ASME Code Case N-729-1, as incorporated by reference in 10 CFR 50.55a(g)(6)(ii)(D). Additionally, the inspectors' review also determined whether essentially 100 percent of the required examination volumes and surfaces were examined, and whether a volumetric or surface leakage path examination was completed.

The inspectors reviewed the examinations that identified relevant indications accepted for continued service. Specifically, the inspectors reviewed a sample of the examination records and their associated evaluations, to verify that licensee's acceptance for continued service was in accordance with the requirements of 10 CFR 50.55a(g)(6)(ii)(D) or an NRC-approved alternative.

Since welding associated with repair of penetration number 22 during the Spring 2014 refueling outage (RF21) occurred after the previous NRC IP 71111.08 inspection, the inspectors reviewed records of those welded repairs to evaluate if the licensee applied the pre-service NDEs and acceptance criteria required by the NRC-approved Code relief request, and the ASME Code Section XI requirements. In addition, the inspectors reviewed the welding procedure specification and supporting weld procedure qualification records, to evaluate if the weld procedure(s) used were validated in accordance with the Construction Code and the ASME Code Section IX requirements.

Boric Acid Corrosion Control Inspection Activities

The inspectors reviewed the licensee's boric acid corrosion control program (BACCP) activities to determine if the activities were implemented in accordance with the commitments made in response to NRC Generic Letter 88-05, "Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants," and applicable industry guidance documents. Specifically, the inspectors performed an onsite records review of procedures, and the results of the licensee's containment walkdown inspections performed during the current refueling outage. The inspectors also interviewed the BACCP owner, conducted an independent walkdown of the containment to evaluate compliance with licensee's BACCP requirements, and verified that degraded or non-conforming conditions, such as boric acid leaks, were properly identified and corrected in accordance with the licensee's BACCP, and CAP. Specifically, the inspectors identified two areas of concern inside containment; one on the pressurizer lower head insulation, and one on the primary system shield wall penetration area. Both areas of concern were entered into the corrective action process. The CRs associated with these concerns are listed in the document reviewed sections.

The inspectors reviewed the following engineering evaluations, completed for evidence of boric acid leakage, to determine if the licensee properly applied applicable corrosion rates to the affected components; and properly assessed the effects of corrosion induced wastage on structural or pressure boundary integrity in accordance with the licensee procedures.

- CR-15-05183, NRC concern for RCS fluid catchment at primary shield wall penetration
- CR-15-04843, Boric Acid residue 'C' Loop Hot Leg Sandbox Area

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

- CR-15-05081, (NRC-identified) White residue on the bottom of the insulation package of the pressurizer heater nozzles
- CR-15-05024, (NRC-identified) Boric Acid Leak, Test Connection on Safety Injection Valve XVT08879-SI
- CR-15-05025, (NRC-identified) Boric Acid Leak, Test Connection Isolation Valve Safety Injection Valve XVT08879C-SI

Steam Generator Tube Inspection Activities

The inspectors verified that for the Unit 1 steam generator tubes, no inspection activities were required this refueling outage, in accordance with the requirements of the ASME Code, the licensee's Technical Specifications, and Nuclear Energy Institute (NEI) 97-06, "Steam Generator Program Guidelines."

Identification and Resolution of Problems

The inspectors reviewed a sample of ISI-related issues entered into the CAP to determine if the licensee had appropriately described the scope of the problem and initiated corrective actions. Specifically the inspectors reviewed the disposition of CR-15-05177, which was initiated in response to the NRC resident inspectors' concern that portions of the reactor vessel supports were not subjected to the required VT-3 examinations, as required by 10 CFR 50.55a and ASME Table IWF-2500-1, Item F1.40, "supports other than piping supports." This issue surfaced with the resident inspectors as a result of a previous inspection finding and violation issued May 6, 2013, and reported in NRC IR 05000395/2013002. The inspectors identified that inspections performed during 2013, in response to the 2013 inspection finding, did not include all IWF designed support load path components, based on a code interpretation of ASME jurisdictional boundaries. This issue was entered into the CAP as CR-15-05177, and the required VT-3 inspections were completed by Work Order (WO) 1511896-001 during the current refuel outage in order to comply with the ASME Code requirements for this interval. This issue was screened in accordance with Inspection Manual Chapter (IMC) 0612, Appendix "B", and classified as a minor violation, similar to IMC 0612, Appendix "E", Example "m" in that the VT-3 inspections performed during this refuel outage did not identify any conditions that prohibited the reactor supports from performing their intended function. The inspectors reviewed a sample of the support inspection results to ensure compliance with the ASME Code inspection requirements and 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requirements.

Inspectors also reviewed licensee identified CR-15-04864, which was initiated to address concerns noted during inspection of the containment moisture barrier. The CR provided direction for areas needing repairs, and concluded that there was a reasonable expectation of operability.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program

.1 Licensed Operator Requalification

a. Inspection Scope

The inspectors observed on December 8, 2015, one sample consisting of two operator simulator makeup scenarios which involved component failures during Mode 5 conditions leading to entry into abnormal 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 two observations of licensed reactor operator activities to ensure consistency with licensee procedures and regulatory requirements. For the two listed activities, the inspectors observed the following elements of operator performance: 1) operator compliance 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.

- Power reduction for start of refueling outage
- Core offload activities

b. Findings

No findings were identified.

.3 Annual Review of Licensee Requalification Examination Results

a. Inspection Scope

On September 9, 2015, the licensee completed the comprehensive biennial requalification written examinations and the annual requalification operating examinations required to be administered to all licensed operators in accordance with Title 10 of the Code of Federal Regulations 55.59(a)(2), "Requalification Requirements," of the NRC's "Operator's Licenses." The inspectors performed an in-office review of the overall pass/fail results of the individual operating examinations and the crew simulator operating examinations in accordance with Inspection Procedure (IP) 71111.11, "Licensed Operator Requalification Program." These results were compared to the thresholds established in Section 3.02, "Requalification Examination Results," of IP 71111.11.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

The inspectors evaluated equipment issues described in the four CRs listed below to verify the licensee's effectiveness with the corresponding preventive or corrective maintenance associated with 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 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 SAP-0157, Rev. 1, "Maintenance Rule Program," to verify consistency with the MR program requirements.

- CR-15-01043, Failure of relay room 'B' train fan motor, XFN00363
- CR-15-03140, 'B' chilled water pump bearing oil bubbler found with dark oil and elevated bearing housing temperature of 193 degrees Fahrenheit
- CR-15-03484, Unexpected start of the alternate seal injection diesel generator
- CR-15-04751 and CR-15-06149, Auxiliary building rain water intrusion and potential impact on RWST level transmitter

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 listed below to assess, as appropriate: 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.

- Lowered RCS inventory in high decay heat conditions for reactor vessel head removal
- Installing temporary power source for the 'A' spent fuel cooling pump
- Emergency switchgear 1DA outage with transformer, XTF0031, isolated from 1DB
- Lowered RCS inventory in low decay heat conditions for reactor vessel head set

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments

a. Inspection Scope

The inspectors reviewed the two 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 verified that the operability evaluations were performed in accordance with SAP-209, Rev. 1B, "Operability Determination Process," and SAP-999, Rev. 13A, "Corrective Action Program."

- CR-15-01043, Evaluate past operability of relay room 'B' fan with 'A' EDG OOS
- CR-15-03574, 'B' service water (SW) traveling screen guide degradation allowing introduction of fish into pump bay

b. Findings

The enforcement aspects regarding CR-15-03574 are discussed in Section 4OA7 of this report.

1R18 Plant Modifications

a. Inspection Scope

The inspectors reviewed one temporary modification or engineering change request (ECR) as noted below, to evaluate the change for adverse effects on system availability, reliability, and functional capability. Documents reviewed included engineering calculations, WOs, site drawings, applicable sections of the UFSAR, supporting 10 CFR 50.59 evaluations, TS, and design basis information. The inspectors evaluated the change documents and associated 10 CFR 50.59 reviews against the system design basis documentation and UFSAR to verify that the changes did not adversely affect the safety function of safety systems. The inspectors reviewed any related CRs to confirm that problems were identified at an appropriate threshold, were entered into the CAP, and appropriate corrective actions had been initiated.

- WO1410044, Install temporary power source for the 'A' spent fuel (SF) cooling pump

b. Findings

No findings were identified.

1R19 Post Maintenance Testing

a. Inspection Scope

For the three 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. 5F.

- WO1413072, replace pump bearings on 'B' chilled water pump
- WO1415985, replace leaking mechanical seal on 'A' RHR pump
- WO1509460, repair 'B' EDG lube oil thermostatic control valve

b. Findings

No findings were identified.

1R20 Refueling Outage and Other Outage Activities

a. Inspection Scope

On October 2, 2015, the unit was shut down to commence refueling outage (RF)-22. The outage was completed on December 2, 2015. The inspectors used IP 71111.20, Refueling and Outage Activities, to complete the inspections described below. Documents reviewed are listed in the Attachment.

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 prior to RCS draindown to lowered inventory conditions. The licensee did not drain to reduced inventory or mid-loop conditions.
- 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
- SF cooling operations to verify that outage work was not impacting the ability of the operations staff to operate the SF cooling system during and after core offload. The inspectors also reviewed the licensee's calculation results of SF and reactor vessel heat up 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 emergency core cooling system recirculation sumps

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

- Plant shutdown activities
- Decay heat removal system operations
- Inventory controls and measures to provide alternate means for inventory addition
- Electrical power availability controls
- Fitness for Duty area of fatigue management
- Reactivity controls
- Reactor vessel defueling and refueling operations
- Reactor heat up, mode changes, initial criticality, startup and power ascension activities

The inspectors reviewed various problems that occurred 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

No findings were identified.

1R22 Surveillance Testing

a. Inspection Scope

The inspectors observed and/or reviewed the 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.

Containment Isolation Valve

- STP-215.003A, "Containment Isolation Valve Leakage Test for the CVCS, ND, RC, SF, SI, SP, and WL Systems," Rev. 7A, for penetration XRP0303

In-Service Tests

- STP-160.001, "Containment Tendon Test," Rev. 4G

Reactor Coolant System

- STP-114.002, "Operational Leakage Calculation," Rev. 12G

Other

- STP-102.001, "Source Range Analog Channel Operational Test N-33," Rev. 7
- STP-125.001, "Electric Power Systems Weekly Test," Rev. 15I
- STP-501.001A, "Battery XBA1A Weekly Test," Rev. 2C

b. Findings

No findings were identified.

1EP6 Drill Evaluation

a. Inspection Scope

The inspectors reviewed and observed the performance of an operator requalification exam that involved multiple failures leading to entry into abnormal operating procedures followed by emergency operating procedures, which required entry into emergency action levels. The inspectors assessed as applicable 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.

2. RADIATION SAFETY (RS)

Cornerstone: Occupational Radiation Safety (OS)

2RS1 Radiological Hazard Assessment and Exposure Controls

a. Inspection Scope

Hazard Assessment and Instructions to workers: During facility tours, the inspectors observed labeling of radioactive material and postings for radiation areas, high radiation areas (HRA), locked HRAs (LHRA), very HRAs, radioactive material storage areas, and contaminated areas established within the radiologically controlled area (RCA) of the Unit 1 (U1) Auxiliary Building, U1 reactor building (containment), and radioactive waste processing and storage locations. The inspectors independently measured radiation dose rates or directly observed conduct of licensee radiation surveys for selected RCA areas including the U1 containment, auxiliary building, and outside areas. The inspectors reviewed survey records for several plant areas including surveys for alpha emitters, airborne radioactivity, and pre-job surveys for selected U1 refueling outage 22 (RF-22) tasks. The inspectors also discussed changes to plant operations that could contribute to changing radiological conditions since the last inspection. For selected RF-22 outage work, the inspectors attended pre-job briefings and reviewed radiation work permit (RWP) details to assess communication of radiological control requirements and current radiological conditions to workers. Selected RF-22 work activities included incore thimble replacement, reactor core barrel removal and inspection, Reactor Coolant Pump (RCP) seal replacement, reactor head inspection, and refueling activities.

Hazard Control and Work Practices: The inspectors observed and evaluated access barrier effectiveness for selected LHRA and VHRA locations to include the U1 auxiliary building and U1 containment. Procedural guidance for LHRA and VHRA controls were reviewed and discussed with radiation protection (RP) supervisors. Controls and their implementation for storage of irradiated material within the spent fuel pool were reviewed and discussed in detail. Established radiological controls (including airborne controls) were evaluated for selected tasks, including U1 incore thimble replacement, and reactor head inspection. In addition, licensee controls for areas where dose rates could change significantly as a result of refueling operations were reviewed, observed, and discussed including the access point for the fuel transfer canal in U1 containment.

Occupational workers' adherence to selected RWPs and RP technician proficiency in providing job coverage were evaluated through direct observations and interviews with cognizant licensee staff. Electronic dosimeter (ED) alarm set points and worker stay times were evaluated against area radiation survey results. Worker response to select ED dose rate alarms were evaluated. For selected RF-22 HRA and LHRA tasks involving significant dose rate gradients, the use and placement of whole body and extremity dosimetry to monitor worker exposure was discussed with cognizant licensee staff.

Control of Radioactive Material: The inspectors observed surveys of material and personnel being released from the RCA and U1 containments using portable radiation survey instruments, hand and foot monitors, small article monitors, personnel contamination monitors, and portal monitor instruments. The inspectors reviewed

calibration records for selected release point survey instruments and discussed equipment sensitivity, alarm setpoints, and release program guidance with cognizant RP staff. The inspectors also reviewed records of leak tests on selected sealed sources and discussed nationally tracked source transactions with cognizant RP staff.

Problem Identification and Resolution: Corrective Action Program (CAP) documents associated with radiological hazard assessment and control were reviewed and assessed. The inspectors evaluated the licensee's ability to identify and resolve the issues in accordance with procedure SAP-0999, "Corrective Action Program", Rev. 13. The inspectors also evaluated the scope of the licensee's internal audit program and reviewed recent assessment results.

RP activities were evaluated against the requirements of Updated Final Safety Analysis Report (UFSAR) Section 12; Technical Specifications Sections 6.8, 6.11, and 6.12; 10 Code of Federal Regulations (CFR) Parts 19 and 20; and approved licensee procedures. Licensee programs for monitoring materials and personnel released from the RCA were evaluated against 10 CFR Part 20 and IE Circular 81-07, Control of Radioactively Contaminated Material. Documents reviewed are listed in the Attachment.

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 October 1, 2014 through September 30, 2015. The inspectors used the performance indicator definitions and guidance contained in 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, plant status reports, CRs, and performance indicator data sheets to verify that the licensee had properly reported the PI data.

- Mitigating System Performance Index (MSPI) – Heat Removal System
- MSPI – Cooling Water Systems
- Safety System Functional Failures

b. Findings

No findings were identified.

40A2 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," 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-15-00541

a. Inspection Scope

The inspectors reviewed CR-15-00541, XVG03005A-SP ('A' train reactor building spray (SP) sump isolation) did not fully stroke open, 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

Introduction: The inspectors identified a Green, non-cited violation (NCV) of 10 CFR 50, Appendix B, Criterion V, Instructions, Procedures, and Drawings, which requires in part that activities affecting quality shall be accomplished in accordance with procedures. Specifically, the licensee failed to accomplish preventative maintenance diagnostic testing in accordance with procedure, SAP-160, "Motor Operated Valve Program," Rev. 1, to identify degradation of a torque switch that led to two failures of stroke time testing of 'A' train reactor building spray sump isolation valve, XVG03005A-SP. This also resulted in a loss of safety function involving the SP system.

Description: On December 11, 2014, during a surveillance test of XVG03005A-SP, the valve failed to fully open and therefore failed its respective stroke time test. The licensee initiated condition report, CR-14-06439, to document the failure and develop corrective actions. The inspectors reviewed the licensee's subsequent investigation which determined the torque switch for the Limitorque motor operator actuated at the 90 percent open limit switch setting. The inspectors noted that per design, the torque switch is bypassed for the first 90 percent when the valve is opening, and then reinstated to provide a backup to the 100 percent limit switch setting and preclude structural failure of the valve if the limit switch fails. The licensee performed motor operator valve

actuator testing (MOVAT) and did not identify any problems. A subsequent operability determination was completed on January 12, 2015, and concluded the valve was operable.

On February 4, 2015, another surveillance test was conducted on XVG03005A-SP and the valve failed to fully open as described above. The licensee initiated CR-15-00541 and subsequently completed work order, WO1501650, to increase the torque switch setting from 1.0 to 1.5. The inspectors reviewed the licensee's second operability determination completed on February 5, 2015, and noted that the licensee determined that since the valve failed prior to reaching the 100 percent open limit switch setting, the required interlock logic was not met. This was not recognized during the operability evaluation for the first failure, and a past operability evaluation would be required. The licensee concluded that the valve would be operable but degraded with the new torque switch setting and that increased testing would be performed to validate the new MOV configuration. The licensee also formed a failure mode analysis (FMA) team to evaluate both failures. The FMA team's investigation and causal evaluation concluded the failures were due to spring pack relaxation and torque switch tolerance. The past operability evaluation completed on March 17, 2015, concluded the valve was past inoperable.

The licensee initiated licensee event report, LER 2015-001-00, due to their discovery of the inoperability of the 'B' train reactor building spray system for approximately one hour in parallel with the aforementioned past inoperability of the 'A' train. The inspectors reviewed the licensee's corrective action documents, LER, and respective program documents relating to Generic Letter (GL) 89-10, "Safety-Related Motor-Operated Valve Testing and Surveillance," and the related subsequent GL 96-05, "Periodic Verification of Design-Basis Capability of Safety-Related Motor-Operated Valves." The inspectors noted that SAP-160, Step 6.3.3, states, "Preventive maintenance diagnostic testing shall be performed to identify degradations." Additionally, Step 6.4.1A states, "Following the initial baseline testing, periodic preventive maintenance diagnostic testing and trending will be used to identify degradations as part of the stations Periodic Verification Program." The inspectors interviewed licensee staff and determined that the torque switch setting for XVG03005A-SP in the open direction was not included within diagnostic testing. Consequently, the inspectors concluded that the licensee had failed to accomplish this procedure requirement which was a significant contributor to the failures of XVG03005A-SP.

Analysis: The inspectors identified a performance deficiency (PD) for the failure to accomplish the requirements of SAP-160 leading to two failures of XVG03005A-SP. The inspectors reviewed IMC0612, Appendix B, "Issue Screening," dated September 7, 2012, and determined the PD was more than minor because it adversely impacted the barrier integrity cornerstone objective to provide reasonable assurance that the reactor building or containment protects the public from radionuclide releases caused by accidents or events and the related attribute of SSC performance. Specifically, the licensee failed to perform preventative maintenance diagnostic testing required by SAP-160 to identify degradation of a torque switch for XVG03005A-SP. The inspectors used IMC 0609, Appendix A, Exhibit 3, "Barrier Integrity Screening Questions," dated July 1, 2012, and IMC 0609, Appendix H, "Containment Integrity Significance Determination Process," dated May 6, 2004, and determined the finding was of very low safety significance or Green, because the finding did not represent a significant impact to Large Early Release Failure. The inspectors reviewed IMC 0310, "Aspects Within Cross

Cutting Areas,” dated December 4, 2014, and determined the cause of this finding involved the cross-cutting area of problem identification and resolution and the aspect of evaluation, P.2, because the licensee failed to thoroughly evaluate the failures of XVG03005A-SP to ensure that resolutions address causes and extent of conditions commensurate with their safety significance.

Enforcement: 10 CFR 50, Appendix B, Criterion V, requires in part that activities affecting quality shall be accomplished in accordance with procedures. Contrary to this, on December 11, 2014, and February 4, 2015, the licensee failed to accomplish SAP-160 to identify degradation of a torque switch that led to two failures of XVG03005A-SP and a resultant loss of safety function. Because the finding is of very low safety significance and because it has been entered into the licensee’s CAP as CR-15-00541, this violation is being treated as a Green NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000395/2015003-02, Failure to Accomplish Procedure for Diagnostic Testing Resulting in Valve Failures.

.3 Annual Sample Review of CR-15-03574

a. Inspection Scope

A sample for CR-14-06439 and CR-15-00541, MVG-3005A (‘A’ train reactor building spray (SP) sump isolation valve) did not fully stroke open, was completed in the third quarter as documented in Section 1R15 of IR 05000395/2015003. A detailed review of this issue was performed as part of this annual sample. The inspectors reviewed CR-15-03574, ‘B’ SW traveling screen guide degradation allowing introduction of fish into pump bay, 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

One licensee identified violation was identified as discussed in Section 4OA7 of this report. On March 2, 2015, the licensee found parts of a fish on the intake tubesheet of the ‘A’ EDG intercooler heat exchanger. The cause was later determined to be a partially blocked spray nozzle associated with the screen wash system. Consequently, the licensee began focused observations on possible causes and regular inspections for fish within the SW pump bays. On August 4, 2015, the licensee discovered that degradation of the ‘B’ SW intake screen resulted in the introduction of fish into the ‘B’ SW pump bay and initiated CR-15-03574. Inspections by divers found corroded holes within the SW traveling screen guides allowing the passage of fish.

The inspectors performed a historical review of the licensee’s CAP and other related documentation and noted the following:

- In 2003 the licensee began plans for SW traveling screen replacement projects and obtained a proposal for screen rebuild from a vendor.

- In 2004 the licensee performed a rebuild of the 'A' SW traveling screen documented in WO0410528. CR-04-01868 was initiated to document items found during disassembly. The detailed description included in part that the bolting material used for the structure of the screen had degraded to approximately 50 percent material remaining and that the screen structure and chain guides were found with major corrosion and wear. The licensee replaced the traveling screen structure as documented in engineering information request, EIR80932A, dated June 18, 2004, which stated that during the refurbishment effort, it was decided that replacement of the travel screens was prudent.
- In 2005 the licensee created a traveling screens program to implement appropriate Preventative Maintenance (PMs) and inspections for condition monitoring as part of the overall station equipment reliability improvement program as documented in CR-05-04208.
- In 2006 the licensee replaced the 'C' SW traveling screen documented in WO0601586. Documents indicating any corrosion damage were not found. The licensee initiated WO0601588 to replace the 'B' SW traveling screen.
- In 2008 the licensee initiated CR-08-00069 to document a review of intake cooling water blockage operational experience as a response to an industry report. An engineering technical work record, TWRGC10203 provided an station evaluation for the CR and noted in section 3.5 that all traveling screens are being replaced as necessary and that WO0601588 for the 'B' SW screen was in planning.
- In 2012 the licensee initiated CR-12-03887 to document that WO0601588 was inadvertently closed due to an incorrect routine run within the WO computer planning program. Consequently, WO1210303 was initiated to replace WO0601588.
- In 2014 the licensee closed out WO1210303 due to corresponding pump work taking longer than normal. An inspection was performed by divers who did not identify any problems. A new WO was not initiated for rebuild of the 'B' SW traveling screen.
- In 2015 following the identification of corroded holes in the 'B' screen guides, the licensee completed a temporary repair and initiated WO1508250 for future rebuild/replacement.

The inspectors reviewed a sampling of videos associated with the diver inspections of SW traveling screens and noted that the divers did not perform a complete survey of each screen guide by removing all of the corrosion buildup along the length of the guides.

The inspectors' review of the above documents determined that the licensee was prompt in initiating corrective action via WO0601588 to rebuild/replace the 'B' SW traveling screen following their observations of the corrosion damage on the 'A' and 'C' SW traveling screens. However, the inspectors concluded their corrective actions for and monitoring of 'B' SW traveling screen were ineffective to maintain adequate functionality. The enforcement aspects involving CR-15-03574 are discussed in Section 4OA7 of this report.

.4 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. This review considered the twelve-month period from January 2015 through December, 2015. 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. Findings

One licensee identified violation was identified as discussed in Section 4OA7 of this report. In general, the licensee has identified trends and has addressed the trends within their CAP. However, inspectors noted that Appendix R fire doors (FRA), including some doors functioning as steam propagation barriers (SPB), control room pressure boundaries (CRP) or CO₂ boundaries (CO₂), continue to have issues.

Specifically from January 2015 to December 2015, the inspectors identified the following CRs grouped into two categories: instances where the associated door was found open and instances where a door was declared non-functional/inoperable. Note that for the condition reports below, no roving fire watch or compensatory measure was in place prior to discovering a door inoperable. In some instances, the doors were repaired immediately in lieu of a roving fire watch.

A similar trend was previously discussed in inspection reports 05000395/2013004, 05000395/2012005 and 05000395/2011005. The licensee previously initiated CR-13-04356 to monitor this trend; however the inspectors note that CR-13-04356 is now closed. The table below includes DRAB/319 which was found open by the resident inspectors; this issue has already been dispositioned as a Green NCV, 05000395/2015002-01, Failure to Maintain Fire door/Steam Propagation Barrier in Accordance with the Fire Protection Program Procedure.

Doors found open with no fire permit (doors not needing repairs):

Condition Report	Description	Door	Inoperable Function(s)
CR-15-00662	Door found unsecured by resident inspectors	DRAB/319	SPB,FRA
CR-15-01015	Door held open by trash can	DRSW/302	FRA
CR-15-01546	Door held open by multiple cords	DRSW/203	FRA
CR-15-02078	Door alarmed and was found unsecure	DRAB/514	SPB,FRA
CR-15-04950	Door found open with no fire permit	DRIB/314	FRA

Doors declared non-functional/inoperable needing repairs:

Condition Report	Description	Door	Inoperable Function(s)
CR-15-00436	Door will not latch under its own power	DRIB/409	FRA
CR-15-02198	Door latching intermittently	DRIB/408	FRA
CR-15-02207	Door has broken closure arm	DRAB/304A	FRA
CR-15-04320	Door will not latch under its own power	DRIB/318	FRA
CR-15-04529	Door will not latch under its own power	DRIB/313	FRA
CR-15-04853	Door leaf very hard to close or open	DRCB/302	SPB, FRA

CR-15-05068	Door not latching properly	DRCB/517	CRP, FRA
CR-15-05132	Door latch broken	DRAB/319	SPB, FRA
CR-15-05389	Door handle pulling away from door skin	DRAB/303A	SPB
CR-15-05994	Door not closing under its own power	DRIB/313	FRA
CR-15-06046	Door not closing under its own power	DRIB/318	FRA
CR-15-06166	Door sticking	DRCB/501	SPB, FRA
CR-15-06312	Door not closing under its own power	DRIB/313	FRA
CR-15-06357	Door not properly latching	DRCB/304	CO ₂
CR-15-06565	Door latch sticking	DRCB/517	CRP, FRA

40A3 Event Followup

(Closed) LER 05000395/2015-001-00: Reactor Building Spray Isolation Valve Failure Renders Train of Reactor Building Spray Inoperable

On March 17, 2015, a past operability evaluation conducted by the licensee concluded that XVG3005A-SP, 'A' train reactor building spray pump containment sump suction isolation valve, was inoperable due to failure to fully stroke open during a surveillance test. The licensee entered the problem into their CAP as CR-15-00541. The inspectors conducted a review of this CR including a previous, related CR-14-06439. The enforcement aspects are documented in Section 40A2.2 of this report. This LER is closed.

40A6 Meetings, Including Exit

On January 21, 2016, the resident inspectors presented the integrated inspection report results to Mr. T. 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.

40A7 Licensee-Identified Violations

The following violations of very low safety significance (Green) were identified by the licensee and are violations of NRC requirements which meet the criteria of Section 2.3.2 of the NRC Enforcement Policy for characterization as an NCV:

- 10 CFR 50, Appendix B, Criterion XVI states in part that conditions adverse to quality shall be promptly identified and corrected. Contrary to this, on August 4, 2015, the licensee discovered degradation of the 'B' SW intake screen allowing the introduction of fish into the 'B' SW pump bay. The licensee had initiated WO0601588 in 2006 to repair/rebuild the screen but failed to correct. A review of IMC0609, Appendix A, determined the finding was of very low safety significance (Green) because the finding was not a design deficiency and it did not result in a loss of function. The licensee has documented this problem in their CAP as CR-15-03574.
- V.C. Summer Nuclear Station TS 6.8.1 states in part that procedures shall be implemented for the Fire Protection Program. Contrary to the above, on March 3, 2015, April 7, 2015, October 10, 2015, and October 11, 2015, the licensee failed to implement Fire Protection Program (FPP) procedure, FPP-25, "Fire Containment," Revision 4H, in that required fire protection permits were not obtained while Appendix R fire doors were left open without being manned. Specifically, Appendix

R fire door DRSW/302 was found blocked open by a trash can on March 3, 2015, Appendix R fire door DRSW/203 was found blocked open by multiple cords on April 7, 2015, and Appendix R fire door DRIB/314 was found open on October 10, 2015 and again on October 11, 2015. The inspectors used IMC 0609, Appendix F, Attachment 1, to determine that the finding was of very low safety significance (Green) because smoke or heat detection was present in all adjacent fire areas. Further, since plant personnel would be alerted in the event of a fire and the doors could then be closed, equipment required for safe shutdown would not be impacted. Fire door DRSW/302 was closed upon discovery, while fire permits and fire watches were required for DRSW/203 and DRIB/314 to support ongoing plant maintenance. The CRs for doors DRSW/302, DRSW/203 and DRIB/314 being found open are CR-15-01015, CR-15-01546 and CR-15-04950 respectively.

ATTACHMENT: SUPPLEMENTARY INFORMATION

SUPPLEMENTARY INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

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M. Coleman, Manager, Health Physics and Safety Services
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R. Fogle, Supervisor, Radwaste
D. Edwards, Supervisor, Operations
J. Garza, Supervisor, Nuclear Licensing
T. Gatlin, Vice President, Nuclear Operations
L. Harris, Manager, Quality Systems
R. Haselden, General Manager, Organizational / Development Effectiveness
R. Justice, Manager, Nuclear Operations
G. Lippard, General Manager, Nuclear Plant Operations
R. Mike, Manager, Chemistry Services
M. Moore, Supervisor, Nuclear Licensing
D. Perez, Supervisor, Dosimetry/Technical Support
S. Reese, Licensing Specialist
J. Rinehart, Health Physics Supervisor
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 Services
S. Zarandi, General Manager, Nuclear Support Services

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000395/2015004-01 URI Departure from NFPA 80-1973 for Replacement Fire Doors.

Closed

05000395/2015001-00 LER Reactor Building Spray Isolation Valve Renders Train of Reactor Building Spray Inoperable (Section 4OA3)

Opened and Closed

05000395/2015004-02 NCV Failure to Accomplish Procedure for Diagnostic Testing Resulting in Valve Failures (Section 4OA2.2)

LIST OF DOCUMENTS REVIEWED

Section 1R04: Equipment Alignment

Procedures

SOP-306, Emergency Diesel Generator, Rev. 19D

SOP-112, Safety Injection System, Rev. 18G

SOP-211, Emergency Feedwater System, Rev 14E

Section 1R05: Fire Protection

Procedures

STP-128.022, FPER Related Fire System Visual Inspection, Rev 8B

STP-128.325, Heat Detector Functional Test, Rev 1

STP-728.015, Fire Hose Stations Valve Flow Check, Hose Hydrostatic Pressure Test and Visual Inspection, Rev 5

STP-728.020, Reactor Building Fire Barrier Inspection, Rev 5B

Work Orders

WO1412322-001, RB Fire Hose Inspections

WO1412323-001, Perform RB fire penetration inspection

WO1500832-001-5, RB fire hose hydrostatic testing

WO1510467-001, Replace hose reel in RB

Section 1R06: Flood Protection Measures

Work Orders for RHR Pump area sump level switch calibrations/repairs

WO1104871

WO1108490

WO1404036

WO1406956

WO1503318

Work Orders for Safety-Related Manhole 1&2 Inspections

WO1507624, EMH-1WO1507625, EMH-2

Section 1R08: Inservice Inspection Activities**Procedures:**

GQP-9.6, PCI Energy Services Visual Examination of Welds, Rev. 14
 GQP-9.7, PCI Energy Services: Solvent Removable Liquid Penetrant Examination and Acceptance Standards for Welds, Base Materials, and Cladding (50° - 125° F), Rev. 16
 MRS-SSP-2913, Westinghouse: Reactor Vessel Head Thermocouple/Spare/CRDM Penetration Repair at V.C. Summer Unit 1, Rev. 1
 WDI-STD-1041, Wesdyne: Reactor Vessel Head Penetration Ultrasonic Examination Analysis, Rev. 10
 SAP-1100, V.C. Summer Nuclear Station, Nuclear Operations, Station Administrative Procedure, Boric Acid Corrosion Control Program, Rev. 2
 PSEG-19, V.C. Summer Nuclear Station, Plant Support Engineering, Plant Support Engineering Guide, Boric Acid Corrosion Evaluation, Rev. 1

Drawings:

1099E34, Reactor Vessel Support Hardware, Rev. 4
 E-511-219, VC Summer Reactor Building, Pipe Sleeve and Liner Plate, Rev. 9
 IMS-07-057 Sht. 1, Reactor Vessel Supports, Rev. 13
 IMS-07-057 Sht. 2, Reactor Vessel Supports, Rev. 1

Self-Assessments:

SA14-PE-04, Boric Acid Program, 9/15/2014

Work Orders/Work Requests:

WO 1502268-033, Install 3 Inch FLEX Piping and valve XVA09750-SF to exiting 3-inch Piping System, 10/12/2015
 WO 1404556-001, Seal Injection Header Flow Bypass Valve XVT08389-CS Shop Welds, 10/13/2015
 WO 1511896-001, Reactor Vessel Support VT-3, "A" Hot Leg, 11/6/2015
 WO 1511895-001, Reactor Vessel Support VT-3, "B" Hot Leg, 11/6/2015
 WO 1511897-001, Reactor Vessel Support VT-3, "C" Cold Leg, 11/6/2015
 WO 1511897-001, Reactor Vessel Support VT-3, "C" Hot Leg, 11/6/2015

Calculations:

DC0311E-013, Primary Shield Wall – Anchor Assembly Reactor Vessel Support (GC), 11/19/1993

Corrective Action Documents:

CR-14-01930, Special Interest Flaws Identified in CRDM Penetration Welds, dated 4/14/2014
 CR-15-04864, Reactor Building Moisture Barrier, Augmented Inspection, 10/7/2015
 CR-15-04843, QC Identified White Residue, "C" Hot Leg Sand Box Area, 10/7/2015
 CR-15-0509, XVT08389-CS Seal Injection Header Flow Bypass Valve weld indication, 10/15/2015
 CR-15-05024, (NRC Identified) Boric Acid Leak, Test Connection on Safety Injection Valve XVT08879-SI, 10/14/2015
 CR-15-05025, (NRC Identified) Boric Acid Leak, Test Connection Isolation Valve Safety Injection Valve XVT08879C-SI, 10/14/2015
 CR-15-05081, NRC Identified concern for white residue on the bottom of the insulation package of the pressurizer heater nozzles, 10/16/2015
 CR-15-05183, NRC Identified concern on the source of the water being directed by drip catch in "C" Loop Hot Leg Nozzle area, 10/15/2015

NDE Examiner Qualifications:

Acuren Certification of NDT Qualification: PT (Bradford), dated 4/17/2014
 Acuren Certification of NDT Qualification: PT (Sipe), dated 4/2/2014
 Acuren Vision Acuity Examination Record (Bradford), dated 4/3/2014
 Acuren Vision Acuity Examination Record (Sipe), dated 3/10/2014
 Curtiss Wright Flow Control Company Personnel Certification: PT (Block), dated 1/2/2015
 Wesdyne Certificate of Qualification: UT (Atcheson), dated 7/30/2015
 Wesdyne Certificate of Qualification: UT (Svensson), dated 9/9/2015
 Westinghouse Vision Acuity Examination Record (Atcheson), dated 6/19/2015
 Westinghouse Vision Acuity Examination Record (Svensson), dated 9/3/2015

Other Documents:

430, PCI Energy Services Procedure Qualification Report, dated 7/24/1995
 677, PCI Energy Services Procedure Qualification Report, dated 9/18/2013
 8-43 RVHP-OV, PCI Energy Services ASME Section IX Welding Procedure Specification, Rev. 8
 864, PCI Energy Services Procedure Qualification Report, dated 3/24/2010
 906761-001, PCI Energy Services Report of Nondestructive Examination: PT (RVH at Pen. 22), dated 4/26/2014
 906761-006, PCI Energy Services Report of Nondestructive Examination: PT (Pen. 22), dated 4/26/2014
 CGE1-R22-CP02-23-01, Wesdyne Ultrasonic Report Data Sheet (Pen. 23), dated 10/15/2015
 CGE1-R22-CP02-27-01, Wesdyne Ultrasonic Report Data Sheet (Pen. 27), dated 10/13/2015
 CGE1-R22-CP02-33-01, Wesdyne Ultrasonic Report Data Sheet (Pen. 33), dated 10/13/2015
 CGE1-R22-CP02-61-01, Wesdyne Ultrasonic Report Data Sheet (Pen. 61), dated 10/16/2015
 OSP-501, Attachment 1, WO 1404556-001 Liquid Penetrant Inspection Report, dated 10/16/2015
 SCE&G, Welder Performance Qualification Record for Symbol SI-1, 2/15/2015
 SCE&G, Welder Performance Qualification Record for Symbol SI-4, 6/9/2015
 SCE&G, Welder Performance Qualification Record for Symbol SI-12, 7/24/2015
 SCE&G, Welder Performance Qualification Record for Symbol SI-24, 8/14/2015
 SCE&G, Welder Qualification Printout, for Welders ID # RPG 3, thru RPG-7, 10/7/2015
 WDI-PJ F-1310544-FSR-01, Unit-1, R-21 Inservice Inspection Final Report, May 2014

Section 1R20: Refueling Outage and Other Outage ActivitiesProcedures

GOP-1, Recovery from Refueling and Return to Mode 5
 GOP-2, Plant Startup and Heatup
 GOP-3, Reactor Startup from Hot Standby to Startup
 GOP-6, Plant Shutdown from Hot Standby to Cold Shutdown
 GOP-7, Core Refueling
 OAP-108.4, Operations Outage Control of Containment Penetrations
 SSP-004, Outage Safety Review Guidelines
 AOP-115.1.04A, RHR Pump Vortexing
 AOP-115.03.03B, Loss of RHR With the RCS Intact
 AOP-115.04.02A, Loss of RHR While Refueling
 AOP-115.5.05A, Loss of RHR With the RCS Not Intact (Mode 5 and 6)

EO-6, RHR Operations
 OAP-108.4, Operations Outage Control of Containment Penetration
 SAP-0152, Fatigue Management and Work Hour Limits
 SAP-1013, Fitness For Duty Program

CRs

CR-15-05053, Fatigue rule issue involving early arrival due to travel information
 CR-15-05058, Fatigue rule issue for employee based on pre-outage/outage work
 CR-15-05090, Fatigue rule issue for Westinghouse employee
 CR-15-04915, NRC identified issue regarding an EFW rotated pipe support
 CR-15-04916, NRC identified issue regarding damaged coating on EFW piping
 CR-15-05373, Penetrations exceed performance limits but less than acceptance criteria
 CR-15-05305, NRC ISI inspector questioned effectiveness of past BACC inspections due to white residue on pressurizer bottom head
 CR-15-05940, During WO package review Xerox copies of data sheets were discovered
 CR-15-05786, RB Scaffolding touching plant equipment
 CR-15-04979, During review of tendon test, average value of end forces did not meet average liftoff force

Section 2RS1: Radiological Hazard Assessment and Exposure Controls

Procedures, Guidance Documents, and Manuals

Guidance (informal), Requirements for the inspection of Gang Boxes and Lockers, undated
 HPP-0152, Radiation Control Area Access Control, Rev. 11, Change C
 HPP-0401.001, Planning and Maintaining RWPs, Rev. 0, Change E
 HPP-0401.003, Performing RWP Pre Job Briefings, Rev. 2
 HPP-0401.002, Creating, Revising and Terminating RWPs Utilizing Sentinel, Rev. 1, Change A
 HPP-0403, Radiological Controls for Nuclear Work Activities, Rev. 12, Change F
 HPP-0408, Fuel Movement Control, Rev. 9, Change C
 HPP-0808, Sample Analysis, Rev. 15
 VCS- HPP-0151, Use of the Radiation Work Permit, Rev. 0
 VCS-HPP-0160.001, Control and Posting of Radiation Control Zones, Rev. 0, Change C
 VCS-HPP-0160.002, Control and Posting of Locked High Radiation and Very High Radiation Areas, Rev. 0, Change A
 VCS-HPP-0303, Airborne Activity Sampling Techniques, Rev. 0
 VCS-HPP-0410, Health Physics Routine Surveys, Rev. 0
 VCS-HPP-0704, Radioactive Source Inventory and Accountability, Rev. 0
 VCS-HPP-0155, Control of Airborne Radiation Exposure (DAC-Hrs), Rev. 0

Records and Data

Calibration Certificate, AMS-4 S/N 1752, 6/15/15
 Excel Spreadsheet, Master List of Gang Boxes and Lockers within the RCA, 5/9/2015
 Excel Spreadsheet, PCM, SAM-11, and PM-7 Alarm Setpoints, undated
 Health Physics Radwaste 5 Year Plan 2015-2020, Rev. 0
 Health Physics Technical Work Record, TWR#: 6.2-14-001, PM-7 Internal Sensitivity, 3/13/14
 Health Physics Surveillance Task Listing, Outage Agenda [Database List], undated
 Health Physics Daily Job Listing, 10/6/2015

HPSS Administrative Instruction No. 14-002, Fuel Cycle 22 Alpha Characterization, 11/10/2014
 HPP-0649, Attachment I, Small Articles Monitor Calibration Report, SAM-11 S/N 335, 9/4/15
 HPP-0654, Attachment I, RTM860TS Personnel Contamination Monitor Calibration Certificate,
 S/N 835, 7/8/15
 Radiological Survey Maps of U1 Containment – Initial Entry Survey, 10/3/2015
 RWP 15-04202, Incore Pit Entries/Activities, Rev. 2
 RWP-15-03107, Reactor Vessel Head Repair, Rev.0
 RWP-15-04004, Seal Table / Incore Thimble Activities, Rev. 0
 RWP-15-04201, Higher Risk Refueling Activities RF-22, Rev. 0
 RWP-15-04600, Reactor Coolant Pump Activities RF22, Rev. 0
 Spent Fuel Pool Inventory and Map, 9/14/15
 Technical Support Document No. 14-066, Neutron Dosimetry Evaluation at Virgil C. Summer
 Nuclear Station, 6/29/2014, Rev. 0
 Technical Work Record (TWR), TWR#: 6.2-14-001, PM-7 Internal Sensitivity, 2/20/13
 U.S. NRC, National Source Tracking System, Annual Inventory Reconciliation Report, License
 ID 5766, Dated 01/12/15
 VCS-HPP-0620, Attachment I, Contamination Monitor Calibration Certificate, PCM-1B S/N
 1079, 10/1/15
 VCS-HPP-0648, Attachment I, PM-7 Calibration Data Sheet, PM-7 S/N 551, 8/20/15
 VCS-HPP-0704 Enclosure A, Source Issue Log, for the period 8/5 – 10/8/2015
 VCS-HPP-0704 Enclosure D, Source Inventory Sheet Unit 1, 6/9/2015
 VCS-HPP-0704 Attachment IV, Leak Test Report, [multiple records], 4/15/2015 and 6/9/2015
 Vendor Leak Test Certification Records, [multiple records], 6/26/2015
 2103 DAW 10CFR61 Analysis, 2/21/13
 2104 DAW 10CFR61 Analysis, 9/15/14

Corrective Action Program (CAP) Documents

CR-14-02639
 CR-14-02662
 CR-14-02877
 CR-14-03509
 CR-14-04225
 CR-14-06550
 CR-15-00077
 CR-15-00906
 CR-15-01033
 CR-15-01697
 CR-15-02937
 CR-15-02938
 CR-15-03192
 CR-15-04303
 SAP-0999, Corrective Action Program, Rev. 13, Change A

LIST OF ACRONYMS

AB	Auxiliary Building
ADAMS	Agency Document Access and Management System
ASME	American Society of Mechanical Engineers
BACCP	Boric Acid Corrosion Control Program
CAP	Corrective Action Program
CB	Control Building
CFR	Code of Federal Regulations
CR	Condition Report
CRP	Control Room Pressure Boundaries
CY	Calendar Year
ECCS	Emergency Core Cooling System
ECR	Engineering Change Request
ED	Electronic Dosimeter
EDG	Emergency Diesel Generator
EMH	Electrical Manhole
ES	Engineering Services Procedure
FMA	Failure Mode Analysis
FPP	Fire Protection Program
FRA	Appendix R Fire Doors
GL	Generic Letter
GTP	General Test Procedure
HRA	High Radiation Area
IB	Intermediate Building
IMC	Inspection Manual Chapter
INPO	Institute of Nuclear Power Operations
IP	Inspection Procedure
IR	Inspection Report
ISI	Inservice Inspection Program
LER	Licensee Event Report
LHRA	Locked High Radiation Area
MOV	Motor Operated Valve
MOVAT	Motor Operator Valve Actuator Testing
MDEFW	Motor Driven Emergency Feedwater
MR	Maintenance Rule
MSPI	Mitigating System Performance Index
NCV	Non-Cited Violation
NDE	Non-Destructive Examination
NEI	Nuclear Energy Institute
NFPA	National Fire Protection Association
NPF	Nuclear Power Facility
NRC	Nuclear Regulatory Commission
NUREG	Nuclear Regulatory
OAP	Operations Administrative Procedure
OOS	Out of Service
PARS	Publicly Available Records System
PD	Performance Deficiency
PI	Performance Indicator
PM	Preventative Maintenance
PMT	Post-Maintenance Testing

PT	Penetrant Test
PWR	Pressurized-Water Reactor
RB	Reactor Building
RCA	Radiologically Controlled Area
RCS	Reactor Coolant System
REV.	Revision
RF21	Refueling Outage Spring 2014
RF22	Refueling Outage Fall 2015
RG	Regulatory Guide
RHR	Residual Heat Removal
RP	Radiation Protection
RTP	Rated Thermal Power
RWST	Refueling Water Storage Tank
SAP	Station Administrative Procedure
SCE&G	South Carolina Electric & Gas
SDP	Significance Determination Process
SF	Spent Fuel
SFP	Spent Fuel Pool
SI	Safety Injection
SOP	System Operating Procedure
SP	Spray
SPB	Steam Propagation Barriers
SSC	Structure, System, and Components
STP	Surveillance Test Procedure
SW	Service Water
TS	Technical Specification
U1	Unit 1
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
VHRA	Very High Radiation Area
VUHP	Vessel Upper Head Penetration
WANO	World Association of Nuclear Operators
WO	Work Order